



INTELLECT

Exploring Technologies, Advancing Innovation

CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

HARNESSING THE POWER OF CELLS AND GENES: THE BIOTECHNOLOGY REVOLUTION, UNISEL

INTRODUCTION

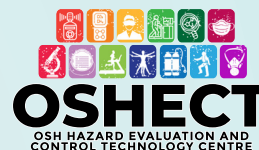
Welcome to the first issue of Intellect, the quarterly magazine of NIOSH that explores technologies and advances innovation in the field of Occupational Safety and Health (OSH). Intellect is a platform for exchanging information, sharing knowledge and experiences and highlighting the latest developments and achievements of NIOSH and its partners. Intellect aims to benefit all the stakeholders in the OSH community, including research institutes, laboratory service providers, universities, academicians, government and private sectors, employers and students.

We hope that Intellect will inspire and inform you about the exciting and important works that NIOSH and its partners are doing to enhance OSH standards and practices in Malaysia and beyond. We also welcome other organisations who are interested in promoting or sharing their laboratory facilities and services in the field of OSH. We welcome your feedback and suggestions on how to improve our magazine and services. We would love to hear from you and feature your contributions in our future issues.

If you have any stories, projects, or achievements that you would like to showcase in our magazine, please feel free to contact us at intellect@niosh.com.my. Thank you for your support and interest in NIOSH. We look forward to hearing from you and serving you better.



Your OSH preferred partner



Editorial Team

Advisor

Haji Ayop Salleh
Executive Director, NIOSH Malaysia

Editor-in-Chief

Tuan Mejar Haji Hanif Maidin (B)
Executive Secretary, NIOSH Malaysia

Secretariat

Noorliza Idawati Mat Nayan
Mohd Hussin Abd Salam
Siti Badariah Abu Bakar
Siti Norshuhada Abdul Aziz

Editor

Muhamad Syarizat Azmi
Fatin Alisha Zulkifli

Publisher

NIOSH
Lot 1, Jalan 15/1, Section 15, 43650 Bandar Baru Bangi,
Selangor Darul Ehsan, Malaysia.
Tel : 03-8769 2100
Fax : 03-8926 2900
Email : penerbitan@niosh.com.my
Website : www.niosh.com.my

Table of Contents

03 | CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

06 | Harnessing the Power of Cells and Genes: The Biotechnology Revolution (UNISEL)

CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

ChM. Mohd Norhafsam Maghpor, Zakiah Mohd Yusoff, Siti Nazhatul Marina M Fitriyana Mior, Aqilah Nabihah Omar, Shafina Nadiawati Abdul, Rochi Anak Bakel, Nor Fitriyana Mohd Yusof, Muhammad Asyraf Afham Abd Kadir

1.1 INTRODUCTION TO CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

In 2000, the Use and Exposure Standards of Chemicals Hazardous to Health (USECHH) Regulations were introduced to strengthen the legislation in which all chemicals hazardous to health are controlled under its clause. The Industrial Hygiene Analytical Laboratory was established as part of the Industrial Hygiene Division in the late 1990s to conduct research and support the surveillance activities of the IHD.

In 2005, laboratory services were commercialized and offered to the Occupational Health Doctor and Industrial Hygiene Technician (IHT1), DOSH competent person to test a biological sample and an environmental sample respectively. The aim was to help industries strengthen industrial hygiene testing as well as help employers comply with legislation through laboratory testing. During the first years of operation, few samples were taken and analyzed each year, but it increased to almost ten thousand samples after almost two decades of operation, except for more than fifteen thousand samples in 2015.

Under the Eleventh Malaysia Plan (11th MP), the Malaysian government, through the Ministry of Human Resources, provided funds to NIOSH Malaysia to develop an integrated OSH laboratory. Known as the Technology Center for OHS Risk Assessment and Control, the project was developed from 2016 to 2020. The overall objective of the project is to provide support facilities for activities at NIOSH Headquarters in Bandar Baru Bangi and the South Johor Region Campus. Within the framework of OSHECT, the IHAL has been renamed Chemical Hazardous to Health Laboratory (CHL).

