



THROUGH BIODIVERSITY TO LEADING INNOVATION



NATURAL PRODUCTS DRUG DISCOVERY & DEVELOPMENT

Faculty of Pharmacy

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Background

Natural product compounds are the source of numerous therapeutic agents. Recent progress in discovering drugs from natural product sources has resulted in compounds being developed to treat cancer, diabetes, malaria, viruses, osteoporosis, aging, and immune disorders. Many of these compounds were discovered by applying recent advances in understanding the biogenesis of metabolism, exploring the marine environment and applying new screening technologies. In many instances, finding a novel natural product serves as a tool to better understand targets and pathways in the disease process.

In medicine, biotechnology, and pharmacology field, drug discovery is when drugs are discovered and designed.

In the past, most drugs found either by identifying the active ingredient from traditional remedies or by serendipitous discovery.

A new approach has been to understand how disease and infection are controlled at the molecular and physiological levels and target specific entities based on this knowledge. The process of drug discovery based on bioassay-guided isolation involves identifying candidates, characterization, synthesis, screening, and assays for therapeutic efficacy. Once a compound has shown its value in these tests, it will begin drug development before clinical trials.

The Natural Product Drug Discovery and Development group's research focuses on developing natural-based drugs for infectious and non-infectious diseases, as well as natural-based cosmetics and nutritional ingredients



Vission and Missions

Our vision:

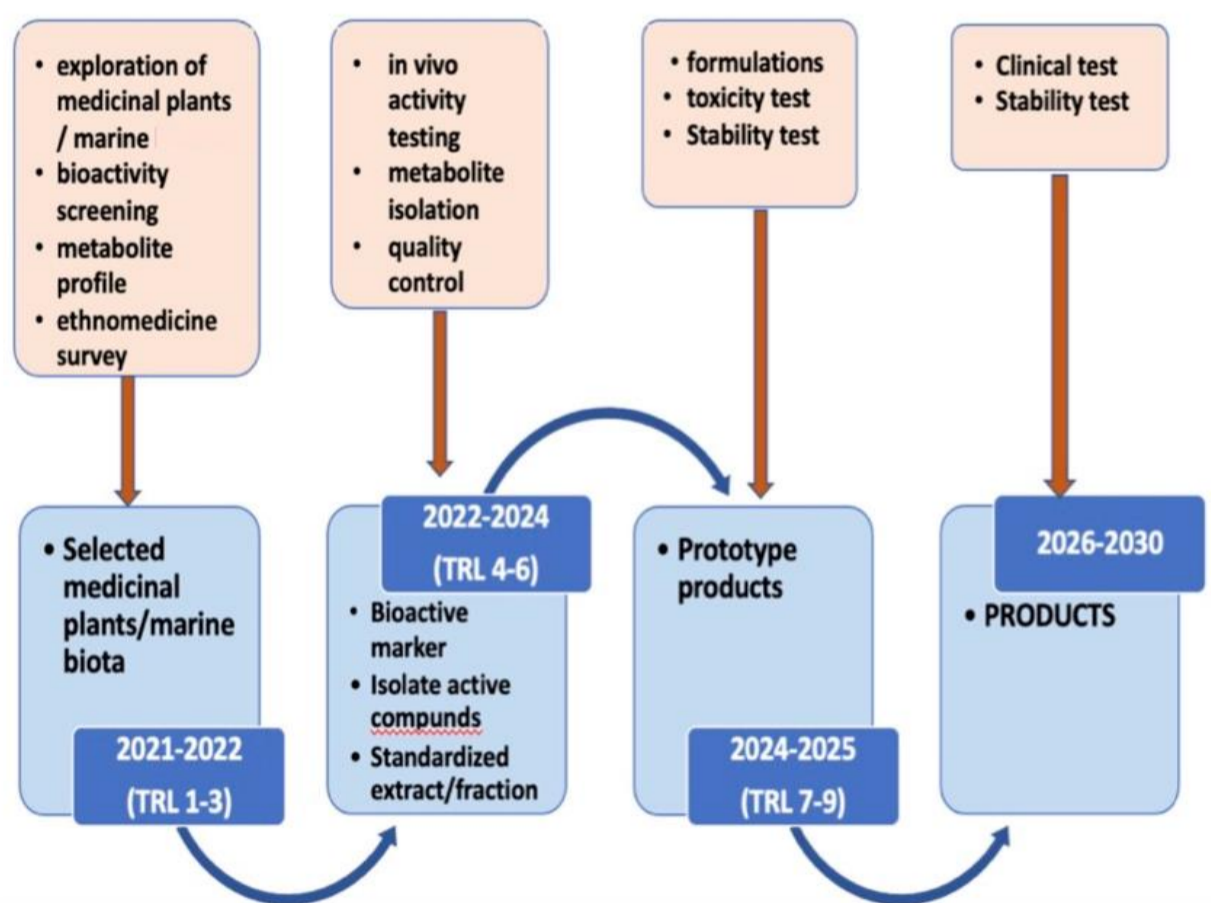
“Become a trendsetter, superior and innovative research group in the field of research and development of new drugs, phytopharmaceutical, cosmeceutical and nutraceutical at the national and international levels”

Our mission:

- ❖ Carry out research activities to discover new drugs based on active compound isolated from natural products
- ❖ Carry out research and development activities related to the effective, safe, and standardized phytopharmaceutical, cosmeceutical, and nutraceutical products
- ❖ Build and strengthen collaboration between national and international academics, industry, and government to increase the quality and quantity of research that impacts public health.



