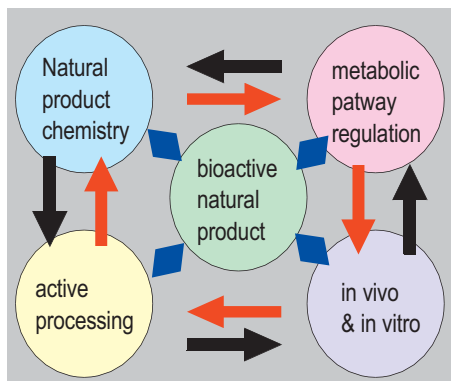


The Center for Active Natural Products Development (CANPD) is a collaborative project of the Faculty of Food Science, Life Science, Aquaculture, Animal Science, Plant Industry, Veterinary Medicine and the Biotechnology Institute. It is a comprehensive research centre for bioactive natural products research and development. The Center strives to be the global leader in natural product science and research and support for education. Our Cooperative Research Program is a model for interaction between Industry, Government and Academia to address research needs related to natural product quality, safety and healthfulness.

The Center is located in one of the largest herbaria in Taiwan and near by Pingtung Agricultural Biotechnology Park (PABP), making a wealth of agronomic data available from collections. Access to advanced scientific methodologies allows more rapid characterization of useful species, chemicals, or genes that lead to new nutritional and pharmaceutical products. The Center has access to improved information technologies that facilitate the rapid communication of data, and allow



repatriation of data to the countries where it is needed to make intelligent decisions about the use of natural resources.

The goal of the Center is to discover single entity and multicomponent bioactive natural products that may serve as leads for the development of new pharmaceuticals or functional foods that address health needs. Emphasis is on agents that control certain chronic diseases, cancer and immune disorders. Chemical constituents responsible for

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biological effects are identified, the functionality were evaluated by using both cell and animal model and then either isolated and purified in the search for new single entity active ingredients or characterized and standardized in the search for new multicomponent functional products. The Center builds on a strong foundation and history of excellence in natural products research at The National Pingtung University of Science & Technology. Particularly noteworthy strengths of this program are in the areas of:

**Agronomic Chemistry :** Isolation and structure elucidation, Analytical methods development, Structure-activity relationship studies,

**Biochemical and Molecular Level Studies :** Signal transduction pathway studies, Mechanism of action determination

**In vivo and In vivo Efficacy and Safety Assessments :** primary cell culture, cell line culture, animal models

**Products Development :** Optimization of Extraction Processes, Preformulation and Formulation Development

The specific goals of the Center for Active Natural Products Development are:

" To discover and characterize new chemopreventive and chemotherapeutic agents, emphasizing natural products.

" To investigate functional mechanisms at the biochemical, cellular, molecular, and genetic levels.

" To develop innovative new molecular targets and assays for small molecules, taking advantage of recent advances in cancer cell biology and signaling.

" To discover innovative new techniques that might be used to design and synthesize drugs, including both chemical and biological production.

" To translate the results of basic laboratory research into more effective cancer prevention and treatment approaches.

" To conduct research and developing cosmetics, cosmeceutics, food supplements and natural and traditional medicines.

" To provide services in natural derived products testing for functional and clinical efficacy, chemical analysis, safety and also offering product development, pre and post marketing surveillance and technology transfer to the local cosmetic industries.

" Actively participate in teaching and training Master and PhD of Science in Natural Product Development candidates

Active compounds were isolated and purified by TLC, column chromatography and preparative HPLC. The isolated pure compound is chemically characterized by different chemical and spectroscopic techniques. Elemental analysis, mass spectroscopy provides information about the elemental composition of compound. Other spectroscopic techniques like ultra-violet, Infra-red, nuclear magnetic resonance and mass spectroscopy provide structural information about the compound. Different 1D and 2D NMR experiments are routinely used. Newer hyphenated techniques like LC-MS, GC-MS provide valuable information where the extracts can be analyzed directly and structures may be confirmed by searching different database and libraries. Such compounds are then subjected for bioactivity testing or used as markers for the identification and standardization of medicinal plants and herbal supplements.

The biological evaluation conducted in the Center is aimed at supporting the discovery of promising lead compounds by using a combination of in vitro and in vivo biological assays to detect agents that show novel activity against selected chronic diseases, cancer, and immunological targets. The Center also collaborates with many academic, government and private sector laboratories that run complimentary biological assays in support of the discovery program. Research projects focus on enhancing product quality and safety through botanical, pharmacological, chemical characterization of agronomic products, and the discovery of new agronomic products. Current projects that focus on enhancing product

functionality, quality and safety include working with the Food and Drug Administration Taiwan to develop an evaluation model for the development of bioactive agronomic products, developing analytical methods for bioactive constituents, degradation products, and contaminants; and the use of genetic profiling to certify authenticity of seeds and plant specimens. The Center's comprehensive approach for the development of new agronomic products relies on traditional use/ethnobotanical

information to identify leads, a battery of biological assays (cellular, biochemical and molecular) to detect biological activity and chemical standardization technologies.

The responsibility of the Center is also to facilitate the commercialization of the products, technologies, and information discovered and developed by the Center. The Center is committed to the aggressive commercialization of its discoveries so that such discoveries can positively impact society and the related industry. By meeting

its objectives of providing focused leadership in natural products research, culminating in the discovery, development and commercialization of new agrochemicals, the Center will meet its mission of improving human health and agricultural productivity. Funding for development activities is provided by externally-funded grants and contracts. The center actively seeks collaborations with specific academic and industrial partners to accelerate the development programs.