1.2 THE OBJECTIVES OF THE ESTABLISHMENT OF THE CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

The main objective of the CHL is to assess the level of worker exposure to health-hazardous chemicals and microbes in the workplace while helping the industry comply with local legal requirements. Unique, compared to other laboratories in Malaysia, CHL is a niche for occupational safety and health testing, especially industrial hygiene. It continues to offer testing and sample analysis primarily in the area of industrial hygiene, including:

- Workplace environmental sample – sampled by Hygiene Technician (IHT1) as per the requirement under Part VIII of USECHH 2000 (Monitoring of Exposure at the Place of Work)
- Biochemical samples such as urine and blood - by an Occupational Health Doctor (OHD) as per requirement under Part IX of USECHH 2000 (Health Surveillance)
- Microbiological samples - by indoor air quality assessor to complement the Industry Code of Practice of Indoor Air Quality, 2010

The CHL is equipped with state-of-the-art scientific equipment such as Inductively Coupled Plasma Mass Spectrometry, Mercury Analyser, Ion chromatography (IC), Phase contrast microscope (PCM), X-ray Diffractometer (XRD), and Gas Chromatography. The CHL offers an analysis of various parameters from particles, solvents, and heavy metals, both organic and inorganic. Most of the test methods are referred to as internationally recognized test methods such as the NIOSH Manual Analysis Method (NMAM). Chemical Hazardous to Health Laboratory (CHL) accredited by Department Standard Malaysia under Skim Akreditasi Makmal Malaysia based on ISO/IEC 17025 was completed in 2009. SMM ID number for CHL was 412 with only 5 parameters. Then, in 2020, the CHL accreditation was extended to 52 test parameters.

1.3 THE ACHIEVEMENTS OF THE CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)

In 2011, for the first time, IHAL (now known as CHL) received the Excellent Laboratory Award organized by the Malaysian Institute of Chemistry (IKM). The award is a recognition for laboratories that have achieved competence in the practice of analytical work. The award is a recognition to laboratories that have achieved competency in the practice of analytical work. In addition, the award was designed to ensure the laboratory's commitment to achieving excellence in providing quality and competent testing services on local legislation, especially in the fields of safety, health and the environment. IHAL has proven its excellence in laboratory services by consistently receiving the award for ten consecutive years. This 10-year award is known as the IKM Laboratory Excellence Silver Award. Through cooperation, in addition to the NIOSH-JICA program, CHL also cooperates with several other domestic and international agencies such as the Korean Occupational Safety and Health Agency (KOSHA), the Malaysian Institute of Chemistry (IKM) and local Universities.

Equipment list and activities in CHL

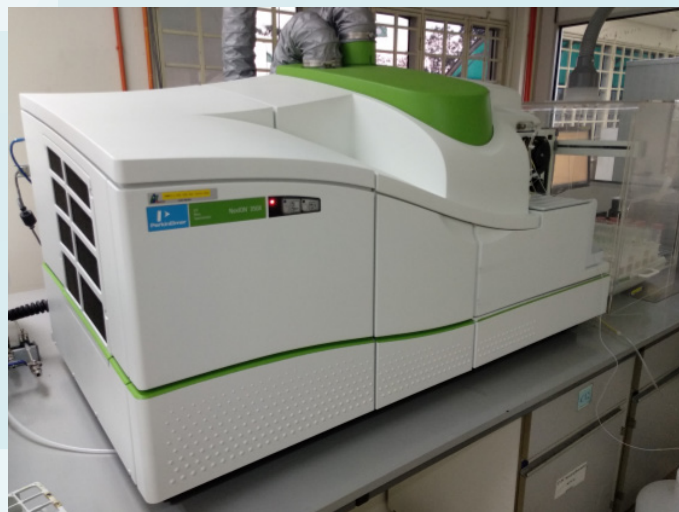


Figure 1.0 Gas Chromatography (GC)

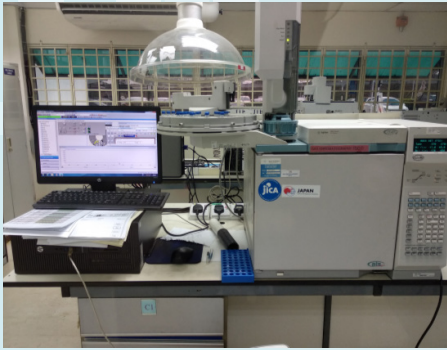


Figure 1.2 Gas Chromatography (GC)