Roadmap NPD3-RG



PROJECT ROADMAP

The four stages for the discovery and development of natural-based products will be carried out and monitored continuously.

Each of these stages’s various achievements are recorded in the form of international publications, patents, and products produced by industry and are on the market.

For the future target, in the next 10 years, NPD3-RG will become a center of excellence in producing new and innovative products in the form of drugs from natural product resources, phytopharmaceutical, cosmeceutical, and nutraceutical.

Members

The person at NPD3-RG have an unquestionable passion and expertise to produce novel and innovative products that are derived from traditional heritage herbs as well as marine sources.

Research Theme: Ethnomedicine

"Core mission – to study of different cultural approaches to health, disease, and illness, and the nature of local healing systems."

PIC : Prof. Dr. apt. Mangestuti, MS
Members:
Dr. apt. Wiwied Ekasari, MSi., Apt,
Apt. Retno Widyowati, MPharm., PhD
Apt. Neny Purwitasari, MSc.

Research theme: Isolation and Structure Elucidation

"Core mission – to explore the Indonesian biodiversity of medicinal plants and marine biology, and to isolate the active compounds using bioassay-guided isolation method followed by structure elucidation of the compounds."

PIC : Prof. Dr. apt. A Fuad Hafid, MS.
Members:
Dr. apt. Aty Widyawaruyanti, MS.
Apt. Retno Widyowati, MPharm., PhD.
Apt. Suciati, MPhil., PhD.
Apt. Rakhmawati , MS

Research theme: Bioactivity & Toxicity (Pre-clinical Study)

"Core mission - to evaluate the activity of natural product extracts, fractions, or active compounds in certain activities (immunomodulator, antimalaria, anticancer, antiosteoporosis, anti-osteoarthritis, antifertility, anticholinesterase, antiviral, analgesic, antiinflammatory, antidiabetes, anti-aging, wound healing, antihyperlipidemic, aphrodisiac) and to ensure the safety."

PIC : Dr. apt. Aty Widyawaruyanti, MS.
Members: Prof. Dr. apt. Bambang Prajogo EW, MS
Prof. Dr. apt. Sukardiman, MS
Dr. apt. Wiwied Ekasari, MSi.
Dr. apt. Idha Kusumawati, Msi.
Apt. Retno Widyowati, MPharm., PhD.
Apt. Tutik Sri Wahyuni, Msi., PhD.
Apt. Suciati, Mphil., PhD.
Apt. Herra Studiawan, MS.
Apt. Neny Purwitasari, MSc.

Research theme: Analytical Method Development and Metabolite Profiling

"Core mission - to develop analytical methods to ensure the quality and stability of extracts, and products, to conduct metabolite profiling research."

PIC : Dr. apt. Idha Kusumawati, MSi
Members:
Prof. Dr. apt. Mangestuti, MS
Prof. Dr. apt. Sukardiman, MS
Apt. Rice Disi Oktarina, MFarm

Research theme: Formulation Development & Drug Delivery System

"Core mission - to develop standardized extracts and or fractions as an active ingredient for phytopharmaceuticals, cosmeceutical, and nutraceutical product formulas, and to modify the drug delivery system of extracts or fractions."

PIC : Prof. Dr. Sukardiman, MS., Apt
Members:
Prof. Dr. apt. Achmad Fuad Hafid, MS.
Dr. apt. Idha Kusumawati, MSi

Research theme: Clinical Trial

"Core mission - to conduct studies on clinical testing of natural-based medicines, phytopharmaceuticals, cosmeceuticals, and nutraceuticals."

PIC : Prof. Dr. Bambang Prajogo EW, MSi., Apt
Members: Dr. Aty Widyawaruyanti, MS., Apt

Past and Current Projects

In 2005-2007 NPD3-RG obtained the PHK-B project, which effected to improve research facility as well as to increase the expertise of staffs through study/research exchange in the well known institutions.

In 2012-2013 this research group received another IM-HERE project, which helped improve facilities quality.

During the last 3 years (2018-2020) almost all group members have received both internal and external research funding. The most impressive is the funding from the LPDP, which amounts to billions.

During 2018-2020 our research group has received research funding of 79 research grants with a total funding of 9.5 billion

“These prove that we are the experts”

Publication and achievements



In the last three years (2018-2020), NPD3-RG members have achieved impressive scientific publications, patents, and new products.

- Total international publications - indexed on Scopus are 23 (2018), 19 (2019), and 41 (2020) articles
- 10 granted patents
- 10 innovative herbal products that have been produced by the industry

In early 2021, several members of the NPD3-RG get a good achievement as top rank in the 210 best researchers in Google Scholar's and get a high-quality scientific articles award in the fields of health and medicine.

Facilities and Supports

Researching NPD3-RG is supported by expert staffs (doctoral graduates, both domestic and foreign), and advanced facilities (HPLC, KLT-Densitometer, inverted microscope, NMR 400 MHz, LCMS/MS-QTOF).

We have collaborated with various institutions both at home and abroad:

- ✚ Universities: Naresuan University Thailand, National Chiayi University Taiwan, Kobe University Japan, Geneva University Switzerland, Hiroshima University Japan, Tokyo University Japan, Nagasaki University Japan, Bogor Agricultural Institute Indonesia.
- ✚ Industry: PT Balatif, PT ASIMAS, PT Konimex, PT Kimia Farma, PT Borobudur.
- ✚ Other institutions: BP2T2O Tawang Mangu, LIPI, Purwodadi Botanical Gardens

