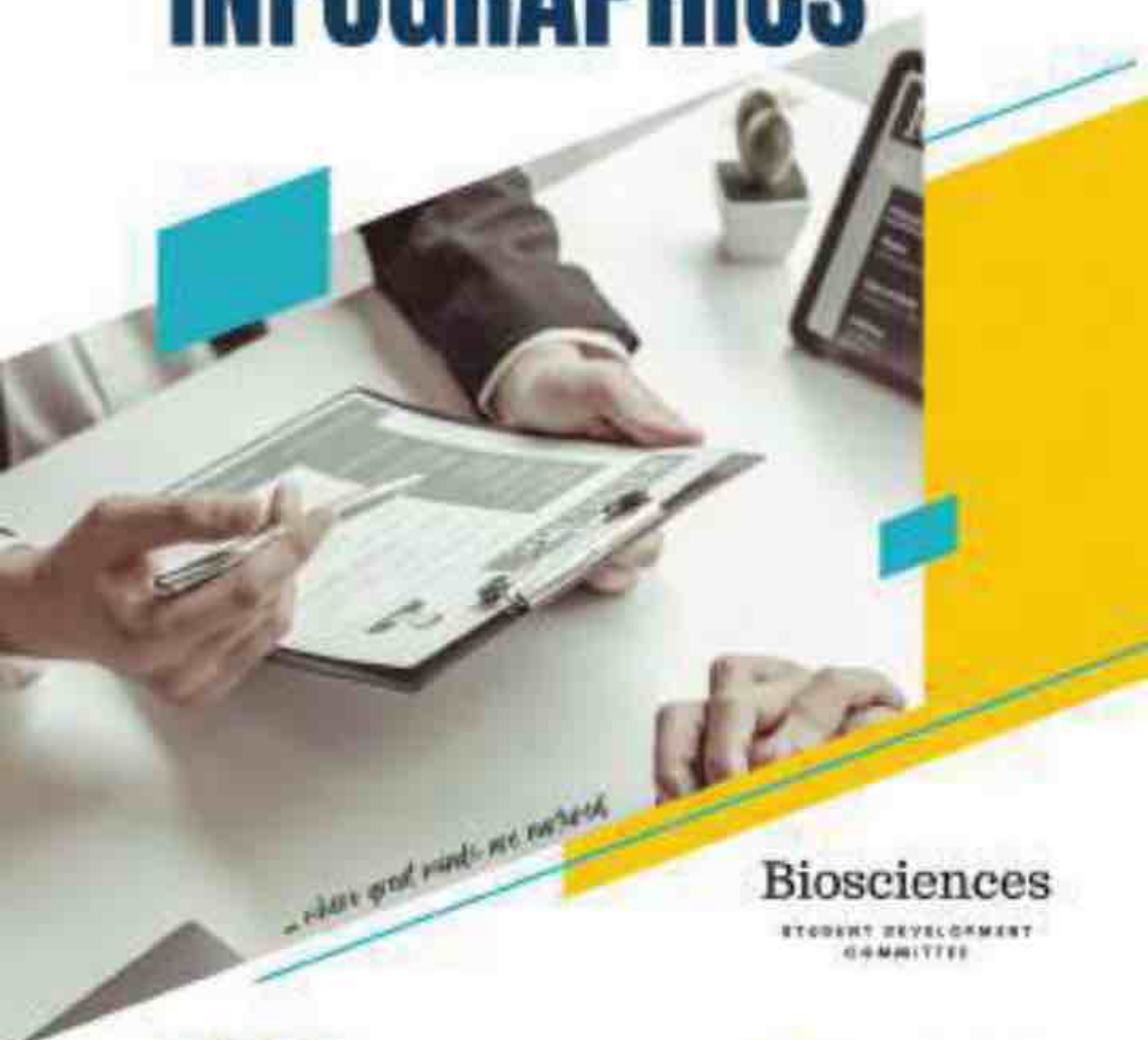


INTERNSHIP INFOGRAPHICS



where great minds are nurtured

Biosciences

STUDENT DEVELOPMENT
COMMITTEE

2021

BSCB- BACHELOR OF SCIENCE (BIOLOGY)
BSCC- BACHELOR OF SCIENCE (INDUSTRIAL BIOLOGY)



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Johor

MALAYSIA

<https://science.utm.my/Interny/>

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INDUSTRIAL TRAINING INFOGRAPHICS

**3 SSCB
BSc. Industrial Biology**

**Department of
Biosciences,
Faculty of Science
UTM Skudai.**

2020/2021-3

COMPILED BY:
DR. NURASHIKIN IHSAN



JOHOR

**ECO BEE SHOP
SDN. BHD.**

SMBU 3915

INDUSTRIAL TRAINING

12 July 2021 - 30 September 2021

Company



ECO BEE SHOP Sdn Bhd
79, JALAN LAGENDA 4
LAGENDA INDUSTRIAL
PARK 81000 KULAI JOHOR

Gas Chromatography

Objective:

- To determine the ethanol content in propolis samples

Procedure:

- Weighed 0.1g propolis sample
- Pipetted 250µL of acetone solvent
- Mixed well and evenly
- Switched on GC and open the software
- Changed to correct method
- Injected samples
- Results obtained

HPLC

Objective:

- To separate, identify and quantify propolis components dissolved in a liquid solvent with a high analytical resolution.

Procedure:

- Sample preparation
- Solvent preparation (eg: 2% acetic acid...)
- Switch on HPLC
- Select Direct Function and Systemprep
- Select Direct Function > Wet Prime > Flow rate: 7ml/min > Time: 2 mins > OK
- Ready for acquisition

TOTAL PHENOLIC CONTENT TEST (TPC)

Objective:

- To determine the total phenolic content in propolis samples which is important for antioxidant activity.

Procedure:

- Sample and solvent preparation
- Add 1ml Folin-Ciocalteu reagent
- Add 5ml 1M sodium carbonate
- Top up distilled water
- Incubated at dark room for 1 hour
- Measured the absorbance at 760nm

MANUFACTURING GINGER MEAD

Procedure:

- Washed and cut ginger into smaller pieces
- Put into blender to get ginger juices
- Boiled the fresh ginger juices at 120°C
- Cooldown to 40°C
- Homogenize honey with ginger juices
- Concentrated the ginger mead produced
- Filled into bottles for sales
- Dried the ginger residue to make ginger powder



PROPOLIS FORMULATION

Procedure:

- Using 70% ethanol for sterilization
- Solvent preparation (2L propylene glycol, 400ml Labrasol....et)
- Mixed solvent with propolis
- Filling into bottles for sales



PROJECT DEVELOPMENT TIMELINES

No	Experiment	Duration of Implementing Experiment		
		NOV	DEC	JAN
1.	Media preparation: Yeast (Glucose Chloramphenicol) (YCC) Medium	✓		
2.	Media Preparation: Yeast Peptone Glucose Agar (YPGA)	✓		
3.	Media Preparation: YPD Broth Media	✓		

BUILDING A SMALL MICROBIOLOGY LAB

Based on my project requirements, I found out that the biological microscope, laminar flow, autoclave, incubator, and a small refrigerator are all necessary equipment. In order to purchase appropriate equipment, I searched for more information about the specification of the equipment during the first few weeks. In order to build up a small and cost-saving microbiology laboratory at ECO BEE SHOP, I requested equipment quotations from different well-known suppliers such as Biobase, Olabo, Hirayama, and UOP company.





JOHOR

**GNOSIS LAB (M)
SDN. BHD.**

INTERNSHIP AT **gnosis** Laboratories

Gnosis Laboratories (M) Sdn Bhd is a medical laboratory company which began operation in year 2002 was jointly created by Lezen Reference Laboratories and local medical laboratory professionals.

Gnosis Laboratories work with physicians, hospitals and other healthcare providers to help deliver better outcomes in patient care.

MAIN ACTIVITIES

PRE-ANALYTICAL PHASE

- Sample preparation
- Sample labelling
- Centrifugation



JOB SCOPE

1. Conduct medical laboratory test
2. Understanding the purpose and procedures for each test
3. Analyze data and interpret result
4. Work as a team to finish task

URINE FULL AND MICROSCOPIC EXAMINATION (UFEME)

Analysis of urine specimen using biochemical methods as well as examination of a sample using a microscope.



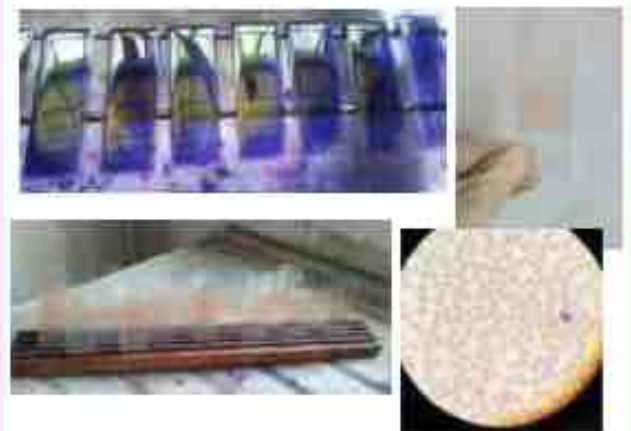
FULL BLOOD COUNT (FBC)

A test used to assess a patient's overall health by an evaluation of the red blood cells, white blood cells, hemoglobin, and platelets.



PERIPHERAL BLOOD SMEAR & LEISHMAN STAIN

Generally used to differentiate between and identify red blood cells, white blood cells, malaria parasites, and trypanosomas.



ERYTHROCYTE SEDIMENTATION RATE (ESR)

A clinical test that serving as an index for marking the presence of inflammation.



FECAL OCCULT BLOOD (FOB)

Test that is used to determine if there is excess blood in the digestive tract.



INFOGRAPHIC BY

Nurul Shazleen Natasha binti Mohd Miskam
A18SC0465 . 990413016920



JOHOR

MYCO₂ (JB)

SDN. BHD.

INTERNSHIP – MY CO2 (JB) SDN BHD



MY CO2 (JB) Sdn Bhd

15, Jalan Molek 1/8, Taman Molek,
81100 Johor Bahru, Johor, Malaysia.

Tel: 07-3558811

Fax: 07-3559808



Company Background

MY CO2 is an award-winning independent laboratory, playing a neutral role in providing high-quality analytical testing services. Currently operating in Perai (Penang), Shah Alam (Selangor) and Johor Bahru (Johor). Capable of performing chemical, microbiology, nucleic acid and physical analyses for petrochemical, industrial, consumer and pharmaceutical products. Also specialise in the following categories: air pollutants, feed, health care, industrial products, iron ore, noise, oil, radiation, toys and water. Apartment testing also offers industrial hygiene assessment and environmental monitoring services.

Lab Skills & Instrumentation



Spread plate



Pour plate



Streak plate



Pipetting



Water bath



Autoclave



Membrane Filtration



Hotplate & Stirrer



Electronic balance



Dispenser



pH meter



Incubator

Reflection



Laboratory Skills



Time management



Documentation Skills

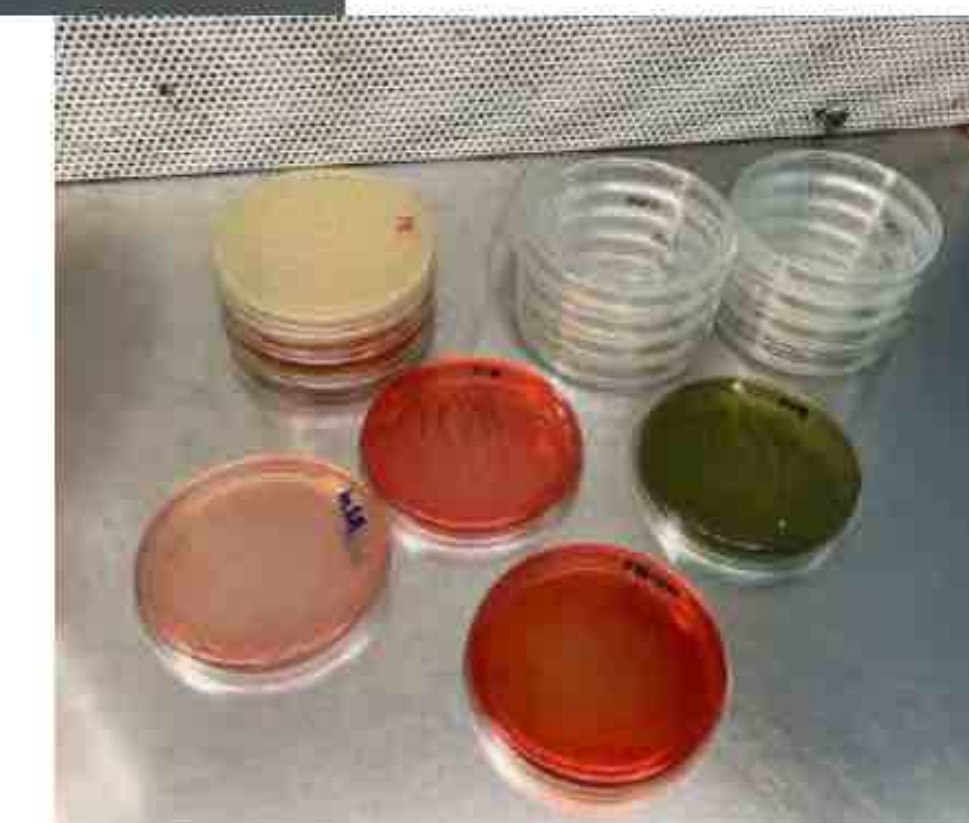


Communication Skills

Microbiology Department

Task

- Media preparation
- Sample preparation
- Microbial testing with different parameter for water samples, food samples, pharmaceutical and herbs
- Confirmation test
- Incubating
- Daily housekeeping
- Documentation
- WFH on duty task- preparing formal report



DAILY REPORT
TITLE
ISO 17025
NAME
CHEONG JING NING

Supervision

Prepared by:
CHEONG JING NING A18SC0385 (3SSCB)



Faculty Supervisor
Ts. Dr. Wan Rosmiza Zana Bt Wan Dagang



Industrial Supervisor
Dr Woo Fong Yen



JOHOR

**ONE LAB TESTING
SDN. BHD.**

INDUSTRIAL TRAINING



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Name: Lee See Ting

Matric No.: A18SC0405

Industry Sv.: Mr. Chong Zhen Yee

Faculty Sv.: Dr Khairunadwa Binti Jemon

Onelab Testing Sdn Bhd

- An MS ISO 17035:2017 accredited laboratory
- performs chemical and microbiological analyses and tests for third parties
- divided into 2 departments: chemical lab & microbiological lab

Type of Samples tested:

- Food & feeds
- Water
- Swab samples
- Cosmetics
- Personal care product
- Pharmaceutical products
- Miscellaneous

• My main tasks are assisting my supervisor in the microbiological laboratory

• I also help in the chemistry laboratory

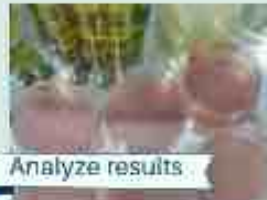
1 day Working On-Site

receive samples from customers and conduct testing experiments based on FDA BAM

Daily tasks:



Prepare medium



Analyze results



Testing experiment



Cleaning

4 days Working from Home

real work assignments or questions related to the bioscience workplace to solve

Reading FDA BAM chapters such as:

- coliforms and E. coli
- Salmonella
- Staphylococcus aureus

Discussions among supervisor and trainee about our findings

Solving questions such as:

- What are the difference between Laminar Flow and Biological Safety Cabinet?
- Why certain media cannot be autoclaved? How to sterilize other than autoclave?

What I learned from industrial training

Knowledge

basic microbiology knowledge, understanding of the industry of commercial testing, legal regulations on microbiological acceptance limits, latest technology in microbiological testing

Technical skills

laboratory skills, techniques using tools, and lab safety.

Soft skills

communication skills, team-working skills, critical thinking skills, time management skills, and professional ethics.



|| No 10A, Jalan Tanjong 2, Taman Desa Cemerlang, 81800 ||
07-861 6783

|| Industry Supervisor : Mr Chong Zhen Yee
Faculty Supervisor : Dr. Khairunadwa bt Jemon

ONELAB TESTING SDN BHD

- An ISO 17025:2017 accredited laboratory that conduct chemical & microbiological analysis that according to customer requirements.
- Assist customer to comply government regulations and export regulations.

CORE TESTING

|| Food & Feed Chemical Analysis

- Heavy metal
- Preservative

|| Microbiological Analysis

- TPC
- Yeast & Mould Count
- Total coliform count
- E.coli, Pseudomonas

|| Environment Monitoring

- Air quality
- Microbiological
- Hygiene

|| Water & Waste Water Analysis

|| Pharmaceutical Product/Analysis

1. What is the difference between mycotoxins and antibiotics
2. What is the difference between endotoxin and exotoxin
3. Find out what effluent is used in pharmaceutical and cosmetic testing



WORK FROM HOME

1. Home task
2. Searching
3. Discussion
4. Self-learning



WORK ON SITE

1. Prepare medium
2. Testing experiment
 - Yeast / mould
 - TPC
 - Salmonella
 - E.coli
3. Analyze result
4. Clean lab apparatus

Internship schedule

Partial = Work from home + work on site

- 4 / 5 days WFH
- 1 day work on site
- 12th July 2021 until 30th September 2021

TECHNICAL SKILLS

- Lab skills & knowledge
- Technique handling lab apparatus
- Exposed to lab safety & precaution

SOFT SKILLS

- Effective communication
- Problem-solving
- Teamworking
- Professional ethics practice



JOHOR

**PRISMA LABORATORY (M)
SDN. BHD.**



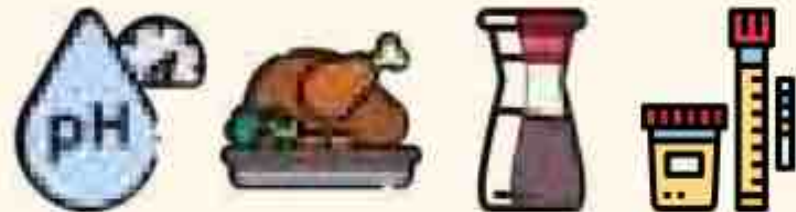
Introduction: Prisma Laboratory was Founded in Johor Bahru and incorporated in 2014. They specialise in analytical lab testing services and environmental monitoring services. The company strives for excellence with ISO/IEC 17025 Accredited laboratories, cutting edge equipment at the height of the industry, and over a decade of experience.



Job scope: Lab analysis, lab maintenance and housekeeping, administrative tasks, documentation, handling samples, media and digital marketing



Ameera Rahaman
A18SC0501 / 3SSCB



Samples analysed



Industrial Supervisor:
Satiyavani A/P Suppiah
micro@prisma-lab.com.my
Faculty Supervisor:
Dr Huszalina Binti Hussin
huzsalina@utm.my



Method Extraction

<p>Bacteriological Analytical Manual (BAM)</p> <p>Food Sample Microbiological Testing</p>	<p>Official Methods of Analysis</p> <p>ADAC Food Testing Methods</p>	<p>Standard Methods</p> <p>APHA (Chemical/Microbiological)</p>
--	---	---

Safety in the Laboratory

<p>Prisma Laboratory (M) Sdn Bhd SAFETY IN THE LABORATORY</p>	<p>SAFETY RULES</p>	<p>EMERGENCY SAFETY</p>	<p>HOW TO WASH YOUR HANDS</p>
--	----------------------------	--------------------------------	--------------------------------------



JOHOR

**UNIVERSITI TUN HUSSEIN
ONN (UTM)**

**FACULTY OF APPLIED SCIENCE AND
TECHNOLOGY**

SMBU 3915

INDUSTRIAL TRAINING

11 JULY - 30 SEP

PUA LEI WEN A18SC0467

Industry's Supervisor: PROF. MADYA Dr. ALONA CUEVAS LINATOC
Faculty's Supervisor: DR. RAIHANA BINTI RIDZUAN



Faculty of Applied Science and Technology, UTHM

- Founded in 2017
- Three departments: Physics & Chemistry, Mathematics & Statistics, Technology & Natural Resources.

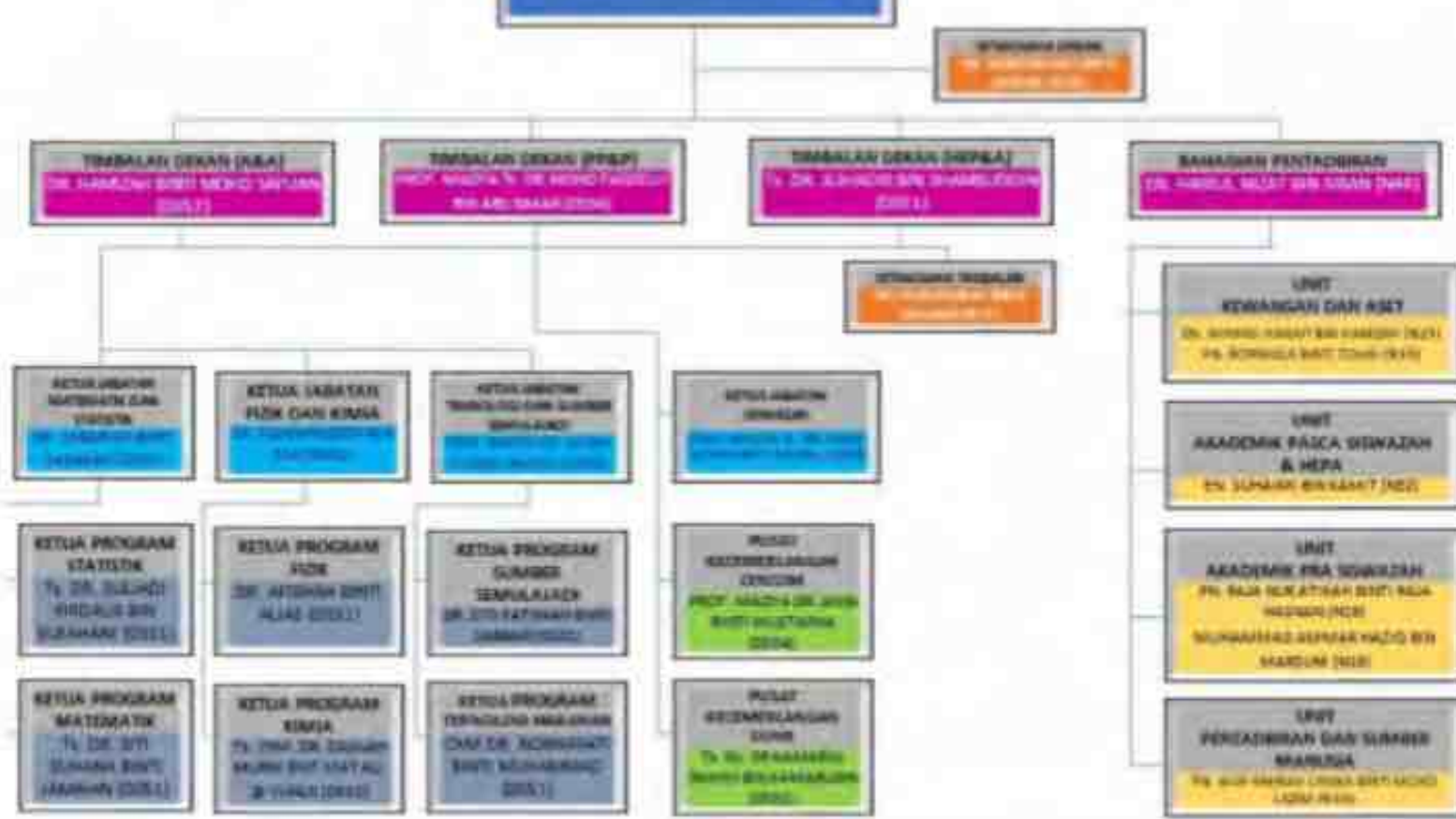
Mision

Educate and produce professionals in the field of applied sciences and technology that are efficient and sound through holistic and balanced academic and research programs

Vision

Committed to excellence in learning, teaching, and research in applied sciences and technology towards sustainable development

Organization Structure



Supervisor



PROF. MADYA Dr. ALONA CUEVAS LINATOC

Field of Expertise

Field Category : NATURAL RESOURCES
Field : Biodiversity

Areas of Research Interest

1. Ecophysiology and climate change
2. Plant diversity
3. Medicinal plants and traditional knowledge
4. Botany and systematics
5. Plant physiology

My Job Scope



Computer based work that can hardness the computer skill, communication skill as well as being more independent



Information Collecting and Summary



Graphic Design



Information Collecting and Summary

Searching

From various scientific database, official website and news.

Filtering

Read and filter out the valid informations that match to the title.

Summarizing

Arrange the information into the table or paragraph

The Title

- The biodiversity in Endau-Rompin National Park, Johor
- The latest trend about biodiversity and its conservation
- The effects of COVID-19 pandemic to the environment
- Environmental problems or natural disaster that are thought to be caused by global warming and climate change since 2015 until now
- The sustainable use of bioresources in Green Economy
- The latest data on tourism in Malaysia
- The Social Dilemma
- Malaysia's initiatives toward achieving the 17 sustainable development goals
- Disease outbreaks that are known to originate from biodiversity
- Policy on environment in Malaysia
- AUAP member university
- Biodiversity that is native and/or endemic to
- river ecosystems in Johor and the problems being faced



Some of the academic search engines i used

The informations were summarized



Graphic Design

Arranging

Arrange the informations into a suitable layout that are clear and easy to read for reader.

Decorating

Decorate the graphic to become more attractive and eye catching based on its purpose.



The infographic created

New and improved skills

Read through information from several journals, official website, news help to broaden my knowledge and providing me with a broad range of reliable website for informations.

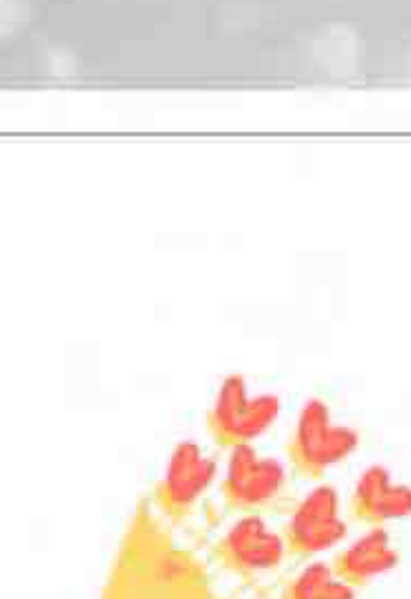
Professional communications

Professional communication via electronic device such as email and whatsapp

What I Learnt

Working independently

Able to work self-sufficiently on assigned tasks with less supervision.



Thank You



SCAN ME



PRODUCT STATUS

- Physicochemical analysis
- Nutritional analysis
- Heavy metal and mineral analysis
- Shelf life testing

BENEFITS



Improve nutritional value



Natural sweetener & additive



No heavy metals detected



Increase product shelf life



Enhance consumer energy



Edible for human consumption



Figure 1: The prototype of Ready – To – Drink Agarwood Hydrosol

PRODUCT DESCRIPTION

INTELLECTUAL PROPERTY



JOHOR

**UNIVERSITITUN HUSSEIN
ONN (UTHM)**

**MICROELECTRICS &
NANOTECHNOLOGY-SAMSUDIN
RESEARCH CENTRE**

Microelectronics & Nanotechnology - Shamsuddin Research Centre

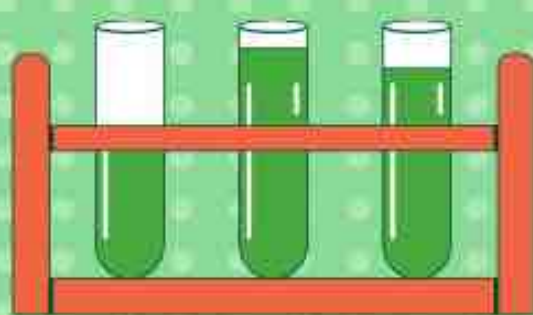
July-October 2021

Introductions: On 11th July 2021, me, Patrick Ng Soon Chait from Faculty of Science, Biology major has undergo industrial training at Microelectronics & Nanotechnology - Shamsuddin Research Centre, Batu Pahat, Johor for 12 weeks. I have been assigned to finish a research project regarding computational fluid dynamic under supervision of Dr. Soon Chin Fhong. Dr. Rahaina evaluated at week 12 via online.

Job Scope 1

Research paper reading

- microfluidic device introduction and application
- paper that discuss about the properties and mixing of laminar flow fluid
- simulation of fluid dynamic related paper
- relationship between dynamic viscosity, pressure, velocity and mixing condition of two fluids



Job Scope 2

Computational simulation of fluid dynamic

- important skills that have been learnt
- wide variety of application even in biological field such as design of bioreactor, biosensor in medical and agricultural field and also simulation of organ activities that can be used in education and research.
- watch a lot of video and go through user's manual to understand how to operate simulation software COMSOL Multiphysics

Job Scope 3

Attend talk

- an important part of my internship as it able me to expose to different kind of knowledge from different field
- including ISO lecture, a SIRIM talk, Jimmy M.'s resume talk, data analysis in IR 4.0 by Dr Tan Chin Kong, a workshop on the process of cell culture, a talk about 3D printing, and a talk about the process of cell culture and talk that discuss about IR 4.0.

Job Scope 4

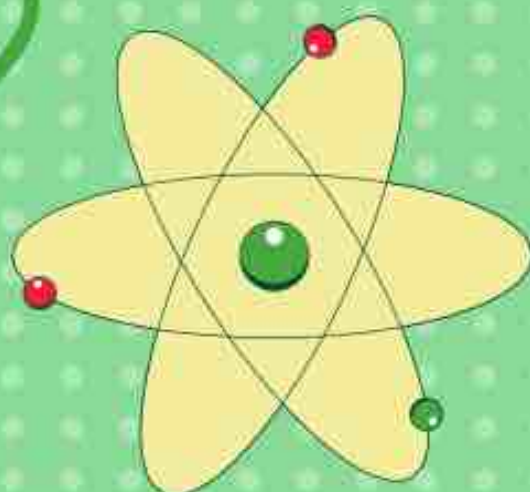
Paper writing

- writing paper to record and analyzed the simulation results
- the variable is dynamic viscosity and pressure, velocity and mixing condition of fluid have been evaluated

Job Scope 5

Video making and data processing

- finding CAS number of chemical, filter article paper related with specific topic in excel, copy chemical name to excel
- record video of simulation in COMSOL Multiphysics



PREPARED BY:

PATRICK NG SOON CHAIT A18SC0466 SSCB FS



KELANTAN

**VETERINARY
LABORATORY
EASTERN ZONE**

Seksyen Latihan

MAKMAL VETERINAR ZON
 TIMUR (KELANTAN)
 Jalan Sultan Yahya Petra,
 Kampung Chabang Pasir Kubang
 Kerian, 16510 Kota Bharu,
 Kelantan

Seksyen Pendaftaran



Proses penerimaan sampel, menyemak borang, dan mengedpos sampel.

Seksyen Kesihatan Awan Veterinar (KAV)

Sampel yang dihantar untuk menguji tahap kebersihan (ujian bakteriologi)



Seksyen Parasitologi dan Serologi

Ujian di Makmal Parasitologi ialah McMaster / Floatation Method untuk mengesan kehadiran telur cacing di dalam sampel tinja. Ujian *thin blood smear* juga dilaksanakan untuk mengesan kehadiran parasit didalam darah. Di Makmal Serologi pula, ujian ELISA dilaksanakan



Contoh penyakit yang diuji adalah Lumpy Skin Disease (LSD), Avian Influenza (AI), dan Newcastle Disease (ND). Bagi sampel diagnostik yang memerlukan keputusan yang cepat ujian PCR dilaksanakan. Manakala untuk kes surveillance, ujian haemagglutination (HA) dan haemagglutination inhibition (HI) dilaksanakan.

Seksyen Bakteriologi dan Media

Bertujuan untuk mengesan spesies bakteria yang membawa penyakit kepada haiwan, jenis ujian yang dilaksanakan sepanjang tempoh penempatan saya di seksyen ini adalah ujian *routine culture* (RC), ujian *isolation of Salmonella*, dan *biochemical test*. Makmal Media pula dikhususkan untuk penyediaan media

Seksyen Virologi Avian dan Mamalia



Seksyen Patologi



Seksyen Patologi terbahagi kepada dua jenis ujian iaitu ujian histopatologi dan ujian bedah siasat. Ujian histopatologi menggunakan sampel organ dalam formalin, ujian ini dilaksanakan untuk melihat *abnormalities* pada sel. Manakala ujian bedah siasat menerima sampel bangkai haiwan, ujian ini dilaksanakan untuk mengenalpasti punca kematian haiwan.

Seksyen Foot-and-Mouth Disease (FMD)



Contoh sampel ialah serum, probang, *epithelium*, darah, organ, dan swab. Sepanjang tempoh saya berada di seksyen ini terdapat tiga jenis ujian yang sempat saya pelajari iaitu ujian *virus isolation* (VI), *reverse transcriptase PCR* (RT-PCR), dan ujian *non-structural protein* (NSP) FMDV.



MELAKA

**MELAKA BIOTECHNOLOGY
CORPORATION**



MALAYSIA
Melaka Biotechnology
Corporation



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

HANNAH NADIAH BINTI ZULKEFLI

3SSCB

A18SC0393

INTERNSHIP: 12 JULY 2021-1 OCTOBER 2021

INDUSTRIAL SUPERVISOR: PUAN FARHANA

FACULTY SUPERVISOR: DR HUSZALINA



MELAKA BIOTECHNOLOGY CORPORATION

LOT 7, MITC CITY, HANG TUAH JAYA,
AYER KEROH, MELAKA 75450 MELAKA CITY,
MELAKA, MALAYSIA

PHONE: 06-231 3622



About Company:

Establish in February 2003, is an initiative of the Melaka State Government to promote scientific based in Melaka. The division has grown into Melaka Biotechnology Corporation (MBC) which was incorporated on January, 1st 2005

Job Scope

Microbiology Lab

- Food testing
- Pharmaceutical testing
- Water testing
- Swab surface

Diagnostic Lab

- RT-PCR



Experiences:

- Able to handle RT-PCR for Covid-19 swab sample
- Learn how to use RT-PCR machines and interpreting data
- Improving social skills, communication skills and lab skills
- Make new friends
- Learn on applying theories with real situation





UTM
UNIVERSITI TEKNOLOGI MALAYSIA



Located in MITC, Melaka, Melaka Biotechnology Corporation is a multimillionaires' company that provides laboratories services such as for pharmaceutical, cosmetic, traditional medicine, medical devices, and environmental industries. MBC established in 2005.

ADDRESS:

Melaka Biotechnology Corporation
Lot 7 MITC City,
75450 Ayer Keroh, Melaka



Job Scope:
Product Testing Pharma & Food (Microbiology Laboratory)
Covid 19 Diagnosis / RT-PCR (Diagnostic Laboratory)

Experience

Product testing such as Total Yeast Mold Count, Aerobic Plate Count, Effectiveness test. Opportunity to perform RT-PCR, any others advance instruments.



Email: info@mib.gov.my
Tel: +606 231 3622
Fax: +606 231 3276

IMRAN QASHFI BIN ISMAIL A18SC0398



ADDRESS:

Malaka State Farming
Cooperative
LOT 1417, C-1/1
75421 Ayer Kuning,
Malaka

CONTACT:

06711049611@gmail.com
Tel: +601 333 2028
Tel: +601 333 2029

Company's background:

Established in February 2013, it was initiated by the Malaka State Government to promote agriculture, named as Malaka. The director has gone back Malaka State Farming Cooperative (MSFC) which was incorporated on January, 1st 2003



Job scopes:

- Conducting Food testing
- Pharmaceutical testing
- Water testing
- Surface swab
- Diagnosing for COVID-19 samples

New experiences:

- Handling COVID-19 swab test
- Working in a laboratory using PPE uniform
- Conducting many microbial test for pharmaceutical and industry purposes

From

06711049611@gmail.com

Faculty of Agriculture

91700 Kuala Kangsar, Perak 08000

Industry Supervisor

Phone No: 06711049611





PERAK

**PERAK VETERINARY
RESEARCH INSTITUTE**



Nurul Sakinah binti
Mohd Zaini
SSCB
A18SCO464

 **Veterinary Research Institute,
59, Jalan Sutan Azlan Shah,
31400 Ipoh, Perak.**

 **+605 5457166**

Industrial Supervisor: Mr. Faizul Fikri bin Mohd Yusop

**Faculty Supervisor:
Prof. Fahrul Huyop**



ABOUT COMPANY

VRI, Ipoh is the premier research division of the Department of Veterinary Services, Ministry of Agriculture and agro-based industry (MOA), Malaysia. It provides leadership in research into animal health and diseases of economic and zoonotic importance and serves as the national animal health reference centre to all regional veterinary laboratories, universities and research Institutions in this country. VRI is the national reference centre for Nipah virus infection and avian influenza. R & D in animal health is the major activity of VRI. Special emphasis is given to diseases of livestock of economic and public health (zoonotic) importance.

Established in 1948, it also spearheads research and development of novel vaccines and biologicals for veterinary use. VRI develops and conducts an array of tests in the investigation and diagnosis of specific animal diseases of multiple aetiologies. Diagnostic services are provided by the various sections of the Institute, such as Bacteriology, Avian and Mammalian Virology, Pathology, Parasitology and Haematology, Epidemiology and Immunology.

JOB SCOPE (VIROLOGY AVIAN SECTION)

The Virology Avian Section offers diagnostic services for avian diseases. This section offer diagnostic services for diseases such as Highly Pathogenic Avian Influenza (HPAI), Newcastle Disease (ND), Infectious Bursal Disease (IBD), Infectious Bronchitis Virus (IB), Avian Leukosis Virus, Egg Drop Syndrome, Parvovirus, Fowl Pox Virus, Swollen Head Syndrome (SHS), Infectious Laryngotracheitis Virus (ILT).

The major activities include diagnostic methods such as Haemagglutination Test (HA), Haemagglutination Inhibition Test (HI), embryonated eggs inoculation, Indirect Fluorescent Antibody Test (IFAT), Agar Gel Precipitation Test (AGPT) and molecular methods such as Polymerase Chain Reaction (PCR), Reverse Transcriptase-PCR (RT-PCR), Real-Time PCR (RRT-PCR), virus sequencing.



EXPERIENCES

- Learn on how Veterinary Research Institute works.
- Learn about different methods to run the tests in virology avian section.
- How to receive and process samples to do diagnostic tests.
- Use apparatus and equipment to test the samples.
- Learn the techniques, theories and have hands-on experience in molecular and serological tests.

PULAU PINANG

**AUSTRALIAN LABORATORY
SERVICES (ALS)
TECHNICHEM (M) SDN. BHD.**

Food testing



Microbiological Testing

- Aerobic Plate Count
- E. Coli
- Coliform

Pathogen Detection

- Yeast & Molds
- Salmonella
- Staphylococcus aureus
- Listeria monocytogenes

GMP

Good manufacturing practice

A system for ensuring that products are consistently produced and controlled according to quality standards.



- Has Standard Operating Procedures (SOPs)
- Enforce / Implement SOPs and work instructions.
- Document procedures and processes.



2021 INTERNSHIP PRESENTATION

TAN ZEN DONG (A18SC0487)

SUPERVISOR: MISS LEE SU ANN
CO. SUPERVISOR: MR. MATHAN KALIMUTHU

GMP

Good manufacturing practice

A system for ensuring that products are consistently produced and controlled according to quality standards.



- Validate the effectiveness of SOPs.
- Design and use working systems.
- Maintain systems, facilities, and equipment.



- AUSTRALIAN LABORATORY SERVICES
 - Has more than 40 years of services worldwide
- VISION
 - maintaining the strong and sustainable growth strategies
 - rewarding partnerships

Things that I've learned from this internship:

- New and improved skills
- Working independently
- Workplace culture

QUALITATIVE TESTING

- To detect the presence of a certain microbes within the sample
 - Can be performed for:
 - Salmonella
 - Listeria monocytogenes



QUANTITATIVE TESTING

- To detect the level of a certain microbes within the sample
 - Can be performed for:
 - Aerobic Plate Count
 - Staphylococcus aureus
 - Yeast & mould
 - E. Coli
 - Coliform





PULAU PINANG

**EUROFINS NM
LABORATORY SDN. BHD.**

YEOH SHIR LING A18SC0495

SMBU 3915 INDUSTRIAL TRAINING

12 July 2021 – 30 September 2021
(12 Weeks)

Company

Eurofins NM Laboratory Sdn. Bhd.
(Headquarters)
Bandar Perda, Bukit Mertajam,
Penang



Housekeeping

Wash glassware, sanitize, sweep, wipe and mop floor with 70% IPA. After lab work, clean and arrange the agar plates and apparatus to the corresponding area. Sanitizes handles and tables of each room by using 70% IPA before leaving.