Figure 1.3 Inductively Couple Plasma Mass Spectrometry (ICP-MS)



Figure 1.4 Inductively Couple Plasma Mass Spectrometry (ICP-MS)



Figure 1.5 Microscope



Figure 1.6 Mercury Analyser



Figure 1.7 X-ray Diffraction (XRD)



Figure 1.8 Ion Chromatography (IC)



Figure 1.9 High-Performance



Figure 2.0 Analytical Balance
Liquid Chromatography (HPLC)

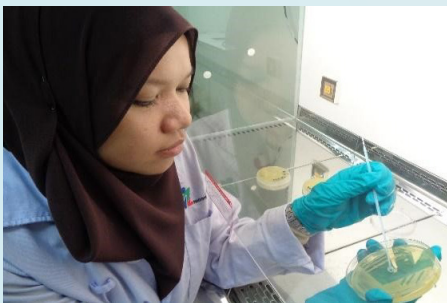


Figure 2.10 Microbe Analysis



Figure 2.11 Microbe Analysis

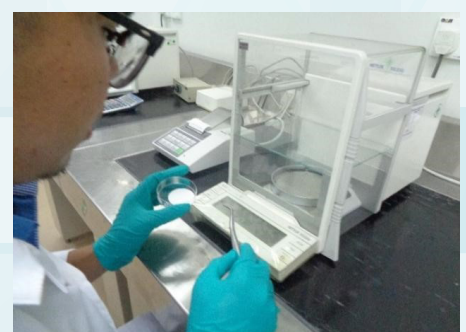


Figure 2.0 Analytical Balance
Liquid Chromatography (HPLC)

Figure 3.12 Certificate of Accreditation ISO 17025: 2017



Certificate of IKM Laboratory Excellence Award (2011 – 2021)



Figure 2.13 Certificate of IKM Laboratory Excellence Award (2011 - 2021)

HARNESSING THE POWER OF CELLS AND GENES: THE BIOTECHNOLOGY REVOLUTION

Dr. Intan Faraha A Ghani

Deputy Dean of Student Development, Resources and Research FELS,
Universiti Selangor (UNISEL)

Biotechnology is a broad and rapidly advancing field that involves the use of living organisms, or parts of living organisms, to develop or create products, processes or technologies for various applications. It combines principles from biology, chemistry, genetics and engineering to manipulate and harness biological systems for practical purposes.

It is a growing field in Malaysia, and the country has made significant investments in biotechnology research and development. Malaysia's government has also recognized the potential of biotechnology to drive economic growth and improve the quality of life.

FACULTY OF ENGINEERING AND LIFE SCIENCES: FROM CELLS TO STRUCTURE

The Faculty of Engineering and Life Sciences (FELS), offers a range of undergraduate and postgraduate programs related to these disciplines. With two departments under one faculty, academic programs under Department of Engineering comprises field such mechanical, civil and electrical engineering. Meanwhile, under Department of Science and Biotechnology, academic programs comprise field of Biotechnology, Bioinformatic, Technology Industry and Aquaculture. All undergraduate and postgraduate programs under FELS, are accredited by the Malaysian Qualification Agency and Engineering Accreditation Council Malaysia.

Rapid revolutionary advances in research and innovation have been taking place in engineering and life sciences to address a wide spectrum of biological, health, environmental, social and industrial issues. Thus, the integration of the two departments namely, engineering, science and biotechnology under one faculty is very relevant because it facilitates synergy and multidisciplinary approaches in facing these issues.

With a mission to provide excellent and conducive learning environment, we have well equipped laboratories to facilitate research and practical experiment in fields like biotechnology, molecular biology and engineering applications. On top of that, we have experienced lecturers in various fields of engineering and life sciences that play a crucial role in teaching, research and mentoring students.

