



Health

The College's capabilities across the health sector demonstrate its innovative approach, focus on applied sciences and links to industry and public policy development.

Complementary medicine testing

The College of Health and Science has pursued a strong position in complementary medicine, establishing an extensive new range of facilities used by industry. The combination of analytical and pharmacological capabilities and the research excellence of the Centre for Complementary Medicine Research (CompleMED) creates a stand-out facility for research and services.

The capabilities cover the full range of product testing including:

- » Acquisition of evidence for efficacy, and validation of products and practices
- » Chemical definition of herbal medicines
- » Herbal pharmacology testing of mechanisms of action
- » Establishing clinical trial standard operating procedures and expertise
- » Herbal analysis and pharmacology

UWS's state-of-the-art Herbal Analysis Laboratory has a strong focus on serving complementary medicine businesses, which is why it has met the demanding standards of Good Laboratory Practice and is one of only a few such laboratories in Australia certified by the Therapeutic Goods Administration (TGA).



This enables CompleMED to issue TGA compliant stability and quality assurance.

The Centre can support product development by extracting, isolating and quantifying biomarkers, validating the components, undertaking pre-clinical and clinical bioavailability studies, and assessing pharmacokinetics and pharmacodynamics. Mechanisms of action can be identified through pharmacological and electrophysiological studies.

CompleMED researchers can then undertake quality assurance and stability testing in World Health Organisation (WHO) climatic zones III and IV, which correspond to hot/dry and hot/humid climates, respectively.

The analysis laboratory features:

- » High performance liquid chromatography
- » Mass spectrometry
- » High performance thin layer chromatography
- » Gas liquid chromatography

The new Herbal Pharmacological Laboratory is designed for biomolecular studies including high-throughput bioassays and quantitative real-time polymerase chain reaction, which can, for example, identify viral load in patients or cells.

Tissue culture experiments

The Herbal Pharmacological Laboratory's tissue culture facility allows researchers to culture a variety of human and animal cell lines as well as primary cells, such as nerve cells from the brains of mice or rats.

Examining cells in culture enables researchers to perform biochemical, molecular biological or biophysical experiments under controlled conditions, such as:

- » Using the patch-clamp technique, recording the tiny electrical currents flowing through ion channels inserted in the plasma membrane of cells in culture. This technique is so sensitive that researchers can directly follow the opening and closing of single channel molecules.
- » Digital fluorescence imaging, in which researchers use dyes to monitor changes in cultured cells in the intracellular concentration of a variety of ions, pH or even transmembrane voltage.

The facility is notable for being able to undertake patch-clamp electrophysiology and digital fluorescence imaging at the same time.



Clinical trials of Chinese herbal medicines

CompleMED has extensive international networks, especially with China. The team works with several Sydney hospitals and Chinese institutional collaborators. CompleMED offers experience with standard operating procedures for clinical trials. Its staff can also assist in generating evidence for regulatory applications for products.

Public health and policy

Government agencies can take advantage of CompleMED's research capabilities for the development of regulations and practices regarding safety, usage, integration, practitioner standards and health policy development. For example, it has been collaborating with the WHO on the development of guidelines for the harmonisation of traditional and modern medicine, and with the TGA on regulatory approaches to complementary medicine products.

Pharmaceuticals and biomedicine

The College maintains facilities in its School of Biomedical and Health Sciences that underpin capabilities in:

- » Pharmacology, particularly in synthetic organic chemistry
- » Synthesis of drugs for the treatment of cancer, for example with agents used to locate disease within the body
- » Materials chemistry development of nanomaterials used in medicine.

Developments in the School of Medicine and School of Biomedical and Health Sciences are focusing on molecular biology, molecular pharmacology, microbiology and biochemistry. The University is investing in new medical laboratory facilities with:

- » State-of-the-art animal facilities
- » Physical Containment 2 areas
- » First-rate proteomics equipment
- » Advanced neuroscience technologies.

These capabilities are suited to the basic drug design needs of the pharmaceutical industry. The School of Biomedical and Health Sciences has extensive experience in the use of functional genomics to reveal the molecular workings of promising anti-cancer drugs, and understand the molecular effects of reactive oxygen species that cause ageing, neurodegenerative disease and cancer.

This rapidly growing branch of biomedical research applies high-throughput robotic technologies to take advantage of information gained from the sequencing of the human genome.

The School of Medicine collaborates with Campbelltown Hospital for clinical trials while the School of Biomedical and Health Sciences continues its collaborations with several Australian and international institutions.

Health and medical services

With capabilities in sports and medical science, health services management, health promotion, public health, occupational therapy and complementary medicine, the College is a potential research and services partner for government agencies, institutes of sport, private health insurers, and private health rehabilitation companies.

- » The University maintains its own clinic for practical experience as well as research in podiatry, traditional Chinese medicine, osteopathy, naturopathy, and remedial and relaxation massage.
- » The School of Medicine offers expertise in population health, the mental trauma that follows disaster, eating disorders, renal and obstetric medicine, immunology, and vascular surgery – and other areas are being rapidly added.
- » The School of Biomedical and Health Sciences offers expertise in health-related physical activity, primary care health interventions, psychological aspects of health and rehabilitation, and clinical trials in rehabilitation.
- » The Men's Health Information and Resource Centre in the School of Biomedical and Health Sciences has established a strong reputation for its capabilities in communicating with men about their health, Indigenous health, and wider policy and advocacy issues.
- » Organisations in the health sector also work with health informatics specialists in the College's School of Computing and Mathematics.

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