Disposing Samples

- Agar plates** • Use Mode 3 for disposing and discarding agar plates.
- Other samples** • Remove the code number of each samples after recording on the list provided. Dispose after further checking by permanent staff.

Media Preparation

1. Calculate the volume of powder and distilled water needed, transfer the media into respective containers by using flexipump.
2. Autoclave the media by using mode 3
3. Store the media in water bath after autoclaving.

Documentation

- Record and arrange the following documents in the respective file.**
 - Result Sheets,
 - Media Preparation Logbook,
 - Autoclave Logbook,
 - Sterilize Assessment Logbook,
 - Glassware pH Testing Logbook,
 - Stock Calculation.

Plating Methods

- 1. Labelling**
- 2. Streak plate**
Streaked over the agar surface by using sterilize inoculating loops.
- 3. Pour plate**
Molten agar is poured, mixed well by moving the petri dish in clockwise and anticlockwise direction and let it solidify.
- 4. Spread plate**
Spread in the circular motion until dry by using spreader.

Most Probable Number (MPN) Method

- Using LST broth**
- Example: 100X Dilution**
Transfer 1ml of sample to Peptone water (PW) 0.1%, then pipette 1ml from PW 0.1% to each 5 tubes of LST and incubated for 24 h at 35°C. If there is any positive result (cloudy) in LST, transfer it to Tryptone water for Indole test. Positive result of indole test, red colour ring will be observed.

Membrane Filtration Technique (MFT)

- 6 parameters**
 - **Total coliform, Escherichia coli (EC)**
Membrane placed onto m-ENDO agar.
 - **Fecal Streptococci (Fs)**
Membrane placed onto ME agar.
 - **Clostridium perfringens (Cp)**
Membrane placed onto TSC.
 - **Pseudomonas aeruginosa (Pa)**
Membrane placed onto m-PAC.
 - **Sulphite reducing anaerobes**
Membrane with 0.22 µm pore size placed onto TSC(X).

Follow-up Testing

- FD samples**
 - Salmonella (Sal)
- DG samples**
 - Bile tolerant gram-negative bacteria
 - E. coli (EC)
 - Salmonella (Sal)
 - Pseudomonas aeruginosa (Pa)
 - Staphylococcus aureus (Sa)
 - Burkholderia cepacian (Burk)
- WA samples**

Conclusion

The knowledge that I gained from this industrial training are the microbiology practical laboratory work and skills. Besides, I have the chance to hands-on in daily laboratory routine works



PULAU PINANG

**UNIVERSITI SAINS
MALAYSIA (USM) PENANG**

**ADVANCED MEDICAL AND DENTISTRY
INSTITUTE (AMDI)**

INTRODUCTION

AMDI was established with novel and unconventional approaches that lead to the development of cutting-edge advanced research, innovative postgraduate programmes in the areas of medicine, dentistry and health sciences and tertiary healthcare services. Clusters have been set up by AMDI to spearhead the academic and research activities in the area of Lifestyle Sciences, Oncological & Radiological Sciences, Regenerative Medicine, Infectomics, Integrative Medicine and Craniofacial & Biomaterial Sciences.

JOB SCOPE

- RESEARCH
- MEDICAL
- IMMUNOLOGY
- PRIMARY IMMUNODEFICIENCY
- ARTICLE WRITING

RESEARCH



Good researchers and writers examine their sources critically and actively. They do not just compile and summarize these research sources in their writing, but use them to create their own ideas, theories, and, ultimately, their own, new understanding of the topic they are researching

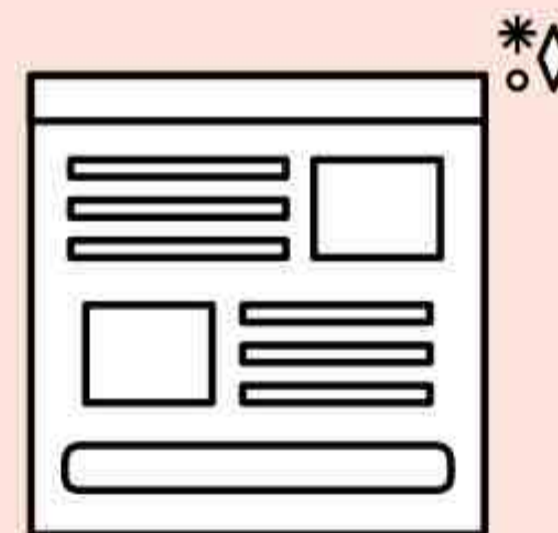
INTERNSHIP EXPERIENCE

IMPROVE WRITING SKILLS



Dealing with writing task unlocked many new writing skills which obviously will helped me in my future working experience in research and thesis.

PUBLISHING EXPERIENCE



Throughout this training, I got the opportunity to publish the articles that have been written to Dewan Kosmik in the Science section. This enable to deliver my message on the importance of public awareness on science-related field. Also, I get to share my knowledge to the publics.



CONTACT DETAILS:

Institut Perubatan & Pergigian Termaju
(Advanced Medical & Dental Institute)
Universiti Sains Malaysia
Bertam 13200 Kepala Batas
Pulau Pinang Malaysia
PHONE NO: 04 562 2888

SUPERVISOR DETAILS:

SUPERVISOR NAME: DR. INTAN JULIANA BINTI ABD HAMID

INTERNSHIP JOURNEY AT INTEGRATIVE MEDICINE CLUSTER, ADVANCED MEDICAL & DENTAL INSTITUTE, USM

NUR NADHRAH MOHD SALIM
A18SC0447
BSC. INDUSTRIAL BIOLOGY

Training Information

UTM Supervisor:

Dr. Nur Izzati Mohd Noh

AMD I Supervisor:

Dr. Nozlana Abdul Samad

Placement:

Cluster of Integrative Medicine, Advanced Medical & Dental Institute, Universiti Sains Malaysia, Bertam 13200 Kepala Batas, Pulau Pinang

Mode:

Work-From-Home

Training Duration:

12/7/2021 - 1/10/2021

Internship Project

Project:

Narrative Review

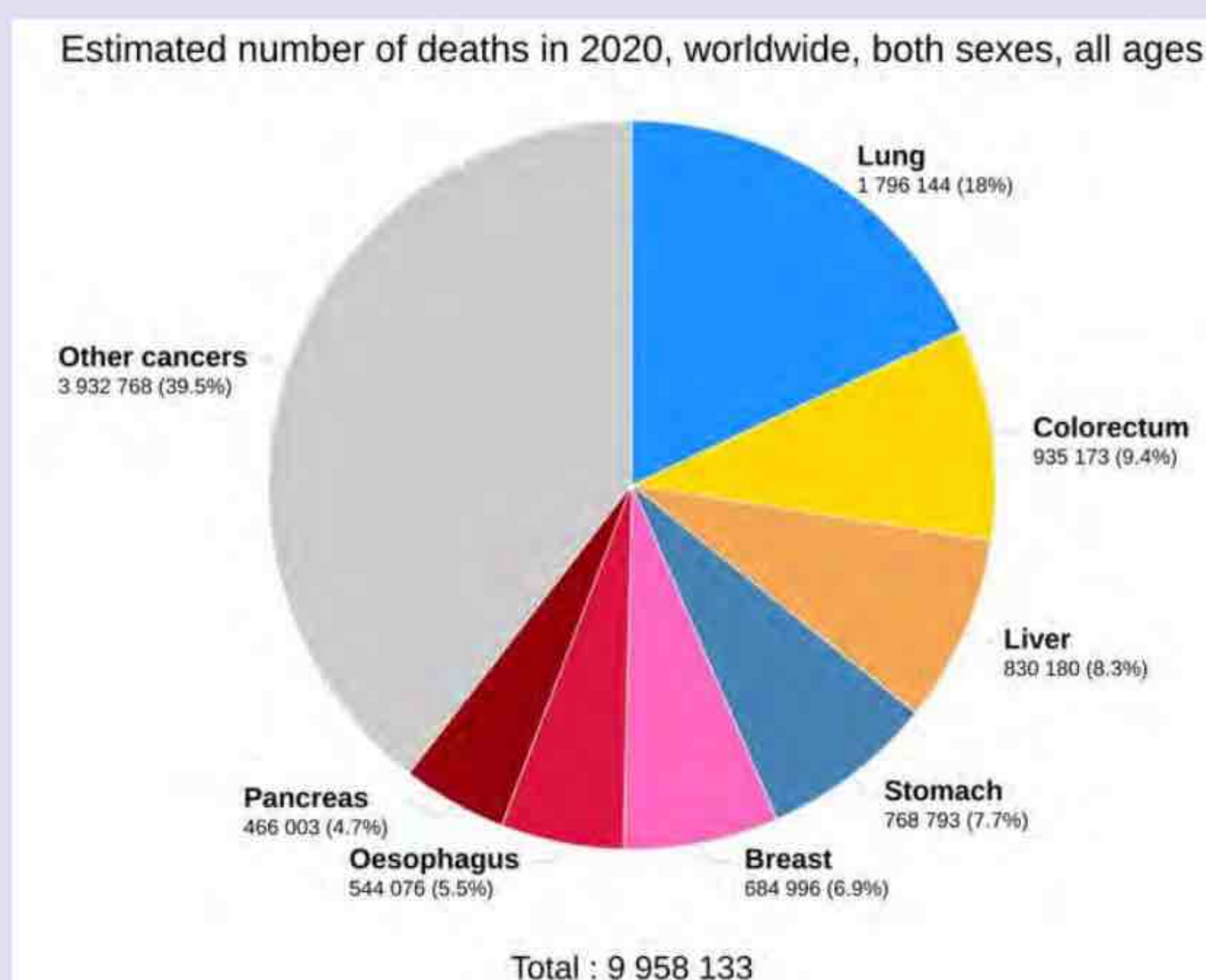
Title: Mitochondrial Metabolism Therapeutic Targeting in Hepatocarcinoma

Format & Publisher:

Malaysia Journal of Medicine & Health Sciences (MJMHS)

01 Introduction

Hepatocellular carcinoma (HCC) is the third common cause of cancer mortality worldwide with the risk factors include infection of hepatitis B virus, hepatitis C virus, hepatitis D virus, alcohol-related cirrhosis, poor lifestyle. Moreover, with biosynthetic, bioenergetic and signalling function, mitochondria also play pivotal role in reactive oxygen species (ROS) generation which are closely related in cell death regulation. Mitochondrial dysfunction induces development of liver cancer through tumorigenesis, metastasis and stemness. Thus, the advance understanding in HCC tumor biology and its interrelation with mitochondrial metabolism, it could be a promising target for HCC anticancer therapy



02 Problem Statement

HCC is a chemo-resistant tumour and conventional cytotoxic chemotherapy has yet to come up with preventive benefit, thus, poor survival rate in patients with advanced HCC. So far, only Sorafenib that successfully helps to prolong HCC patients survival for couple of months. Thus, more research are needed in developing HCC anticancer therapy.

03 Main Objective

Updates on the recent relevant contributions focusing on mitochondrial-metabolism while identifying needed research to ease other researchers for future research and also providing better insight of the interrelation between mitochondrial-metabolism and HCC progression.

04 Method of Literature Search

1. Keywords listing & Thesaurus for synonyms

- Mitochondrial-metabolism
- Hepatocarcinoma
- Apoptosis

2. Search method (Boolean Operators method)

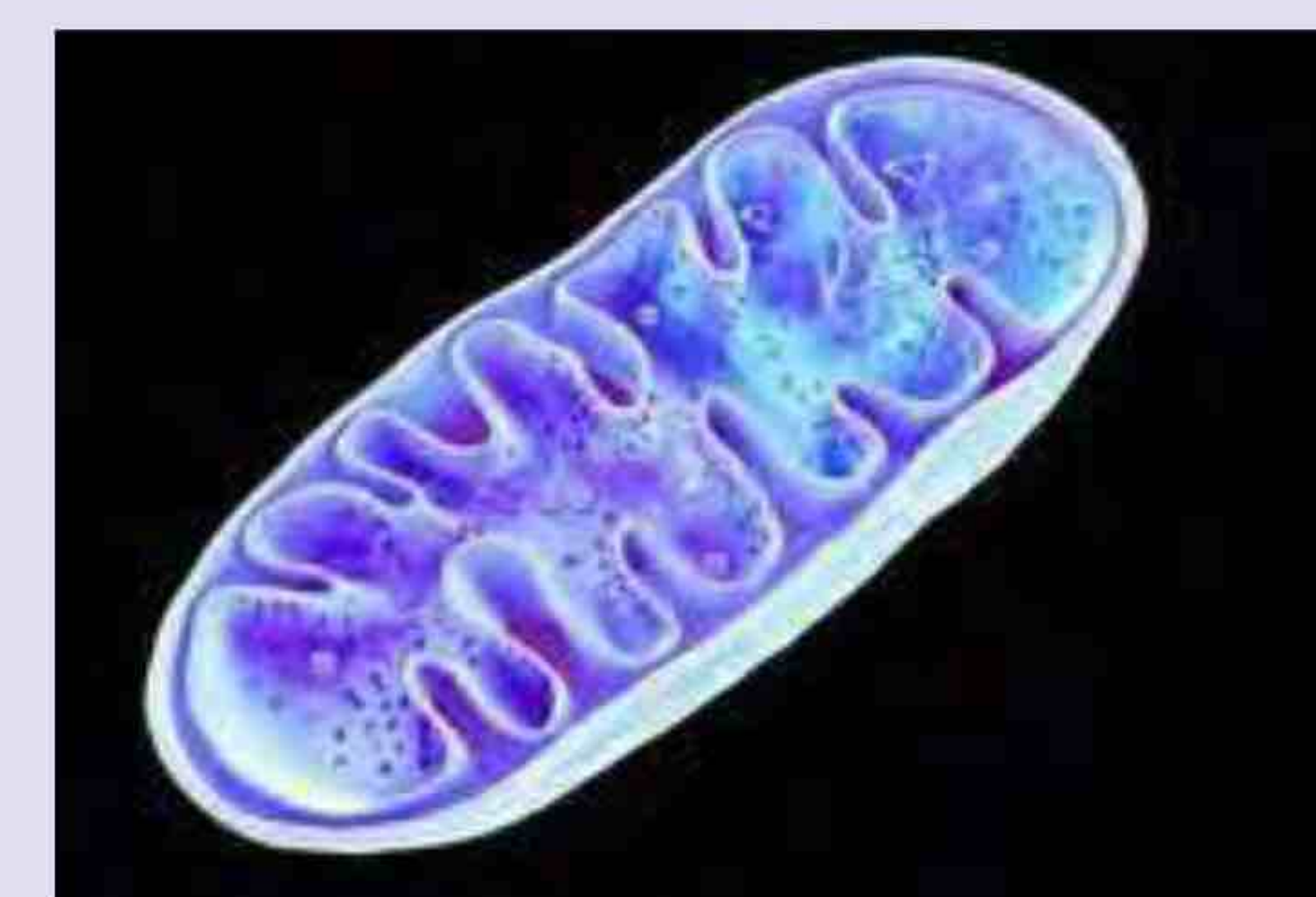
- AND
- OR
- QUOTATION MARKS ("")

3. Search engine & scientific database

- Google Scholar
- ScienceDirect
- PubMed

4. Article preferences

Prioritizing articles published over the last 10 years



References

- World Health Organization. International Agency for Research on Cancer. GLOBOCAN. Available from https://gco.iarc.fr/tomorrow/en/dataviz/isotype?years=2025&single_unit=50000&cancers=11
- Llovet JM, Kelley RK, Villanueva A, et al. Hepatocellular Carcinoma. Nature Reviews Disease Primers. 2012; 7:6.
- Jin T, Wang C, Tian Y, Dai C, Zhu Y, Xu F. Mitochondrial metabolic reprogramming: An important player in liver cancer progression. Cancer letters. 2020 Feb 1; 470:197-203.
- DeWaal D, Nogueira V, Terry AR, Patra KC, Jeon SM, Guzman G, et al. Hexokinase-2 depletion inhibits glycolysis and induces oxidative phosphorylation in hepatocellular carcinoma and sensitizes to metformin. Vol. 9, Nature Communications. 2018.
- Abdel-Wahab AF, Mahmoud W, Al-Harizy RM. Targeting glucose metabolism to suppress cancer progression: prospective of anti-glycolytic cancer therapy. Pharmacol Res [Internet]. 2019;150(August):104511. Available from: <https://doi.org/10.1016/j.phrs.2019.104511>
- Fabregat I. Dysregulation of apoptosis in hepatocellular carcinoma cells. Vol. 15, World Journal of Gastroenterology. 2009. p. 513-20.
- Min S, Wang HJ. Mitochondrial Defect in Hepatocellular Carcinoma Promotes an Aggressive Phenotype with Mitochondrial Defect in Hepatocellular Carcinoma Promotes an Aggressive Phenotype with Suppressed Immune Reaction. 2020;
- Wang W, Xie Q, Zhou X, Yao J, Zhu X, Huang P, et al. Mitofusin-2 triggers mitochondria Ca²⁺ influx from the endoplasmic reticulum to induce apoptosis in hepatocellular carcinoma cells. Cancer Lett. 2015;358(1):47-58.
- Tenen DG, Chai L, Tan JL. Metabolic alterations and vulnerabilities in hepatocellular carcinoma. 2021;9(August 2020):1-13.

05 Findings

Mitochondrial-metabolism therapeutic targets includes:

- Aerobic glycolysis
- Electron Transport Chain
- Tricarboxylic Acid Cycle
- Mitochondrial Calcium Signaling.
- Mitochondrial-mediated Apoptotic Pathway
- Mitochondrial Ribosome

06 Conclusion

Overwhelming current evidence also indicates that targeting altered mitochondrial function in HCC exerts potentially curative treatments result in excellent possibilities for early-prevention of HCC and also have provided a new direction for development of anti-HCC treatments.

07 Training Outcomes

- Improve writing skills which especially will benefit for thesis writing.
- Able to work efficiently and independently within a short period by successfully summarizing large number of articles.
- Gained new knowledge which is on cancer metabolism especially hepatocarcinoma.
- Enhanced self-discipline & determination in accomplishing task given.
- Able to work under minimal supervision with satisfying outcomes.
- Able to efficiently plan the review paper workflow.



Wan Nooranis Binti Wan Zaid

A18SC0491

Faculty supervisor: Dr Izzati Binti Mohd Noh



**Advanced Medical & Dental Institute,
Universiti Sains Malaysia,
13200, Bertam Kepala Batas,
Pulau Pinang**

Tel : +604 562 2888



**Industrial Supervisor: Dr Ahmed Suparno
Bahar Moni**

Job Scope



- 1) Writing Review Paper
 - Role of MMPs, ADAMTs and pro-MMPs in Osteoarthritis
- 2) Journal Club (JC) Session:
 - JC-1 (The role of Matrix Metalloproteinases in Osteoarthritis Pathogenesis)
 - JC-2 (Osteoarthritis Pathogenesis: A Review of Molecular Mechanism)
 - JC-3 (Matrix Metalloproteinase and Proinflammatory Cytokine Production by Chondrocytes of Human Osteoarthritic Cartilage)
- 3) Request for Product Quotation from Company
- 4) Observe the knee injection procedure

About Institute

AMDI has three main activities namely clinical services, collaborative research and post-graduates degree programmes. A clinical trial complex has been set up with clinical facilities and research laboratories to equip the needs of clinical services. AMDI is also a post graduate research institute specializing in selected medical and dental fields. It also plays a vital role in producing competent medical and dental specialists who, among others, are able to conduct clinical trials for patients in northern region of Malaysia, in the established Clinical Trial Centre.

Experience

- Learn on how to improve writing skills
- Learn on how to properly use reference manager
- Learn on how to write a review paper
- Learn on how to request product quotation from company
- Observed the knee injection





PULAU PINANG

**UNIVERSITI SAINS
MALAYSIA (USM) PENANG**

CENTRE FOR DRUG RESEARCH (CDR)

MASHITOH BINTI AHMAD

A18SC0409

11 JULY 2021-30 SEPTEMBER 2021
CENTRE FOR DRUG RESEARCH (CDR)



Introduction of CDR

Centre for Drug Research (CDR) was established in 1973 with the recommendation of the World Health Organization (WHO). Universiti Sains Malaysia was instructed by the Malaysian government to study the drug abuse problem then. The centre aims to be a leading centre in drug research, and its missions are to conduct relevant, innovative and quality research for advancing and disseminating new and useful knowledge to serve mankind. The centres research activities were placed under the Cabinet Committee on Drug Abuse Control also had collaborations with international bodies such as WHO.

MODE OF INTERNSHIP TRAINING

Due to the pandemic Covid -19 , my internship training conducted by using online platform such as Google meet & Cisco Webex . We had meeting and mini presentation once per week .

ACTIVITIES CONDUCTED BY CDR

- Journal Club CDR talked by Associate Prof .Dr.AbdulKarim Kanaan Jebna entitle ' Changing Landscape of Digital Technology Due to Covid-19'
- Webex meeting invitation entitle ' Fungsi Fisiologi dan Struktur Rintangan Darah Otak ' by Dr.Juzaili Azizi
- Journal Club CDR collaborate with Pantai Hospital talked by Ms Verona Lee via Webex meeting



INTERNSHIP PROJECT IN CDR

My supervisor proposed me to do mini thesis project with the title " The Importance of Herbal Active Compounds for Treatment in Neurodegenerative Diseases" .

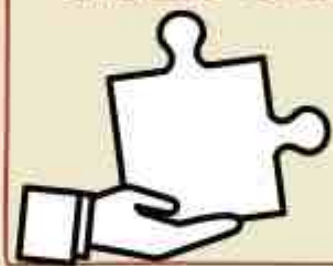
- Mind Mapping of my mini thesis
- Mini Presentation every week
- Report of my project



MIND MAP OF MY PROJECT



SKILLS USED IN MY INTERNSHIP TRAINING



- Communication Skills - used during virtual meeting in every week
- Computing Skills - used in writing content for my mini thesis
- Reading Skills - used in every day in order to get the information
- Time Management
- Typing speed



SUPERVISOR FACULTY
DR NOR AZIMAH BINTI MOHD ZAIN

MY INTERNSHIP JOURNEY

AT CDR,USM

Industry SV : Prof. Dr Sabariah
Ismail

Faculty SV : Dr. Nor Azimah Bt
Mohd Zain

Understanding the theory of
Pharmacokinetics & Herb-Drug
Interaction

Interaction

Week 1 - 2

Literature Review on
Phytochemical of Eurycoma
Longifolia

Week 3-4

Reviewing Papers regarding the
Pharmacokinetics of Eurycoma
Longifolia

Longifolia

Week 5 - 7

Review of the Herb-Drug
Interaction of Eurycoma
Longifolia

Week 8 - 9

Presentation & Preparation of
Mini-Thesis

Mini-Thesis

Week 10 - 12

Value/Skills Learned :

Independent

Time Management

Responsibility

Ability to Review Paper Critically

Ability to Locate Gaps In Research

Ability to Present Data in an Understandable Way.



PULAU PINANG

**UNIVERSITI SAINS
MALAYSIA (USM) PENANG**

**INSTITUTE FOR RESEARCH IN
MOLECULAR MEDICINE (INFORMM)**

INFORMMM , USM

SMBU 3915 : Industrial Training

Supervisor : Associate professor Dr. Choong Yee Siew

Intern : Tan Li Teng

Mode of internship : Virtual Internship



8 Tutorials

- Protein Modelling Part 1 and 2
- Protein Docking Part 1 and 2
- Protein Modelling - Case Study
- Molecular Docking Simulation Part 1 & 2
- Virtual Screening



2 Mini Projects

Project 1 : Inhibitor Bound Human Angiotensin Converting Enzyme-Related Carboxypeptidase (ACE2) towards 7999 ligands

Project 2 : SARS-CoV-2 spike receptor-binding domain bound with ACE2 towards 7999 ligands

Interpersonal Skill

- Communication skill
- Problem solving skill



Problem

Insufficient specification of laptop
Ligand file cannot be recognized by Autodock Vina

Solution

Perform laptop maintenance and solve according to the error shown in the command line.





SABAH

YSG BIOSCAPE SDN. BHD.

SMBU 3915

INDUSTRIAL TRAINING

12 JULY 2021 - 1 OCTOBER 2021

LOIS LO TZU HUI | A18SC0408

YSG Bioscape SDN BHD

- Known as the Plant Biotechnology Laboratory.
- Subsidiary company under the Yayasan Sabah Group.
- Specializes in the mass production of tissue culture.
- Large-scale plantation of teak (*Tectona grandis*) and Acacia hybrids.



Main Products

- Nursery Plant Collections
- Collectible Hybrid Orchids
- Tissue Culture plantlet

Media Preparation

1. First, stock solution of macronutrient, micronutrient, meta-nutrient, and Vitamin are prepared



2. Mix the stock solution mentioned in step 1 according to the list of composition

3. Then, bring the volume of the mix to desired level by adding distilled water

4. Add sucrose into the mix according to the amount listed in the list of composition



5. The pH of the mix is measured by using a pH meter. The pH is maintained at 5.70 by adding KOH or HCl



6. Pour agar into the mix then heat it by microwave



7. Once the agar is fully cooked, remove excess air bubbles from the media



8. Dispense 30mL of media into each flask using dispenser



9. After that, autoclave all the flasks containing fresh media at 121°C for 20 minutes

Teak Transfer (Subculture)

Species: *Tectona grandis*

1. Start using the culture area. Clean the working area (laminar flow) using 70% isopropyl alcohol or ethanol



2. To sterilize your metal equipment like forceps, sterilize your forceps in 100% ethanol then flamed with bunsen burner

3. Then using forceps, split the plant into smaller explants



4. Place the smaller explants into a new flask containing fresh media



5. At last, turn off the air-filter. Place the cultures in incubation room at temperature 25°C under light condition



Project: Micropropagation of African Mahogany

1 **MEDIUM PREPARATION**
Prepare MS medium (3% sucrose) and stock solution of PGRs. Medium's pH were adjusted at 5.7. Medium were autoclaved prior to use

2 **EXPLANT PREPARATION**
Explants (Shoot tips & nodal segments) are cut and collected from healthy African mahogany plant (*Khaya* spp.)

3 **SURFACE STERILIZATION**
Surface Sterilization of the explants with mercury chloride (HgCl₂) for 15 mins

4 **SHOOT PROLIFERATION**
Explants were placed in MS medium containing BA at different concentration (0.5, 1.0, 2.0, 3.0, 4.0, 5.0) (mg/L) for shoot induction

3 DAYS DARK INCUBATION
+
4 WEEKS LIGHT INCUBATION

5 **ROOT INDUCTION**
Regenerated micro-shoots were excised and transferred to MS medium containing NAA (0.1, 0.2, 0.3, 0.4, 0.5) (mg/L) for root induction in dark condition

6 **SUB-CULTURING**
Sub-culturing was accomplished into fresh medium after every 3 week of culture

7 **INCUBATION CONDITION**
Plantlets were grown in MS medium incubated at 25°C under a 16-h photoperiod with cool white fluorescent illumination





SELANGOR

CRYOCORD (M) SDN. BHD.

Industrial Training @ Cryocord

Duration: 2/8/2021 - 22/10/2021

Organization Background

- Established in 2002
- Stem cell banking and preservation
- **Services:** CordBlood, CordMSCs, ToothMSCs, MarrowMSCs, AdiMSCs, AdultPBSCs
- **Location:** Bio-X Centre, Persiaran Cyberpoint Selatan, Cyberjaya



Department

Research & Development
(R&D) Department

Supervisor

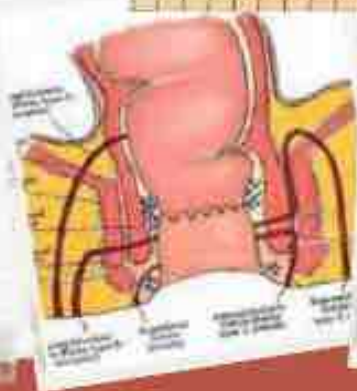
Dr. Vijayendran
Govindasamy

Job scopes

- Assist in R&D projects
- Perform routine lab operations
- Present summary report on research projects

Projects involved

1. Perianal Fistula Review Paper
2. Cell Aggregation Study



OTHER ACTIVITIES

Gene Expression

To identify the CT value of each gene of interests from UB-MSCs by using RT-PCR

Cytokine Analysis

To identify the types of proteins present in UB-MSCs

Buffer Preparation

To prepare buffer solution required for western blot

Western Blot

To identify the presence of exosomes in UB-MSCs

Laboratory Cleaning

Mopping the floor, wiping benches and chairs, prepare consumables for autoclave, refill of alcohol



Experience Gained & Achievement

- ✓ Techniques on writing review paper
- ✓ Hands-on experience on tissue culture and molecular biology
- ✓ Benefits of networking
- ✓ Team working
- ✓ Time management

Introduction

Cryocord Sdn. Bhd was founded in 2002. It is one of the stem cell cryopreservation bank in Malaysia.

Cytokine Array



Objective: To measure the expression of certain proteins under different samples.

Cell Aggregation study



Objective: To study whether the Wharton's Jelly MSCs will aggregate without cell wash before infusion.

Cell Count & Viability



Objective: To analyze the time taken for the cell viability to drop 7% .

Western Blot



Objective: To detect the presence of exosomes in cell culture media.

Others

Writing review paper

Title: Future perspective on mesenchymal stem cells therapy against perianal fistula: An affordable approach".

Faculty supervisor

Dr Nurashikin Binti Ihsan

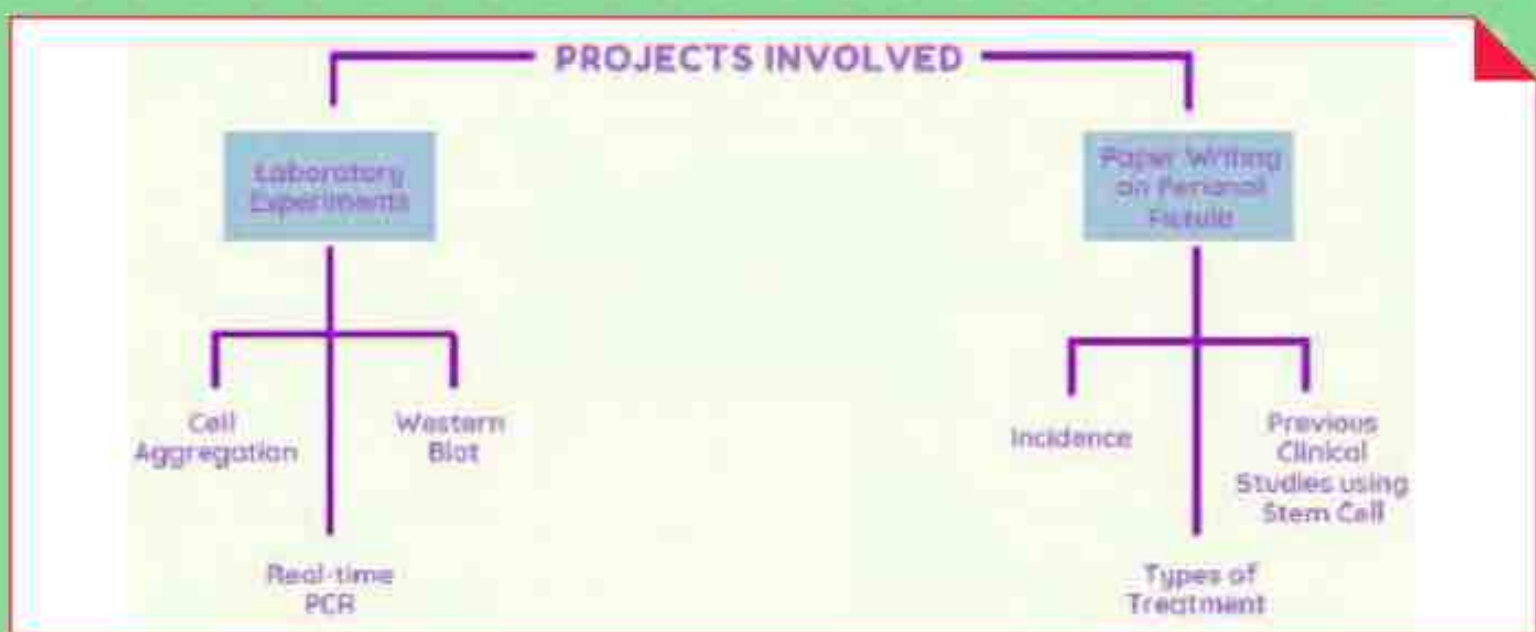
Industry supervisor

Dr Vijayendran A/L Govindasamy

Industrial Training Infographic

Name: Lee Jing Wen (A18SC0404)
 Placement: CryoCord Sdn. Bhd. (Cyberjaya)
 Industrial Supervisor: Dr. Vijayendran Govindasamy
 Faculty Supervisor: Dr. Nurashikin Binti Ihsan

Projects Involved During Training:



Laboratory Experiments:

Cell Aggregation

Objective: To investigate and compare the size of cell aggregation between wash and non-wash Wharton's Jelly-Mesenchymal Stem Cells (WJ - MSCs).

Result: Non-washed WJ-MSCs formed a higher number of cell aggregation

	With wash			Without wash		
	Small	Medium	Large	Small	Medium	Large
Set 1	0	2	0	0	1	2
Set 2	1	1	1	0	0	0
Set 3	1	2	0	11	2	1
Total		23			38	
Average		7.67			12.67	
Difference	5					

Real-time PCR

Objective: To study the gene expression of the selected genes.

Procedures:

1. Well plates is prepared.
2. PCR template is set.
3. 10 different master mix according to genes involved is prepared.
4. 4.5 μL of master mix + 0.5 μL cDNA + 4.5 μL SYBR Green is added into the well plates.
5. The well plates is send for analysis using PCR machine.



Western Blot

Procedures:

1. Preparation of general stock solution.
2. Preparation of separating and stacking gel.
3. Gel electrophoresis using SDS-PAGE
4. Western Blot process
5. Blocking
6. Preparation of primary antibody
7. Preparation of secondary antibody
8. Chemiluminescence detection

Objective: To detect the presence of specific protein molecules.

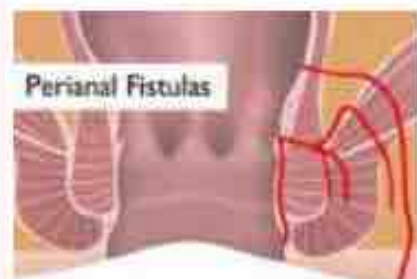
Result: Although there are bands visible, however, the ladder could not be seen. A repetition might be needed.



Paper Writing on Perianal Fistula

Perianal Fistula: An abnormal connection that developed between the anorectal canal and the perianal area.

Perianal Fistulas



Part that I am writing on:





SELANGOR

**INSTITUTE OF MEDICAL
RESEARCH (IMR)**

ATTACHMENTS

- MS SASELA DEVI
- EN MOHD FAIZNUR AIZZAT
- PN NORHAZAN

NUR ANIS NADIA BINTI
MOHAMAD SHAH
A18SC0440

INDUSTRIAL TRAINING

21/07/2021 - 13/10/2021

MOLECULAR PATHOLOGY UNIT,
CANCER RESEARCH CENTRE (CaRC),
INSTITUTE FOR MEDICAL RESEARCH (IMR),
NATIONAL INSTITUTES OF HEALTH (NIH)
LEVEL 4, BLOK C7-SEK U13, SETIA ALAM
40170 SHAH ALAM, SELANGOR



Research, specialized diagnostic services, training, and technical consultancies

Molecular Pathology Unit,
CaRC, IMR

Conduct research to improve prevention, early diagnosis and treatment of cancers

Major focus; Nasopharyngeal Carcinoma (NPC), vital in identifying and treating diseases

MICROBE TEST

A microbe test will be done to the swab samples from the mice that are suspected to be dying or even dead due to factors other than the injected tumor; growth of unwanted microbe



MYCOPLASMA TEST



Mycoplasma test is usually done to detect if there is any contamination by Mycoplasma using three steps; sample preparation, PCR test and detection on agarose gel. Double band indicates the presence of mycoplasma contamination meanwhile single band indicates absence of mycoplasma contamination

BUDGET MANAGEMENT OF MOLPATH UNIT



Update the budget management of molecular pathology which my tasks are to record, update and proofread every purchase made for Molecular Pathology Unit in the Excel sheet (based on the manual record)

MEDIA PREPARATION

Two media were prepared; RPMI-1640 and sterile PBS



REVIVING CRYOPRESERVED CELL LINE

Reviving cell line from frozen state (cryopreserved) for next task usage



SUBCULTURING CELL LINE

Transfer some or all cells from a previous culture to a fresh growth medium after reaching certain confluency



PDX DIGESTION



Produce tumor tissue fragments to be cryopreserved by mincing the tumor into smaller fragments

CRYOPRESERVATION



Preserve and store the viable biological samples in a frozen state over extended periods of time - in liquid nitrogen

UPDATE INVENTORY; NEW NIH ASSET REGISTRATION

Count and check the well-being of the assets



LABEL BIOMEDICAL ASSET'S SERIAL NUMBER

Track down all the asset's existence and locations accordingly



UPDATE PPM RECORD AND DOCUMENTATION

Check and documentate the recorded PPM by Sinar Jernih Sdn. Bhd. in files according to the asset





SELANGOR

LE BOURNE (M) SDN. BHD.



INDUSTRIAL TRAINING EXPERIENCE



CHEONG KAI XUAN A18SC0386

LE BOURNE SDN. BHD

Chocolate and Confectionery Manufacturing

Established since July 21, 2008.

Founder: Ng Boon Yeap

Problem Statement

Students learned theory in school but they are lack experience to apply their knowledge because most of the time is not that ideal to imagine when students step into the real working environment. Hence, industrial training is important to let us gain experience before step into the real working world.

Objectives

- To raise awareness and increase students' interest in the subject selected.
- To expand technical knowledge and skills of the student
- To assess us to prepare for the working world after graduation.

Scope of Study

A third year student in UTM need to conduct a compulsory course which is Industrial Training for 12 weeks. Students need to study how to apply their theory learned from school in a real working. The industrial training program will give students a direction to choose their career field.

Activities in Each Department:

Production

- ✓ Record the conching's parameters in the Chocolate Processing Record.
- ✓ Metal Traping



R&D

- ✓ Application test
- ✓ Double Boiling Process
- ✓ Conching of chocolate in lab conche
- ✓ Tempering process

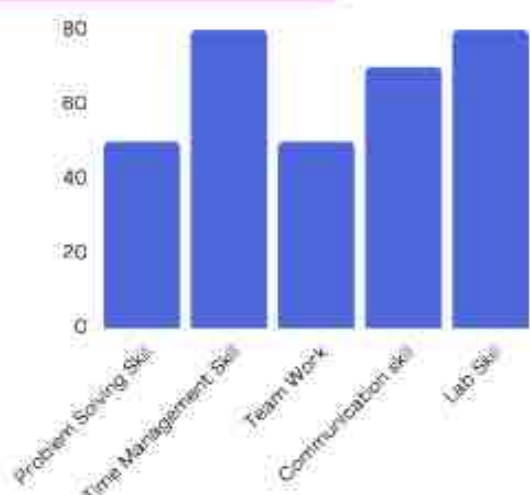


QAQC

- ✓ Viscosity Test
- ✓ Fineness Checking
- ✓ Internal Microbe test
- ✓ Blending Process
- ✓ Color Test
- ✓ Sensory test
- ✓ Record IPQC and On line packing quality control form



Experience Gained



Recommendation

- LE BOURNE can try to arrange a suitable place for trainees so that they can have a place to have their lunch and do their paper works.
- Faculty can try to adjust on the duration of students go for internship by extent the internship period

Conclusion

LE BOURNE had given trainee opportunities to prepare ourselves as future experts. I gained a lot of knowledge and skill from the people and from tasks in this company such as SOP need to follow in food industry.

Challenges and Solution

Challenge: Weak in time management skill
Solution: set a time limit for tasks and prioritize tasks based on importance and urgency.