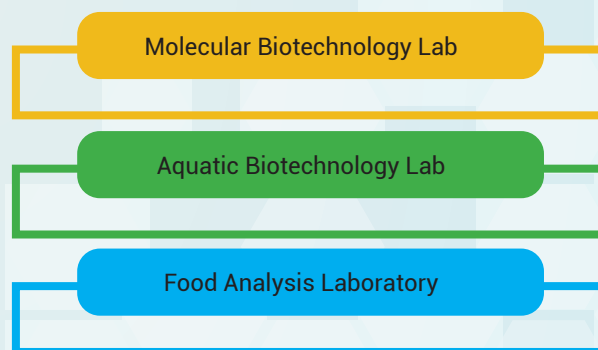
SELANGOR SCIENTIFIC ADVANCEMENT LABORATORY (SELSCA LAB)

The Selangor Biotechnology Action Plan 2021-2030 (SBAP 2021-2030) is a state initiative with the aim to further flourish the biotechnology sector in Selangor and at the same time positioning the state to be more attractive to the investors by making it as a regional Biotechnology Hub encompassing innovation, technology dissemination, investment and human development. Flourishing biotechnology through education involves fostering a strong foundation of knowledge and skills, inspiring innovation and preparing future professionals for the challenges and opportunities in the field.

To fulfil the agenda of SBAP 2021-2030, the Selangor State Government, under the "Inisiatif Kemahiran Teknikal dan Ikhhtisas Smart Selangor" has provided financial assistance for UNISEL to develop Selangor Scientific Advancement Laboratory (SELSCA LAB) under the Department of Biotechnology Lab, FELS.

The establishment of SELSCA LAB, is to provide the best facilities and equipment for students and lecturers to conduct their research as well as to keep the curriculum updated with the latest technologies and trends in biotechnology. Practical exposure to techniques in various laboratory experiences is essential to prepare students to embark in real-world biotechnology applications. Not only that, the establishment of SELSCA LAB helps to foster partnerships and provides services with affordable prices to companies and research institution. SELSCA LAB will ensure that FELS, UNISEL is competitive as other institutions. This is in line with the mission and vision of UNISEL, which is committed to provide excellent and conducive learning environment to develop competent, upright and ethical professionals and scholars.

Below are laboratories under SELSCA LAB



MOLECULAR BIOTECHNOLOGY LABORATORY

Molecular Biotechnology Laboratory under the Faculty of Engineering and Life Sciences, UNISEL is a lab designed to

What do we do?

The lab is responsible for handling samples or cases for diagnostic, teaching and research services. We provide analytical services which operates on a fee for service basis for all laboratory services and access, as well as providing assistance in collaborative research and consultation. Equipped with brand new instruments, we guarantee satisfactory services to meet the the expectation from any research laboratories, particularly those dealing with molecular works.

OUR SERVICES

- DNA ISOLATION FOR SEQUENCING
- DNA PURIFICATION SERVICES
- DNA QUALITATIVE & QUANTITATIVE ANALYSIS
- PCR ANALYSIS
- PROTEIN ANALYSIS WORK
- OTHER MOLECULAR RELATED WORK

OUR HIGH-END INSTRUMENTS

- Bio Rad CFX95 Real-Time PCR Detection System with Software, Desktop PC.
- Bio Rad C1000 Touch™ ThermalCycler with 96-Well Fast Reaction Module
- GelDoc Go imaging system
- Bio Rad Gel Electrophoresis
- Eco Polymerase Chain Reaction Cabinets
- Hoshizaki Flaked Ice Machine
- Glass Door Chillers Model CHLL-1050
- PROTECH Chest Freezer CF-500
- VWR Mechanical Pipettes
- Hirayama HVE-50 Autoclave

OUR TEAM

- 

MDM. YASOTHA SUNDARAJ
Head of Laboratory
Molecular biology, Proteomics
yasotha@unisel.edu.my | +6 016 - 301 1469
- 

TS. DR. HASDIANTY ABDULLAH
Lecturer/ Researcher
Microbial Enzyme Technology, Bioinformatics
dianty@unisel.edu.my | +6 019 - 260 0661
- 

TS. MOHD FADZLI AHMAD
Lecturer/ Researcher
Molecular biology, Bioinformatics
fadzli@unisel.edu.my | +6 012 - 693 1644
- 

MDM. NOOR ASIAH HASSAN
Lecturer/ Researcher
Molecular biology
noorasiah@unisel.edu.my | +6 019 - 354 5315

perform various research activities pertaining to Molecular Biology involving DNA, RNA and protein analysis using state of art technology.

