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Natural Products Research Capabilities Overview at VUW

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Business Liaison Advisor
Research Development Office

Quick Overview

- Schools and Institutes for NPNZ
  - Chemistry and Physics
  - Biology
  - Centre for Biodiscovery
  - Ferrier Research Institute
  - Design
- Some project concepts
- Models for engagement

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Bioactive discovery

- Novel & bioactive compounds targeted
  - Hunting or Fishing?
- Two approaches:

Screening paradigms in natural products research

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Complex Carbohydrate Chemistry

- Extraction, purification and characterisation of complex carbohydrates
  - Oligo- and polysaccharides from plants & algae
  - Glycosaminoglycans – heparan sulfate, keratan sulfate
- Extraction from natural sources
  - Whole plants, seaweeds, corneas, bacterial cultures
- Purification to give individual polysaccharides
  - Chromatography, selective precipitation, enzymes
- Characterisation
  - Range of chemical and physical techniques
- Understanding how the chemistry of non-starch oligo- and polysaccharides (dietary fibre) affects digestion, and fermentation by gut microbiota

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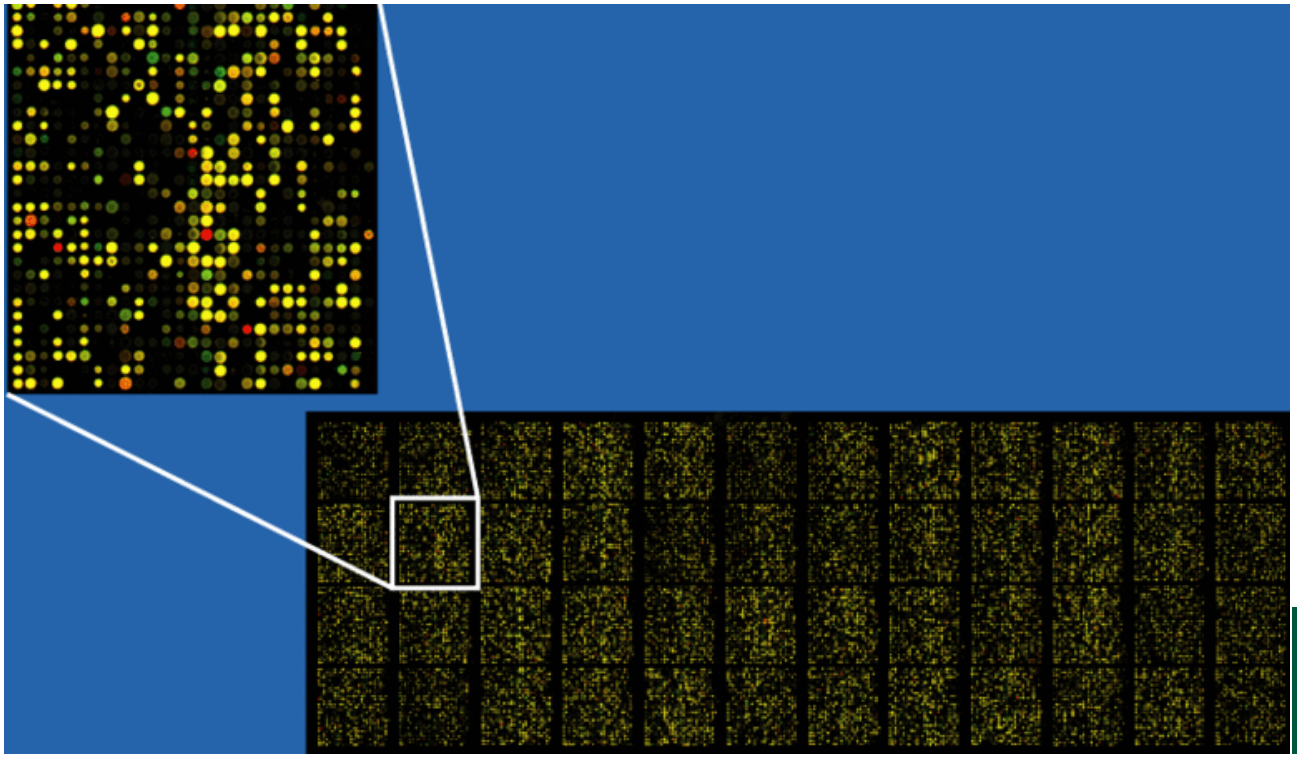
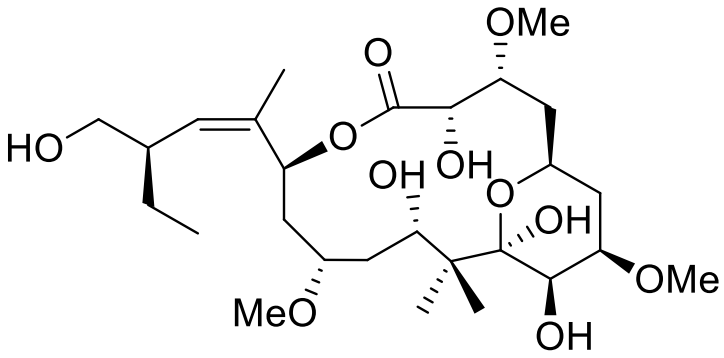
Biological characterisation