References

LE BOURNE. (2019). LE BOURNE SDN. BHD. (MALAYSIA). Retrieved from <https://www.ems.com.php/company-profile/MY/Le-Bourne-Sdn-Bhd-en-4242468.htm>



It's all about my

INDUSTRIAL TRAINING EXPERIENCE

26 JULY 2021-15 OCTOBER 2021

Under supervision of Ms Nanthini Chandrasekara

LE BOURNE

Chocolate Industry

Incorporated on 21 July 2008

Shah Alam

OBJECTIVES

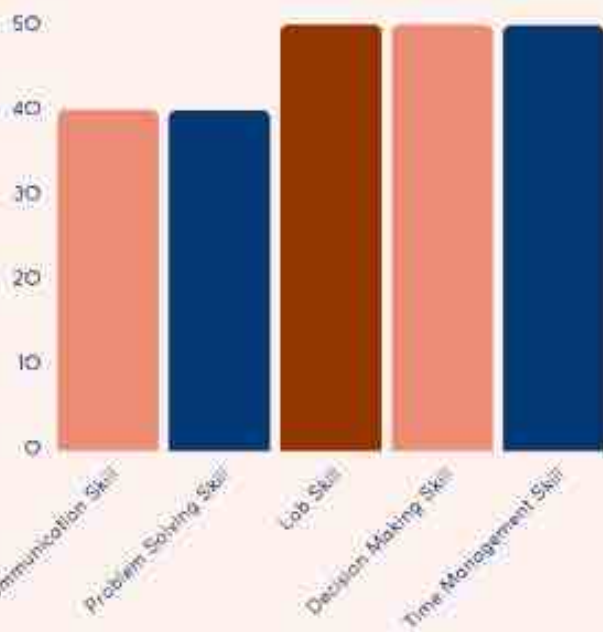
- Provide hands-on experience in the company
- Apply general knowledge in the company
- Exposed to a variety of job scopes in the company
- Gain extra knowledge
- Develop team working skill
- Develop communication skill
- Develop problem-solving skill

SCOPE OF STUDY

A study regarding industrial training will be conducted in Le Bourne company by a third-year student from the course of Industrial Biology from faculty science from University Technology Malaysia (UTM). This will help the students to have more motivation and direction in choosing the career of their interest in the future.

PROBLEM STATEMENT

Issues regarding whether students need to involve themselves in industrial training are being raised. Thus, many studies have been done to assess the importance of industrial training



QC DEPARTMENT

- Microbe Test
- Microbe identification and enumeration
- Viscosity Checking
- Fineness Checking
- Moisture Content Test

PRODUCTION DEPARTMENT

- Tipping Process
- Conching Process
- Refining Process



R&D DEPARTMENT

- Tempering Process
- Application Test
- Viscosity Checking
- Fineness Checking
- Sensory Test



CONCLUSION

- An interesting and unforgettable experience for me. I also have achieved the objectives of industrial training.
- Le Bourne company has given me a good environment and opportunity to learn and explore more about my future career that is related to my job scope

RECOMMENDATION

- Recommend the period for the internship training can be more longer
- Recommend to the students that will join the industrial training to find the company that related to the job scope

PROBLEMS

- Period to learn or to get things more familiar is a bit short for me
- Assigned to work from home for a week due to the pandemic

REFERENCE

Gunaratne, T. M., Vlejo, C. C., Gunaratne, N. M., Tarrico, D. D., Dunshea, F. R. & Fuentes, S. (2019). Chocolate quality assessment based on chemical fingerprinting using near infra-red and machine learning modelling. *Foods*, 8(10). <https://doi.org/10.3390/foods8100426>



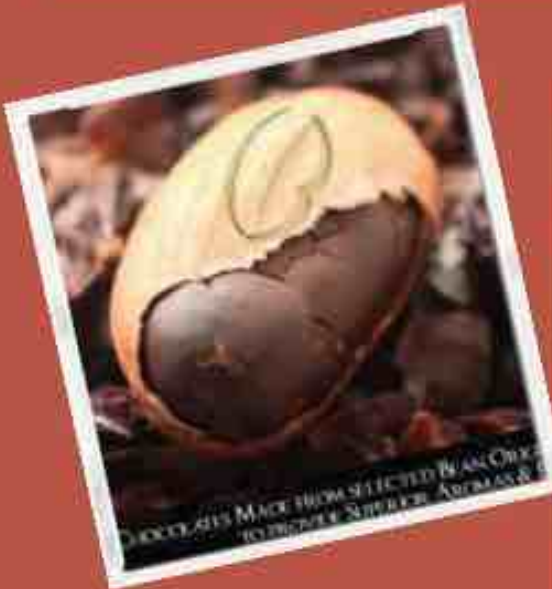
INDUSTRIAL TRAINING

at LE BOURNE SDN BHD

from 26th July - 15th Oct

COMPANY PROFILE

- Chocolate manufacturer founded by Mr. Ng Boon Yeap, incorporated in 2008
- Vision: create the perfect chocolate for their manufacturing process and applications
- Mission: provide good aroma and taste, easy to work, and simply irresistible chocolates



PROBLEM STATEMENT

In today's environment, having a decent degree is no longer enough to obtain a good job offer after graduating. Students are lacking real-life exposure, first-hand experience, interpersonal interaction, and soft skills.

OBJECTIVES

- To provide an opportunity for students to expose to the real-life work environment.
- To provide students with practical and hands-on experience.
- To enable students to apply the theoretical knowledge to a real industrial operation.

SCOPE OF STUDY

A compulsory course taken by 3rd year student which conducted for 12 weeks to put their academic knowledge into practice and gain practical information from this company.

DEPARTMENTS INVOLVED



SKILLS DEVELOPED



EXPERIENCES & TRAINING

R&D

- Viscosity test
- Fineness measurement
- Color test
- Mooncake making
- Cookies making
- Bread baking
- Conching of chocolate

QA/QC

- Microbe test
- Peptone and distilled water preparation
- Quality checking process: (Viscosity test, Fineness measurement, Color test, Flavor test, Packing process, Pest control activity)

PRODUCTION

- Chocolate manufacturing process: mixing, conching, refining,, tempering, moulding, storing, packing
- Flushing activity
- Prepare presentation slides (Powerpoint & Excel)
- Operation of machines



Supervisor: Ms. Wong Su Zuan

CHALLENGES

- Pandemic of COVID-19
- Rotation of jobs
- Encountered unfamiliar tasks

RECOMMENDATIONS

- Create course syllabus
- Extends the LI period

Internship Training

[Natco] Lot 9, Unit A2, Lorong Keluli 1B,
Kawasan Perindustrian Selatan,
Seksyen 7, 40000, Shah Alam

[Gateway] No 5, Jalan Astana 1E,
Bandar Bukit Raja, 41050, Klang

603-3344 9870

603-3344 9871

info@le-bourne.com



TRAINING PERIOD: 26TH JULY - 15TH OCT 2021



TRAINING PROGRAMS

Food Handler Training Course



Good Manufacturing Practice (GMP)

ACHIEVEMENTS

LAB SKILLS



Sample preparation



Medium preparation



Hot plate stirrer



Bag mixer



Petrifilm plating technique



Pipetting



Spread Plate



Incubator



Autoclave



Micrometer



Viscometer



SEARCH

Unlimited Learning from Training



KNOWLEDGE

Food Production & Quality Assurance



APPLICABLE

Apply Theoretical Knowledge Practically



REAL WORK

Working Culture & Importance of Cooperation

ABOUT LE BOURNE SDN. BHD.

Le Bourne Sdn. Bhd. was incorporated on **21st of July, 2008** & directed by **Mr. Ng Boon Yeap**. It is a **chocolate & confectionery manufacturing industry**, certified by **HACCP, GMP, MeSTI & HALAL verification** as well as operating on the **trading of chocolate & cocoa products** for both domestic & overseas markets.



couvertures



compounds



paste



coatings

SCOPES OF TRAINING & DAILY ROUTINE TASKS

DEPT. PRODUCTION [PROCESS MANAGEMENT]

FIELDWORK

- Chocolate conching process & parameters monitoring
- Loading/ outgoing container & stocks checking
- Fastjet inkjet machine operating & printing
- Packing line: filling, sealing & packing



DOCUMENTATION



- Chocolate processing record
- Chocolate processing recipe checklist
- Daily finished goods packing record
- Finished goods transfer record

DEPT. QUALITY ASSURANCE & QUALITY CONTROL

DOCUMENTATION

- Sticker tracing record
- Certificate of Analysis (CoA)
- Corrective Action Request (CAR)
- Label printing inspection record



FIELDWORK



- Incoming materials quality checking
- Incoming container inspection & sanitization
- In-process quality control checking
- On line packing quality control checking

LABORATORY PRACTICAL

- Sensory test: flavour & odour testing
- Chemical test: moisture content checking
- Physical test: colour, particle size & viscosity checking
- Microbe test: food microbes & environmental swab test



SUPERVISION



Faculty Supervisor,
Dr. Nuriyana Bt Ahmad Zawawi



LE BOURNE
Industrial Supervisor,
Ms. Izzati Mohd Termiji



UTM

UNIVERSITI TEKNOLOGI MALAYSIA

INTERNSHIP

YAP YING YAN
A18SC0493
3SSCB

BACKGROUND

Le Bourne Sdn Bhd is founded in year 2009 with more than 50 years of accumulated experience in chocolate processing, technology development, product technical and applications.

Le Bourne's chocolate products are made with a selection of finest ingredients to ensure customers achieve the desired taste, distinctive profile, workability and nutritional values. Our chocolates are produced under the most dedicated recipe, process and hygienic food safety conditions. The quality control is supported by a well equipped laboratory, and strictly monitored throughout by highly experienced and well trained professionals to ensure ultimate quality assurance, product safety and consistency.

Le Bourne Sdn Bhd is a leading manufacturer for high quality industrial chocolate supplying to premium market segment globally. Our standard state-of-the-art processing facilities has been certified and qualified by the top gourmet and food manufacturers while the quality management system is strictly comply to the HACCP & ISO 22000:2018 standard plus the stringent food safety standard demand by the respective authorities and clients.



QUALITY CONTROL

- in process quality control record
- on-line packing quality control record
- check container
- check sticker request form
- collect samples to do microbe test



MICROBE TEST

- collect sample
- do microbe test
- record microbe result
- prepare peptone water

PRODUCTION



PRODUCTION

- record chocolate processing record
- packing product
- printing stickers

LEBOURNE



SELANGOR

**MERIEUX NUTRISCIENCES
(M) SDN. BHD.**

Merieux NutriSciences Malaysia Sdn. Bhd.



Wisma Texchem Lot 808 & 809, Jalan Subang 5, Taman Perindustrian Subang, 47610 Subang Jaya, Selangor.

19 July 2021 - 8 October 2021



Name
KEK JAZZ YEE

Matric No.
A18SC0400

Course
3 SSCB
(Industrial Biology)

About

- Expertise in chemical, food and microbiology testing in Malaysia
- Provide analytical testing and consultant services for food, water, pharmaceutical, cosmetics, agrochemicals and agrochemicals products

Industrial Supervisor

Ms Nurul Fatihah binti Mohammed Azanan
(Microbiologist)

Faculty Supervisor

Dr Wan Rosmiza Zana Wan Dagang

Major Tasks (under Microbiology Department)

- Preparing media (agar and broth) based on the parameters required by customers
- Sampling of food (FDA- BAM method); sampling of pharmaceuticals (BP method); and sampling of cosmetics (FDA- BAM- 23 method)
- Other tasks: Pour plate, Gram staining (confirmation test), Check stock, Calibration of incubators, chiller, freezer, water bath, dispenser, micropipette and weighing balance

What I Learnt

- Microbiological knowledge and laboratory skills such as preparing media and sampling
- Time management in completing the tasks given
- Communication skills





UTM
UNIVERSITI TEKNOLOGI MALAYSIA

MERIEUX
NutriSciences



**Merieux NutriSciences Malaysia Sdn. Bhd, WISMA TEXCHEM, Lot 808& 809,
Jln Subang 5, Taman Perindustrian Subang, 47610 Subang Jaya, Selangor**

604 398 1609



**Industrial Sv: Ms. Syafiqah Binti Saupi
Faculty Sv: Ts Dr Wan Rosmiza Zana Bt Wan Dagang**



Nutrient Component Testing Service (for example)

Normal Nutrient Component	Water, Fat, Carbohydrate, Dietary Fiber, Crude Fiber, Energy, etc.
Elements	Cu, P, Na, Mg, Ca, Zn, Se, K, Fe, (Co, Mn, Ni, I, etc)
Vitamins	Vitamin A, Vitamin B, Vitamin C, Vitamin E, Vitamin K1, etc.
Fatty Acid Profile	Saturated fatty acid, Unsaturated fat, Monounsaturated, Trans fatty acid, Omega 3 fatty, EPA, DHA, Omega 6, Omega 9, etc.
Sugar	Total sugar, Fructose, Glucose, Sucrose, Maltose, Lactose, Maltotriose, etc.
Others	Minerals, Salt, Acids, etc. (for example, Sodium Chloride, Sodium Nitrate, etc.)

MERIEUX NUTRISCIENCES EXPERTISE

one stop analysis solution provider which provides an extensive range of analytical testing, consultancy service in the field of environment, chemistry, microbiology and others.



FOOD NUTRITION & LABELING TESTING AND LABEL VERIFICATION

JOB SCOPE



- Preparation of Chemical Reagent
- Food sample digestion (Hot- plate method)
- Reflux Digestion (BP digestion Method)
- Wastewater sample digestion
- Drinking water sample digestion
- Chemical Sample (air Method)
- Chemical Sample (Wet Ashing Method)
- Specific Gravity Method
- Determination of Moisture in Food by Air Oven
- Quantitative Determination of Ash in Food
- Quantitative of Invert Sugar in Food
- Quantitative of Dietary Fibre in Food
- MicroWave Digestion



**Name: Steven Anak Lilo
Matric No: A18SC0483
Year: 3 SSCB**



VALUE LEARNED

- Independent
- Excellent time management
- Able to work under pressure
- Multitask
- Communication Skills





SELANGOR

**UNIVERSITI TEKNOLOGI
MARA (UiTM) SG. BULOH
INSTITUTE OF MEDICAL MOLECULAR
BIOTECHNOLOGY**



UNIVERSITI
TEKNOLOGI
MARA



Institute of
Medical Molecular
Biotechnology



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

INDUSTRIAL TRAINING

ABOUT COMPANY / INSTITUTE

INSTITUTE OF MEDICAL MOLECULAR BIOTECHNOLOGY, FACULTY OF
MEDICINE UiTM

- Institute of Medical Molecular Biotechnology (IMMB) is a multidisciplinary institute for molecular research, open for lecturers from the medical faculty as well as other faculties within UiTM or other universities. IMMB is equipped with state of the art equipment, catering for research in genomics, proteomics and molecular cell biology.
- To be a world class research institute in fundamental and applied medical molecular biotechnology research.



Universiti Teknologi MARA Fakulti Perubatan
Kampus Sungai Buloh, Jalan Hospital, 47000
Sungai Buloh, Selangor.



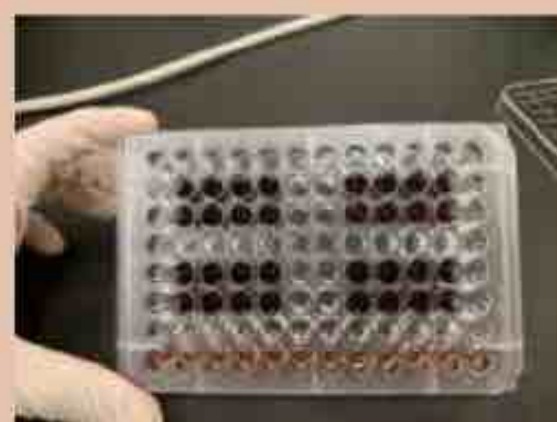
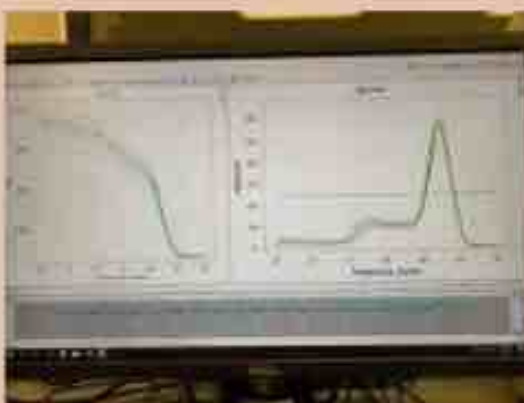
Supervisor of Industrial training:
Assc. Prof. Dr Mohammad Johari Ibrahim
mji@uitm.edu.my



A'dlina Binti Husny @ Badrul Hisham
3SSCB
Dr Halimah Hasmoni

JOB SCOPE / TASKS

- Presentation about topic that should be hands on during face to face training.
- Topic that have covered during presentation;
 - Human cell culture
 - Real-time PCR
 - Western blot
 - ELISA & IHC
 - Cell viability
- Topic that have been covered during lab work;
 - Human cell culture
 - Western blot
 - Cell viability
 - RT-PCR



EXPERIENCES

Be able to:

- Gain a lot of knowledge especially from theories to skills.
- Develop and enhance soft skills especially how to handle human tissue culture.
- Learn how to handle new apparatus and machine that I have not seen during my degree lab work.
- Troubleshoot every problems especially western blot.
- Interpret data from cell viability into graph.
- Make cDNA using RNA sample.
- Calculate the concentration and reaction needed to run RT-PCR.
- Interpret data from RT-PCR.

thank you!



SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

**BIOPROCESSING AND
BIOMANUFACTURING RESEARCH
CENTRE (BBRC)**



UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERAKTI



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

BIOPROCESSING AND BIOMANUFACTURING RESEARCH CENTER (BBRC)

Background

- BBRC is a research centre under the Faculty of Biotechnology and Biomolecular Sciences.
- Founded in 1999 as Fermentation Technology Unit at Institute of Bioscience.
- Specializes in fermentation and bioprocess technology (fermentation process based on microbial, fungi and plant cultivation)

Training Information

Job scope

Fermentation/Downstream process



Mode

Working From Home (WFH)

Placement

Bioprocessing and Biomanufacturing Research Center, Universiti Putra Malaysia, UPM Putra InfoPort - IOI Resort, Jalan Kajang - Puchong 43400 UPM Serdang, Selangor Darul Ehsan 03-8945 8487.

Things I learnt

- Improve my writing skills
- Acquire new knowledge
- Works with minimal supervision



Mini Project



1) Literature review

Title: Perspective of Halal in Fermentation

The review focused on halal perspective of fermentation in different areas mainly;

- The halal status of ethanol and enzymes produced through the fermentation process.
- Information about halal related to cosmetic production.

2) Conducting survey

Title: Halal Product Awareness Among Malaysian

- The purpose of the survey was To determine Halal Product Awareness in different demographic profiles of Malaysians.
- Consist of **three section**, **Section A** (Demographic Profile), **Section B** (Halal Product Knowledge) and **Section C** (Halal Product Awareness).
- Total of respondents was 230 respondents.

3) ANOVA analysis

- Total samples was 230.
- Analyzed using XLMiner Analysis ToolPak App in Google Sheet for ANOVA Single Factor Analysis.
- Highly significant data.
- P-value is 0.00000

About Me

Nor Azlia Aziera Binti Abd Shukor
3 SSCB



Faculty Supervisor

Dr. Mohd. Helmi Bin Sani



Industrial Supervisor

Assoc. Prof. Dr. Helmi Bin Wasoh
@ Mohamad Isa





SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

**BIODIVERSITI UNIT, INSTITUTE OF
BIOSCIENCE**



UTM
UNIVERSITI TEKNOLOGI MALAYSIA



LEVEL 3, BIODIVERSITY UNIT (UBD), MAIN BUILDING
OF INSTITUTE OF BIOSAINS, UNIVERSITI PUTRA
MALAYSIA, 43400, SERDANG, SELANGOR



INDUSTRIAL SUPERVISORS:

Dr Mohd Firdaus Ismail
Mrs Julia Abdul Aziz

Nur Isyafatira binti Japri
A18SC0446

University supervisor:
Dr Mohd Firdaus Abdul
Wahab

About UBD

The Biodiversity Unit supports Institute of Bioscience in its mission to become a local and international centre of excellence for research and development in plant biodiversity. This unit offers services in research on plant sciences and its high achievement have been enhanced and supported by the high technology facilities in institute. It aims to establish a plant database for research. Biodiversity Unit also serves as a centre of plant ex-situ conservation and extension for research, teaching and education



Job Scope

- Tissue culture
- Essential oil
- Nursery and Conservatory Park
- Herbarium
- Compost
- Medium preparation for tissue culture

Experiences

- Sterilization process of plant tissue culture
- pH adjusting for medium preparation
- Hydrodistillation technique for extraction of essential oil
- Plant identification by QR code database





Unit of Biodiversity Institute of Bioscience

Prepared by:

Nur Aisyah binti Md Nizam
3 SSCB
A18SC0437
aisyahhhnizam@gmail.com

Introduction

The Biodiversity Unit supports Institute of Bioscience in its mission to become a local and international centre of excellence for research and development in plant biodiversity. This unit offers services in research on plant sciences.



Job Scope

- Mini project of plant tissue culture (*Trichanthera gigantea*)
- Did herbarium database and sampling.
- Compost fertilizer using leftovers.
- Plant tissue culture (red ginger and pisang lemak manis)
- Ginger essential oil using hydro distillation.

Experience



- Able to do hands-on for plant tissue culture.
- Gain more knowledge about plant species from conservatory park and nursery tour.
- Enhance my lab skills with the guide of my supervisor and UBD's staff.



Supervisors



- Dr. Mohd Firdaus bin Ismail
Unit Coordinator of UBD
mohd.firdaus@upm.edu.my
- Mrs. Julia Abdul Aziz
Science Officer
julia_a@upm.edu.my

Contact info

Institute of Bioscience
Universiti Putra Malaysia

03 - 9769 3045/ 3047
03 - 9769 2101
dir.ibs@upm.edu.my

UNIT BIODIVERSITI

UNIVERSITI PUTRA MALAYSIA

UNIT BIODIVERSITI, INSTITUT BIOSAINS, UPM 43400

DR. MOHD FIRDAUS BIN ISMAIL (019-3873432)

PUAN JULIA ABDUL AZIZ (03-89472189)

NURASYURA NAJLA
BT BASRI

A18SC0456

SMBU 3915

DR. MOHD FIRDAUS BIN
ABDUL WAHAB



MENGENAI UNIT BIODIVERSITI

Pusat kecemerlangan penyelidikan dan pembangunan biodiversiti tumbuhan di peringkat tempatan dan antarabangsa. UBD menawarkan perkhidmatan penyelidikan dalam bidang sains tumbuhan dengan dibantu oleh kemudahan teknologi tinggi yang dimiliki oleh institut.

SKOP PEKERJAAN

- Taman konservatori UPM mempunyai pelbagai jenis tumbuhan.
- Herbarium.
- Makmal tisu kultur.
- Minyak pati.
- Ladang penyelidikan dan pemuliharaan.

PENGALAMAN

- Mengasah kemahiran dalam penggunaan IT.
- Mempelajari pelbagai jenis tumbuhan.
- Mempelajari dan melaksanakan makmal tisu kultur.
- Mempelajari penghasilan minyak pati.
- Mempelajari mesin dan teknologi yang digunakan.





SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

HALAL PRODUCT RESEARCH INSTITUTE



HALAL PRODUCT RESEARCH INSTITUTE



Prepared by:
Norarina Suraya Binti Mohd Razali
 3 SSCB
 A18SC0431
 norarinasuraya@gmail.com

INTRODUCTION

Halal Product Research Institute was established on 1 July 2006. Main laboratory that I focused on is Laboratory of Halal Science Research. LAPSAH mainly focused on conducting research and development of new techniques which are rapid and accurate to ensure the authentication and safety of halal products.

JOB SCOPE

- Gather all the publications that includes the researchers from halal product research institute.
- Sort the publications based on authentication and innovation programme.
- Create charts to determine the total publications involved.
- Do some research and literature review on review paper of Innovation of Halal Food Ingredients: past, present, and future.
- Study a review paper entitled 'Halal Ingredients in Food Processing and Food Additives and summarize in power point.
- Study the requirement needed for Biosafety and Biosecurity Approval in UPM
- Establish database and also email database for manufacturing industries according to industries.
- Determine market demand for halal product analysis among manufacturing industries.

SUPERVISOR

FACULTY SUPERVISOR:

Prof. Madya Dr. Razauden Mohamed Zulkifli

INDUSTRIAL SUPERVISOR:

Puan Nur Fadhilah Khairil Mokhtar
 nuradhilah@upm.edu.my
 03-9769 1344

EXPERIENCES

- Enjoyed all the webinar event
- Learned to plan systematically to all the task assigned
- Exposed to the worldwide halal industry
- Explored the halal food ingredients
- Gain a lot of knowledge about halal food



Contact Info

Halal Product Research Institute,
 Universiti Putra Malaysia, Putra Infoport,
 43400 UPM Serdang Selangor.

✉ halal@upm.edu.my

☎ 0397691426




UPM
UNIVERSITI PUTRA MALAYSIA
BERILMU BERBAKTI



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Norazrin Anis Binti
Rosman
A18SC0432

Faculty Supervisor :
Assoc Prof Dr Razauden Bin
Mohamed Zulkifli

 LABORATORY OF HALAL SERVICES, HALAL PRODUCTS RESEARCH INSTITUTE, UNIVERSITY PUTRA MALAYSIA, 43400, UPM SERDANG, SELANGOR.

 012-915 9191
INDUSTRIAL SUPERVISOR :
DR MOHD HAFIS YUSWAN BIN MOHD YUSOFF



About IPPH :

Halal Law.
Besides, IPPH offers a professional service for product analysis through several methods as well. IPPH actively performs headway efforts in halal research for the improvement of Islam.

Job Scope :

Experiences :





SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

INSTITUTE OF BIOSCIENCE



ARAS 3, BANGUNAN UTAMA INSTITUT BIOSAINS, UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG, SELANGOR

INDUSTRY SUPERVISOR

: mohd.firdaus@upm.edu.my (Dr. Mohd Firdaus bin Ismail)

: julia_a@upm.edu.my (Puan Julia binti Abdul Aziz)

FATIN NABILAH BINTI RAKIB (AI8SCO39I)

3SSCB

FACULTY SUPERVISOR : DR. FAEZAH BINTI MOHD SALLEH



ABOUT COMPANY :

- The Biodiversity unit (UBD) is one of the units under the Institute of Bioscience.
- This unit focuses on the production of high quality tissue cultured plantlets for conservation.
- There are five services and facilities in UBD which are UPM Conservatory Park, essential oil, herbarium, tissue culture lab and research and conservation farm.



JOB SCOPES :

Online Internship

- Mini Project 1 : Plant tissue culture report writing
- Mini Project 2 : Herbarium website
- Mini Project 3 : Compost
- Mini Project 4 : Herbarium
- Mini Project 5 : Plant tissue culture workshop poster
- Mini Project 6 : Plant Infographic

Physical Internship

- Plant tissue culture
- Essential oil extraction and media preparation
- Herbarium
- Herbal bath
- UPM nursery

EXPERIENCES :

- Gain more knowledge and information about Bunga Telang
- Learn how to create a website and make compost from food waste and organic materials
- Hands-on plant tissue culture and essential oil
- Know more about herbal plants
- Learn how to use lab machine, apparatus and equipments correctly
- Improve technical and soft skills

Institute of Bioscience, UPM

Institute of Bioscience (IBS) was the first research institute established in Universiti Putra Malaysia (UPM) to improve the research

and development (R&D) and postgraduate training in the field of biological sciences. Laboratory of Vaccines and Biomolecules (VacBio) of the Institute of Bioscience (IBS) focuses on the activities of Research and Development (R&D) and offer services in the area of vaccines and diagnostics, immunotherapeutics, in addition to probiotic and prebiotic technology.

About Me

- Hue Seow Yie
- A18SC0397
- Bachelor of Science (Industrial Biology)

Industrial Supervisor

- Assoc. Prof. Dr. Mariatulqabtiah Abdul Razak

Faculty Supervisor

- Dr. Mohd Helmi Sani

INSTITUT BIOSAINS
Pusat Kejuruteraan R & D dan Inovasi

Project title:
In Silico Phylogenetic Analysis and Molecular Modelling Study of Avian Papillomavirus L1 Gene Origin from Rockhopper Penguin

Objectives

- To identify the evolutionary relationships among avian papillomaviruses using phylogenetic approach.
- To investigate the physicochemical properties and secondary structure of major capsid protein L1 from Rockhopper penguin (*Eudyptes chrysocome*).
- To predict the 3D model of major capsid protein L1 from Rockhopper penguin (*Eudyptes chrysocome*).
- To evaluate the 3D model of major capsid protein L1 from Rockhopper penguin (*Eudyptes chrysocome*).

Job Scope

- Perform in silico analysis
- Analyze the results
- Attend meeting, talk and conference

Experiences

- Explore avian papillomavirus
- Various bioinformatic tools
- Proposal, thesis and journal article writing

Skill Gained

- Teamwork
- Independence
- Adaptability
- Time management
- Research and Analysis





SARAWAK

**BORNEO MEDICAL CENTRE
(MIRI)**



UTM

UNIVERSITI TEKNOLOGI MALAYSIA

NAME: ANGELICA CHRISTINA KHIU SING HUI
MATRIC NUMBER: A18SC0378
PROGRAMME: SSCB
DATE: 12/7 - 1/10/2021
INDUSTRIAL SUPERVISOR: MISS PHANG HUI LI
FACULTY SUPERVISOR: TS DR WAN ROSMIZAH
ZANA BT WAN DAGANG

COMPANY BACKGROUND



- STARTED OPERATION ON 1ST OF SEPTEMBER 2019.
- TERTIARY CARE PRIVATE HOSPITAL
- LOCATED IN MIRI, SARAWAK
- HAVE VARIETY OF FACILITIES SUCH AS LABORATORY.

SAMPLE PREPARATION

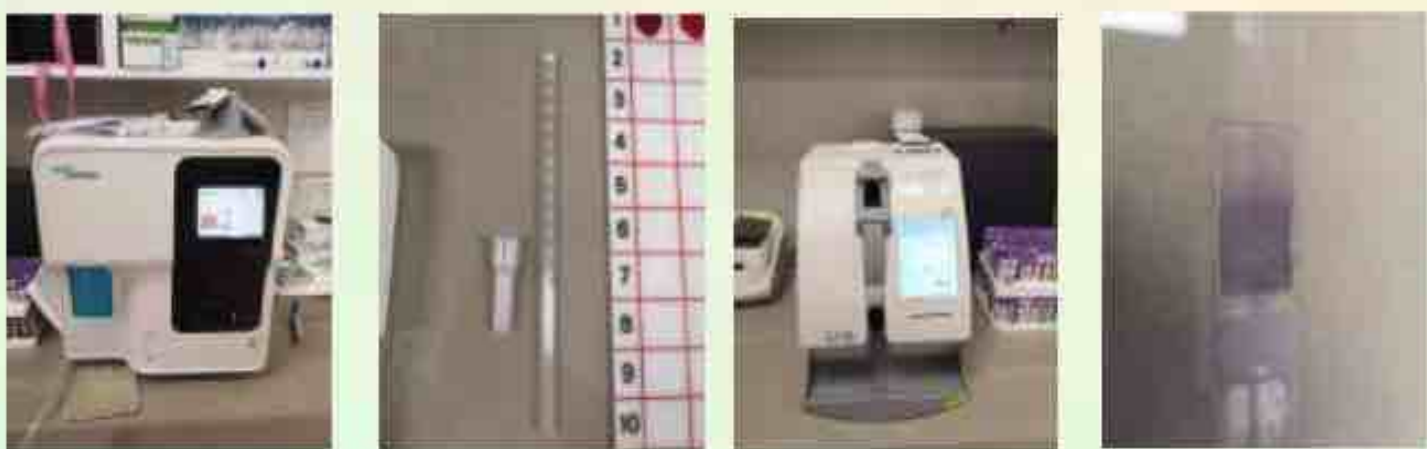
CENTRIFUGE (3500 RPM, 5 / 10 MINS)



CENTRIFUGE NOT NEEDED

HEMATOLOGY

EDTA TUBE



FBC Manual ESR ESR Blood Staining



G6PD Deficiency ABO & RH pro-BNP, Trop I & Procal

CITRITE TUBE



AP & APTT

URINE



- PHYSICAL APPEARANCE
- LABSTRIP 11 PLUS
- VIEW UNDER MICROSCOPE

BIOCHEMICAL PROFILE



- USING SIEMENS DIMENSION® XPAND® PLUS
- MOST COMMON TESTS RUN ARE RENAL FUNCTION PROFILE & LIVER FUNCTION PROFILE

IMMUNOLOGY



- USING ADVIA CENTAUR CP IMMUNOASSAY SYSTEM
- MOST COMMON TESTS ARE HEP A & B, HIV.

COVID-19 TESTING



RTK-Antigen





SARAWAK

**UNIVERSITI MALAYSIA
SARAWAK (UNIMAS)**

**FACULTY OF COGNITIVE SCIENCE AND
HUMAN DEVELOPMENT**

Industrial Training

Introduce My Training Location and Supervisor!

Faculty of Cognitive Sciences and Human Development, UNIMAS



Associate Professor DR. Lee Nung Kion

Interest: Applied AI in Bioinformatics & real world problems

My Scope of Work!

The Learning of New Knowledge....

Biopython



Freely available Python tools for computational molecular biology

- Ex: Extract seq within the specific location, direct translate DNA into protein

Google Colaboratory



Allows us to write and execute Python in our browser

- Loading data, visualize our data



Data Mining in Orange

An open-source machine learning and data visualization tools
Build data analysis workflows visually

Machine Learning for sequence analysis

Develop a small project

USING MACHINE LEARNING FOR ANTIMICROBIAL RESISTANCE IDENTIFICATION

PROBLEM STATEMENT

- AMR threatens global health
- Conventional approaches for identifying AMR bacteria are complex and time consuming



OBJECTIVES

To identify if a certain species of bacterium is resistant to a given type of antibiotic using machine learning approach.



Methodology

STEP 1: DATASET PREPARATION

- Protein coding sequences collected directly from NCBI
- Or using Biopython to extract the coding sequence



STEP 2: DESCRIPTORS AND LABELLING

- Convert the protein sequences into numerical values using representing sequence-based feature descriptors
- Ex: Molecular weight, isoelectric point, charge and hydrophobicity value

STEP 3: PREDICTIVE MODELLING

- 3 supervised algorithms were used for prediction purposes.
- Ex: Naive Bayes, k nearest neighbour, artificial neural network.



60

STEP 4: MODEL EVALUATION

Find the best model that represents our data

- Based on accuracy
- Based on area under the curve



Outcomes!

Dataset	Measure/Methods	kNN	ANN	NB
A	Accuracy	81.7%	85.1%	84.3%
	AUC	0.89	0.91	0.90
B	Accuracy	90%	90.9%	90.3%
	AUC	0.89	0.90	0.91
C	Accuracy	92%	91.1%	89.7%
	AUC	0.83	0.87	0.83
D	Accuracy	84.3%	83.7%	82%
	AUC	0.776	0.766	0.777
E	Accuracy	94.3%	94.9%	93.1%
	AUC	0.861	0.865	0.866

- All AI/ML models had a good classification accuracy (CA) of over 80% for all datasets.
- All AI/ML models for each datasets had a good AUC evaluation.
- Thus, we believe that the machine learning models generated in the present study will efficiently and rapidly predict antibiotic resistance.
- Using this approach, researchers without resources may be able to identify the resistant isolates to determine proper course of action and prevent wide infections.



TERENGGANU

**JABATAN ALAM SEKITAR
NEGERI TERENGGANU**



Latihan Industri

NAMA: NUR AZZASYAZLIN BINTI ALHAKIM

NO MATRIK: A18SC0367

PROGRAM: SARJANA MUDA SAINS (BIOLOGI INDUSTRI)

PENYELIA INDUSTRI: PN ZALEHA ABDULLAH

PENYELIA FAKULTI: DR MOHD FARIZAL A KAMARODDIN



Jabatan Alam Sekitar Negeri Terengganu

- Ditubuhkan pada Ogos 1979.
- Bertempat di Wisma Alam Sekitar, Kuala Terengganu.
- Dibahagikan kepada tiga bahagian utama iaitu Bahagian Pentadbiran, Operasi dan Pembangunan.
- Pelatih diberi jadual tugas mengikut unit-unit yang terdapat di bawah setiap bahagian utama JAS Negeri Terengganu.

Unit Pentadbiran & Kewangan

Pelatih diberi tunjuk ajar untuk menguruskan kaunter JAS Negeri Terengganu seperti menerima dan merekod surat yang masuk atau keluar, menerima panggilan daripada pelanggan dan membantu pihak Kelab JAS Negeri Terengganu.

Unit Kenderaan Bermotor

Pelatih diberi peluang untuk mengikuti pegawai dalam Operasi Mencegah Pelepasan Asap Tercemar menggunakan kamera Handicam dimana pelatih membantu pegawai untuk mencatat jumlah kenderaan yang lalu di kawasan operasi.

Unit Input Pembangunan & EIA

Pelatih membantu pegawai unit untuk menghadiri serta mencatat minit Mesyuarat Penilaian Kesan Kepada Alam Sekeliling (EIA) dan Mesyuarat Rancangan Pengurusan Alam Sekitar (EMP), minit fail, membuat senarai semak fail EMP dan membuat lawatan tapak projek



Unit Aduan, OMP & Kontigensi

Pelatih membantu untuk menerima dan merekod aduan penceraman yang diterima daripada orang awam dan mengikuti pegawai yang bertanggungjawab menguruskan aduan tersebut untuk menyasat dan mengkaji aduan di alamat yang diber oleh pihak pengadu

Unit Kesedaran & Pendidikan Alam Sekitar

Pelatih akan dilibatkan dalam pelbagai aktiviti dan program yang dianjurkan oleh pihak JAS Negeri Terengganu seperti:

- Program Tanam Pokok Denai Sungai Kebangsaan
- Program Pengumpulan E-Waste
- Sambutan Hari Ozon Sedunia

Unit Pengawasan Kualiti Alam Sekitar

Pelatih dibawa ke stesen-stesen pengawasan kualiti air tanah untuk mengukur kualiti air tanah menggunakan BOD Meter tersebut berada di paras yang baik dan tidak tercemar. Maklumat dan data yang diperolehi oleh unit ini akan disalurkan ke Bahagian Operasi bagi memastikan pencemaran yang berlaku boleh dikawal.





INDUSTRIAL TRAINING INFOGRAPHICS

**3 SSCG
BSc. Biology**

**Department of
Biosciences
Faculty of Science
UTM Skudai.**

2020/2021-3

COMPILED BY:

DR. NURASHIKIN IHSAN



JOHOR

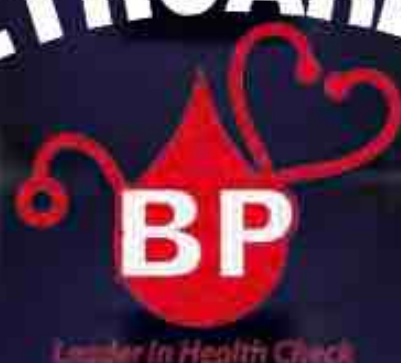
**BP HEALTHCARE (M)
SDN. BHD.**



BP HEALTHCARE SDN BHD

Leader In Health Check

INTERNSHIP



HAEMATOLOGY

- Full blood picture (FBP) / Full Blood Count (FBC)
- Erythrocyte Sedimentation Rate (ESR)
- ABO Blood Grouping Test
- Reticulocyte counting
- Blood smear preparation
- Malaria Parasite (MP) test
- Microscopic analysis



URINOLOGY

- Visual Examination
- Urine Dipstick Test
- Microscopic Examination
- Drugs (THC, OPI) Test
- Pregnancy Test

BIOCHEMISTRY

Centrifugation of samples
 Separation of serum from blood
 Clotting



FOOD & ENVIRONMENTAL TESTING

- Agar preparation, plating, and sealing
- Surface Monitoring Test
- Disk Diffusion Test
- Membrane Filter Technique

MOLECULAR LAB

- RT-PCR for SARS-CoV-2





LATIHAN INDUSTRI BP HEALTHCARE

BP Healthcare Skudai, Danga Utama Commercial Center, 68, Jalan Pertama 1, 81300, Johor Bahru, Johor



LATAR BELAKANG

- Ditubuhkan pada 1 Januari 1982 yang diasaskan oleh Dato Beh Chun Chuan dan isterinya, Datin Poh Lay See.
- Bergiat aktif memberikan rawatan dan perkhidmatan kesihatan dalam tempoh 39 tahun sehingga kini.