AQUATIC BIOTECHNOLOGY LABORATORY

Aquatic Biotechnology Laboratory under the Faculty of Engineering and Life Sciences, UNISEL is a lab designed with a purpose to conduct various research activities involving aquatic health, reproductive biology, molecular biology as well as to perform histopathology analysis with the primary purpose to study and analyze tissue specimens at the microscopic level.

What do we do?

Aquatic Biotechnology Laboratory, Faculty of Engineering and Life Sciences, is responsible for handling samples or cases for diagnostic, teaching and research services. We provide analytical and histology services which operates on a fee for service basis for all laboratory services and access, as well as providing assistance in collaborative research and consultation. Equipped with brand new instruments, we guarantee satisfactory services to meet the expectation from any research laboratories, particularly those dealing with aquatic biotechnology and histology works.

Analytical Testing Services
pH Testing Services

Analytical Testing Services
Nanodrop Testing Services

Histology Services

LIST OF EQUIPMENT

- Automated Rotary Microtome
- Automatic Benchtop Tissue Processor
- Heated Paraffin Embedding Station
- Cold Plate
- Multiple staining
- Stereo Microscope
- NanoDrop Spectrophotometer
- Flat orbital shaker
- Tumbling shakers
- Digital Analytical Balances
- Bench pH meter








OUR TEAM



DR. ROSHANI OTHMAN
*Head of Laboratory / Senior Lecturer
 Fish Reproductive Biology*
 Phone : +6019 665 9080
 Email : roshani@unisel.edu.my



ASSOC. PROF. TS. DR. SITI HASMAH MOHTAR
*Associate Professor
 Immunology / virology*
 Phone : +60133957392
 Email : hasmah@unisel.edu.my



DR. INTAN FARAHA A GHANI
*Senior Lecturer
 Aquaculture/Fish Biology/Fish Ecology*
 Phone : +60137996997
 Email : intanfaraha@unisel.edu.my



NUR AKMAL SULIMAN
*Lecturer
 Fish Disease*
 Phone : +60103885664
 Email : nurakmal@unisel.edu.my

FOOD ANALYSIS LABORATORY

The Faculty of Engineering and Life Sciences (FELS), UNISEL, has established a Food Analysis Laboratory under SELSCA LAB to meet commercial and industrial needs through laboratory testing to ensure compliance with food and trade laws.

What do we do?

Food Analysis Laboratory, Faculty of Engineering and Life Sciences (FELS), Universiti Selangor (UNISEL) provides a wide range of food analytical testing services to industries nationwide and commercial clients worldwide. Using cutting-edge technology, high-quality equipment and strict adherence to local standards, we provide our customers with accurate results that are critical to their business growth

LIST OF EQUIPMENT

- Automated Rotary Microtome
- Automatic Benchtop Tissue Processor
- Heated Paraffin Embedding Station
- Cold Plate
- Multiple staining
- Stereo Microscope
- NanoDrop Spectrophotometer
- Flat orbital shaker
- Tumbling shakers
- Digital Analytical Balances
- Bench pH meter



LIST OF EQUIPMENT

- Automated Rotary Microtome
- Automatic Benchtop Tissue Processor
- Heated Paraffin Embedding Station
- Cold Plate
- Multiple staining
- Stereo Microscope
- NanoDrop Spectrophotometer
- Flat orbital shaker
- Tumbling shakers
- Digital Analytical Balances
- Bench pH meter



OUR SERVICE

Analytical Testing Services

Texture analyzer (Brookfield, CTX)

A Texture Analyzer is a texture measurement system that moves in either an up or down direction to compress or stretch a sample. A Texture Analyzer is the source of ultimate objective quantification of whether the food is crispier, firm, sticky, etc. as a result of a new technique or the addition of a certain ingredient to the formulation.



Freeze dryer (Labconco, FreeZone 4.5 Liter Benchtop Freeze Dry System)

Freeze-drying, also known as lyophilization, is the process of removing moisture from raw, frozen goods using a vacuum system and a process called sublimation. It is a safe food preservation method since it preserves the majority of the beneficial plant components and nutrients in foods, as well as their colour, flavour, and appearance.