- Mode of action assessment
- Network analysis
- In-house yeast model capability

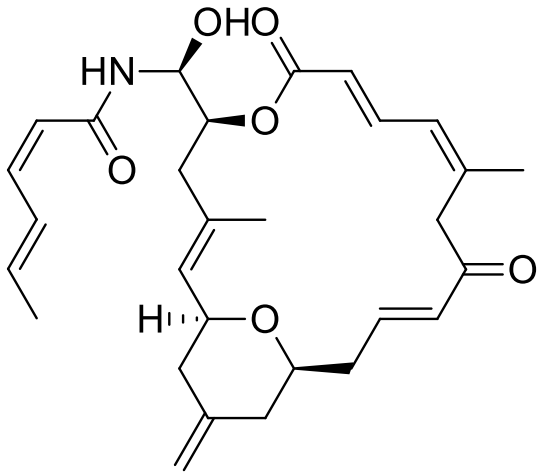


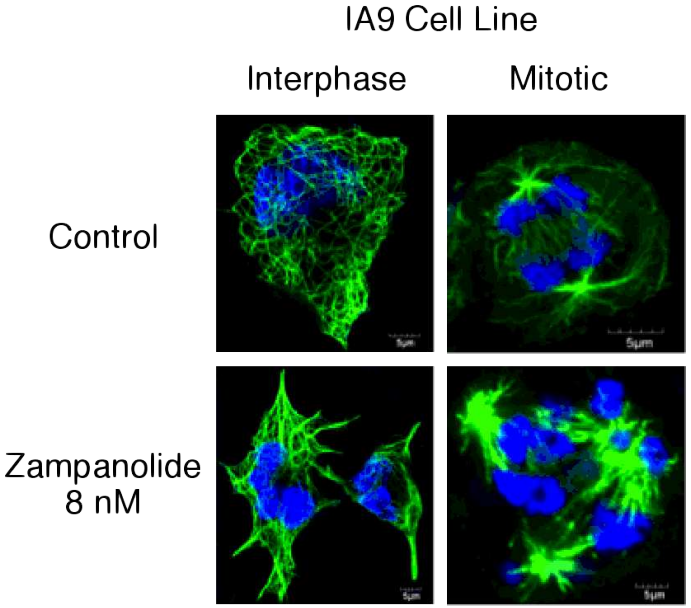
Some VUW success stories

- Peloruside



- Zampanolide





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Novel Dichroic Polymers

- Polymers exhibit different colours in transmitted and reflected light
- Can be 3D printed into non-copyable coded labels
- Some applications
  - Security applications
  - Genuine product tagging
  - High value goods protection

Lycurgus Cup viewed in reflected light (left) and transmitted light (right)

Gold Polyurethane viewed in reflected light (left) and transmitted light (right)

Models for engagement: Research Projects

- How might a VUW-Natural product project work:
  - Small projects can be built around a number of student research opportunities
  - Exploration projects can be built collaboratively with academics from the relevant field
    - supported by smaller funds that researchers have access to
  - Large projects where we could be assessing and validating health claims
    - At this stage we build a support team around a project idea including the Research Development Office and our commercialisation agency VicLink

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Models for engagement: Students

- Summer students
  - 10 week projects over summer. Aimed at students finishing undergraduate studies. Good experience for students and companies that wish to undertake small projects. Low cost and co-sponsored by the university.

- MSc students
  - Two year projects. There are a number of MSc students sponsored by industry at VUW working on a project developed and agreed between their industry and academic supervisors.

- PhD Students
  - Three year projects. PhD students with industry are most commonly done under an MBIE or Callaghan Innovation funded grant.

Summary: What can VUW offer?

- Collaborative partnerships in research
- A wide range of relevant expertise
- Access to internationally recognised experts
- Network of well established international research collaborators
- A multidisciplinary approach

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Useful links

- Centre for Biodiscovery
  www.victoria.ac.nz/sbs/research-centres-institutes/centre-for-biodiscovery/
- Ferrier Research Institute
  www.victoria.ac.nz/ferrier
- School of Chemical & Physical Sciences
  www.victoria.ac.nz/scps
- School of Biological Sciences
  www.victoria.ac.nz/sbs
- Victoria Link (VicLink)
  www.viclink.co.nz

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