BP CLINICAL LAB



Makmal pertama di Asia yang dianugerahkan pentauliahian daripada Joint Comission International (JCI)



Beroperasi selama 24 jam, 7 hari seminggu



Makmal tempatan yang pertama di Malaysia mencapai pentauliahian ISO 15189 sepenuhnya



Makmal klinikal utama di Malaysia

JABATAN URINOLOGI



Ujian visual - melihat warna dan tahap kejernihan urin



Ujian mikroskopik- melihat kristal, sel darah merah, sel darah putih, sel epitelium



Ujian dipstick- ujian FEME, ujian dadah & ujian kehamilan



Semen Analysis- menguji kesuburan lelaki

JABATAN HAEMATOLOGI



Full Blood Picture (FBP) - ujian darah secara keseluruhan



Erythrocyte Sedimentation Rate (ESR) - menguji tahap keradangan dalam badan



Full Blood Count (FBC) - ujian darah melibatkan sel darah putih dan platlet



HB indices - mengukur bentuk, saiz & ciri-ciri fizikal sel darah merah



Malaria Parasite (MP) - mengesan malaria



ABO Blood Grouping Test - mengetahui jenis darah dan rhesus

Jabatan Biokimia

Mengagihkan sampel kepada jabatan yang sepatutnya



Mengasingkan serum daripada sampel darah



Mengumpul semua sampel & hantar ke HQ

Meletakkan sampel darah ke dalam mesin centrifuge



FOOD & ENVIRONMENTAL TESTING

Menyediakan agar

- Menimbang media -->+ air suling --> kacau sehingga sebati (stirer hotplate) -->autoclave



Menyediakan 70% etanol
- 99% etanol + air suling



Membuat spread plate
- menguji kebersihan air



Membuat streaking
- untuk dapatkan koloni tunggal



Membuat pour plate agar

- Soberaud Dextrose Agar (SDA)
- Tryptone Soy Agar (TSA)
- MacConkey Agar (MAC)
- Brilliance Agar
- M-enterococcus Agar (ME)
- CLED agar
- Eosine Methylene Blue agar



Membuat membrane filter - mengesan kehadiran mikroorganisma dalam sampel air

MAKMAL MOLEKULAR

Melakukan RT-PCR Test

Menampal barcode sticker pada sampel SWAB Covid



Yartex sampel



Pipet reagent & sampel



MESIN IPONATIC



Mesin yang digunakan untuk RT-PCR Test



Centrifuge PCR tube



Letak reagent carrier



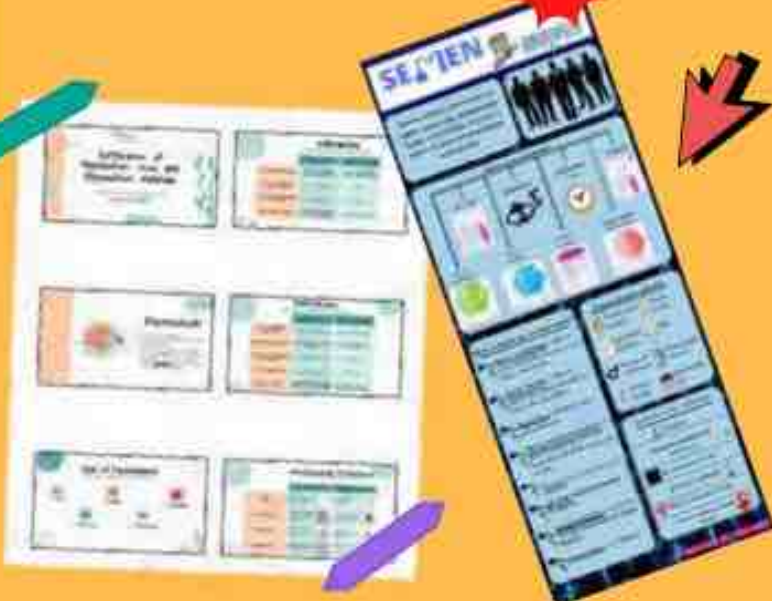
Masukkan PCR tube



Rekodkan hasil keputusan

Tugasan ketika kuarantin

- Membuat pembentangan video tentang perbezaan *P. malariae* & *P. vivax*
- Membuat infografik tentang Semen Analysis





JOHOR

ECO TOUCH ORGANIC FARM



ECO TOUCH ORGANIC FARM

THE JOURNEY TO ORGANIC



1. BIOCHAR
PRODUCTION

2. VERMICOMPOST BY
AFRICAN
NIGHTCRAWLERS



3. DUCKWEEDS AND
AZOLLA SP



4. BLACK SOLDIER
FLY



5. AEROBIC
COMPOSTING



6. LACTOBACILLUS
BACTERIA



7. LIQUID FERTILIZER



8. FISH AMINO ACIDS



Eco Touch Organic Farm



The problems when pesticide are overused

- Impacts health of farmers especially when used without proper PPE. Some long-term effects of exposure to pesticides are fertility and reproductive issues and respiratory complication.
- Impacts soil fertility and decrease number of soil beneficial microorganisms and inhabitants.
- Pollutes water when excess pesticide run off occur.
- Volatilization of pesticide pollute air.
- Decrease biodiversity such as bees and pollinators, beneficial insects and non-target plant.

At Eco Touch Organic Farm, we incorporate organic-farming methods which use less amount of pesticide. We are also putting an effort to replace livestock pellets with other alternative.

BLACK SOLDIER FLY AS BIOCONVERTER OF FOOD WASTE

Exploit the diet of BSF larvae to eat food waste such as fish intestines. When the correct amount of frass are supplemented, the yield are comparable to when pesticide are used.

The larvae also can be fed to livestock as it is high in protein.

AFRICAN NIGHTCRAWLER AS BIOCONVERTER OF FOOD WASTE

ANC has the ability to eat fermented kitchen waste up to

150%

of its own body weight.

Vermicompost consist of casting concentrated of nitrates, phosphorus, magnesium, potassium, and calcium.

BIOCHAR AS SOIL AMENDMENT

Its very porous surface can inhabit beneficial microbes and hold water molecules better to reduce watering requirement.

Harmful gasses

emitted can be condensed to wood vinegar that be used as a great natural pest repellent and cleaning products.

FISH AMINO ACID FERTILISER

High in nitrogen and promotes flowering and fruit setting when used at proper amount.

Promotes the growth of soil microbes and increase disease resistance of a plant.



AZOLLA AND DUCKWEED AS FEEDSTOCK

Duckweed and **azolla** sp. can grow at growth rate of

200%

Duckweed contain an average of 30% of protein per its dry weight, making it a great alternative for feedstock of chickens and ducklings.

AEROBIC BIO-COMPOST AND ANAEROBIC LIQUID ORGANIC FERTILISER

Job scope:

- Maintain favourable condition of BSF, ANC, azolla and duckweed, aerobic bio-compost in terms of moisture, temperature, odour growth rate.
- Collect organic fertiliser and soil amendment from BSF larvae, vermicompost.



INDUSTRIAL TRAINING

SMBU3915

BY: PUTRI NUR NAJIAH BINTI HUSIN (A18SC0469)



COMPANY BACKGROUND



ECO TOUCH ORGANIC FARM (M) SDN BHD
DUSUN DURIAN JALAN BESAR KOTA TINGGI
81900 JOHOR BAHRU,
JOHOR, MALAYSIA

MAIN ACTIVITIES

- Organic farming
- Poultry farming
- Production of organic fertilizer
 - Fish Amino Acid
 - Anaerobic fermentation

CONTACT INFO



012-7730929 (Mr. Ray)
ecotouchorganicfarm@gmail.com

- To expose students to the work environment in respective fields.
- To give opportunities for students to gain work experience in respective field.
- To practice and improve student soft's skills.

- Production of organic fertilizer
- Organic farming
- Production of biochar
- Handling bio-compost
- Handling Black Soldier Fly larvae and African Nightcrawler



- Black Soldier Fly larvae and African Nightcrawler as bio converter
- Biochar
- Bio-compost
- Liquid fertilizer
- Azolla and Duckweed

- Working in a multiracial environment.
- Proper way in handling kitchen wastes.
- Handling Black Soldier Fly and African Nightcrawler.





Activity/Tasks:

eee

- Biochar production
- Vermicompost production
- Bio Compost production
- Producing few types of organic liquid fertilizers
- Azolla and duckweed production



Introduction

eee

The company's best-known organic products include durian, rambutan, chickens, ducks, quail, rooster and organic vegetables. The company also has established a unique reputation by selling the purest and cleanest organic products. The mission of the company is to stay away from the farm chemicals and have a better environment for the world.

How to contact?

eee

- Company name:
Eco Touch Organic Farm Sdn Bhd
- Company address:
Dusun Durian, Jalan Besar Kota Tinggi - Ulu Tiram, 81900 Johor Bahru, Johor
- Contact:
ecotouchorganicfarm@gmail.com

Information

eee

- Khayrin Ilyana binti Mohd Lotfi
- 3 SSCG
- A18SC0508
- Faculty of Science (Biology)
- Faculty supervisor: Dr Abdul Fatah bin A.Samad
- Industry supervisor: Mr Chin Hap Boon



JOHOR

**GNOSIS LABORATORIES (M)
SDN. BHD.**

GNOSIS LABORATORIES (M) SDN BHD JOHOR BAHRU

10-A, Jalan Indah 1, Taman Bukit Indah, 81200 Skudai, Johor

MISSION AND VALUE

To provide comprehensive and advanced medical laboratory diagnostic services and solutions with an unmatched level of reliability, service and support, to the healthcare providers and institutions.

CATHERINE HAN YONG XIN

A18SC0383
3SSCG

INDUSTRIAL SUPERVISOR

MADAM HEMA A/P
THERMALINGAM

FACULTY SUPERVISOR

DR. HARYATI BINTI
JAMALUDDIN

INTRODUCTION AND SCOPE OF COMPANY

Gnosis Laboratories is a company which started the services from 2002. Gnosis Laboratories was implemented by Lezen Reference Laboratories and local laboratory. Lezen Reference Laboratories is a Taiwanese company which started operation since 1978.



- CLINICAL CHEMISTRY
- HAEMATOLOGY
- URINALYSIS
- IMMUNOASSAY

- MICROBIOLOGY
- HISTOLOGY
- CYTOLOGY



SPECIFIC DAILY TASKS

- Sample preparation and labelling process
- Centrifugation process
- Urine Full Examination
- Microscopic Examination
- Erythrocyte Sedimentation Rate
- Urea Breath Test
- Fecal Occult Blood
- Covid-19 Sample Preparation and Labelling
- ABO Testing
- Rotavirus Testing
- Covid-19 Antigen and Saliva Testing
- Abuse Drug Testing
- Ziehl-Neelsen Staining
- Malaria Parasite Staining (Field Staining)



WORKING EXPERIENCES

1. COMMUNICATION SKILLS

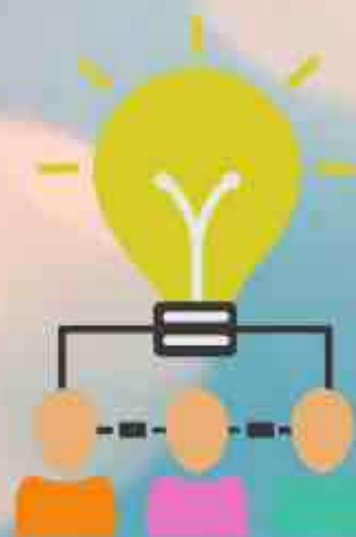
- Learn to communicate with colleague
- Deliver point of view effectively
- Be patient and polite

2. TEAMWORKING SKILLS

- Separate tasks evenly
- Finish tasks on time and efficiently
- Can experience different tasks and techniques

3. PROFESSIONAL KNOWLEDGE AND THINKING SKILLS

- Learn many diseases related to routine health checking
- Learn the relationship between biochemical compound and diseases
- Relate the knowledge together



**THE DAILY TASKS
GNOSIS LABORATORIES
JOHOR BAHRU**

Medical Laboratory Science (MLS) is a professional discipline specializing in the study of human health and disease. It involves the use of laboratory techniques to diagnose, monitor, and manage various medical conditions.

Students are required to complete a series of practical tasks during their studies, which are designed to develop their skills in laboratory procedures and data analysis.



PRE-ANALYTICAL PHASE

Sample Collection
Sample Handling
Transportation

URINALYSIS

Urinalysis is a common laboratory test used to detect urinary tract infections, kidney disease, and other conditions. It involves the examination of urine samples for various components, including color, odor, pH, and the presence of glucose, protein, and blood.



FULL BLOOD COUNT

A Full Blood Count (FBC) is a common laboratory test used to measure the number of red blood cells, white blood cells, and platelets in the blood. It is used to diagnose a variety of conditions, including anemia, infection, and leukemia.

ERYTHROCYTE SEDIMENTATION RATE

The Erythrocyte Sedimentation Rate (ESR) is a blood test that measures the rate at which red blood cells settle in a test tube. It is used to detect inflammation in the body, which can be caused by a variety of conditions, including infection, autoimmune disease, and cancer.



PERIPHERAL BLOOD SMEAR AND LEISHMAN'S STAIN

Peripheral blood smears are used to examine the morphology of red blood cells, white blood cells, and platelets. Leishman's stain is used to stain the smears, making it easier to identify abnormal cells and organisms.



Leishman's stain is used to stain the smears, making it easier to identify abnormal cells and organisms. It is a common laboratory test used to diagnose various conditions, including malaria and leishmaniasis.



UREA BREATH TEST

The Urea Breath Test (UBT) is used to detect Helicobacter pylori infection. It involves the ingestion of a urea solution, which is then broken down by the bacteria, releasing carbon dioxide that is detected in the breath.



UBT is a non-invasive test that is easy to perform and does not require any special preparation. It is a common laboratory test used to diagnose H. pylori infection.

FECAL OCCULT BLOOD TEST

Fecal Occult Blood Test (FOBT) is used to detect hidden blood in the stool, which can be a sign of colorectal cancer, polyps, or other gastrointestinal conditions.





JOHOR

**SPECTRA LABORATORY
PLT SDN. BHD.**

FATIN NATASHA YUSOF
A18SC0392



INTERNSHIP

SPECTRA LABORATORY PLT

SPECTRA LABORATORY PLT

Taman Ungku Tun Aminah,
Skudai, Johor

MISSION

To provide quality, efficient, accurate and productive medical laboratory services in order to satisfy and meet the need of healthcare practitioners as well as raising public awareness toward health concerns

TAGLINE

Always Care Always Here



INTERNSHIP ACTIVITIES

11 July-30 September 2021

- Diagnostic test
- Urine analysis
- Blood test analysis
- Virologic test (Detection of viral infectious disease)
- Immunological test
- Serological test
- Biochemical test

SELF-REFLECTION

- Proper laboratory practices
- Good work ethics
- Professional communication and networking
- Benefits of taking on feedbacks
- Significant of individual and teamwork performances
- Sense of accomplishment

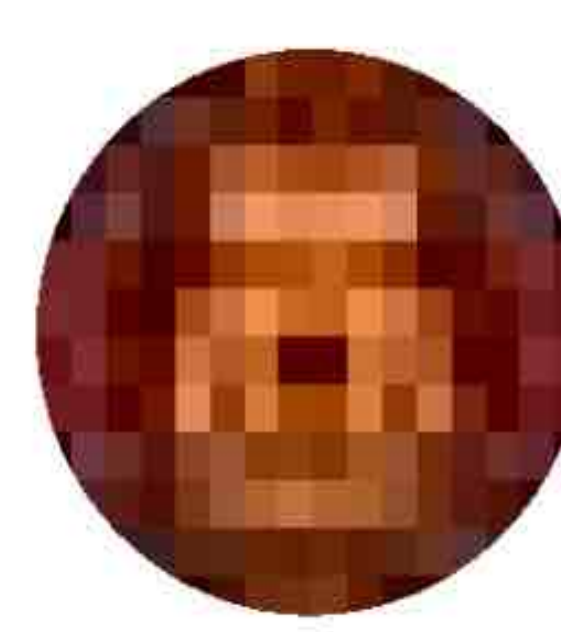
For more information, click:
<https://qr.go.page.link/Gg8EX>





KUALA LUMPUR

**FOREST RESEARCH
INSTITUTE MALAYSIA
(FRIM)**



Forest Research Institute Malaysia (FRIM)



teehong@frim.gov.my



About the Company

Forest Research Institute Malaysia (FRIM) is an institution that focuses on tropical forestry research, founded in 1929 and currently is governed by the Ministry of Energy and Natural Resources. The main function of FRIM is planning and implementing research for the development of the forestry sector and the conservation of forest resources.



STEP 1

Sample collection and DNA extraction from fresh materials

- Sample: Leaf material from silica-dried samples and herbarium specimens
- Each species had 1 to 5 individuals been collected
- Total DNA was extracted via DNeasy Plant Mini Kit (Qiagen)



STEP 2

PCR amplification and DNA sequencing of Candidate Plastid Markers

- rbcL, trnH-psbA and ITS2 barcodes were amplified by PCR in 10 µl reaction mixtures using the thermocycler
- PCR product sequence based on Sanger sequencing
- Purify before been run on the genetic analyzer



STEP 3

Data Analysis of DNA Barcodes Species Identification

- The sequence was edited using SEQUENCHER v5.0
- The efficiency of the plastid markers was evaluated using similarity BLAST analysis and Neighbor-Joining (NJ) tree



code performance by computing barcoding gap, similarity BLAST, and construct tree

Knowledge Gained

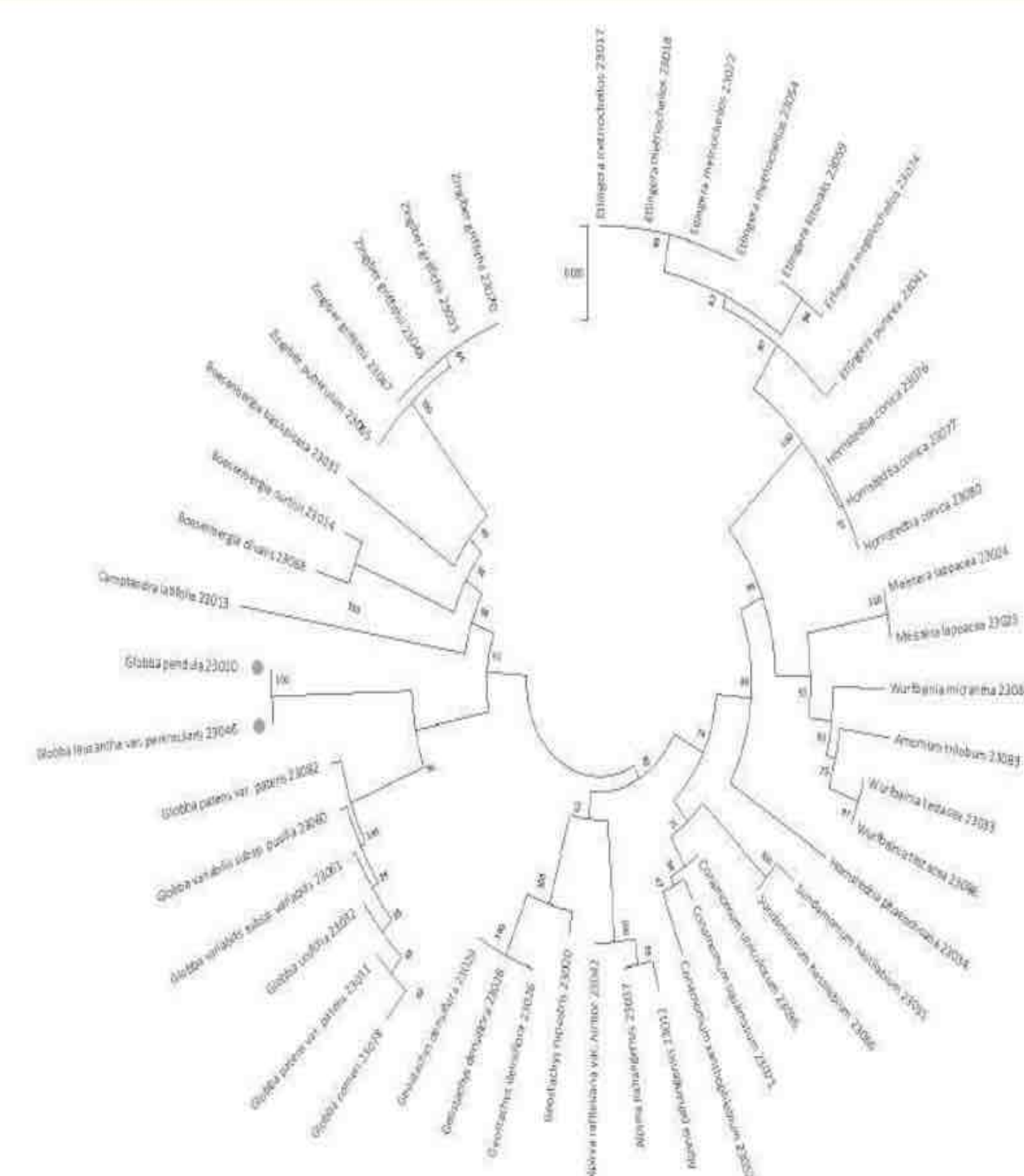
Knowledge on DNA barcoding and its various

to evaluate DNA barcode effectiveness in different species

in an environment with minimal guidance

good relationships with my industrial SV

insight into a real-life research environment





KUALA LUMPUR

UNIVERSITI MALAYA (UM)

DEPARTMENT OF PARASITOLOGY

Department of Parasitology, UM

Alvin Lu Jiunn Hieng A18SC0375

Introduction



The Department of Parasitology, Faculty of Medicine, University of Malaya is one of four Para clinical department under Faculty of medicine and functions to teach, research and perform diagnostic service.

The Department is responsible in teaching Medical Parasitology to Diploma, Bachelor and Master students.

The Department also serves as a reference center for parasitic diseases for government and private hospitals, Teaching and research are continuously being improved and upgraded in order to meet the needs and demands of the clients

Diagnostic tests in the Department are benchmarked against international standards.

Job scope

- Assists with academic research
- Meets regularly with supervisor to discuss research assignments
- Assists in administrative duties



Internship experience

The experience in **searching** relevant and trustworthy research/ review paper from the internet

Skills in **reading** a research paper and summarize important points and idea from it.

Experience in **writing** a publication of review paper



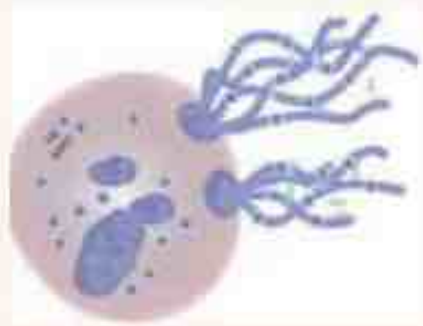
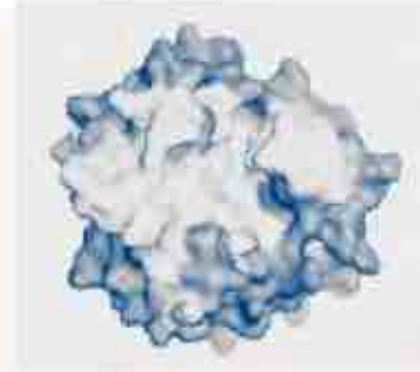
The experience in **critical thinking** by answering the question given by supervisor and guest who attend my presentation

Learns the **knowledge of medical parasitology** regarding to malaria, which I did not learn from UTM academically.

Functional & Immunological studies of *P. knowlesi*

Pk-TatD-like DNase

Extracellular, DNase I, divalent Mg²⁺ ion dependent



Cleave neutrophils extracellular traps (NETs) use to capture invading parasites

Vaccine of TatD like DNase non cross protective toward other malaria

Varies in immune epitope



Pk-DHFR-TS

Responsible in de novo folate synthesis for DNA replication

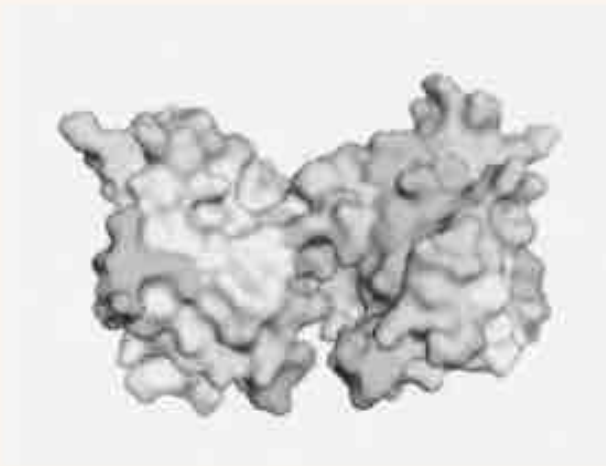
Utilize dihydrofolate and dUMP

Antifolates capable to inhibit this enzyme



Pk-FKBP 35

Peptidyl-prolyl cis-trans isomerase (PPIase) family



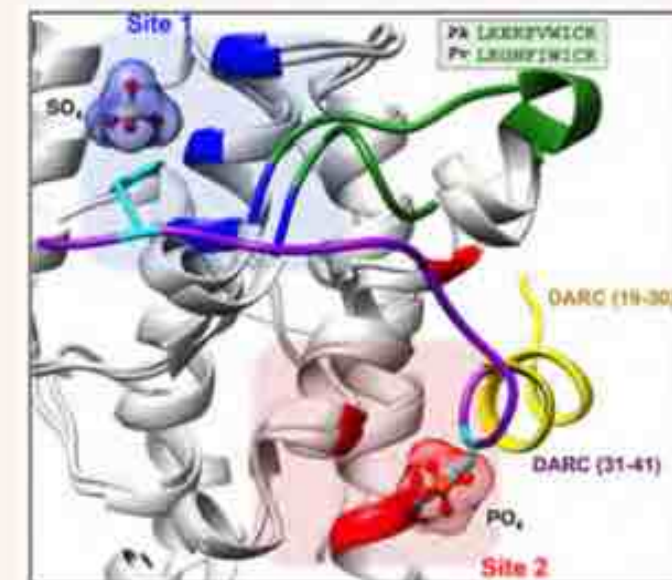
Consists of two domain :
FKBD - Cis-proline bond isomerization
TPRD - Contribute to dimeric structure

FK506 can inhibit PPIase activity (competitive inhibitor)

Capable to inhibit calcineurin phosphatase activity, FK506 independent

PkDBL-DARC Interactions

Sulfated Tyr41



Sulfate Tyr30 & DARC (19-30 peptide spanning residues)

Two distinct DARC binding sites on Pk-DBLs

Application of PkAMA1 for multi-epitope vaccine design

Vaccine design on in silico analysis facilitates the epitope mapping process (possible antigenic epitope)

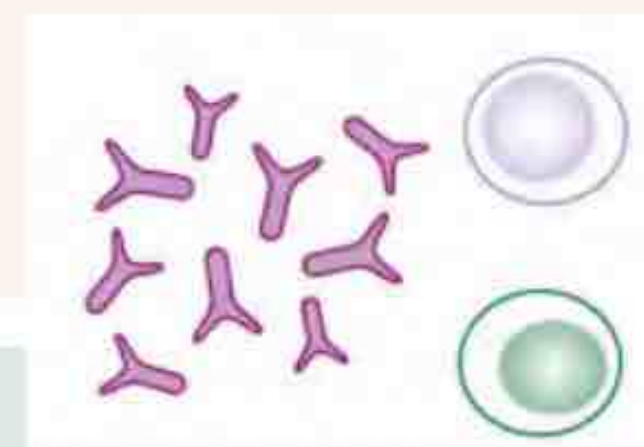
time-consuming

inconvenient process

B cell epitope
BepiPred, ABCpred, BcePred, IEDB

T cell epitope (MHC I&II)
NetMHCpan4.1, NetMHCIIpan-4.0

Validation
VaxiJen server



PkAMA1 expressed on both sporozoites and merozoites Pre erythrocytic and erythrocytic stage

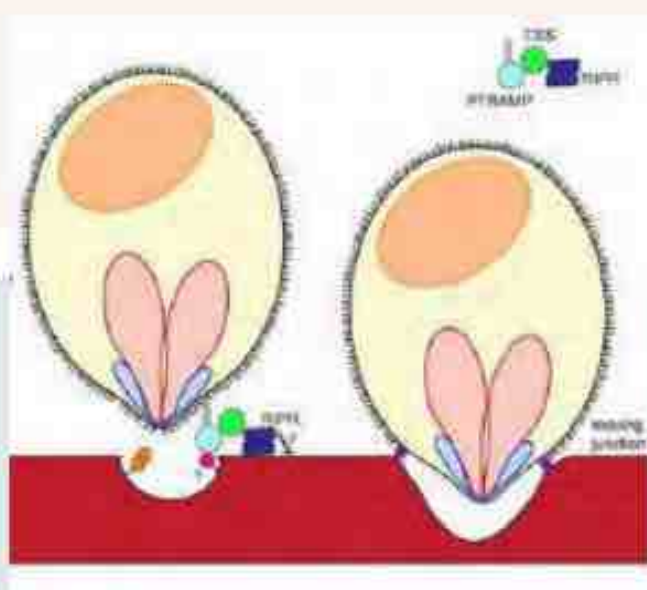
Suitable as multistage vaccine

The desired epitope for the malaria vaccine should be capable to trigger both cell mediated and humoral immunity

NSGIRIDLGEDAEVGNKYRIPAGKCP (codons 28-54) and, KTHAASFVIAEDQNTSY RHPAVYDEKNKT (codons 122-150) Domain 1 ectodomain, PkAMA1

Heterotrimeric complex Pk-RIPR, Pk-CSS and Pk-PTRAMP

PkRIPR interact PkCSS & PkPTRAMP



PkRIPR - Micronemal
PkCSS - Cysteine rich
PkPTRAMP - Apical membrane protein

Immunological studies shows only anti-RIPR antibodies capable to inhibit significantly to the complex.

DEPARTMENT OF PARASITOLOGY, FACULTY OF MEDICINE, UNIVERSITI MALAYA

INDUSTRY SV: DATIN PROF.
DR. INDRA A/P
VYTHILINGAM

FACULTY SV: DR. SALEHA
BINTI SHAHAR

Presented
by:



Chay Chee Teng
A18SC0384
3SSCG

JOBSCOPE

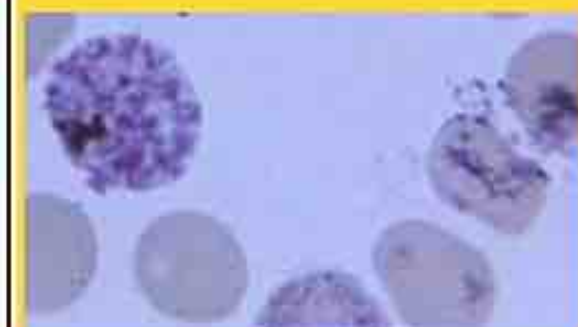
- Literature search & Literature review
- Paper Summarizing
- Write a review opinion paper, title: "Can we eliminate malaria when large number of *P. knowlesi* are infecting the population?"

OBJECTIVES

- To identify challenges poses by *P. knowlesi* in Malaysia malaria elimination program.
- To express ideas regarding the necessary of WHO to include *P. knowlesi* in the context of malaria free status.

Plasmodium knowlesi?

- Zoonotic parasites
- Natural host: long-tailed & pig-tailed macaques
- Transmitted by *Anopheles* mosquitoes- *Leucophyrus*
- Widespread around Southeast Asia.



Methods

- Database: Google Scholar, NCBI, PubMed, ELSEVIER, ScienceDirect, MDPI
- Refinement strategies: geographical location, language, < 15 years
- Extra tools: Mendeley Reference Manager, Plagiarism checker & Plagiarism detector. net.

Results & Discussions

Reasons of WHO should include *P. knowlesi* in malaria elimination context.

1. Potential of Land Use & Land Cover Changes (LULCC)
2. Effect of human malaria elimination program
3. Misdiagnosis, Submicroscopic & Asymptomatic

Eradication Strategies

1. New pyrethroid formulations
2. Implement of larvivorous fish
3. Nuclear technique + introduction of *Wolbachia* into vectors

CONCLUSIONS

- Improved skills in doing literature review & professional writing.
- Developed understanding on mosquito parasite- *P. knowlesi*.
- Expanded views & perspectives in biology area.



DEPARTMENT OF THE PARASITOLOGY UNIVERSITI MALAYA

LIAU SOOK YUN

A18SC0407

3 SSCG



INTRODUCTION

Universiti Malaysia (UM) is the oldest university in Malaysia located in the southwest of **Kuala Lumpur**, Malaysia.

Department of Parasitology under Faculty of Medicine aims to be

- the **Centre of Excellence for research, innovation, publication and teaching in Parasitology**.

Act as an **education center** to teaching subjects

Creates **awareness** regarding the ill effects of parasitic infections among the public.

Serve as a **reference center** for parasitic disease for private and government hospitals.

INTERNSHIP EXPERIENCE

Widen my Exposure

- The internship exposure me to the **new insight and understanding** for malaria parasite.

Teamwork

- I was assigned in a group. **Working together** as a team to complete the assigned tasks.

Presentation Skills

- By the **feedback and advice** from supervisor, I brushed up my presentation skills
- **More confident** in presenting

Review Paper Writing

- Experiencing the review paper writing related to the **function studies of Plasmodium knowlesi**

JOB SCOPE

- **Sourcing** for related journal paper
- **Assisting** with academic research writing
- **Presenting** finding biweekly
- **Discussing** the finding for the journal paper with leader and supervisor

SUPERVISOR DETAILS

Industrial Supervisor

Professor Lau Yee Ling

Faculty Supervisor

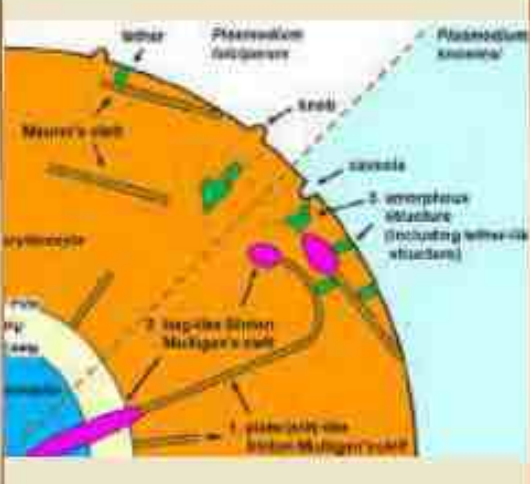
Dr. Azman bin Abdul Saman

Internship Programme

Functional Studies of *Plasmodium knowlesi*

Liau Sook Yun
Department of Parasitology,
Faculty of Medicine,
Universiti Malaya

1



The *Plasmodium knowlesi* MAHRP2 Ortholog Localizes to the Structure Connecting Sinton Mulligan's Clefts in the Infected Erythrocyte

- Erythrocyte modification & protein transport
- To **examine** the membranous structure of erythrocytes
- SMC **analogous** to MC
- Identify **druggable** targets

2

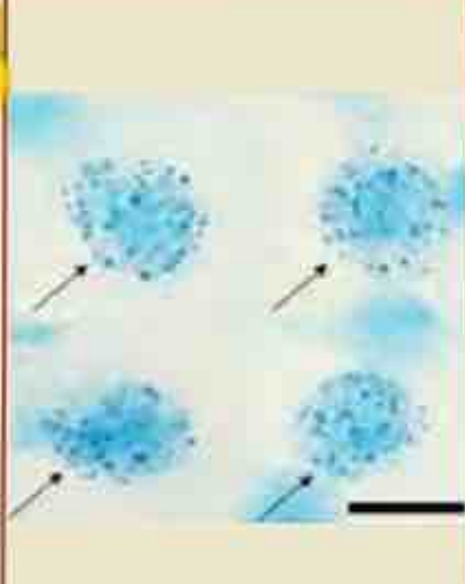
Interaction of Merozoite Surface Protein 2 with Lipid Membranes

- **Facilitates** the invasion
- To **investigate** the effect of peptide-membrane interactions
- DMPG **promotes** the oligomerization
- **Vaccine** candidate



DMPG nonodiscs

3



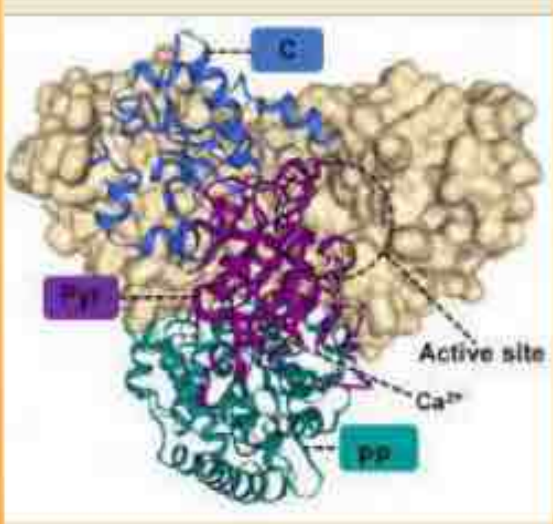
Duffy-Positive Reticulocytes Generated *In Vitro* from Human peripheral Blood CD34+ Hematopoietic Stem Cells are Susceptible to Invasion by *Plasmodium knowlesi*

- **Receptor** for the invasion
- To **produce** reticulocytes & **identify** the presence of the Duffy blood group antigens
- **Fy(a+b+)** phenotype & **young** reticulocytes
- ***In vitro* culture** & research

4

Characterization of Plasmodial Tranketolases & Identification of Potential Inhibitors: an *in Silico* Study

- **Generating** NADPH, pentoses & R5P
- To **study** the differences & identify the inhibitors
- **Differences** binding pocket - human & plasmedium TKT
- Design the PTKT **inhibitors**



Active site
Ca²⁺

5



Exploration & Identification of Novel Inhibitors against Knowpain-4 of *P. knowlesi* using a Combinatorial 3D Pharmacophore Modeling Approach

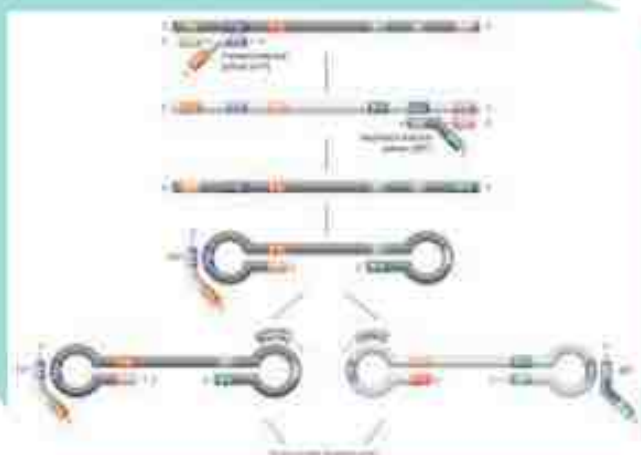
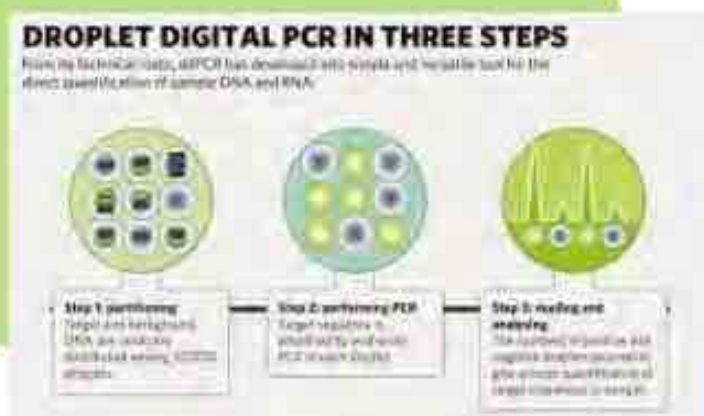
- Hemoglobin **hydrolysis**, erythrocyte **invasion** & **rupture**
- To identify functional & active sites of KP4
- **KP4** - targeted to design inhibitor & **E64** - inhibitor
- **Inhibiting** the expression of KP4

Malaria Diagnosis

- The standard gold method, microscopy, have trouble identifying *Plasmodium* species.
- Despite, it is crucial to diagnose *Plasmodium knowlesi* accurately to prevent further malaria complication.
- Therefore, three diagnostic tools have been discussed on the efficacy of diagnosing knowlesi malaria.

1- ddPCR (Mahendran et al., 2020)

- An alternative tool to overcome parasite density quantification concerns.
- More accurate than:
 - Nested PCR: in mixed infection cases
 - qPCR: ddPCR has higher sensitivity.

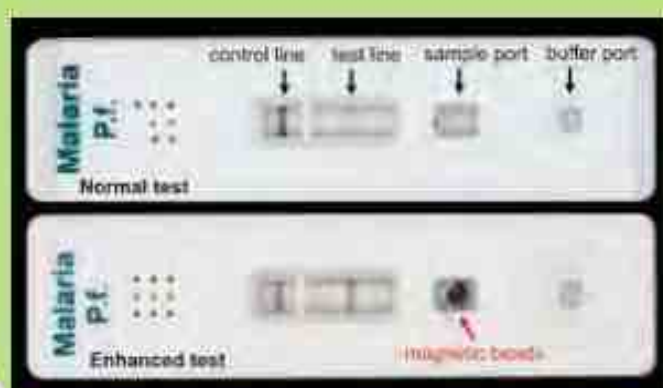


2- LAMP (Lai et al., 2021)

- More convenient than PCR—rapid, highly sensitive, cost-effective than PCR.
- Have better performance than nested PCR.