OUR TEAM



DR. ROSHANI OTHMAN
*Head of Laboratory / Senior Lecturer
 Fish Reproductive Biology*
 Phone : +6019 665 9080
 Email : roshani@unisel.edu.my

ASSOC. PROF. TS. DR. SITI HASMAH MOHTAR
*Associate Professor
 Immunology / virology*
 Phone : +60133957392
 Email : hasmah@unisel.edu.my



DR. INTAN FARAHA A GHANI
*Senior Lecturer
 Aquaculture/Fish Biology/Fish Ecology*
 Phone : +60137996997
 Email : intanfaraha@unisel.edu.my

NUR AKMAL SULIMAN
*Lecturer
 Fish Disease*
 Phone : +60103885664
 Email : nurakmal@unisel.edu.my



OUR TEAM



TS. DR. NORAKMA BINTI MOHD NOR
*Head of Laboratory
 Expertise: Food technology*
 Phone : +6019 222 7552
 Email : norakma@uniseledu.my

DR. NURHAFIZAH BINTI IBRAHIM
*Lecturer
 Expertise: Nutrition & nutraceutical*
 Phone : +6016 232 1042
 Email : nurhafizah@uniseledu.my



DR. RODIAH BINTI MOHD HASSAN
*Lecturer
 Expertise: Food biotechnology*
 Phone : +6012 587 6790
 Email : rodiah@uniseledu.my





OSHECT

OSH HAZARD EVALUATION AND CONTROL TECHNOLOGY CENTRE

Under the Eleventh Malaysia Plan (11th MP), NIOSH Malaysia has been funded RM25 million by the Government of Malaysia (Ministry of Human Resources) to develop OSHECT. The development of OSHECT is from 2016 to 2022

 <p>SCIENTIFIC EQUIPMENT CALIBRATION LABORATORY (SECL)</p>	 <p>GAS DETECTOR CALIBRATION LABORATORY (GCL)</p>	 <p>PPE SIMULATION LABORATORY (PSL)</p>	 <p>ENVIRONMENTAL ERGONOMICS LABORATORY (EEL)</p>
 <p>FORENSIC ENGINEERING LABORATORY (FEL)</p>	 <p>FACE AND MEDICAL MASK LABORATORY (FMML)</p>	 <p>CHEMICAL HAZARDOUS TO HEALTH LABORATORY (CHL)</p>	 <p>DUST MASK LABORATORY (DML)</p>
<p>Objectives :</p> <ul style="list-style-type: none"> ➤ To provide the capabilities and capacities of technical services facilities as well as the quality of delivery and effective services. ➤ To provide the capabilities and capacities of research development facilities and the sharing of research results. ➤ To strengthen and preserve the relationship between government and industry. 			
 <p>GAS MASK LABORATORY (GML)</p>	 <p>OCCUPATIONAL HEALTH LABORATORY (OHL)</p>	 <p>HUMAN ERGONOMICS ASSESSMENT LABORATORY (HEAL)</p>	 <p>HYDROSTATIC TESTING LABORATORY (HRL)</p>
			 <p>FALL PROTECTION EQUIPMENT TESTING LABORATORY (FPETL)</p>



FOR MORE INFORMATION EMAIL TO : sekretariat@niosh.com.my



OSHECT NIOSH



NO : SAMM 412.

www.niosh.com.my



www.niosh.com.my

Contact Us :

National Institute of Occupational Safety and Health Malaysia (NIOSH)
Institut Keselamatan dan Kesehatan Pekerjaan Negara (243042-U)
Kementerian Sumber Manusia



Lot 1, Jalan 15/1, Seksyen 15,
43650 Bandar Baru Bangi,
Selangor Darul Ehsan



Tel: 03-8769 2100
Fax: 03-8926 5655

Disclaimer

Copyright 2023. National Institute of Occupational Safety and Health Malaysia. All right reserved. No part of this publication can be reproduced, stored in retrieval system, or transcribed in any forms or by any means, electronic, photocopying, or otherwise, without the prior written permission of the copyright owner. Facts and opinions in articles published on FYi are solely the personal statements of respective authors. Authors are responsible for all contents in their articles including accuracy of the facts, statements, citing resources and so on.