3- RDT biomarker (Krause et al., 2018)

- Established RDT biomarker facing difficulties to distinguish *P. knowlesi*.
- Therefore, phosphoethanolamine-N-methyltransferase (PMT) has diagnostic potential for *P. knowlesi*.
- Because PMT is involved in Plasmodial lipid biosynthesis and absent from the human genome.



CONCLUSION

The ideal cost-effective & resource-constrained point-of-care tools has yet to be developed

PREPARED BY:
NUR AINA SOFIA BINTI ZUBIR (A10SC0435)
SMBU 3915- 01

References

- Krause, R. G., & Goldring, J. D. (2018). Phosphoethanolamine-methyltransferase is a potential biomarker for the diagnosis of *P. knowlesi* and *P. falciparum* malaria. *PLoS one*, 13(3), e0193833.
- Lai, M. Y., Ooi, C. H., & Lau, Y. L. (2021). Validation of SYBR green I based closed-tube loop-mediated isothermal amplification (LAMP) assay for diagnosis of knowlesi malaria. *Malaria Journal*, 20(1), 1-6.
- Mahendran, P., Liew, J. W. K., Amir, A., Ching, X. T., & Lau, Y. L. (2020). Droplet digital polymerase chain reaction (ddPCR) for the detection of *Plasmodium knowlesi* and *Plasmodium vivax*. *Malaria Journal*, 19(1), 1-10.

PLASMODIUM KNOWLESI, A NEW THREAT TO MALARIA ELIMINATION IN MALAYSIA

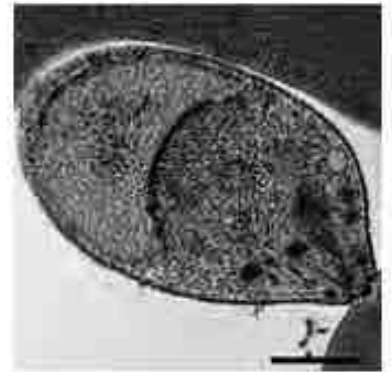


Organizational Background

- Department of Parasitology of UM is managed by 30 staffs including 15 academic lecturers
- One of the oldest and biggest Parasitology Department in the world

Problem Background

- Simian malaria parasites that can infect both macaques and human in nature
- Natural hosts: Long-tailed and pig-tailed macaques
- Transmitted by *Leucosphyrus* group of *Anopheles* mosquitoes
- Symptoms: High fever, abdominal pain, diarrhea
- The number of knowlesi malaria cases increased while human malaria cases decreased
- Became a huge stone of progress to malaria elimination programme in Malaysia
- Crucial to identify factors, challenges and suggest ideas of elimination methods



Factors that caused increased cases of knowlesi malaria



Anthropogenic activities caused by humans

- Land exploration and deforestation
- Affect the water system (unsuitable as breeding site)
- Macaques lost home and migrate, mosquitoes followed them

Improved diagnostic capacity

- Most *Plasmodium knowlesi* are misdiagnosed as *Plasmodium falciparum*
- Nested PCR and lamp-thermal isothermal amplification (LAMP)

Loss of the relative immunity against *Plasmodium knowlesi*

- Natural immunity to other *Plasmodium* species does not provide substantial protection against *Plasmodium knowlesi*

Impacts & challenges faced in malaria elimination

Complexity of life cycle and morphologies caused lots of uncertainties

- Transmission cycle is unique
- Need to consider both reservoir hosts and vectors
- Distribution and host-switching preference still uncertain

Treatments and vaccines still under clinical trial and testing

- Treatment using artemisinins derivatives still under clinical trial
- Difficult to develop vaccine due to life cycle is unique

Previous malaria controls and prevention became ineffective and affected the economy of the countries

- Agriculture sector is affected
- People cannot go to work and lost their jobs (farmers, foresters)



Ideas suggested to eliminate the knowlesi malaria



Law enforcement, forest protection and strengthening surveillance system

- Prevent illegal deforestation and land exploration
- Surveillance system: Monitor epidemic areas to implement immediate measures

Specific mosquito sprays, repellents, larvicides and bio-control strategies

- Insecticide sprays, *Anopheles* mosquitoes repellents
- Larvicides or using larvivorous fish

Self-protection is required before the introduction of effective treatment

- Avoid contact with macaques
- Have a medical check-out immediately

Internship experience & Things that I learnt

Knowledge-searching skill --> In order to search the journals that I wanted, I required to think about the topic that assigned and keep it simple and specific like "simian malaria", "*Plasmodium knowlesi*" and "elimination of malaria" that related to topic.

Information analysis skill --> I was able to deconstruct the information collected from 40 journals into smaller categories and drawn out the small conclusions such as factors, impacts and challenges and elimination methods.

Learnt how to express opinions --> I was able to give insights and opinions based on the knowledge that I found even though there was no physical experiments to examine the effectiveness of the methods.



Internship Program

DEPARTMENT OF PARASITOLOGY, FACULTY OF MEDICINE,
UNIVERSITY OF MALAYA, 50603 KUALA LUMPUR



01 INTRODUCTION

The Department of Parasitology at the University of Malaya's Faculty of Medicine is holds workshops for scientists and the public on a regular basis to share parasitic information and knowledge. In order to pique students' interest in the topic of parasitology, an inter-university quiz has also been organized. The Department is working to promote parasitology not only as a teaching discipline, but also to raise public awareness about the dangers of parasitic illnesses.



02 JOB SCOPE

- Fundamental concept reading
- Topic assigned reading
 - Task assigned reading
 - Research paper finding
 - Presentation preparation
 - Weekly meeting (presentation)
 - Daily Logbook update.

03 INTERNSHIP EXPERIENCE

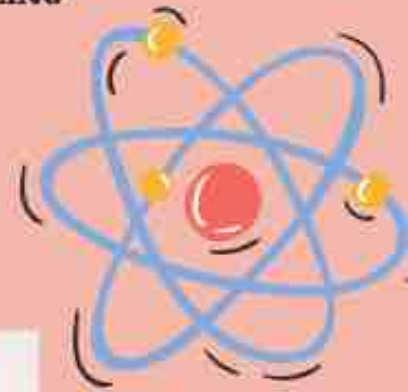
- Take risks. Try something new.
- Know more into details to parasites that causes Malaria.
- Techniques on finding trustable and verified informations.
- Don't be afraid to ask questions during the meeting.
- Experience on handling critical questions after the presentation
- Keep an open mind and positive attitude.



04 SUPERVISOR DETAILS

Faculty supervisor:
Dr. Azman Bin Abd Samad

Industrial supervisor:
PROFFESOR LAU YEE LING



05 Student details

YONG JIA YI
A18SC0496
3SSCG (BIOLOGY)
krisyong0427@hotmail.com



Industrial Training

Zulhisham bin Zulzahrin
A18SC0498

Department of Parasitology
Faculty of Medicine
Universiti Malaya

Lab Meeting

- Learn that not all articles are reliable
- Learn responsibilities of a researcher

5th Article

- Criticizes current drug
- Claims that artemisinin and derivatives are dangerous

In vitro assessment of cytotoxic, genotoxic and mutagenic effects of antimalarial drugs artemisinin and artemether in human lymphocytes

Nissa Cergasika (Universiti Sains Malaysia), Carlos Alberto Machado da Rocha, Juliana Cristina Motta, Marcelo de Oliveira Rocha, Fagundes Maciel dos Santos, Correa, Lucrécia Marinho Gomes, Thiago Di Felice Azeiteiro, Tatiana Maria Thomas Araujo, Leopoldo Silva de Moraes & Verônica Barbosa

4th Article

- New drug target
- FNT protein are crucial for *Plasmodium spp.* survivability

Plasmodium 2-hydroxy-pantoin 1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

3rd Article

- Compares effectiveness of existing drugs
- Susceptibility profile is important for drug development

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Plasmodium knowlesi exhibits distinct in vitro drug susceptibility profiles from those of *Plasmodium falciparum*

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

2nd Article

- Plant extract as treatment
- Tested the efficiency and safety on olive baboons

Warburgia agaidensis: A potent in vivo phyto-medicine against *Plasmodium knowlesi*

Patrick Stevan Wiro, Ulrike Lydia Kattana, Shantana Omeru Saha and Wasika Wabromidiba

Treatment and Drug Resistance

- Look for articles
- Present biweekly

1st Article

- Newly modified drug
- Compares efficiency towards *P. knowlesi* vs towards *P. falciparum*

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Novel Folate-1,2,4-Oxadiazole Derivatives Possess In Vitro Activity against *Plasmodium knowlesi* and *Plasmodium falciparum* with Propagated

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Phenothiazin-2-ylidene-pantoin-1-oxo-5-oxo-pyridin-4-ylidene-FNT-type Lactate Dehydrogenase from *Plasmodium falciparum* Pathogenic Plasmodium Species

Need an update!





KUALA LUMPUR

UNIVERSITI MALAYA (UM)

**TROPICAL INFECTIOUS DISEASES
RESEARCH & EDUCATION CENTRE
(TIDREC)**

**DEPARTMENT OF MEDICAL
MICROBIOLOGY**

FACULTY OF MEDICINE



**NUR FATIN SYAMIMI
BINTI MOHD NOR**
A18SC0443
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(BIOLOGY)**

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Tropical Infectious Diseases
 Research & Education
 Centre, Level 4, Block N&O,
 Faculty of Medicine,
 University of Malaya, 50603
 Kuala Lumpur, Malaysia

SUPERVISORS

Industry Supervisor
 Dr. Norhidayu binti Sahimin
 Senior Lecturer (TIDREC, UM)

Faculty Supervisor
 Dr. Saleha binti Shahar
 Senior Lecturer (UTM)

INDUSTRIAL TRAINING

TROPICAL INFECTIOUS DISEASES RESEARCH & EDUCATION CENTRE (TIDREC)

TIDREC houses World Health Organization (WHO) Collaborating Centre for Arbovirus Reference & Research and recognised as one of three Tick Cell Biobank specifically for Asia outpost. During COVID-19 pandemic, TIDREC was chosen by a Special COVID-19 Screening Team as one of the diagnostic laboratories to carry out tests in assisting Ministry of Health (MOH).

1 MAIN PROJECT

KNOWLEDGE TRANSFER PROGRAM ON COMMON INFECTIOUS DISEASES AND OUTBREAK MITIGATION AMONG MADRASAH / TAHFIZ SCHOOL STUDENTS IN KLANG VALLEY, MALAYSIA

2 OBJECTIVES

- To assess knowledge and hygiene (include sanitation) practice towards COVID-19, vector-borne diseases, dengue and food-borne gastrointestinal diseases.
- To conduct and transfer knowledge on COVID-19, vector-borne diseases, dengue and food-borne gastrointestinal diseases through our designed activities.
- To transfer knowledge of the new-norm era on the prevention and control of the infectious disease.

3 ROLES/RESPONSIBILITIES

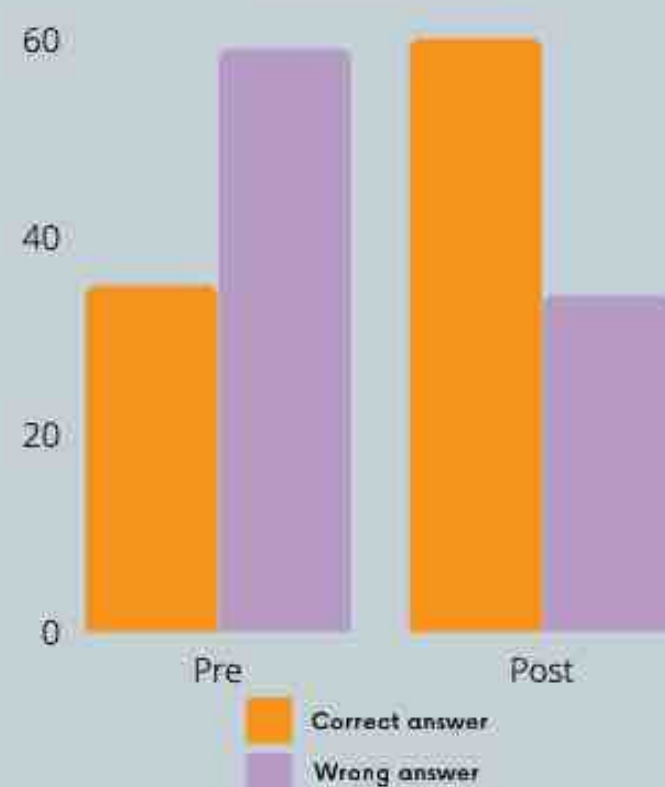
- Assist vector-borne disease's speaker
 - Prepare the presentation slides and pre & post assessment (google form, Quizizz)
- Chosen as the moderator
 - Hosting the program
- Manage the technical part
- Extract and organise the data/ results obtained

4 EXPECTED RESULTS

Have you ever seen and heard of black flies and black fly -borne diseases?



Which of the following diseases is a flea -borne disease?



5 CHALLENGES & WAYS TO OVERCOME

- Lack of response from the participants**
 - Conduct interactive mini games /poll to gain their attention
 - Use simple words and pictorial for better understanding
 - Switch the assessments into more exciting platform (Quizizz, Kahoot)
 - Prepare prizes for the winners
- Duration of program exceeded**
 Improve on the time management for each slots
- Technical issues**
 Choose the best and accessible platform/application to conduct the program

6 ACTIVITIES

1. Biological Risk Management (BRM) Training

- Biorisk assessment
- Personal Protective Equipment (PPE)
- Emergency Response Plan

2. Introduction writing

- Knowledge, Attitudes and Practices (KAP)
- (a) Vector-borne diseases
- (b) Hand washing

3. Demonstration on how to maintaining tick cell lines

- Feeding and splitting tick cells



7 LESSON LEARNT

- Improve soft skills - communication & time management skills
- Gained various knowledge on infectious diseases
- Exposed to laboratory procedures
- Enhance hard skills- data organization & data analysis


INDUSTRIAL SUPERVISOR

Dr Pouya Hassandarvish

FACULTY SUPERVISOR

Dr Nurriza binti Ab. Latif

PREDICTION FOR POTENTIAL INHIBITORY ACTIVITY OF NARINGENIN AGAINST ZIKA VIRUS THROUGH MOLECULAR DOCKING



Introduction

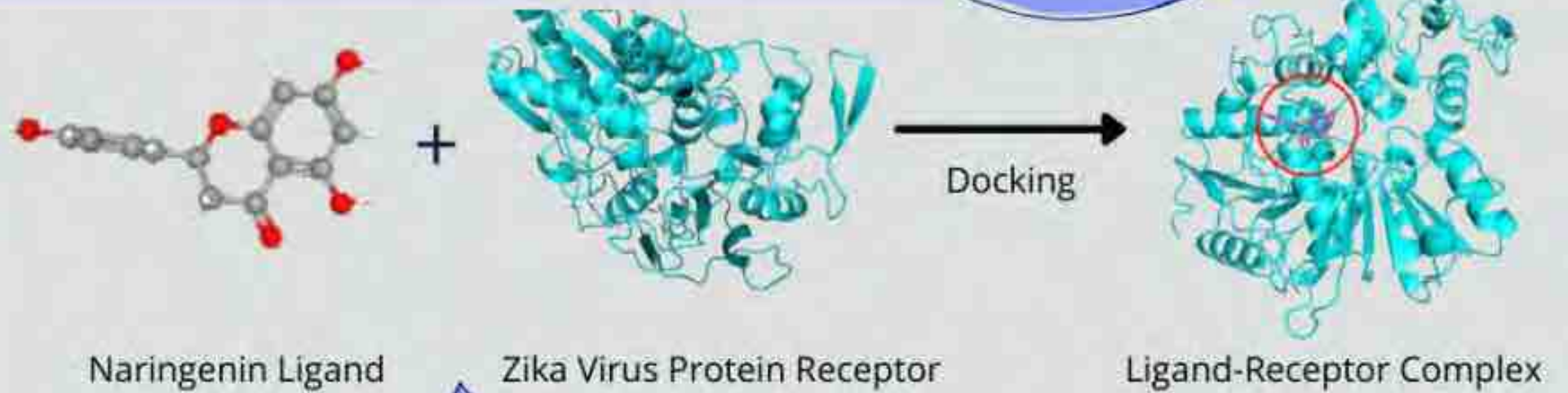
- Zika Virus (ZIKV) is an arthropod borne virus of that commonly transmitted via the infected mosquitoes as the vectors.
- ZIKV was reported to infect countless people and have been cause epidemic outbreak few times in several countries.
- Until today, there is no specific treatment have been clinically approved to cure this virus.
- Molecular docking can be a significance approach for a ZIKV drug design.

Objective

- To obtain the ligand-receptor complex between Naringenin & ZIKV protein with optimum conformation with less binding energy.
- To examine the interaction between Naringenin ligand and few protein receptors of ZIKV (NS3 helicase, NS5 polymerase and Envelope protein).

Conclusion

The study on the protein-ligand interaction showed the molecular interaction efficiency between the ZIKV amino acid residues on the Naringenin natural compound. It can potentially inhibit the ZIKV substrate or change the biological activity of the ZIKV that infecting human.

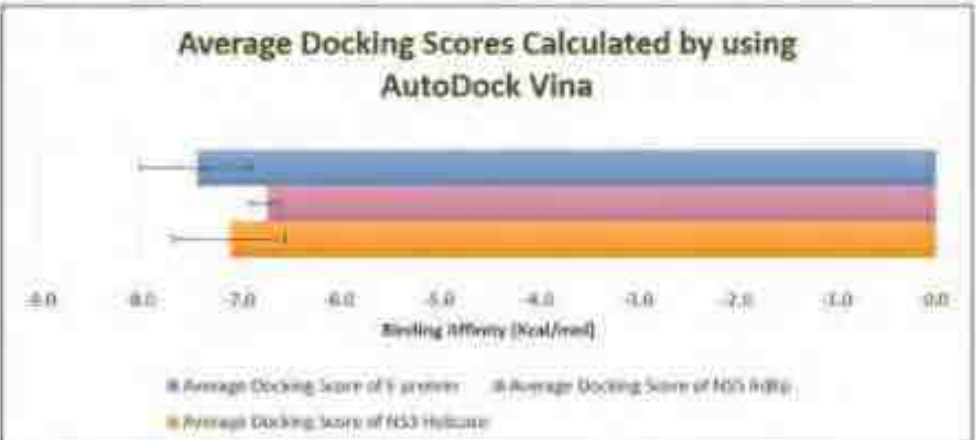


Methodology

- Structural retrieval.
- Active site prediction.
- Ligand and protein preparation.
- Molecular docking.
- 3D and 2D visualization.
- Results analysis.

Results

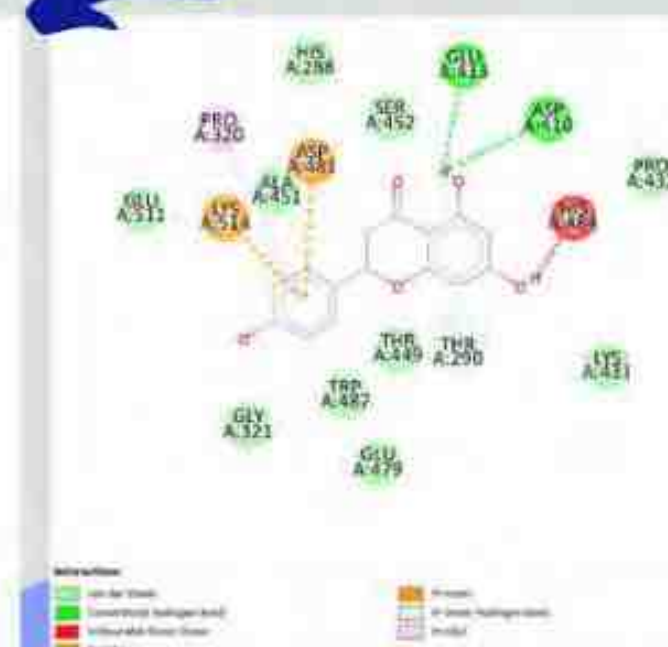
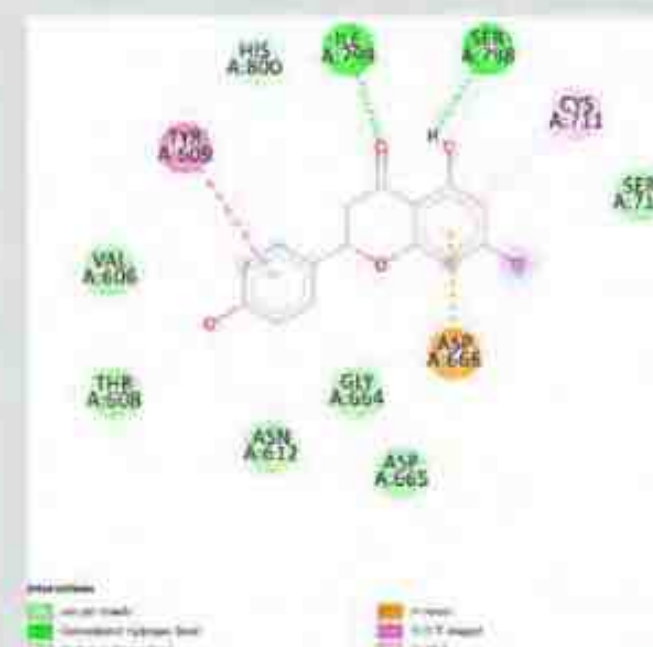
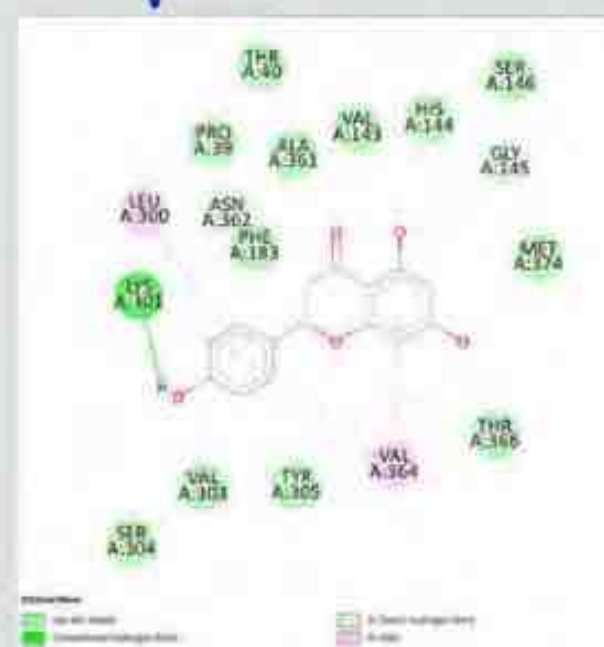
The binding analysis of Naringenin and ZIKV protein receptors with the amino acid residues contributed essential details about the catalytic binding site. The clustered bar chart can be seen as the average docking scores calculated by AutoDock Vina. The results of molecular docking are summarized in the table below.



ZIKV Protein Receptor	Binding Energy (kcal/mol)	Number of Hydrogen Bond	Number of Hydrophobic Interaction	Electrostatic Interactions	Involved in Protein-Ligand Complex
NS3 Helicase	-7.9	3	1	2	Pro 320, Asp 410, Glu 413, Lys 431, Asp 481, His 484, and Lys 514
NS5 RdRp	-7.0	4	2	1	Tyr 609, Asp 666, Cys 711, Ser 798, Ile 799 and His 800
Envelope protein	-8.5	5	4	-	Gly 145, Leu 300, Lys 301 and Val 364

Literature Review

- Naringenin (C₁₅H₁₂O₅) is one of the flavonoid natural product that have the antiviral activity against many viruses such as HIV, influenza, herpes, dengue as well as ZIKV.
- NS3 helicase, NS5 RdRp and E protein of ZIKV are the most popular candidate as the antiviral drug targets for drug design.



Envelope Protein-Naringenin

NS5 RdRp-Naringenin

NS3 Helicase-Naringenin



TROPICAL INFECTIOUS DISEASES RESEARCH AND EDUCATION CENTRE



COMPANY PROFILE

- Listed as 1 of 20 of Higher Institution Centre of Education (HICoE) in Malaysia.
- Consisted of 7 units: Quality Assurance & Training Program, Tick Cell Biobank, High Level Biocontainment, WHO Collaborating Centre, Arthropod Research Laboratory, Vaccine & Therapeutic and Antiviral Research.
- Multiple quality services: Laboratory detection, Bacterial Identification, Antiviral Screening and Consultation & Training

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PROJECT

Knowledge Transfer Program on Common Infectious Diseases and Outbreak Mitigation Among Madrasah / Tahfiz School Students in Klang Valley, Malaysia

- AIM:**
1. To assess COVID-19, mosquito-borne diseases, and food-borne gastrointestinal diseases knowledge and hygiene (including sanitation) practises.
 2. Through our planned efforts, we will conduct research and share information about COVID-19, mosquito-borne infections, and food-borne gastrointestinal ailments.
 3. To promote new-norm era knowledge on infectious disease prevention and control.

- ORGANIZER:**
1. **Advisor:** Prof. Dr. Sazaly bin Abu Bakar
 2. **Director:** Dr. Norhidayu binti Sahimin
 3. **Speakers:** Dr. Zubaidah Ya'cob, Dr. Nurhafiza Zainal & Puan Rafidah Lani
 4. **Secretariat:** 4 Intern Students & 9 TIDREC's Staffs

SCHOOL
Hard to find and invite Tahfiz schools
Focus on active schools and open for discussion

COMMUNICATION
Lack of 2 ways communication
For question or poll during the talk

PARTICIPANTS
Do not participate consistently
Change from plain form into attractive quiz game
Change perception
Bold or highlight the keywords to grab attention

MANAGEMENT
Time constrain
Extend the time
Technical issue
Message students with problems to assist them in details

Challenges

SOLUTIONS

ROLE & RESPONSIBILITY

- **Organize and manage the program**
 - Deal with the teacher
- **In charge for Dengue part**
 - Prepare Dengue pre & post assessment
- **Responsible for technical matter**
 - Help to resolve any technical problems before & during program
- **Become moderator**
 - Hosting the program from beginning
- **Manage & prepare data/result/document of program**
 - Extract, collect and compile data

OVERALL DENGUE ASSESSMENT

- Most participants have **good attitude & practices** upon Dengue
- Most participants have **low knowledge** upon Dengue specifically on question "What is the cause of Dengue?"

Agreement & Disagreement on Proper Attitude & Practices on Dengue

Category	AGREE (%)	NOT AGREE (%)
ATTITUDE 1	85	15
ATTITUDE 2	50	50
ATTITUDE 3	80	20
PRACTICE 1	75	25
PRACTICE 2	85	15

ATTITUDE 1: REALIZE THE SEVERE EFFECT OF DENGUE
 ATTITUDE 2: REALIZE THE RISK OF DENGUE
 ATTITUDE 3: AWARE TO PREVENT DENGUE
 PRACTICE 1: PREVENT MOSQUITO BITE
 PRACTICE 2: ROLE AS STUDENT TO PREVENT DENGUE

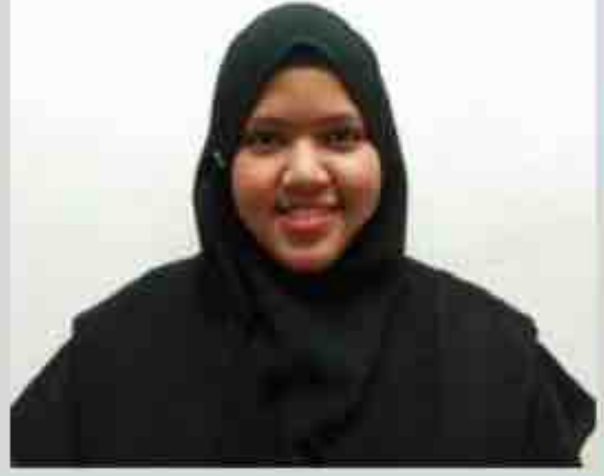
ACTIVITIES

- Biorisk Management Training.
- Feeding & Maintaining Tick Cells
- Introduction writing on Foodborne Diseases

LESSON EXPERIENCE

- Widen my social level/range
- Improve my confident, communication, management & knowledge
- Expose more about infectious diseases & laboratory works
- Learn about Tick Cells Lines (new to me)
- Boost my interest in Biology
- Get the chance to ready physically & mentally for any challenges during working

Molecular Docking Study on the Interactions of PI3K α -baicalein and PI3K α -baicalin complex



NURAIHANAH NAJIHAH BINTI ZAIDI

A18SC0454

UTM

Introduction

Cancer is a crucial health problem across the world.

Have research on the inhibition of baicalein & baicalin against class I PI3K isoforms but no in-silico studies on the binding interactions of the baicalein & baicalin towards receptor PI3K α .

To investigate the binding interactions between PI3K α -baicalein and PI3K α -baicalin.

Making PI3K α as the main target for the inhibition of PI3K signaling pathway could lead to the effective cancer treatment.

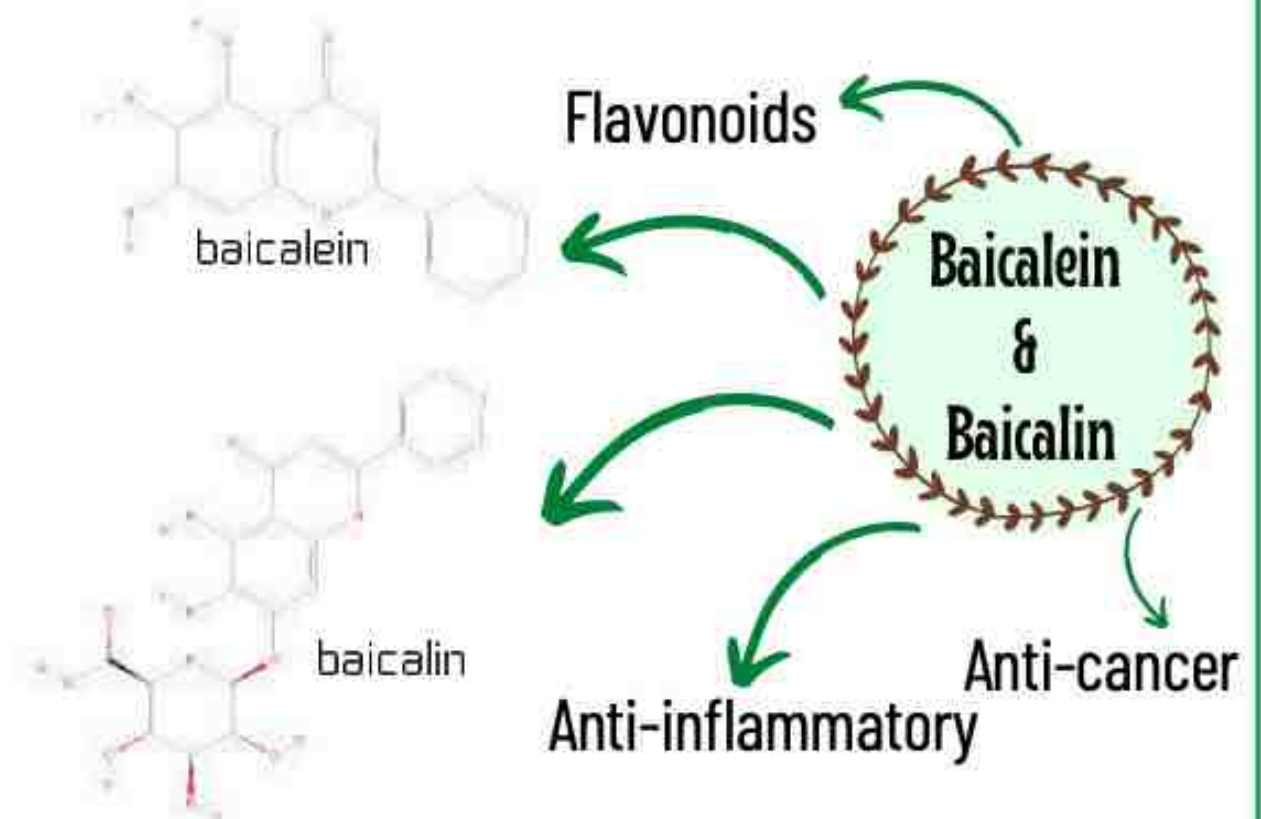
Phosphatidylinositol 3-Kinases (PI3Ks): involve in cancer development. PI3Ks pathway: dysregulated in almost all human cancers.

Docking: best conformation, binding energy & binding interaction. Help in further analysis to develop a drug, improve molecular understanding.

Literature review

Molecular docking

- ★ Prediction of binding modes, binding energy - binding affinity
- ★ Develop more potent, selective & efficient drug candidates



Result & discussion

Methodology

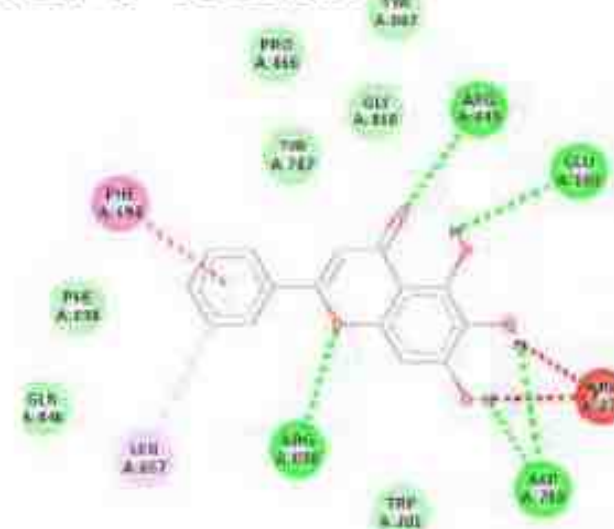
1 Receptor (4FA6) & ligands (baicalein & baicalin) structure - PDB & PubChem

2 Active site residues - CASTp server

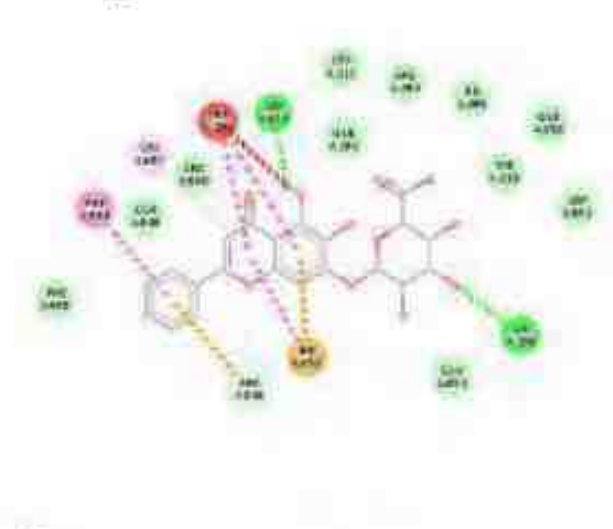
3 Preparation & molecular docking - AutoDockTools & AutoDock Vina

4 Visualizing & analyzing - Discovery Studio Visualizer

PI3K α -baicalein



PI3K α -baicalin



Criteria	PI3K α -baicalein	PI3K α -baicalin
Binding energy (kcal/mol)	-8.7	-10.2
Hydrogen bond	6	4
Hydrophobic bond	2	6
Unfavorable donor-donor bond	2	1
Amino acid residues involved	ARG277, LEU657, ARG690, PHE694, ASP788, ARG849 and GLU880	TRP201, LYS298, ASP654, LEU,657, HIS658, PHE694 and ARG849

Baicalin have the potential to be PI3K α inhibitor by having lowest binding energy (highest binding affinity), more hydrophobic bonds & less unfavorable donor-donor bond



INTERNSHIP AT TIDREC, UM

Tropical Infectious Diseases Research & Education Centre

Founded on 2008, TIDREC is known as the leader in Malaysia for tropical infectious diseases research and education centre. The main research focus by TIDREC are vector and vector-borne diseases, emerging zoonotic diseases, vaccine and protein therapeutics, and biosafety & biosecurity.



ADDRESS & CONTACT

+603-79676670

tidrec@um.edu.my

Tropical Infectious Diseases Research & Education Centre (TIDREC), Level 4, Block N & O, Faculty of Medicine, University of Malaya, 50603 Kuala Lumpur, Malaysia



SUPERVISORS

Industry Supervisor

Dr. Norhidayu binti Sahimin
Senior Lecturer (TIDREC,UM)

Faculty Supervisor

Dr. Saleha binti Shahr
Senior Lecturer (UTM)

1

PROJECT TITLE

KNOWLEDGE TRANSFER PROGRAM ON COMMON INFECTIOUS DISEASES AND OUTBREAK MITIGATION AMONG MADRASAH / TAHFIZ SCHOOL STUDENTS IN KLANG VALLEY, MALAYSIA



OBJECTIVES

2

- To evaluate knowledge and hygiene (include sanitation) practice towards COVID-19, vector-borne diseases, dengue and food-borne gastrointestinal diseases
- To conduct and transfer knowledge on COVID-19, vector-borne diseases, dengue and food-borne gastrointestinal diseases
- To transfer knowledge of the new-norm era on the prevention and control of the infectious disease

3

ROLES/RESPONSIBILITIES

- Acted as moderator
- Assisted COVID-19's speaker
- Designed the program flow
- Dealt with the person-in-charge of respective schools
- Prepared the questionnaires' platform
- Edited the certificates and brochures
- Became the technical team during the program



CHALLENGES & WAY TO OVERCOME

4

- Find school that interested to join the program
 - Select school that is active with their social media
- Questionnaire platform is not interesting
 - Replace with Quizizz, increase competitive level
- Interaction with kids under 12 years old
 - Moderate with cheerful tone



5

What should you do if you were classified as close contact with positive COVID-19 patient?



Figure 1: Comparison between true and false answer on pre & post assessment

RESULTS

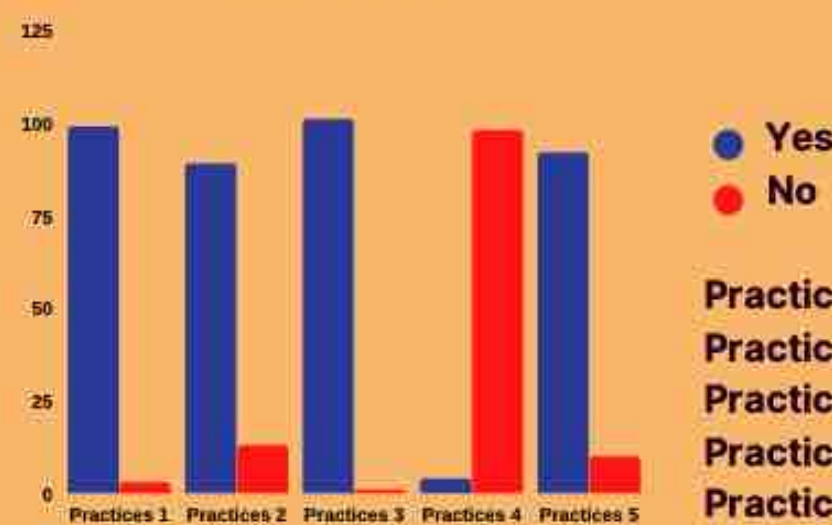


Figure 2: Common practices practiced by participants

- Practices 1:** Wear mask when going outside
Practices 2: Wash hands with water & soap
Practices 3: Practice social distancing
Practices 4: Attend to social gathering
Practices 5: Seek treatment if symptomatic

6

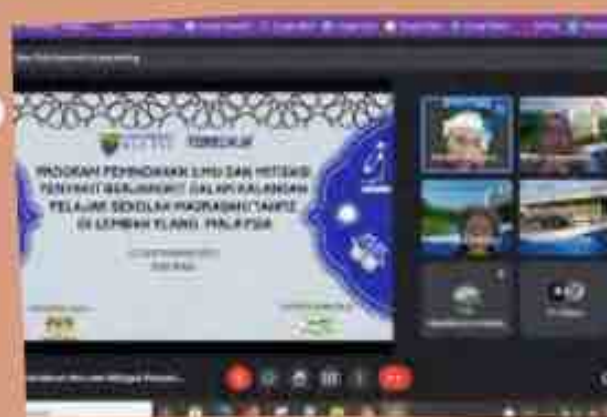
ACTIVITIES/TASKS

- Training on biorisk management
- Training for maintaining ticks cell lines
- Introduction writing on suggested titles

7

LESSON LEARNT

- Enhanced my communication skill
- Gained more confident
- New knowledge on infectious diseases
- Exposed to tick cell lines
- Learned to perform data analysis





Nuratiqah binti Maslan
A18SC0457

MOLECULAR DOCKING STUDIES FOR DENV-2 PROTEIN

INTRODUCTION

- Exist in 4 serotypes of DENV (1-4) but DENV-2 was the most widespread arboviral disease-causing virus.
- No particular therapy for dengue virus infection & immunization has not been successful in preventing the virus
- Consist of structural protein which responsible in viral particle assembly while non-structural protein help in RNA genome replication.
- Targeted compound such as **hypoxanthine, vitamin D3, purine & aminocaproic acid** were used for the discovery of drugs against DENV

Dengue proteins	PDB Code
NS3/NS2B (Protease)	2FOM
NS5 (Polymerase)	2j7u
E protein (Envelop)	1OKE

AIM

- To study the interaction between targeted dengue protein with targeted compound for drug discovery
- To search the best binding affinities of target compound with DENV-2 protein for drug target
- To identify the potential therapeutics compound in curing the dengue infection

TARGETED PROTEIN

NS2B/NS3 protease

- Involved in the cleavage of polyprotein which required for virus maturation
- N-terminal 180 residues of NS3 is a serine protease which combined with 47 residues of NS2B
- Presence of NS2B affect the stability & catalytic activity of NS3
- Previous antibiotic used : doxycycline, rolitetracycline, meclofenamic acid

NS5 Polymerase

- RNA-dependent RNA polymerase which essential in catalyzing the new viral particle
- Establish both positive & negative double stranded RNA
- Negative strands play role in serving template for synthesizing new positive RNA for viral replication
- Previous inhibitor used: ribavirin, mycophendic acid, adenosine analogues

E protein

- Found as dimer on surface of mature virus that involved in virus attachment & entry by membrane fusion with host
- Exist as dimer at neutral pH while trimer at low pH
- Respond to reduced pH of endosome by conformational rearrangement which then changes can induce viral fusion & host cell membrane allowing the virus genome enter cytoplasm
- Previous antiviral: peptide targeting hydrophobic pocket that influence pH threshold

METHODOLOGY



- Downloading the protein & ligands files



- PyMol finding of protein's active site & preparing ligand PDB files



- AutoDock Tools & AutoDock Vina Perform docking & preparing the files needed for docking



- Discovery Studio Visualizer Observing the protein-ligand interaction

RESULTS & DISCUSSION

Targeted DENV-2 Protein	Active Sites Residue
NS2B/NS3 protease (ID: 2FOM)	TRP-69, LYS-74, LEU-76, TRP-83
NS5 polymerase (ID: 2j7u)	ASP-520, PRO-822, TRP-823
E protein (ID: 1OKE)	ASN-67, GLU-84, ARG-89, PHE-90, MET-118

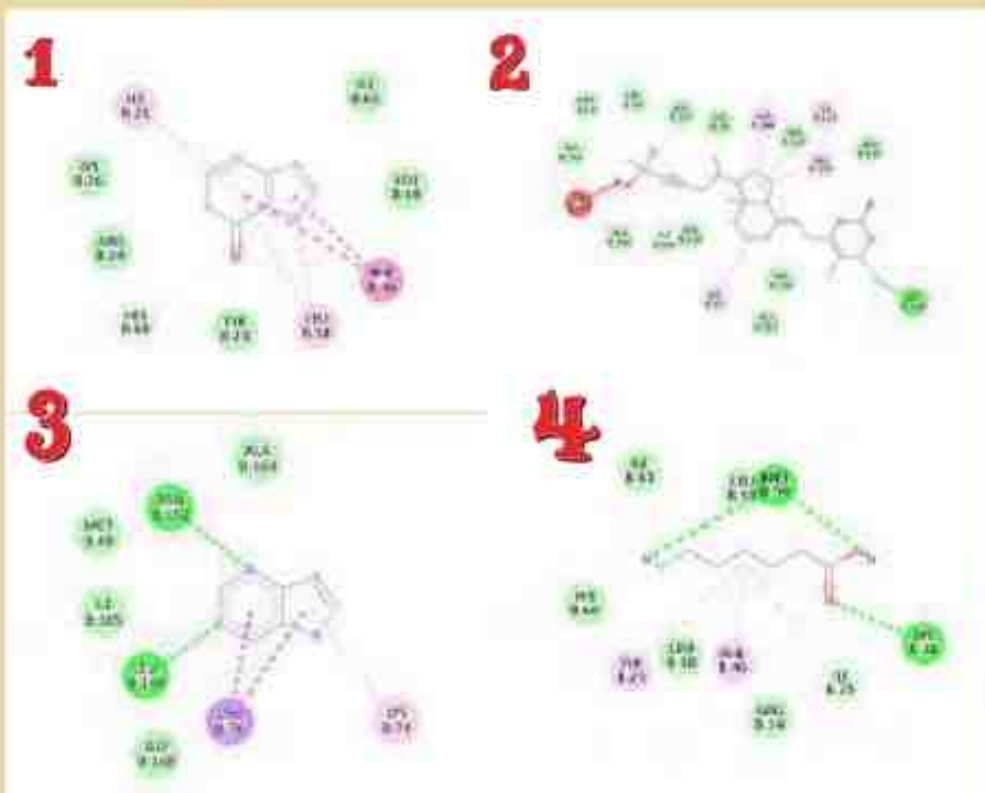
- Active site can be found in literature (if stated) & if not, PyMol or other server can be used
- Keeping only one chain for focus docking
- Only 1 ligand was chosen if existing complexed ligand >1 to find the closest residue interacting between them

TOP BINDING AFFINITY OF LIGAND WITH DENV-2 PROTEIN

Protein	Ligand	Binding Energy (kcal/mol)
2FOM	Hypoxanthine	-5.1
	Vitamin D3	-8.8
	Purine	-4.6
	Aminocaproic acid	-4.7
2j7u	Hypoxanthine	-4.9
	Vitamin D3	-7.9
	Purine	-4.5
	Aminocaproic acid	-3.9
1OKE	Hypoxanthine	-4.6
	Vitamin D3	-6.6
	Purine	-4.0
	Aminocaproic acid	-4.3

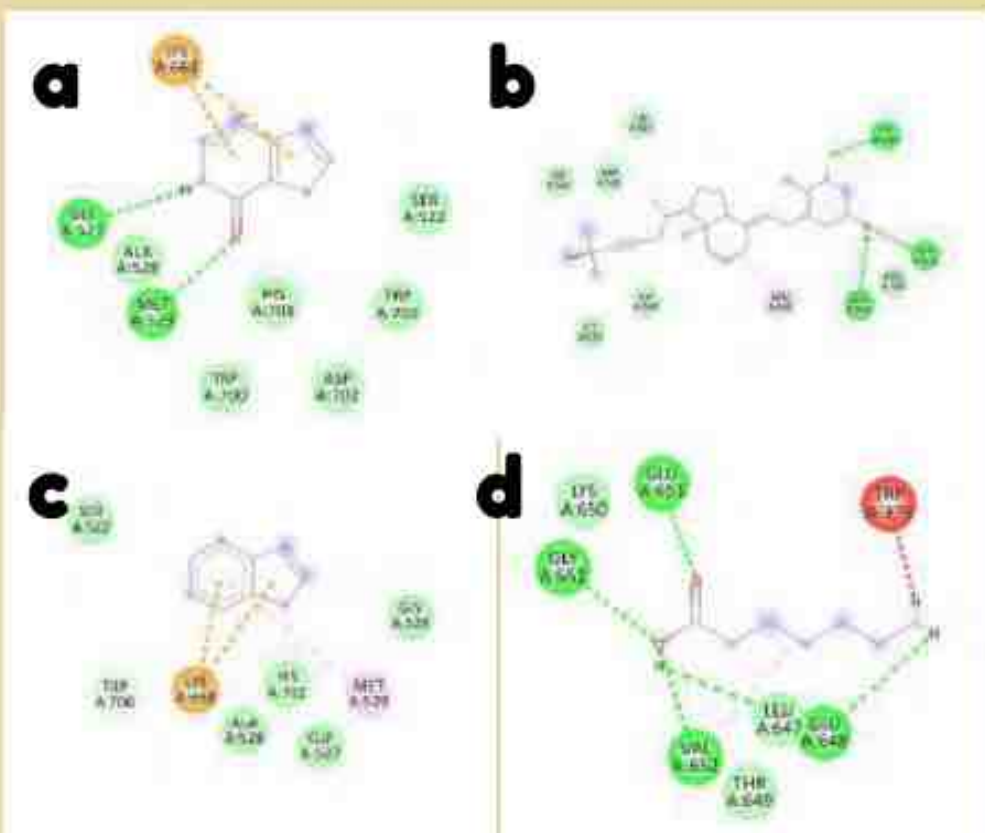
- Vitamin D3 gave a better binding affinity with each target protein compared to other targeted compound
- It showed the best binding energy with NS2B/NS3 protease than with other target protein

2D DIAGRAM INTERACTION OF 2FOM WITH EACH LIGANDS



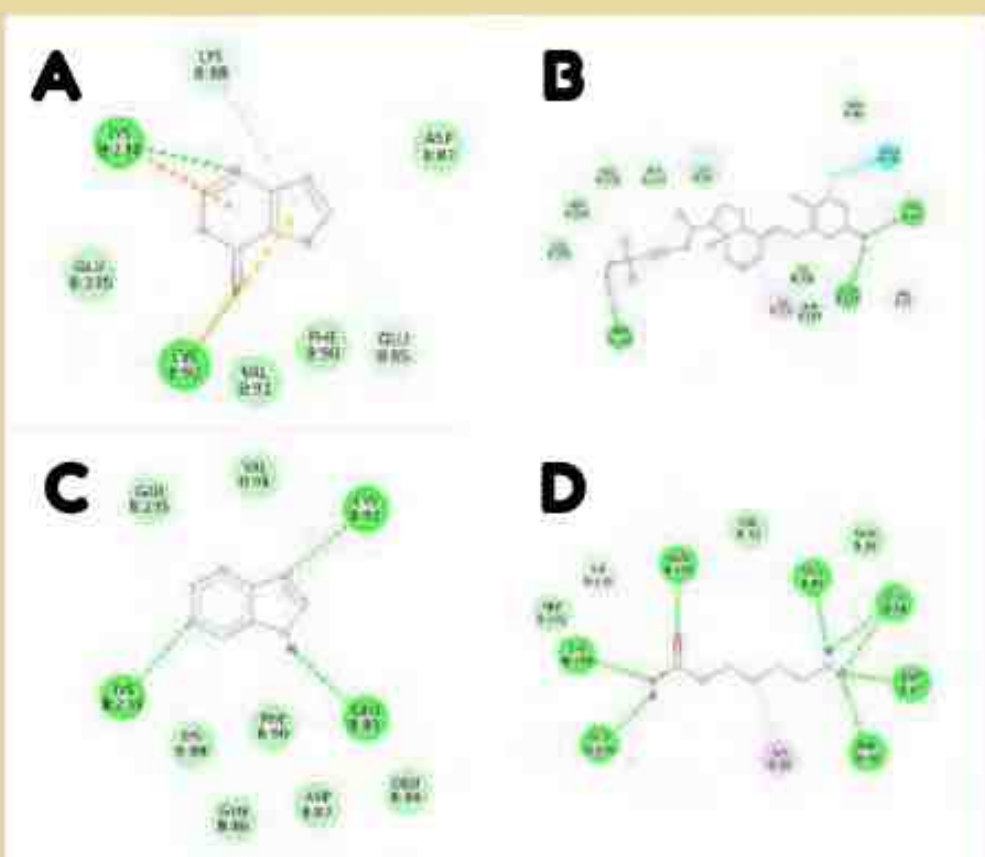
- Presence of conventional H-bond with residues Val155, Asn152, Leu149, Met59 & Lys26 (green circle) contribute in stabilizing the complexes
- VitaminD3 showed the highest binding energy with 2FOM (-8.8)
- Presence of unfavorable donor-donor interaction with residue Leu149 in vitaminD3 may reduce the stability of ligands
- In vitaminD3, similar residue found interacting in the 1st pose with the predicted active site residue of 2FOM. (Lys74 & Leu76)
- Other similar residue also interacting at other poses

2D DIAGRAM INTERACTION OF 2J7U WITH EACH LIGANDS



- Interaction of hypoxanthine with 2j7u (a) & (c) formed pi-cation interaction with residue Lys668 (orange circle)
- Best binding energy were recorded as vitaminD3>hypoxanthine>purine>aminocaproicacid
- Presence of unfavorable interaction in 2j7u-purine complexes (d) reduce the stability of ligand
- VitaminD3 with highest binding energy of -7.9 revealed similar residue that interacting in active site of 2j7u which was Asp520
- Other similar active site residue found interacting at other ligand poses

2D DIAGRAM INTERACTION OF 1OKE WITH EACH LIGANDS



- H-bond & van der Waals interaction (dark green (medium green circle) play a primary role in maintaining the interaction between 1OKE with each ligands
- Halogen interaction (blue circle) exist in 2D diagram of 1OKE-vitaminD3 interaction (B) with residue Glu85
- Among those interaction, vitaminD3 showed the best binding score of -6.6 than others
- Residue Phe90 found in the active site of 1OKE also found interacting in ligand vitaminD3 as shown in (B)
- Residue found in the active site of 1OKE also found interacting in other ligand poses respectively

CONCLUSION

- Vitamin D3 was showed a better binding affinity for the target DENV protein even performing better with than the other 3 ligands (hypoxanthine, purine, aminocaproic acid)
- Similar residue with active site of each target protein also found in each highest binding affinity of vitamin D3 with target protein respectively
- The presence of more H-bond and other non-covalent interactions such as van der Waals, pi-stacking may contribute in giving the highest binding affinity for each ligands as well as the interaction with target protein
- Molecular docking studies provide understanding in binding mode and interaction for each targeted ligands with targeted DENV-2 protein which may useful in development of potential anti-dengue drugs.

In silico Prediction of Protein-protein Interaction between DC-SIGN Receptor and Domain III of Dengue Virus Envelope Protein

SETI PUSAT RISET DAN PENGEMBANGAN TEKNOLOGI (SIPOK-RIKTI)



INTRODUCTION



Spreading Dengue fever globally
Aedes aegypti, 2009-2014



Dengue viruses have four serotypes and each of the most prevalent serotypes is able to cause illness



The WHO estimates that 75% of all dengue virus infections occur every year. 10% of which are in Asia



There are no effective antiviral therapies and there is only one licensed dengue vaccine called Dengvaxia

MAIN OBJECTIVE

To find the interaction between DC-SIGN and domain III of dengue virus envelope protein to find potential candidate for vaccine development

LITERATURE REVIEW

DC-SIGN
 A C-type lectin receptor
 The interaction is reversible
 It has the unique capacity to bind a potential ligand with a high affinity

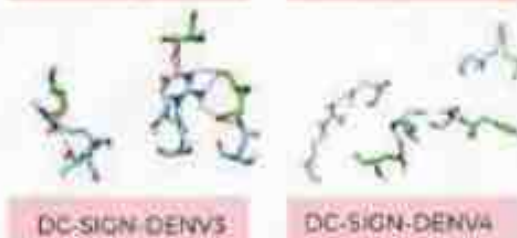
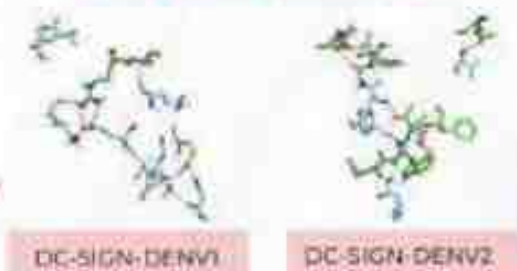
DC-SIGN
 Involved in the interaction with dengue virus envelope protein able to bind with all serotypes of DENV

DOMAIN III OF ENVELOPE PROTEIN
 Involved in binding to receptor molecules present on the host cell membrane

METHODOLOGY



RESULTS & DISCUSSION



Binding mode of domain III of DENV (cyan) with the receptor DC-SIGN (green). It binds along with blue ligand and receptor as follows

The complex involve the same residues such as Glu259 His254 Arg309 in the protein structure prediction. The alpha structure interact with the EDE forming hydrogen bonds and with these results we could see that the alpha helix supports the stable complex between proteins

COMPLEX	WEIGHTED SCORE	RESIDUES
DC-SIGN-DENV1	-3343 kJ/mol	Arg309, His254, Ser250, Glu259, His254
DC-SIGN-DENV2	-3651 kJ/mol	Glu259, Thr250, Thr251, Phe252, Glu258, Glu306, Arg309
DC-SIGN-DENV3	-7417 kJ/mol	Arg309, Thr250, Glu259
DC-SIGN-DENV4	-8136 kJ/mol	Arg309, Glu306, Phe252, His254

CONCLUSION

In conclusion, our results from molecular docking to analyse the interaction of the EIII of DC-SIGN shows the potential use of all domain III of dengue virus serotype's envelope protein as the candidate to develop an effective recombinant subunit vaccine.

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1. WHO. Dengue and ZIKA virus infections: global health estimates. Geneva: WHO; 2016. 2. WHO. Dengue: guidelines for diagnosis and management. Geneva: WHO; 2009. 3. WHO. Dengue: guidelines for prevention and control. Geneva: WHO; 2010. 4. WHO. Dengue: guidelines for surveillance. Geneva: WHO; 2010. 5. WHO. Dengue: guidelines for clinical management of dengue and dengue fever. Geneva: WHO; 2010. 6. WHO. Dengue: guidelines for the management of dengue and dengue fever. Geneva: WHO; 2010. 7. WHO. Dengue: guidelines for the management of dengue and dengue fever. Geneva: WHO; 2010. 8. WHO. Dengue: guidelines for the management of dengue and dengue fever. Geneva: WHO; 2010. 9. WHO. Dengue: guidelines for the management of dengue and dengue fever. Geneva: WHO; 2010. 10. WHO. Dengue: guidelines for the management of dengue and dengue fever. Geneva: WHO; 2010.



MELAKA

**MELAKA BIOTECHNOLOGY
CORPORATION**



INDUSTRIAL TRAINING

MELAKA BIOTECHNOLOGY CORPORATION



ABOUT COMPANY

 MELAKA BIOTECHNOLOGY CORPORATION
LOT 7 MITC CITY
75460 AYER KEROH
MELAKA

 +606 231 3622

 INDUSTRIAL SUPERVISOR:
MS NOR FARHANA BINTI RUSLAN

Melaka Biotechnology Corporation was established in 2005. MBC is one of the Bioindustries in Malaysia. MBC provides facilities to develop innovating skills and enhance innovators' ideas, which suits MBC's catchphrase "innovating biotechnology." The MBC's goal is to strive as a Biotechnology Centre in the state of Malacca. Its vision is to create an ecosystem with scientific information related to biotechnology. MBC consists of a few labs such as Chemical Lab, Biological Lab, and Diagnostic Lab. In June 2021, MBC's Diagnostic Lab was approved by the Malaysian Health Ministry (KKM) to diagnose COVID-19 samples.

JOB SCOPE

MICROBIOLOGY LABORATORY

TESTING SERVICE:

- ✓ PHARMACEUTICAL
- ✓ FOOD
- ✓ WATER
- ✓ SURFACE SWAB

DIAGNOSTIC LABORATORY

- ✓ VIRAL PURIFICATION
& RT-PCR
DETECTION

EXPERIENCES

- ✓ Understand the job scope of microbiologists better.
- ✓ Learn many types of microbial product testing.
- ✓ Have an opportunity to involved in the diagnosis of the COVID-19 swab test.
- ✓ Able to operate an automated nucleic acid extractor and real time-PCR machines.

NURUL FARAH HAIDAH BINTI FUAD
FACULTY SUPERVISOR:
DR HUSZALINA BINTI HUSSIN

A18SC0462





PULAU PINANG

**MERIEUX NUTRISCIENCES
(M) SDN. BHD.**



Industrial Training



Name: Siti Nur Nasuha Wahid
Duration: 12/7/2021 - 1/10/2021
Location: Merieux NutriSciences Malaysia Sdn. Bhd.
 Plot No. 256, Tingkat Perusahaan 5, Kawasan Perindustrian Perai 2, 13600 Perai, Pulau Pinang.
Faculty Advisor: Dr Wan Rosmiza Zana Wan Dagang
Industrial Advisor: Mr Chiang Shy Yang



Company Background

- With 50 years of experience in food safety and quality from food, microbiology, and chemical testing
- Serve companies in water and environment, agrochemical, consumer goods, pharmaceutical and cosmetics sectors.
- Formerly known as Acumen Scientific Sdn. Bhd.
- Present in 27 countries with more than 8000 employees.
- Accredited under MS ISO/IEC 17025 from Department of Standards Malaysia (SMM Certificate No. 253) in 2003.
- Accredited under Organization for Economic Co-operation and Development (OECD) GLP (Certificate No. GLP-001) in 2010.

Objectives

- To gather more experience and expertise from various roles in workplace.
- To apply and practice theoretical knowledge in real situation
- To familiarize with the industrial environment and system, social network and organization.
- To enhance knowledge and skills in the particular selected profession.

Mission

Providing services and solutions on a global basis, from food safety and environmental monitoring to research in nutrition.

Vision

Because you care about consumers' health.

Values:

- Integrity: Acting with ethics, honesty, teamwork, and trust.
- Excellence: Leveraging scientific leadership, performance driven.
- Accountability: Demonstrating commitment, reliability and ownership in each of our responsibilities.
- Initiative: Acting with flexibility, proximity, innovation, responsiveness and with a pro-active approach.

The Merieux Legacy

- **1897:** Following a French chemist, Louis Pasteur footsteps, Marcel Mérieux established the Institut Mérieux, based on experienced leadership teams that have shared vision of public health. Later on directed by Marcel's son, Dr. Charles Mérieux and later his grandson, Alain Mérieux.
- **1967:** Silliker company was created by Dr. John H. Silliker, a microbiologist known for his work on Salmonella. The business began with a staff of just 4 people and has grown rapidly to more than 80 laboratories in 21 countries.
- **1990s:** Institut Mérieux addressing food safety and nutrition issues through acquisition of American food testing company Silliker -that became the historical pillar of Mérieux NutriSciences

Work Experience & Responsibilities

Daily laboratory equipment and apparatus calibration and monitoring.

Record temperature in the morning and in the afternoon:

- Incubators and water baths.
- Chillers and freezers

Calibration of equipment:

- Analytical balances with weighing standard.
- Micropipettes and dispenser.
- pH meter.

Daily laboratory internal swabs and air monitoring.

- Glove analysis worn during qualitative transfers.
- Qualitative and quantitative swabs based on provided schedule.
- Air monitoring in the morning and in the afternoon.

Media preparation and handling autoclave machines.

- Agar and broth media preparation principles.
- Hotplate stirrers maintenance.
- Reagents and supplements usage and storage.

Sampling, enrichment and plating samples with appropriate technique applied referring to Food and Drug Administration Bacteriological Analytical Manual (FDA BAM).

- High risk area- sampling and plating.
- Low risk area- sampling and plating.
- Microbe parameters with different methods:

Salmonella, *Listeria monocytogenes*, *Vibrio cholerae*, *Vibrio parahaemolyticus*, *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, Coliform count, Total plate count, Yeast and mold, & Enterobacteriaceae

- Qualitative transfer area for transferring samples from non-selective enrichment to a selective enrichment broth.
- Streak-plating; Qualitative assay.
- Pour-, spread-plating; Quantitative assay.
- Positive culture preparation for reference.

Daily cleansing of apparatus, disinfection and maintenance of the workplace's sterility.

- Alcohol 70% concentration for daily surfaces disinfection.
- Benzalkonium chloride to prevent bacterial resistance.
- Sodium hypochlorite to prevent bacterial resistance.
- Washing used and autoclaved tubes and bottles.
- Decontamination room for autoclaving wastes and used tubes.
- Waste management.

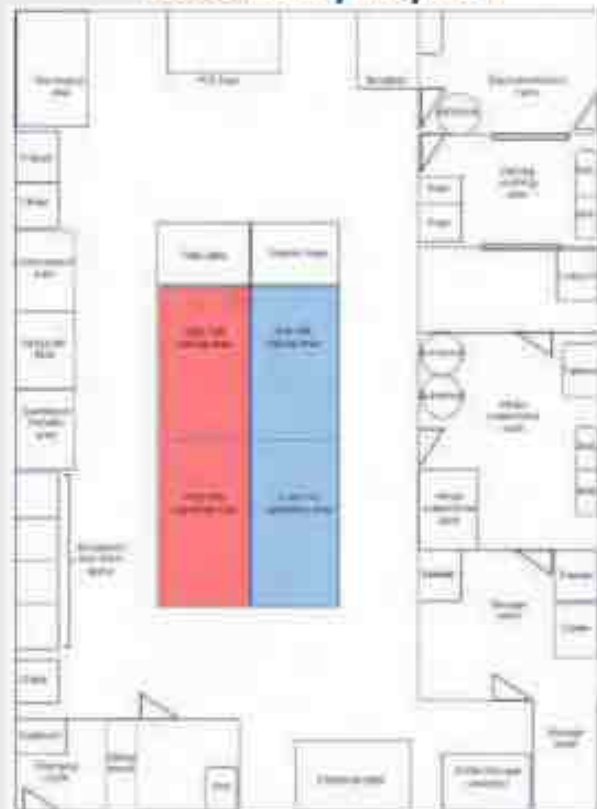
Screening and conformation tests to verify growth of colonies.

- Biochemical tests on positive colonies.
- Analytical profile index (API) strips used for efficient biochemical tests.

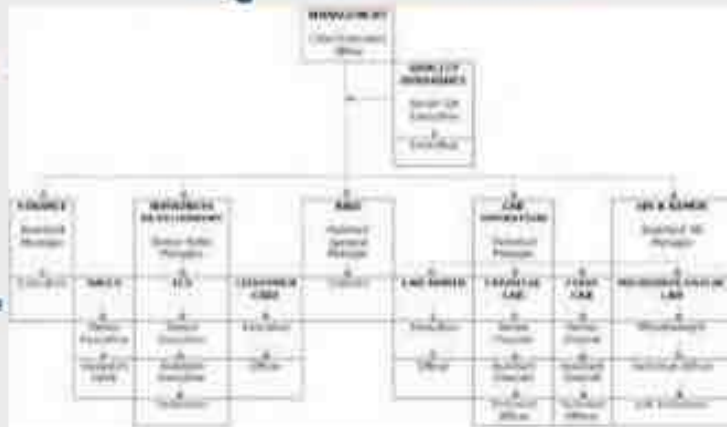
Additional task:

- Run autoclave on orthopedic steels for 10 times in a row (non-microbiological samples).

Laboratory Layout



Organizational Chart



Conclusion

The past 12 weeks I interned at Merieux NutriSciences Malaysia Sdn. Bhd. has been fruitful to me as I did not only gain useful knowledge, but the insight as to how the industry works and biology market is. It was a beneficial opportunity to be exposed to the real work as I got the chance to sharpen my thinking skills and efficiency in practical work. Although I did not have the chance to experience more of the analytical part of the work, but I did get to enjoy the wonderful working environment and company.



PULAU PINANG

**UNIVERSITI SAINS
MALAYSIA (USM) PENANG**

CENTRE FOR DRUG RESEARCH (CDR)

Industrial Training Infographic



Name : Anas Azizi bin Mohd Asri
Matric no. : A18SC0377
Year/Programme : 3/SSCG
Faculty supervisor : Dr Praseetha A/P Prabakaran
Industry supervisor : Dr Darshan Singh A/L Mahinder
Industry name : Centre of Drug Research, Universiti Sains Malaysia



Centre for Drug Research (CDR) was established in 1973 with the recommendation of the World Health Organization (WHO). Universiti Sains Malaysia was instructed by the Malaysian government to study the drug abuse problem then. The centre aims to be a leading centre in drug research, and its missions are to conduct relevant, innovative and quality research for advancing and disseminating new and useful knowledge to serve mankind.

The centre's research activities were placed under the Cabinet Committee on Drug Abuse Control. In fact, the centre has also had collaborations with international bodies such as WHO, United Nations Narcotics Commission, etc.,

Conclusion



- more research on kratom needs to be done in order to firmly validate the benefits of kratom and whether or not kratom is totally safe to be consumed under control
- Malay news media must also frequently portray the bright side of kratom so that the policy makers that mainly consist of the Malays will have a more rational perspective towards kratom

Project 1

An Ethnographic Study on Kratom's (*Mitragyna speciosa Korth*). Sale and Distribution, Consumption Patterns, Motive of Use and Legal Issues in Malaysia.



Objective

To describe the sales/distribution, consumption patterns, motives of use, and legal issues surrounding kratom consumption in Malaysia

Methodology



1. Use observational and communication techniques to gain the information about how kratom is being used and become a part of culture
2. The information that had been gathered then was being recorded on a report
3. The communication that had been conducted was only by online platforms.

Result



1. Culture of Kratom use in the state of Kedah

- Kratom usage is very popular in Kedah for many purposes primarily for increasing work stamina and as traditional medicinal plant

2. Areas that are popular for kratom use

- Kubang Pasu, Padang Terap, Yan and Sik are four districts that have the largest kratom cultivation areas

3. Size of kratom plantation in Kedah

- 114 hectares of kratom farm had been recorded by National Anti-Drugs Agency (NADA)

4. Medicinal Value

- Treat diabetes and high blood pressure, wound healer, Relieve pain, muscle aches sexual libido, help reduce dependence on drugs

5. Kratom use by farmers

- Kratom is used by farmers as a stimulant agent to increase stamina and physical strength

6. Kratom usage

- Kratom leaves can be freshly eaten raw, dried, and consumed with tea and brewed into a solution

Project 2

Media Depiction on Kratom (*Mitragyna speciosa Korth*.) Issues on Mainstream Malay Newspapers during the Covid-19 Pandemic in Malaysia



Objective

To provide an overview on media depictions on kratom issues in the Malay-language newspapers in Malaysia.



Methodology

1. Identify Malay language newspapers that have the highest coverage of kratom cases during the pandemic (18/3/20 - 31/7/21)
2. Malay newspapers had been chosen because kratom is more popular among the Malay ethnic group and policy makers solely rely on Malay media reports due to its extensive coverage
3. Analyzed the selected newspapers
4. Tabulated the informations into table that consists of several themes
5. Summarized the data in frequency table



Result

	Harian Metro (Total reports=174)		Sinar Harian (Total reports=142)		Berita Harian (Total reports=76)	
	n=	%	n=	%	n=	%
Type of Cases						
Smuggling	75	50	47	40	42	59
Consumption	20	13	11	10	8	11
Distribution	48	32	42	36	15	21
Processing	7	5	16	14	6	9
Smuggling Type						
Import	4	9	24	48	32	76
Interstate	1	2	25	50	10	24
Export	39	89				
Interdistrict			1	2		
Number of Involver						
1-3	90	72	71	66	37	66
3<	35	28	37	34	19	34
Form of Seizure						
Leaves	78	56	68	54	47	65
Liquid	40	29	30	23	20	28
Leave and Liquid	22	16	29	23	5	7
Preservance Method						
Ice Tank	17	89	3	75	1	50
Fridge	2	11	1	25	1	50
Rat Hole Involvement	10					
Drug Positivity						
Positive	24	16	17	15	7	11
Negative	126	84	95	85	55	89
Media Potrayal						
Positive	1	1	1	1		
Negative	186	96	138	97	74	98
Neutral	6	3	3	2	1	1

NAME: MUHAMMAD ASHYRAF BIN AZREEN
MATRIC NO: A1BSC0421
COURSES: 3-SSCG
INTERNSHIP SUPERVISOR: PROF MOHD NIZAM MORDI
FACULTY SUPERVISOR: PRASEETHA A/P PRABHAKARAN

RESEARCH TRAINING INFOGRAPHIC

HISTORY OF CENTRE FOR DRUG RESEARCH

The idea of drug research in USM was begun since 1974 to study drug abuse problem. Later on 1985, a full fledged center officially established and known as Centre for drug research. Tons of achievement and awarded gains by CDR in recent years. Now, the Centre of drug research facility was located in Universiti Sains Malaysia that involved multiple staff and variety of laboratory are available.



FACILITIES AVAILABLE

- Cell Culture Facility
- Radioactivity Detection Facility
- Animal Behaviour and Electrophysiology Facilities
- Molecular Biology Research Facility
- Drug Discovery & Development Facilities

MISSION AND VISION

- Mission : To conduct relevant, innovative and quality research for advancing and disseminating new and useful knowledge to serve mankind
- Vision : Leading in drug research

PROJECT TITLE

3D-QSAR.COM : THE DETERMINATION OF ACTIVITY OF TETRAHYDRO β -CARBOLINES AND ITS DERIVATIVE

INTRODUCTION

Fundamental of QSAR

- Quantitative Structure Activity Relationship (QSAR) is a technique to evaluate the activity of a large number of compounds virtually, reducing the time and labor costs required for chemical synthesis and experimental determination. (Yu-Liang et al., 2020)
- Computational mathematical methods aimed to build models which attempts to find statistically significant correlations between a series of molecular structures and their associated biological property. (Reker D., 2015)

CoMFA Modeling

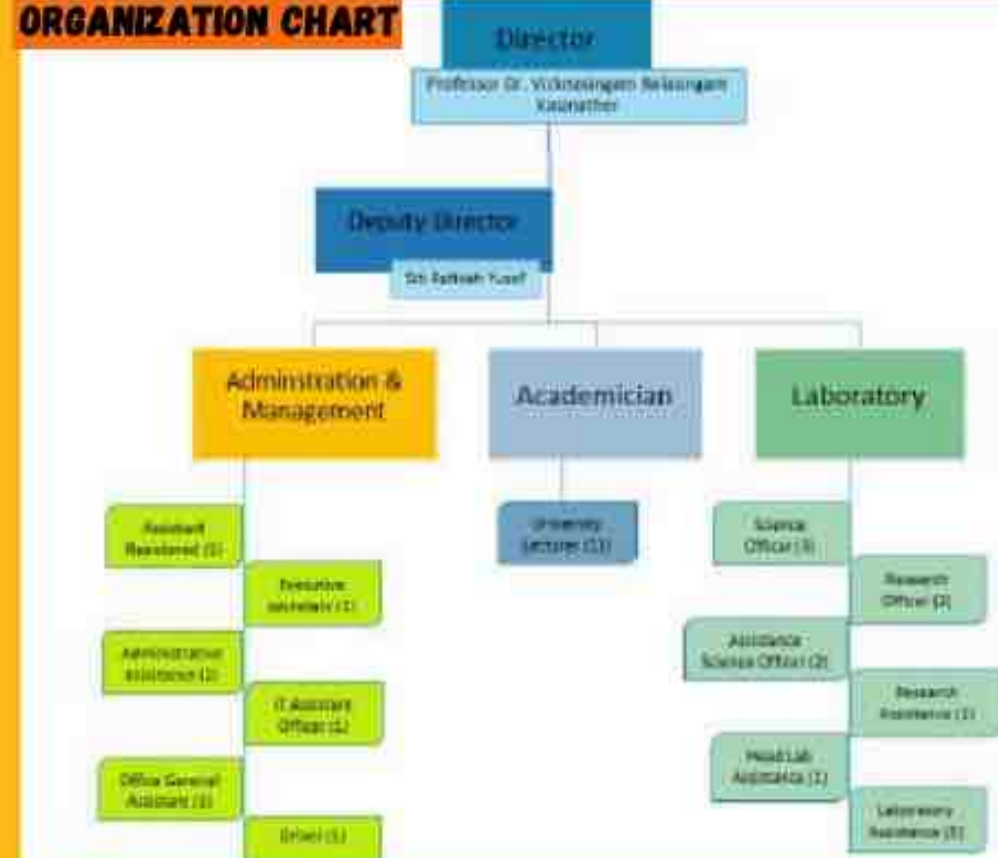
- Comparative molecular field analysis (CoMFA) was introduced by Cramer et al in 1988. This method uses steric (STE) and electrostatic (ELE) calculated by means of the Lennard-Jones and Coulomb law definition



Tetrahydro- β -carbolines (TH β Cs)

- A type of analgesic drug
- Also known as Tryptoline,
- TH β Cs have a wide variety of pharmacological properties, including PDE5-inhibitory, antimalarial, antiviral and antitumor activities. (Laine AE, Lood C, Koskinen AMP., 2014)
- Tadalafil, important synthetic compound encompassing the TH β C structure used for treatment of erectile dysfunction and pulmonary arterial hypertension treatment. (Daugan et al., 2004)

ORGANIZATION CHART



EXPERIENCE GAINS

- understand new things and lessons in terms of drug discovery and development.
- Improve communication skills and works as a team despite having different backgrounds of study, we are able to discuss and give our own perspective in conducting our mini project.
- Able to build character and adapt to the working time successfully.
- Able to divide time wisely depending on the priority and responsibility in completing the task.

PROBLEM AND SUGGESTION

- Unclear status of working before start the internship - Give an early status of working either physically or working from home for a student preparation towards their internship program.
- Short experience in internship - Three month period be prolonged into a semester period.

METHODOLOGY

Data collection

Molecule of TH β Cs & unknown compound



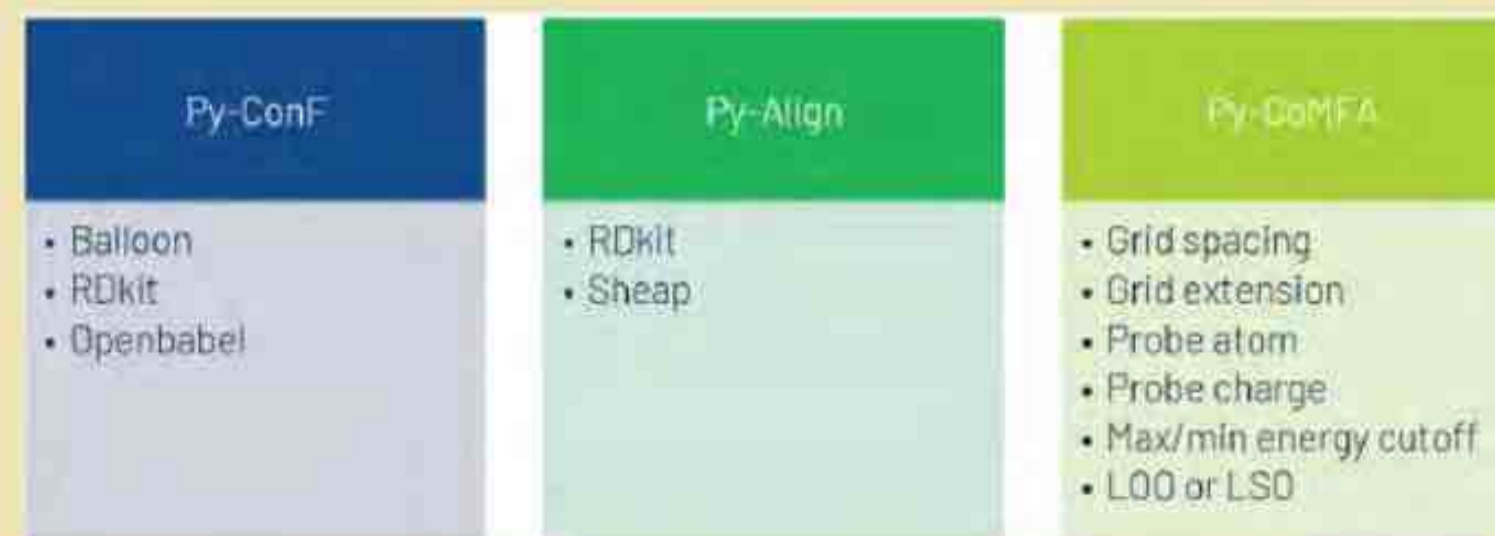
All 47 set of molecule were divided into training and test set. All the activity value were expressed as IC50. Five unknown molecules named A6, A7, A8, A9 and A10 were used for prediction in SwissADME.

Alignment of molecule

Alignment process by using Biovia Discovery Studio

All 47 set of compounds in the training and test sets were aligned with "most active compound" or act as template using the Tether > Molecular overlay option in Biovia Discovery studio.

3D-QSAR modeling



Analysis & Result

Data analysis

All the result were obtained in form of tables and graphical. Higher q2 value indicate the good statistical result.

DISCUSSION AND CONCLUSION

- In conclusion, all 47 molecules were able to run in 3D-QSAR.com web server tools. CoMFA models were established based on a training set of 42 molecule using molecular alignment by Biovia Discovery Studio. The statistical significance of the models was evaluated. The highest q2 values of the CoMFA models generated are 0.206 (model 258818) and 0.300 (model 259073), respectively. However, these results are slightly different from the recommended value (>0.4) indicate the problem on the alignment of molecules in Py-align application.
- In addition, according to the result obtained from the Recalculate/Predicted activity model on both parent (258818) and child model (259073) showing unusual plotting for fitting and its cross validates. These results were varied with the experimental activity value provided. This might be due to an error that happened during the alignment process or molecule selection for the TH β Cs in the early phase.

APPRECIATION

I wish to express my sincere thanks to Professor Dr. Mohd Nizam Mordi, researcher of the Drug Discovery and Development department also who is my supervisor for the research training for guiding and supervising me throughout this research training. I also would like to thank to Dr Praseetha Prabakaran, academic lecture also who is faculty supervisor in charge for the internship training, staff and all the lecturers of Bioscience department, Universiti Teknologi Malaysia gave to me a golden opportunity to follow the particular practical internship training in the Centre of Drug Research (CDR). Their guidance, necessary support, co-operation, encouragement, fullest effort of them to the success of this opportunity, all are grateful and unforgettable.

OPIOID ABUSE IN ADOLESCENCE: EFFECTS ON COGNITIVE FUNCTIONS

Opioids are chemicals that produce morphine-like effects. In the medical area, it is used as pain relievers including anaesthesia. Information on the effects of opioid abuse in adolescence is insufficient. Therefore, a review paper is written to inform people of its effects on adolescence.

ADOLESCENCE

Based on the World Health Organization (WHO), adolescence is people whose age are between 10 to 19 years old. Adolescence age can be divided into 3 stages which are early adolescence, middle adolescence and late adolescents. This age range also falls to individuals between ages 10 and 24.

EFFECTS OF OPIOID ABUSE ON THE ADOLESCENCE BRAIN

- Animal studies show that high amounts of drugs prescribed to adolescent rats, compared to adult rats, reveal brain impairments in their prefrontal cortex region and their working memory brain region.
- Some studies show that drug abuse can have an impact on the microglia, the immune cells that play a certain role in brain infections and inflammation.

DRUG RELAPSE

- A relapse is the reoccurrence of a past condition or the medical condition which had previously stopped or improved.
- Several views on drug relapse factors were obtained such as lack of self-efficacy, peer influence, lack of family support, lack of employer support and lack of community support.

EFFECTS OF OPIOID ABUSE ON COGNITIVE ABILITIES

- Brain maturation has been proven to increase the cognitive skills of a person. Since adolescence years involves brain maturation, opioid abuse might give birth to bad side effects involving cognitive abilities.
- The impairment involves decision-making, short-term and working memory, psychomotor speed and the psychomotor including cognitive speed.

NEURAL PATHWAYS INVOLVED IN COGNITIVE SKILLS

- Drug addiction can form its own neural pathway involving several different pathways to promote the need for drugs. These three elements form an addiction cycle in the brain which is 'preoccupation/anticipation' (craving), 'withdrawal/negative affect' and 'binge/intoxication'.
- Under the addiction mechanism, there are some known neural pathways that are involved in cognitive function such as the dopaminergic pathway, serotonergic pathway, glutamatergic pathway, cholinergic pathway and noradrenergic pathway.

NAME:

MUHAMMAD RUSYAYDI BIN ROSLI

Matric No:

A18SC0422



INTRODUCTION TO CDR



Centre for Drug Research (CDR) was established in 1973 with the recommendation of the World Health Organization (WHO). The centre aims to be a leading centre in drug research, and its missions are to conduct relevant, innovative and quality research for advancing and disseminating new and useful knowledge to serve mankind. In 1978, Universiti Sains Malaysia went ahead to established the Drug Abuse Research Centre (also known as Pusat Penyelidikan Dadah Kebangsaan)

KRATOM (MITRAGYNA SPECIOSA)

- Kratom's scientific name is *Mitragyna speciosa* Korth (Rubiaceae, a genus from the coffee family).
- It is a native plant which can be widely found in Southeast Asia especially in Thailand, Indonesia, Malaysia, Myanmar and Papua New Guinea.
- Kratom has a long history of traditional use in these countries

PROJECT 1: AN ETHNOGRAPHIC STUDY ON KRATOM'S (MITRAGYNA SPECIOSA KORTH.) SALES AND DISTRIBUTION, CONSUMPTION PATTERNS, MOTIVES OF USE AND LEGAL ISSUES IN MALAYSIA

- Employed an ethnographic study design to conduct the proposed study in the state of Kedah where kratom is widely used among rural dwellers
- All the study findings were collected through field observations.

1

CULTURE OF KRATOM USE IN THE STATE OF KEDAH

- Kratom used to increasing work stamina among manual labourers, and as a traditional medicinal plant
- Kratom is also used as a recreational substance among villagers as it is shown to promote socialization among the older folks

2

AREAS THAT ARE POPULAR FOR KRATOM USE

- Kratom cultivation and consumption activities are seen to occur in all the districts in Kedah.
- Four districts are infamously known for kratom cultivation activities - Kubang Pasu, Padang Terap, Yan and Sik

3

SIZE OF KRATOM PLANTATION IN KEDAH

- 114 hectares of kratom farm had been identified by National Anti-Drugs Agency (NADA) in 2018 where 80 hectares of land in Padang Terap district, 22 hectares of land in Kubang Pasu district, nine hectares of land in Yan district and three hectares of land in Sik district
- The smallest size of kratom farm is around 0.7 hectares
- The largest kratom farm measures about 1.4 hectare and is found to be in Padang Terap district

4

MEDICINAL VALUE

- Kratom has been used among people in Kedah to treat diabetes, high blood pressure, as a wound healer, and is also used to improve sexual libido.
- Kratom also used to reduce body fatigue, relieve pain, cough, and even diarrhea problems.
- Potential in improving athletic endurance, helping in high blood pressure, and also treating diabetes
- Helps to reduce the dependence of drug addicts on opioids as well as other drugs.

5

KRATOM USE BY FARMERS

- Kratom is used by farmers as a stimulant agent to increase stamina and physical strength of the body in doing heavy work.
- Kratom is used before farmers do work in the morning and in the evening to provide freshness after tired work.
- They use kratom in moderation so as not to cause any other health problems.



6

KRATOM USAGE

- Kratom leaves can be freshly eaten raw, dried, and consumed with tea, and brewed into a solution
- Kratom used is more popular among men than women. Usually, men used kratom as a leisure drink during relaxing and socializing. While, women in villages consume kratom leaves as a home treatment
- Kratom use among adolescents differs in that they mix kratom with other ingredients.

CONCLUSION

Kratom cultivation and consumption is popular in Kedah and has been a part of the culture. Kratom is not seen as totally bad by the locals. Kratom researchers should consider studying kratom in Kedah because kratom is widely used there and a deeper insight into kratom in many aspects can be established.

PROJECT 2: MEDIA DEPICTION ON KRATOM (MITRAGYNA SPECIOSA KORTH) ISSUES ON MAINSTREAM MALAY NEWSPAPERS

- The second project aims to provide an overview on media depictions on kratom issues in the Malay-language newspapers in Malaysia
- Three Malay newspaper were selected for content analysis include Harian Metro, Berita Harian, and Sinar Harian. The timeline of the news report that we studied is from 18 March 2020 to 31 July 2021



RESULT

TYPE OF CASES

Smuggling cases were among the most highly reported issues compared to consumption, distribution and processing issues because during the COVID-19 pandemic in Malaysia, the Royal Malaysia Police (RMP) had set up roadblocks in every district and state borders to enforce the movement control order (MCO)

SMUGGLING TYPE

Kratom export activity is the highest kratom smuggling activity reported in the three newspapers compared to export, interstate and interdistrict smuggling. High number of kratom export activities was mainly because of the 'Ops Benteng'

FORM OF SEIZURE

Most of the seized products come in the form of fresh leaves and processed liquid. Most smugglers only carry kratom in the form of leaves to keep freshness of kratom leaves.

PRESERVATION METHOD

Using ice tank or fridge to preserve the kratom liquid as reported in the three newspaper.

NUMBER OF INVOLVER

Mostly constitute between one to three people as being reported in all the three newspapers. This is because smuggling activities mostly were carried out by one or two people as most of the smuggling were carried out by using trucks or other high-load-capacity vehicles that are limited in passenger capacity.

DRUG POSITIVITY

Most of the detainees who were caught for kratom smuggling activities were tested for illicit drug use - indicating that those with previous drug use history were more likely to be involved in kratom smuggling activities.

MEDIA POTRAYAL

Media portrayal about kratom in all of these three main Malay newspapers is mostly negative. Only one report by Harian Metro and Sinar Harian described kratom in a positive way.

LAW ENFORCEMENT'S STATEMENT

- Poison Act 1952 is the most frequent act that has been used. This act regulates the import, possession, manufacture, compounding, storage, transportation, sale and use of Poisons.
- The second most frequently reported law is the Prevention and Control Infectious Diseases (Measures within the Infected Local Areas) Regulations 2020. This regulation limits the citizens' movement and only allows essential sectors to operate
- The last reported law is the Panel Code law which most frequently under section 186 because they were obstructing public servants in discharge of their public functions

LOCATION

- Perlis is the state with the most frequently reported kratom cases by Harian Metro and Berita Harian
- Kedah is the state with the second highest reported kratom cases by Harian Metro and Berita Harian and the highest by Sinar Harian
- Kelantan is the state with the second most frequently reported kratom cases by all of the three newspapers.

SEIZURE QUANTITY

The maximum quantity of kratoms that were seized were up to 3 tons that were carried by the lorries for smuggling purposes.

SALES VALUE

Sales value in the states that are far from Kedah is more expensive than the sales value in Kedah or states that are nearer to Kedah. We assume that this phenomenon happens because the cost of kratom transportation from Kedah has increased the sales value

SEIZURE VALUE

The highest seizure value that was reported is RM3.74 millions

CONCLUSION

The local media gave a negative view of kratom without giving space to discuss the benefits of kratom although local studies of kratom used involving animals have shown that kratom is not harmful. The local media should play a crucial role to educate us by giving a balanced view about kratom.

INTRODUCTION

Centre for Drug Research (CDR) is 1 of 26 research centres that have been offered inside Universiti Sains Malaysia (USM). In 1973, World Health Organization (WHO) recommend USM to study the drug abuse problem and by 1985, it had been upgraded to a full-fledged centre and known as Centre for Drug Research (CDR).

Prepared mini thesis about
"Pathophysiology and
Therapeutic invention of
Alzheimer's Disease"

JOB SCOPE



LESSON GAINED

Communication
skills

Writing
skills

Reading and
extract
skills

SUPERVISOR DETAILS

Industrial Supervisor:

Prof. Madya Zurina
Hassan

Faculty Supervisor:

Dr. Nor Azimah Mohd
Zain

ABOUT ME

Nur Aida Farzana binti Fadzli
A18SC0434
3 SSCG
Faculty of Science (Biology)





PULAU PINANG

**UNIVERSITI SAINS
MALAYSIA (USM) PENANG**

**INSTITUTE FOR RESEARCH IN
MOLECULAR MEDICINE (INFORMM)**

INFORMM

USM

Intern : Amos Yee Feng
Supervisor : Assoc. Prof. Dr Venugopal Balakrishnan



REVIEW PAPER WRITTING

Link for the paper - <https://qrgo.page.link/QqtDX>

Emphasize on overuse and long term health impact of hand sanitizer are address in the following chapters :

- Formulation of hand sanitizer :
 - Type and Grade of alcohol permitted used by WHO and approved by FDA
 - Potential danger of Denatured alcohol and QUATS hand sanitizer
- Adverse effect :
 - Various Toxicity
 - Dermatological issue
 - Antiseptic tolerated Superbug
 - Environmental Hazard
- Analysis of phytochemical as alternative active ingredient :
 - In silico analysis of affinity towards COVID-19 viral replicating protein
 - In vitro analysis of inhibition towards similar COVID-19 viral protein found in SARS-CoV

WEEK 1 - WEEK 9



QR for the Paper

BIOINFORMATIC EXPLORATION

- Autodock 4.2 and Autodock vina : Determine the affinity of protein-protein/protein-ligand interaction
- OpenBabel : Correct self created pdbqt files that contain both protein and ligand of interest
- Protein-Ligand Interaction Program : Identify the protein-ligand interaction and offer best orientation of the pdbqt file



WEEK 9 - WEEK 12



SABAH

**UNIVERSITI MALAYSIA
SABAH (UMS)**

FAKULTI SAINS & SUMBER ALAM

INDUSTRIAL TRAINING INFOGRAPIC



by :
MOHD AIDIL IZZUDIN BIN
SUDARMAN

- The purpose of industrial training is to expose the students to real work environment experiences and at the same time to gain knowledge and skills through hands on observation and job execution. From the industrial training, the student can develop skills in work ethics, communication, management and other related skills that will benefits the students.
- Student must complete their industrial training within the short semester period of 12 weeks and pass the training assessment in order to graduate.

Chapter 1

BACKGROUND



Universiti Malaysia Sabah (UMS) is a public university in Malaysia. It was officially established on 24 November 1994 as the ninth public university in the country. The university is located on a 999-acre site at Sepanggar Bay in Kota Kinabalu in the Malaysian state of Sabah. With Mount Kinabalu and the South China Sea as its background, UMS is often considered as among the most beautiful campuses in Southeast Asia.

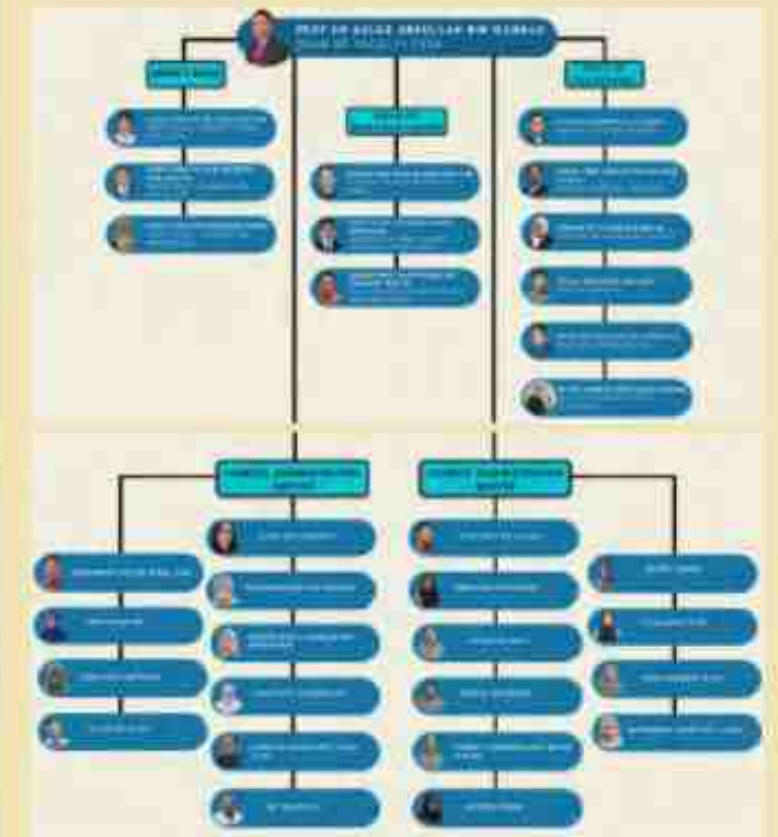
VISION & MISSION

- Vision - UMS strives to be an innovative university of global standing.
- Mission - UMS strives to achieve academic excellence and international recognition through its attention to learning and teaching, research and publications, social services and balance in knowledge specialization. The university also prioritizes the personal growth of its students, resulting in greater innovation and productivity for the benefit of society and the nation as a whole.

OBJECTIVES

- To offer study and research programmes of quality and relevance to society and nation, and develop intellectual assets and innovation.
- To develop various university commercial projects that are viable and able to generate income.
- To explore, nurture and utilize knowledge effectively for the development of society and nation in line with the university and national ethos.

ORGANIZATION CHART



Chapter 2

PROJECT 1 : SAMPLING OF SELECTED RIVER AROUND KOTA KINABALU, MALAYSIA

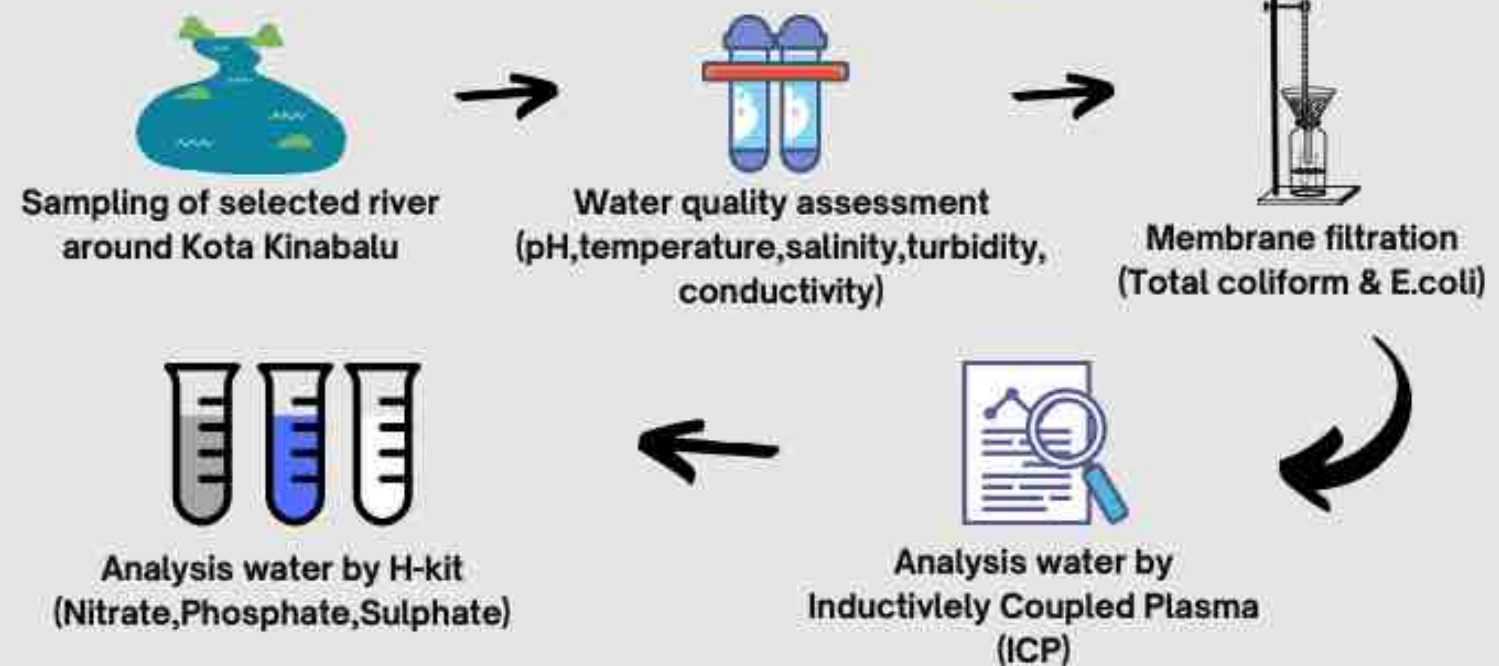
Objective of the study :

- To determine of total coliform and E.coli in water by membrane filtration
- To determine of heavy metals in water by Inductively Coupled Plasma (ICP)
- To determine of nutrients (nitrate, phosphate and sulphate) in water by H-Kit

LOCATION

ALONG INANAM RIVER

METHODOLOGY



PROJECT 2 : THE POTENTIAL OF WILD MUSHROOM FOR MYCOREMEDIATION OF HEAVY METAL

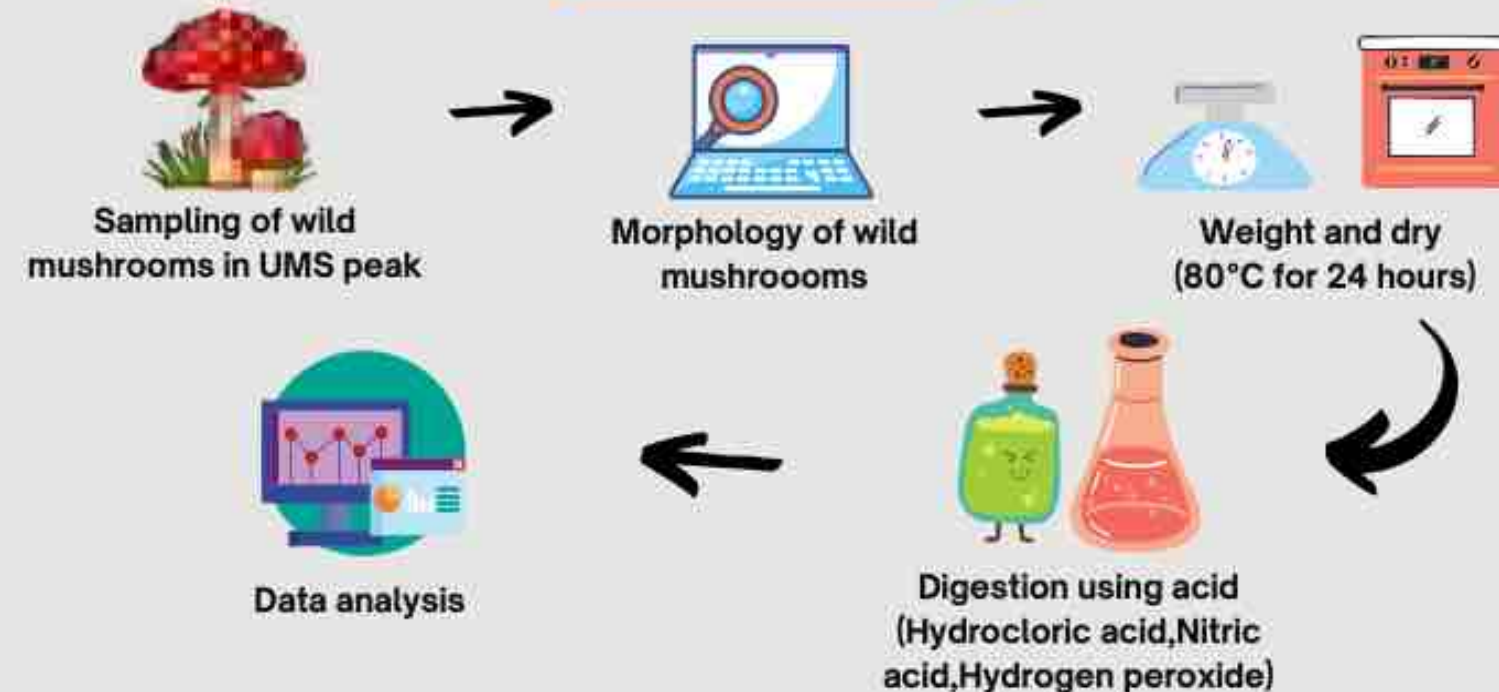
Objective of the study :

- To determine the distribution and abundance of wild mushroom in UMS peak.
- To carry out physical morphology, molecular identification and screening of wild mushroom.
- To cultivate selected wild mushrooms for mycoremediation study

LOCATION

UMS PEAK

METHODOLOGY



Chapter 3 & 4

SUGGESTION

• During the period of industrial training time, many experiences I traveled and some brought bitter and sweet experiences. However, here are some suggestions that I feel must be highlighted as appropriate for improvement and modification in the future.

1. The University should replace the old equipment with new equipment so that unwanted accidents occur.
2. The three month period should be extended to five months. During that long period of time, faculty supervisors are able to train students and equip them with valuable resources and skills that will be useful for future careers. If students complete their industrial training process with good performance and high quality, they may be offered a permanent position at their industrial training place.

CONCLUSION

I wish to express my sincere thanks to Dr Nur Zaida binti Zahari, Who is my supervisor for the research training for guiding and supervising throughout this research training.

I also would like to thank to Dr Chong Chun Shiong, academic lecture who is faculty supervisor in charge for the internship training, staff and all the lectures of Bioscience department, University Technology of Malaysia (UTM) gave to me a golden opportunity to follow the particular practical internship training in the Faculty of Science and Natural Resources (FSSA), University Malaysia Sabah (UMS).

Their guidance, necessary support, co-operation, encouragement, fullest effort of them to the success of this opportunity, all are grateful and unforgettable.





UMS
UNIVERSITI MALAYSIA SABAH



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Intership : NURUL AFIQAH KAMAL (3SSCG)

Tempat ; Faculty of Science and Natural Resource (FSSA); UMS.

Tempoh : 12 Julai-30 September 2021

12/7/2021

Introduction about internship proect's by faculty of Science and Natural Resource (FSSA), UMS.



2/9/2021

SAMPLING 1ST PHASE AT KOTA KINABALU RIVER



6/9/2021

sampling 1st phase at UMS peak



7-23/9/2021

Do Project 1 'Kajian Hidrogeomia dan status kualiti air sungai kesan pandemic covid-19, di sekitar zon merah kota kinabalu, Sabah. and Project 2 'The Potential of wild mushroom for mycoremediation of heavy metal and oil in soil' for sampling and lab activity.



24/9/2021

sampling for 2nd phase at UMS peak



29/9/2021

sampling 2nd phases at kota kinabalu river





SARAWAK

**CRAUN RESEARCH
SDN. BHD.**

Industrial Training

CRAUN RESEARCH SDN. BHD



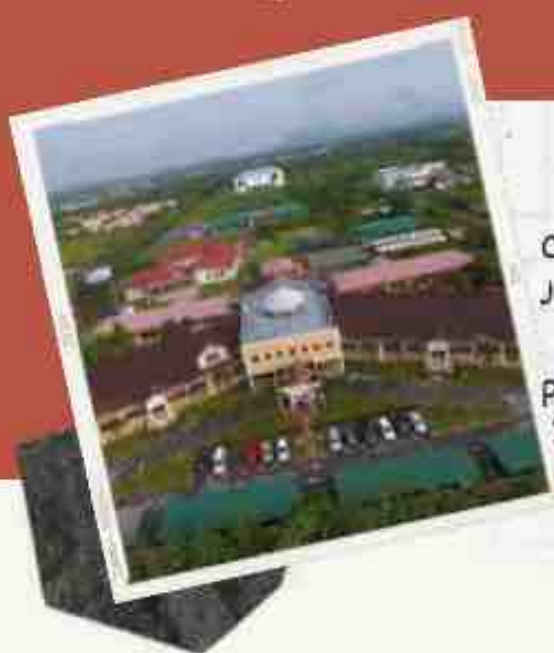
Address

-Lot 3147, Block 14, Jalan Sultan Tengah,
Petra Jaya, 93050 Kuching, Sarawak
(Headquarters)
-Sg. Talau Research Station, Dalat, Mukah



About company

CRAUN Research Sdn. Bhd was established on 22nd July 1993 by the Sarawak State Government. On 1st April 1997, CRAUN was corporatised and being placed under the Ministry of Education in 22nd May 2017. The meaning of CRAUN is Crop Research and Application Unit and main reasearch and developments are Sago Crop and Sago Starch.



Main Duties

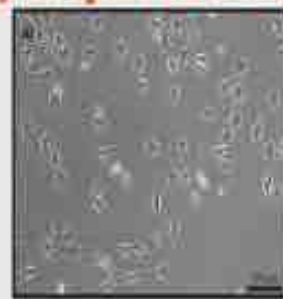
Mainly focusing on Research and Report Writing

A) Literature review



Somaclonal variation in
palmae

B) Report review



The effect of virgin coconut
oil on the expression of
fatty acid synthase in MCF-
7 breast cancer cells

Experiences

- Understand the job scope of researcher better
- Learn to write literature review and report review
- Improve the communication skills as well as presentation skills

Prepared by

Dayang Nur Aida Hamieza Binti Abg Abu Bakar
(A18SCO390)

FACULTY SUPERVISOR: DR MOHD FARIZAL AHMAD KAMARODDIN
INDUSTRY SUPERVISOR: MDM EVRA RAUNIE IBRAHIM



SARAWAK

**UNIVERSITI MALAYSIA
SARAWAK (UNIMAS)**

**INSTITUTE OF HEALTH & COMMUNITY
MEDICINE**

Institute of Health and Community Medicine, University Malaysia Sarawak (UNIMAS)

WONG KIING ING
A18SC0492

Industrial Supervisor : Prof Dr. David Perera

Faculty Supervisor : Dr. Chong Chun Shiong



Introduction

- Universiti Malaysia Sarawak (UNIMAS) is a Malaysian public university located in Kota, Samarahan, Sarawak. **UNIMAS** was officially incorporated on 24 December 1992. Recently, UNIMAS has been ranked among top 200th in Asian University Rankings 2017 by **QS World University Rankings**.
- The mission of the institute is to become a **world centre** for the study of tropical diseases by developing the appropriate technology and methods detection, surveillance and control of disease.
- They are currently **pursuing projects** related to enteroviruses, dengue, Japanese encephalitis, Coronavirus and adenoviruses.
- Their lab has also responded successfully to new and emerging health threats within the Sarawak community, such as the epidemic in 1997 which caused a **spate of infant deaths**.

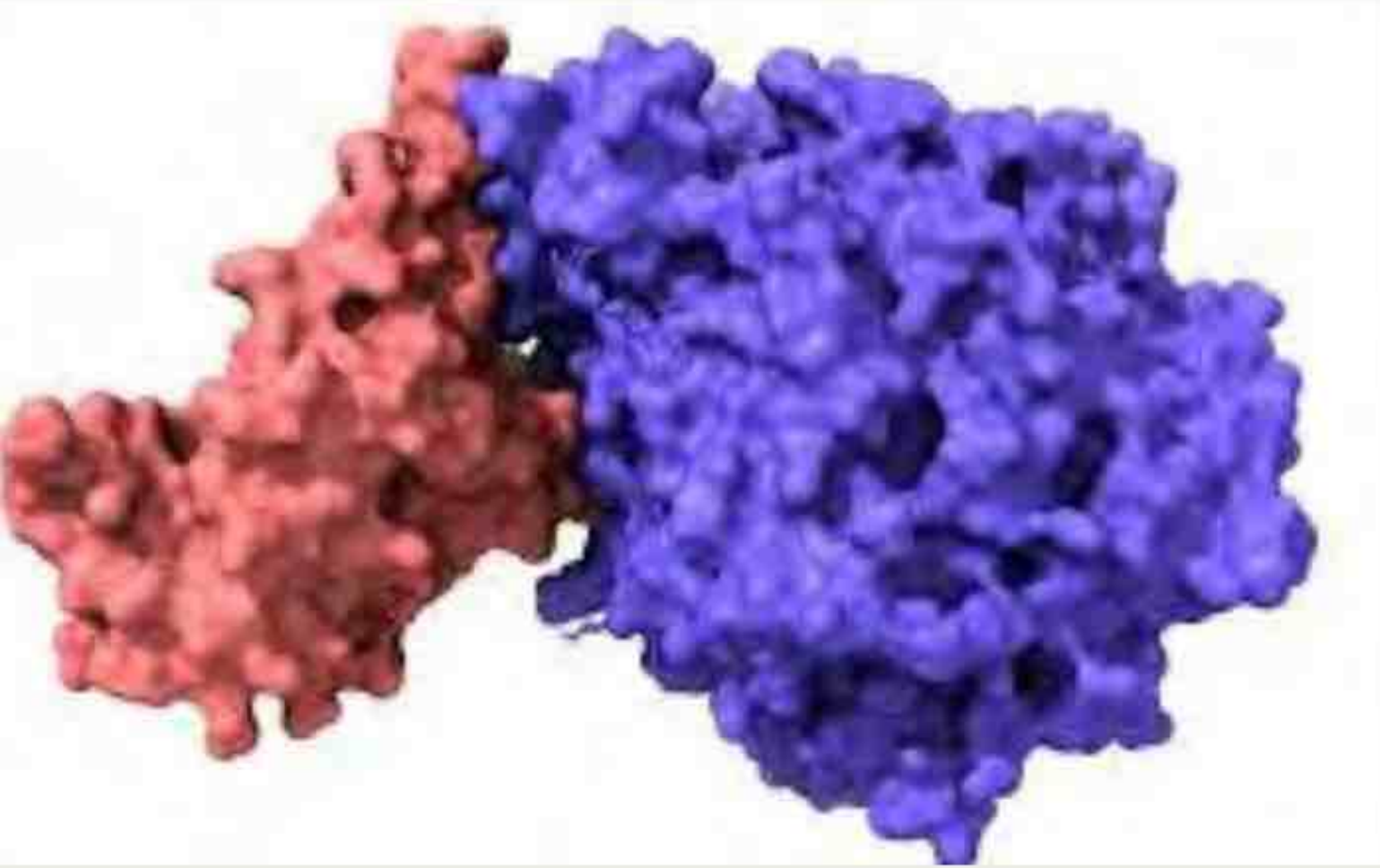
Internship Experience

- Learned the technique to **express the receptor binding domain** of Covid-19 Pasai strain
- Hands on operating some machines such as **PCR, UV Vis Transilluminator, Nanodrop 1000 Spectrophotometer**.
- Experienced **critical thinking** in answering QnA questions from industrial supervisors and University supervisor
- Develop **communication skills** and integrate with colleagues
- Learned how to solve problems when **encounter problems** in the experiment
- Cultivate **self-encouragement** and don't give up

Job Scope

- Operating **RT-PCR and PCR amplification**
- **Sequencing** the PCR product
- Cloning the PCR product into **pET SUMO vector** (Champion pET SUMO Expression System)
- Performing **Protein expression**
- Run the **SDS-PAGE** and **immunoblotting**

Expressing receptor-binding domain of SARS-Cov-2 Pasai strain



RT-PCR and PCR amplification

RNA samples from Pasai covid-19 variants were reverse transcribed into cDNA samples by RT-PCR and PCR amplification was run to obtain higher DNA sample yields.



Sequencing (BigDye Terminator v3.1)

The extracted DNA sample is subjected to DNA sequencing to analyze the genome encoded by the DNA sample, and sequence confirms the targeted DNA sample.



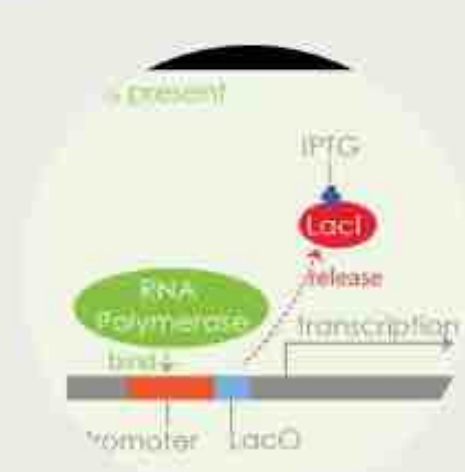
Cloning PCR product (Champion pET SUMO Expression System)

The targeted DNA sample ligated into pETSUMO vector and transform it into Mach 1 cloning host for cloning PCR product.



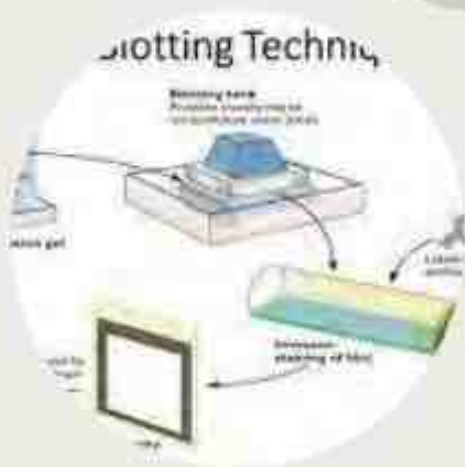
Protein Induction

The extracted plasmid was transformed into BL21 (DE3) expression host, and isopropyl β-d-1-thiogalactopyranoside (IPTG) was added for protein induction.



Run the SDS-PAGE and Immunoblotting

The target protein undergo SDS-PAGE to separate protein based on their molecular weight and run the immunoblotting to test the immunoreactive of our protein.





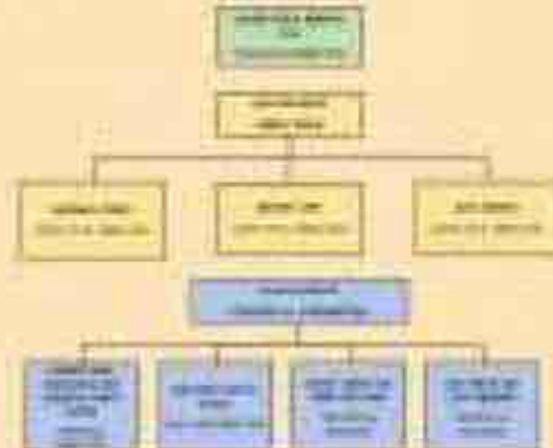
SELANGOR

CRYOCORD (M) SDN. BHD.

NAME: MUHAMMAD AIDIL WAFI BIN ROSLI
MATRIC NO.: A188C0418
YEAR/PROGRAM: 3/ BSCG
TRAINING GROUND: CRYOCORD SDN BHD
INDUSTRIAL SUPERVISOR: MS CHOY YEE WA
FACULTY SUPERVISOR: DR NURABHIKIN BINTI IHSAN

COMPANY BACKGROUND

CryoCord Sdn Bhd is one of the companies under Cryocord Holdings Sdn Bhd established in 2013. They know for their specialises services in cold chain medical cold storage in accordance to their services as a start up bank that is one of the largest cold chain banks in South East Asia. The company has one branches with Thailand Malaysia and 1 branch in Indonesia and Philippines, while the headquarters is located in Singapore, Selangor, Malaysia. The products offered by Cryocord Sdn Bhd to the customers are Certified, Certified, MarineMEDICAL, MMSCAL, TMSMSCAL, MMSPEI. The company started their collaboration with IMA Spitalenklinik Medical Centre (IPUM) in 2018 regarding structured of clinical research and cooperation which leads to the current research project that done in IPUM through our internship learning.



ORGANIZATIONAL CHART OF CRYOCORD SDN BHD

JOB SPECIFICATION

Job Title: RAS Intern
Job Purpose: Assist in management
Responsibility: To assist in cold storage
Key Responsibilities:
 1. Coordinate with sales of food and other of habits and any other daily routine.
 2. Evaluate any abnormality of habits with being.
 3. Perform daily-regular diagnostic-continuity treatment.
 4. Purchase supplies on the housing job.
 5. Plan or arranged to start up communities.

KNOWLEDGE MANAGEMENT

Explicit Knowledge: - a process of development that knowledge structure of information received or first the gathering of existing knowledge
Tacit Knowledge: - a process of receiving knowledge coming from inside a person's mind or people's experiences or values.
Knowledge Capture: - a process of verbalization among members to learn the knowledge

Knowledge	Knowledge Source	Knowledge Outcome
Explicit	Work-related explicit knowledge (Organizational Chart)	Structure of information & knowledge
Tacit	Knowledge captured through being	Personal experience, skill
Explicit	Knowledge captured through being	Document
Tacit	Knowledge captured through being	Learning through experience, skill

ACTIVITIES

Activities Training

How to identify the danger of any part of animal's behaviour.

Wound Care

Cleaned and the edge of animal's behaviour. Washed and kept sterile and clean.

Wound Tending

Essential knowledge under (classified) by using surgical gloves (hands).

Wound Tending

Cleaned and the wound area with saline solution. Sterilized and applied surgical gloves (hands).

Wound Tending

Disinfect and the wound area with saline solution.

Wound Tending

Collecting the first aid kit of the wound.

Wound Tending

Clean and sterilize a wound in the wound area. Then covering the wound with sterile bandage. Cleaning the wound area with saline solution. Disinfect and the wound area.

Wound Tending

Treating the animal with hygiene and safe. Treating the animal around the wound. Treating the wound with saline solution.

Wound Tending

Preparing the first aid kit for the animal's behaviour. Preparing the animal's behaviour. Preparing the animal's behaviour to be used in the animal's behaviour.

Wound Tending

Preparing the animal of the animal's behaviour. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution.

CHALLENGES

CHALLENGE: Facing animal behaviour with disease.

Fur Removal

Steps of collection to the eye of the animal like identify the challenge is not whole state. Washed the animal with a syringe. The surface of the animal's eye. Washed the animal's eye with a syringe. The surface of the animal's eye. Washed the animal's eye with a syringe. The surface of the animal's eye.

Wound Care

How to identify the danger of any part of animal's behaviour. Washed and kept sterile and clean. Essential knowledge under (classified) by using surgical gloves (hands). Cleaned and the wound area with saline solution. Sterilized and applied surgical gloves (hands). Disinfect and the wound area with saline solution.

Wound Care

Cleaned and the wound area with saline solution. Sterilized and applied surgical gloves (hands). Disinfect and the wound area with saline solution.

Wound Care

Preparing the first aid kit for the animal's behaviour. Preparing the animal's behaviour. Preparing the animal's behaviour to be used in the animal's behaviour.

Wound Care

Treating the animal with hygiene and safe. Treating the animal around the wound. Treating the wound with saline solution.

Wound Care

Preparing the animal of the animal's behaviour. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution. Treating the animal with saline solution.

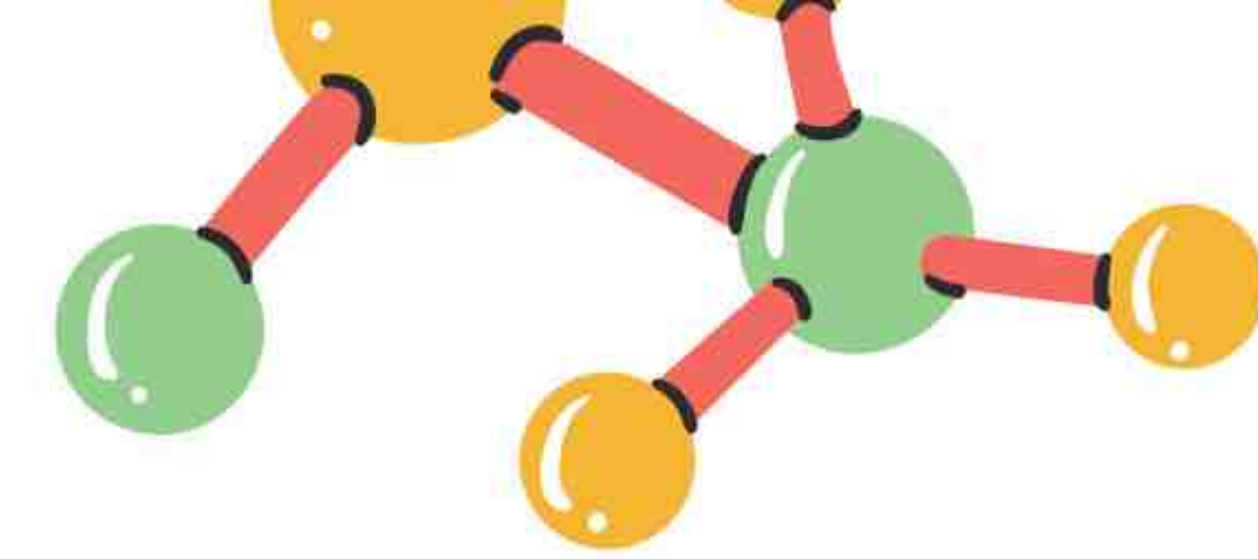


SELANGOR

**UNIVERSITI TEKNOLOGI
MARA (UiTM) SG. BULOH
INSTITUTE OF MEDICAL MOLECULAR
BIOTECHNOLOGY**

Internship Programs

Institute for Medical Molecular Biotechnology (IMMB)



Mini Project 1

Objective: To study the Life Cycle of *Chrysomya megacephala*

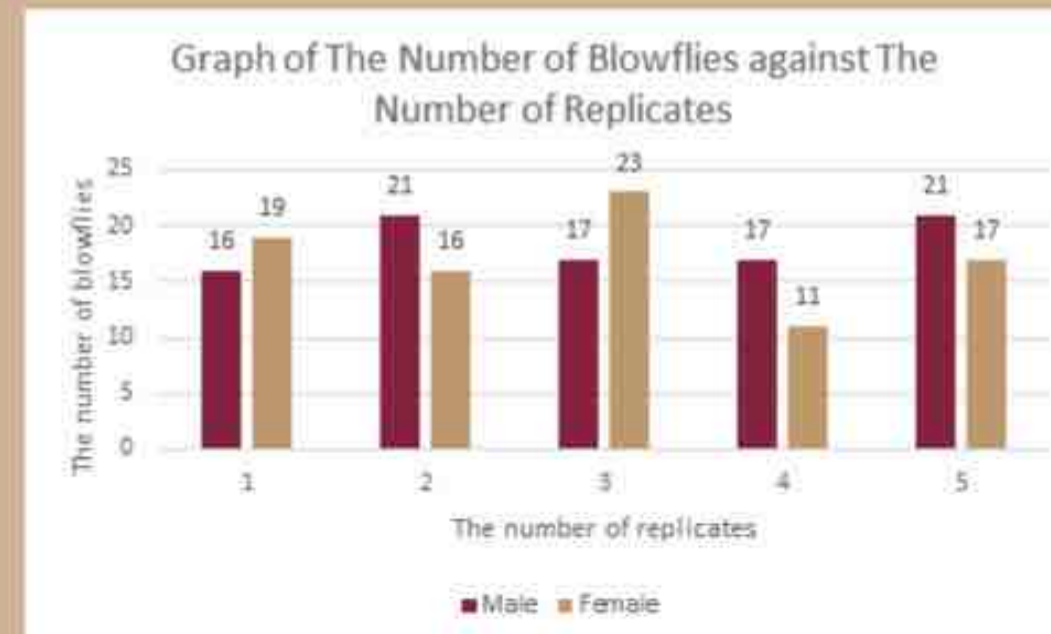
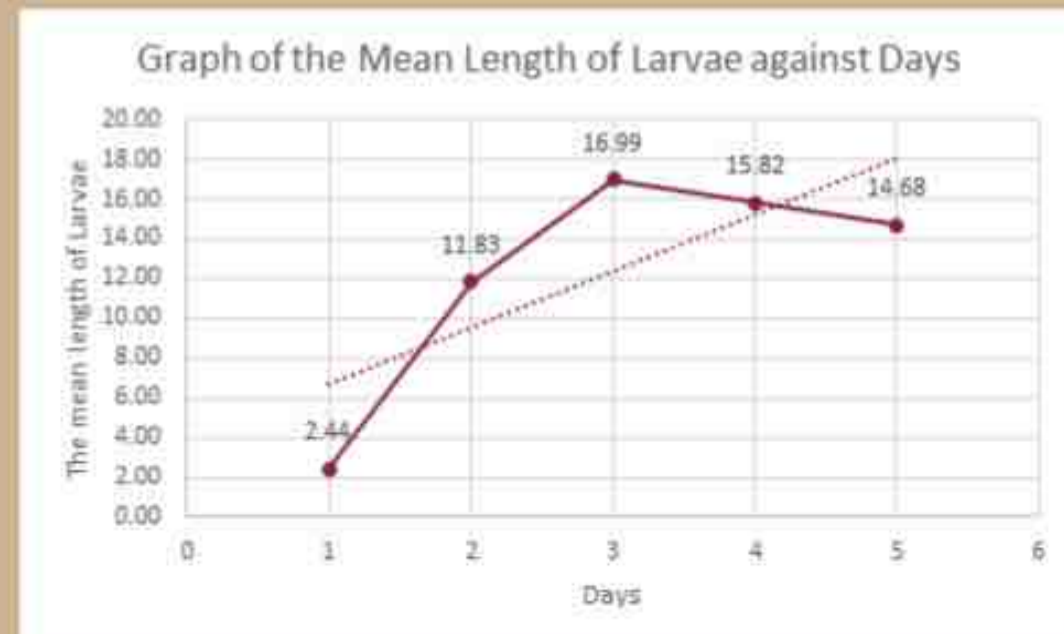
Methodology

- 1 The eggs obtained from the colony were introduced in an incubator chamber
- 2 When the larvae hatched (± 12 h), a group of 100 first instar larvae were transferred into a 100 g of fresh beef liver in a container
- 3 Daily, the five largest larvae from each replicate were collected, boiled in hot water for 5 minutes and preserved in 70% ethanol.
- 4 After three days, the mesh was removed, and the container relocated into a bigger container with sawdust in the bottom to facilitate the pupation of the larvae
- 5 The pupae of each replicate were isolated into another container each day until the adult emergence, after that the emerged adults were sexed to know the sex ratio.

Result

Life cycle of *Chrysomya megacephala* at 34.5°C

- *Chrysomya megacephala* took 11 days from eggs until it die without any food and water.



Mini Project 2

Objective: To determine the attractiveness of the *Synthesiomyia nudiseta* on the bait

Quantitative Methodology

- 1 Fresh liver and fish were defrosting 12 hours before the experiment started.
- 2 50g of the fish and liver were put in the cage. The light was open 12h during the experiment.
- 3 After 12h, take the liver and fish out and count the number of eggs on both medium. The experiment is repeated three times with 1 day resting interval

Result



Qualitative Methodology

- 1 All the adults are 3-d-old and be maintained in control [27-30°C, 65-75% RH, 12:12 (L:D)] environment.
- 2 At the outside of each arm of the Y-shaped tube, liver and fish is put, respectively.
- 3 Both liver and fish are put 5 minutes before the experiment started.
- 4 An adult male is placed in center of the Y-shaped tube in control environment.

Result

Gender	Observations	
	Minute-5	Minute-10
Male	No movement of the fly	The fly moved to the fish
Non-Gravid Female	No movement of the fly	The fly moved to the fish
Gravid Female	No movement of the fly	The fly moved to the fish



SELANGOR

**UNIVERSITI KEBANGSAAN
MALAYSIA (UKM)**

**INSTITUTE OF SYSTEMS BIOLOGY
(INBIOSIS)**

INDUSTRIAL TRAINING

Nurhaziqah Syahirah

A18SC0458

3 SSCG

PART 1: ARTICLE REVIEW



The title is An Overview of Potential Antidiabetic Plant as the Future Antidiabetic Drugs



Focus on plant-based active compounds chosen for clinical trials for antidiabetic treatment & attempt to correlate the mechanisms with the structure activity relationship (SAR)



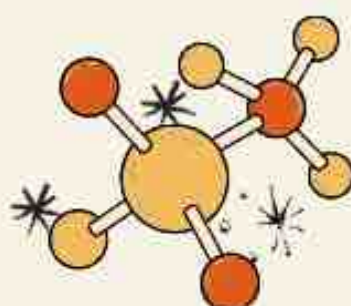
Current antidiabetic drugs:
α-glucosidase inhibitor
DPP-4 inhibitors
SGLT2 inhibitors



Structure Activity Relationship (SAR)

- flavonoid compounds with stilbene molecules
- hydroxylation at 4'-position of B ring
- hydrophilic substitutions at the phenyl ring

PART 2: BIOINFORMATICS



Molecular docking study was conducted to obtain the binding affinity (kcal/mol) for compounds



Molecular Docking Tools

1. Autodock (protein, ligand preparation & setting for docking site)
2. Autodock vina (docking)
3. PyMOL (visualization)



Molecular Docking Procedure

1. Choose protein target & ligand molecules
2. Carry out protein & ligand preparation
3. Select docking site in protein
4. Carry out protein-ligand docking using docking tool
5. Different ligand poses are generated



Ligand Free Binding Energy (kcal/mol)

- Hypolaetin = -9.4
- Isoscutellarein = -8.9
- Quercetin = -8.8
- Kaempferol = -8.6

CONCLUSION

A very productive program providing the medium for student to gain working experience, learn new things, obtain new skills and knowledge as well as to further develop and improve themselves beyond the classroom.



SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

**BIODIVERSITI UNIT,
INSTITUTE OF BIOSCIENCE**



LATIHAN INDUSTRI DI UNIT BIODIVERSITI, UPM

Unit Biodiversiti adalah salah satu unit di bawah Institut Biosains, Universiti Putra Malaysia yang menekankan pembangunan sumber-sumber biologi yang berkaitan dengan pemuliharaan dan penggunaan lestari.

Tempoh latihan ialah dari 12 Julai sehingga 30 September 2021. Sepanjang menjalani latihan industri di sini, saya telah menjalankan 4 projek mini (secara atas talian) dan beberapa latihan amali yang dijalankan secara bersemuka

PROJEK-PROJEK MINI

Secara atas talian (Minggu pertama - Minggu ke-11)

1. Kultur Tisu Tumbuhan

- Objektif 1: Menerangkan maklumat dan ciri-ciri tentang tumbuhan yang diberikan
- Objektif 2: Mengenalpasti kaedah kultur tisul dan mikropropagasi yang terbaik untuk tumbuhan tersebut

2. Taman Konservatori UPM

- Objektif: Membangunkan pengkalan data tumbuhan di Taman Konservatori UPM dengan kod QR

3. Kompos

- Objektif: Menghasilkan kompos di rumah menggunakan bahan-bahan dan sisa-sisa dapur

4. Herbarium

- Objektif: membuat herbarium mudah dari rumah

LATIHAN AMALI

Secara bersemuka (Minggu ke-12)

1. Mengekstrak Minyak Pati Tumbuhan

- Mempelajari dan mengekstrak minyak pati daripada halia dengan kaedah *hydro distillation*

2. Penyediaan Media Untuk Kultur Tisu

- Menyediakan media yang mengandungi nutrisi, hormon tumbesaran, gula dan agar untuk pertumbuhan eksplan kultur tisul

3. Kultur Tisu Tumbuhan

- Mempelajari dan melaksanakan kultur tisul tumbuhan di dalam makmal dari pemotongan eksplan sehinggalah proses penyimpanan di bilik kahal untuk *photoperiodation*

4. Sub-culturing

- Mempelajari dan melaksanakan sub-culture terhadap eksplan-eksplan yang berjaya menumbuhkan pucuk dan akarnya.

Infografik diperbuat oleh

- Nama: Natasya binti Azman
- No Matrik: A18SCO424
- Universiti: Universiti Teknologi Malaysia (UTM)
- Tempat Latihan Industri: Unit Biodiversiti, Institut Biosains, Universiti Putra Malaysia
- Penyelia Fakulti: Dr. Faezah Mohd Salleh
- Penyelia Industri: Puan Julia Abdul Aziz



Unit Biodiversiti,
Institut Biosains,
Universiti Putra
Malaysia,
Serdang, Selangor



UTM
UNIVERSITI TEKNOLOGI MALAYSIA



UPM
UNIVERSITI PUTRA MALAYSIA



Physical Training:

- Tissue culture
- Essential Oil
- Media Preparation
- Stock preparation

What I Get from Training?

- Working experiences
- Networking
- New knowledge
- Learn how to handle new device

Contact: ib@upm.edu.my
+603-89472209

Tissue culture

Objectives: To report on background, socioeconomics and micropropagation techniques of *Musa Paradisiaca*

Compost

Objectives: To create compost using household waste and organic waste

MINI PROJECTS

Conservatory park

Objective: To build a database using QRcode

Herbarium

Objective: To create 2 herbarium specimens

Summary:
Unit Biodiversiti is a unit under Institut Biosains, UPM which focus on developing all relevant biological sources for preservation and sustainable utilization

Prepared by: Siti Zulaikha binti Syamsul Bahri
(A18SC0480)

INTRODUCTION

- Biodiversity unit (UBD) is one of the unit under the Institute of Bioscience (IBS)
- The location of this unit is on the 3rd level in the main IBS building.
- UBD has 5 main divisions, and they are Herbarium, UPM Conservatory Park, Tissue Culture Lab, Essential oil, and Research and Conservation Farm



INSTRUMENT USED

- HYDRO DISTILLATION (ESSENTIAL OIL DISTILLATION)



JOB SCOPES

- Use hydro distillation for essential oil extraction.
- Do tissue culture.
- Do compost
- Do herbarium
- Prepare media for tissue culture

MINI PROJECTS

- Plant tissue culture (Halia bara)
- Conservatory Park QR code
- Compost
- Herbarium



THINGS LEARNED

- Learn to extract essential oil by using hydro distillation.
- Learn to do plant tissue culture.
- Gain more knowledge about plants.
- Improve communicating skills.

FACULTY SUPERVISOR DETAILS

Dr. Faezah Binti Mohd Salleh
Email: faezah@utm.my

INDUSTRIAL SUPERVISOR DETAILS

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PUAN JULIA BINTI ABDUL AZIZ
julia_a@upm.edu.my

INDUSTRIAL TRAINING

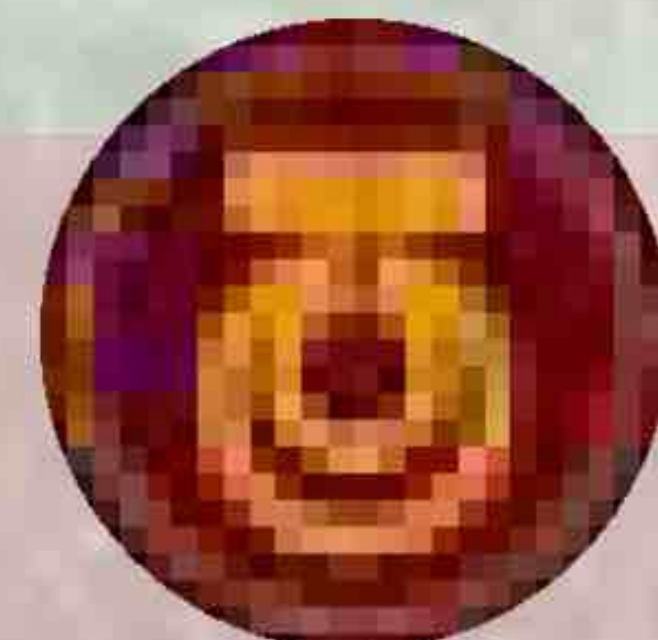
BIODIVERSITY UNIT, UPM

ZAWANI NADZIRAH BINTI ZAMANI

A18SC0497

3 SSCG

FACULTY SCIENCE



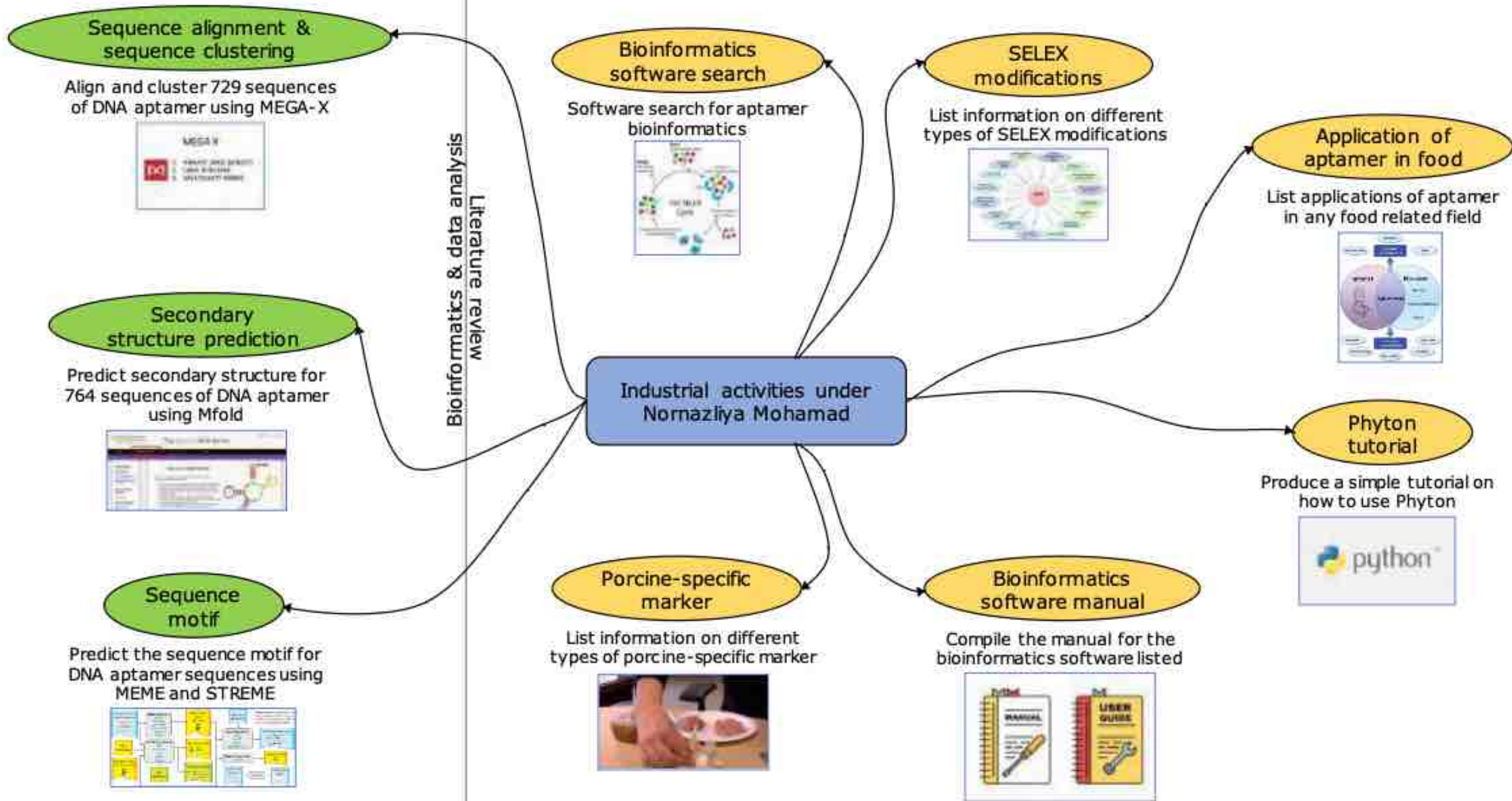
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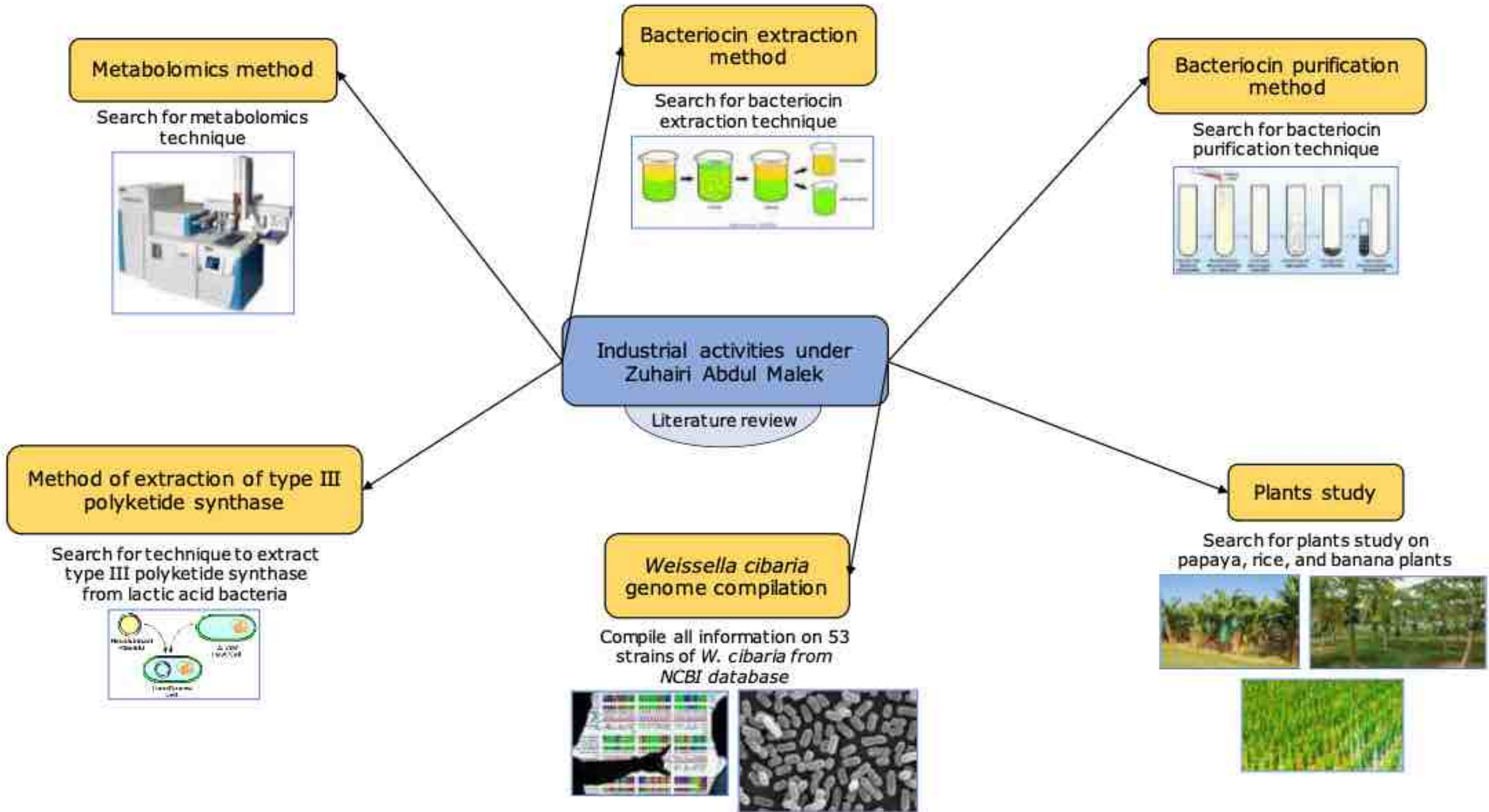


SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

**FAKULTI BIOTEKNOLOGI & SAINS
BIOMOLEKUL**





Industrial activities under
Siti Zaharah Imran

Literature review

Metagenomics

Literature reading of
metagenomics



Transcriptomics

Literature reading of
transcriptomics



Metabolomics

Literature reading of
metabolomics



Ezbiocloud & PATRIC
database

Literature reading of
bioinformatic tools



Multi-omics

Literature reading of multi-
omics



Search engine used:

1. Google scholar
2. Web of Science
3. ScienceDirect Journal
4. SpringerLink Journal
5. Proquest Dissertations and Thesis Global

Industrial activities under
Zuhairi Abdul Malek

Literature review

Metabolomics method



Search for metabolomics
technique

Bacteriocin extraction
method



Search for bacteriocin
extraction technique

Bacteriocin purification
method



Search for bacteriocin
purification technique

Add more literature to the list

Add more literature to the list

Weissella cibaria
genome compilation



Compile all information on 53
strains of *W. cibaria* from
NCBI database

Method of extraction of type III
polyketide synthase



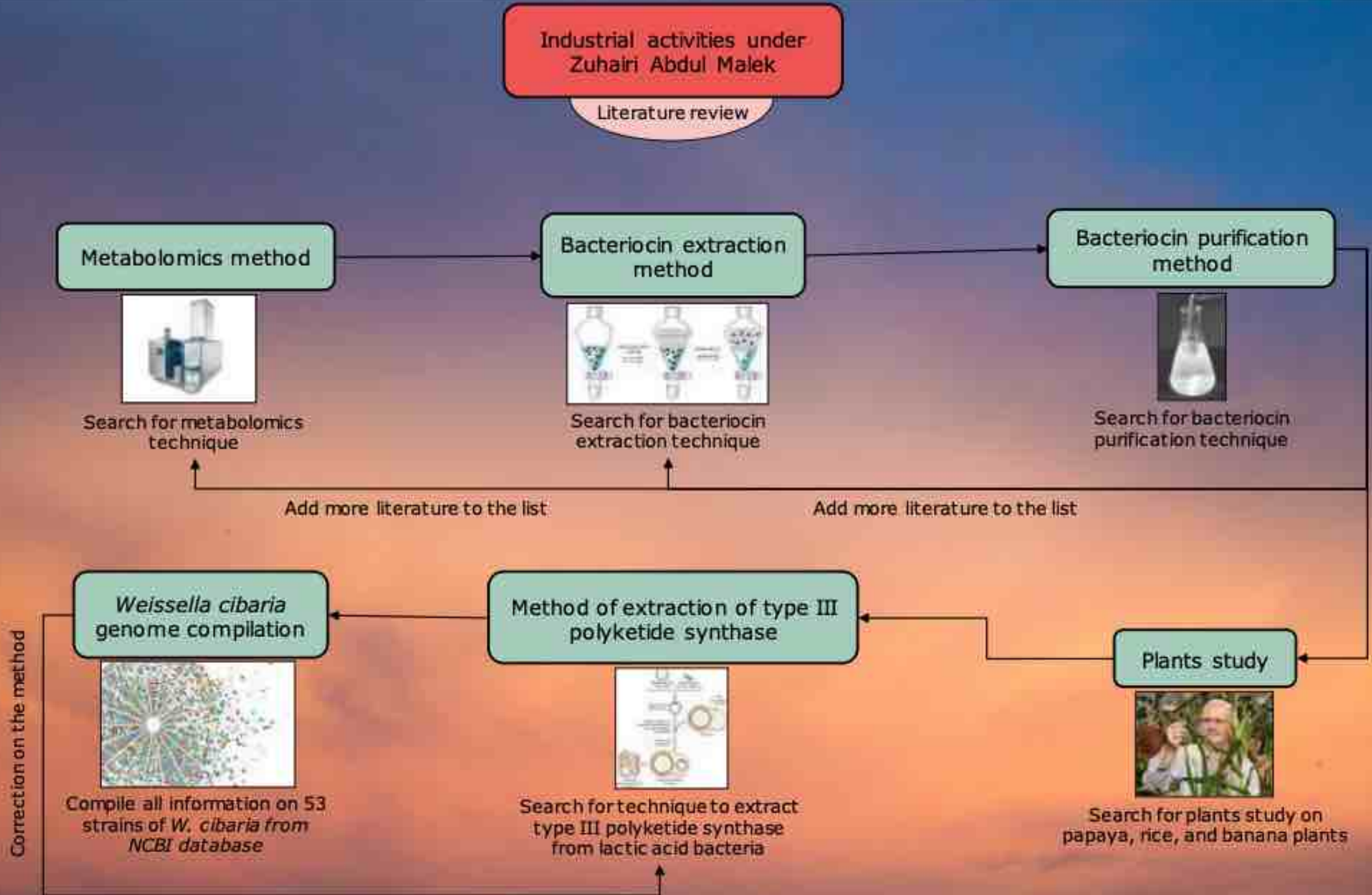
Search for technique to extract
type III polyketide synthase
from lactic acid bacteria

Plants study



Search for plants study on
papaya, rice, and banana plants

Correction on the method





SELANGOR

**UNIVERSITI PUTRA
MALAYSIA (UPM)
SERDANG**

**NATURAL MEDICINES AND PRODUCTS
RESEARCH LABORATORY
(NATURMEDS)**



NAME: NUR ALIFFAH ILYANNA BT MUHAMMAD HARIRI

MATRIC NO: A18SC0438

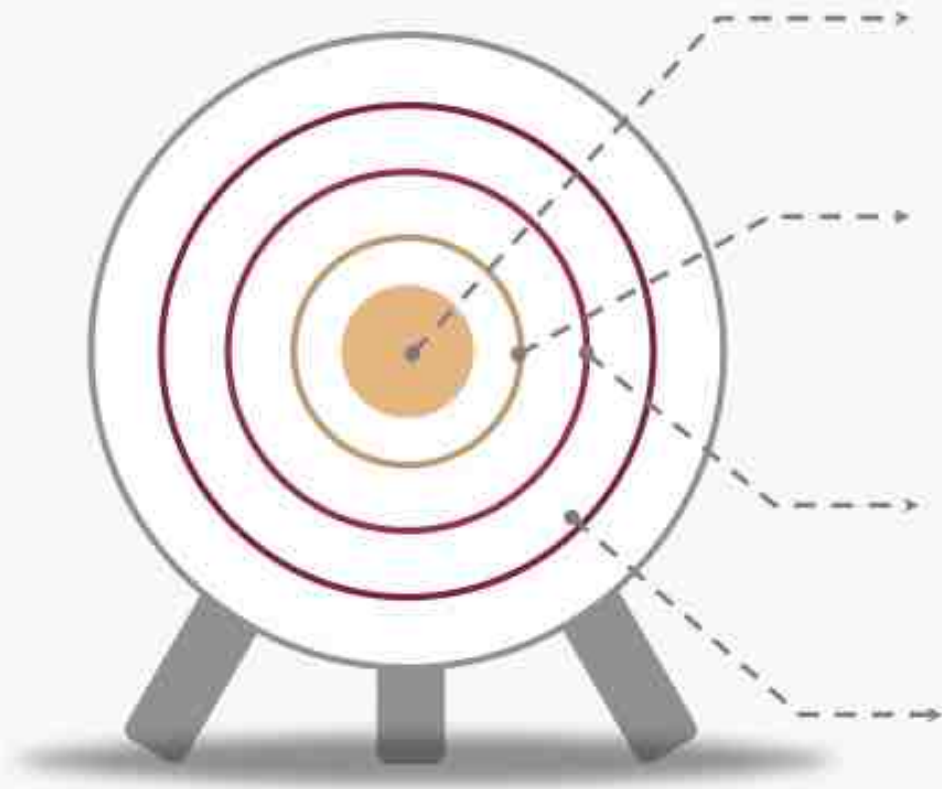
**INDUSTRY SUPERVISOR: PROF MADYA DR. AHMAD FAIZAL
ABDULL RAZIS**

FACULTY SUPERVISOR: DR RAZAUDEN ZULKIFLI

**NATURAL MEDICINES AND PRODUCT RESEARCH
LABORATORY, INSTITUTE OF BIOSCIENCE UPM**



VALUABLE EXPERIENCE



Learn new things about natural products

Benefits of using natural products especially in health

Enhance existing knowledge

High Performance Liquid Chromatography (HPLC), Nuclear Magnetic Resonance (NMR)

Improve research skills

Reading a lot of research article and article review to write a good literature review

Laboratory skills

Sample preparation for NMR analysis



TERENGGANU

**UNIVERSITI MALAYSIA
TERENGGANU (UMT)**

MARINE BIOTECHNOLOGY INSTITUTE

First task (*Vernonia cinerea*)



Kingdom: Plantae
Genus: Cyanthillium
Species: cinereum
Scientific name: Cyanthillium cinereum (L.) H. Rob or Vernonia cinerea
Local name: Rumput sepagi (MY), Ironweed (US)

Flower

Type: Inflorescences: a cluster of small flower/disc florets, Bisexual flower.
Arrangement: Flat-topped panicle.
Growth form: Erect.
Shape: Urceolate/Urn shaped.
Location: Terminal/Top of the stem.
Symmetry: Radial.
Colour: white, pink, purple.

Leaf

Colour: Evergreen, green when mature.
Type: Single petiole leaf.
Arrangement: Alternate manner.
Margin: Serrate or toothed.
Apex: Acute shape
Shape: Ovate, egg-like shape.
Venation: Pinnate structure.

Second task (Aquatic animals)

Eels/Belut/ikan Linang

Family - Synbranchidae (Belut) and Anguillidae (Ikan linang).
Species - Synbranchus sp., Monopterus sp., Macroptema sp., Anguilla sp.
Found - Africa, Liberia, Asia, Mexico, Central America, and South America.
Habitat - Rice paddy fields, burrowing in mud or caves.
Features - Elongated body, Sword-like tail, small eyes, lack of pelvic and pectoral fins, narrower caudal fin or absence. Diff. Elongated dorsal and anal fins connected to caudal fin.



Snakehead/Haruan/ikan Kedak

Family - Channidae
Species - Channa striata (Haruan/ Snakehead murrel), Channa limbata (Kedak/dwarf snakehead)
Found - Tropical Africa and southern Asia.
Habitat - Freshwater.
Features - Haruan, shape like a head of a snake, long dorsal and anal fins, some lack of pelvic fins, pectoral fin round and wide, broader base.
Kedak: adopted as aquarium pet.



Catfish/Keli

Family - Clariidae, Pangasiidae
Species - Clarias sp. (keli kayu, keli afrika) and Pangasius sp. (silver catfish)
Found - Southern and western of Asia, Africa and Syria.
Habitat - Freshwater, muddy water, able to 'walk' on land to search for suitable environment.
Features - Small pectoral and pelvic fins, small eyes.



Mudskipper/Belacak

Family - Oxudercidae
Species - Periophthalmus sp., Periophthalmodon sp. (Giant mudskipper)
Found - Freshwater and brackish water of oceanic islands in tropical and subtropical areas.
Features - Broader and shorter head with rounded snout, two separate dorsal fins, a broad pectoral and caudal fins and ability to popping out or retracted eyes from the head which is useful when out of water.



Buffalo Leech/Lintah Kerbau

Family - Hirudinae
Species - Hirudinaria manillensis (Asian buffalo leech), Hirudo medicinalis.
Found - Indo-west pacific region, Bangladesh to Sri Lanka and along Southeast Asia and Singapore
Habitat - Rice paddies, swamps and sluggish streams from
Features - Olive-green colour and discontinuous black line at the middle dorsal; has hirudin protein in saliva.



Apple snail/Siput Gondang

Family - Ampullariidae
Species - Pomacea canaliculata (golden apple snail) and Pomacea maculata (as 'insularum', 'black apple snail')
Found - South and Central America
Habitat - Mostly in rice paddies.
Features - Large and globular shell, ranging from yellow to green and brown to nearly black colour, bight-pink coloured egg.



References

1. <https://www.researchgate.net/publication/328128101>
2. <https://www.researchgate.net/publication/328128101>
3. <https://www.researchgate.net/publication/328128101>
4. <https://www.researchgate.net/publication/328128101>
5. <https://www.researchgate.net/publication/328128101>
6. <https://www.researchgate.net/publication/328128101>
7. <https://www.researchgate.net/publication/328128101>
8. <https://www.researchgate.net/publication/328128101>
9. <https://www.researchgate.net/publication/328128101>
10. <https://www.researchgate.net/publication/328128101>

Microbes detection and the usage of water waste of extract from *Melaleuca cajuputi* (Pokok Gelam)

INTRODUCTION TO HBUKK



Hatchery Belangkas UMT, Kuala Kemaman (HBUKK) is one a crab conservation center established on June 20, 2020 and began full operations on March 1, 2021. The center is located at next to the Kuala Kemaman Berhad Fishermen's Cooperative Office, Jalan Kuala Kemaman, 24000 Kemaman, Terengganu. The establishment of a horseshoe crab's hatchery is an initiative from University Malaysia Terengganu (UMT) in maintaining the crab which is one of the treasures of nature.

- "Living fossils" that have existed since 250 million years ago
- *Limulus polyphemus*, *Tachypleus gigas*, *Tachypleus tridentatus* and *Carcinoscorpius rotundicauda*.
- Horseshoe crab blood has been widely used as an endotoxin detector



- *Melaleuca cajuputi* is commonly known as the Gelam tree and is used to cure cholera as well as muscle and joint pain in folk medicine.
- It is a member of the Myrtaceae family with reported anti-inflammatory, anticancer, hepatoprotective, and anthelmintic activities.



Problem Statement

The horseshoe crab eggs cannot survive for long because of microbial infection. Its lead to low hatching number of horseshoe crabs.



- To identify the microbes from the horseshoe crab eggs
- to determine the effect of waste water from the extract of *Melaleuca cajuputi* using the eggs of horseshoe crab.

1. Isolation of microbes from the eggs of horseshoe crabs
2. Identification of the isolated microbes by 16s rDNA sequencing
3. Introduction of the waste water extract using the leaves of *Melaleuca cajuputi* using different concentration and water extract ratio.
4. Observation of the contaminants in every two days

Material & Methods



Results and Discussion

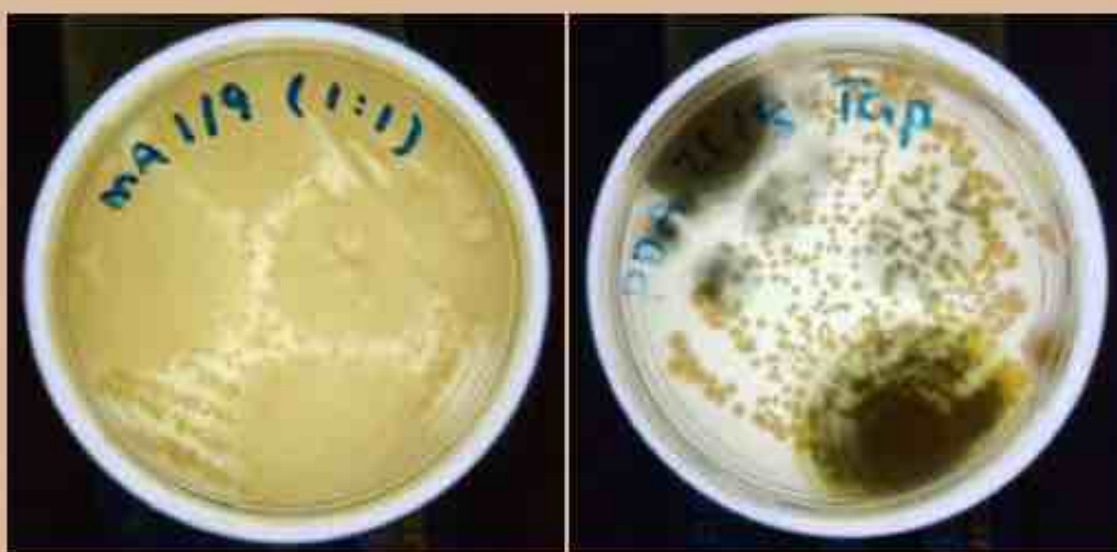


Image : Growth of microbes from water samples onto MA & PDA

Concentration of water samples	Number of infected eggs
Tap	19
1:10	32
1:5	40
1:1	7
5:1	2
10:1	1
Gelam	2

From the collected data that has been recorded along the experiment, it has shown that water samples from 100% Gelam, 5:1 and 10:1 concentration have less number of infected eggs.

For water samples of 100% Tap water, 1:5, 1:10 concentration have higher number of infected eggs. For water sample with the concentration of 1:1, it shows average number of infected eggs which means it is not very high or very less.

Conclusion

Water waste from Melaleuca cajuput's leaves help to reduce the infection on the horseshoe crab eggs. The identification of the type of microbes on the infected eggs will help the other research on finding the anti-microbial agents that can reduce the infected eggs.

NOR HAIZAADIELA BT ABDUL RAHMAN
A18SC0429

18/7/2021-7/10/2021

HATCHERI BELANGKAS UMT, KUALA KEMAMAN