

Our Purpose

To help business succeed through technology



Our Inspiration

Rukuhia te wāhi ngaro
hei maunga tātai whetū

Explore the unknown,
Pursue excellence

Sir Paul Callaghan
(1947–2012)



How we help businesses

- ▶ Technology & product development



- ▶ Access to experts



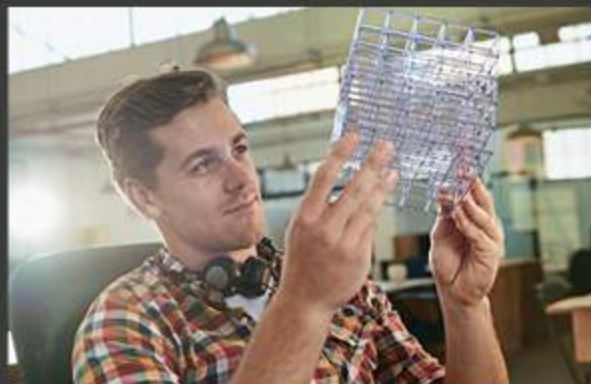
- ▶ Innovation skills



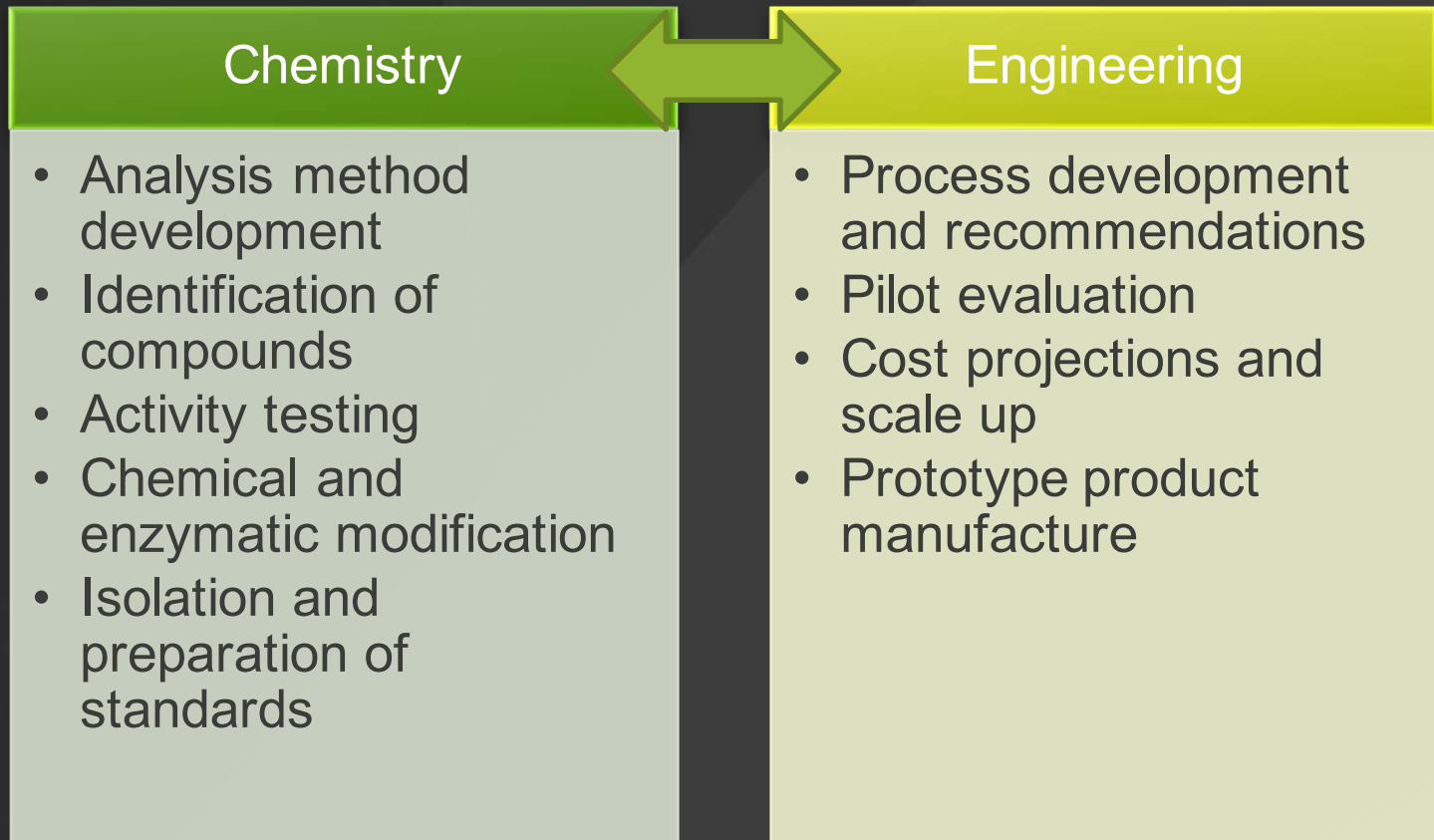
- ▶ Business collaborations



- ▶ R&D grants



R&D services for the natural products industry



Natural Products Chemistry

Identification / structure elucidation of bioactive compounds in natural products:

Marine (e.g. astaxanthin), Dairy (cerebrosides/gangliosides), Apiary, Plants (Polyphenolics, flavanoids, etc., pigments), Microbial products (pigments and secondary products) , Essential oil analysis: e.g. Xanthophylls in Gac fruit, Vitamin E wheatgerm

Preparation of metabolites of active compounds: e.g. Glucuronides

Assessments of bioactivity: Antioxidant assays, Anti-inflammatory assays, Anti-microbial assays.



Lipid Chemistry

Extraction, isolation and identification of: Neutral lipids, glycolipids, Sphingolipids (in. gangliosides), Phospho- and phosphono-lipids, Betaine lipids, Eicosanoids, Endocannabinoids, novel lipids structure elucidation, rare lipids and fatty acids, regiospecific analysis of TG's

Preparation of purified lipids, lipid extracts and synthetic standards: Complex lipids, Lipids containing polyunsaturated fatty acids, other bioactive lipids

Adding value to lipids via: enzymatic / chemical modifications, enrichment, fractionation and purification, encapsulation (liposomes)

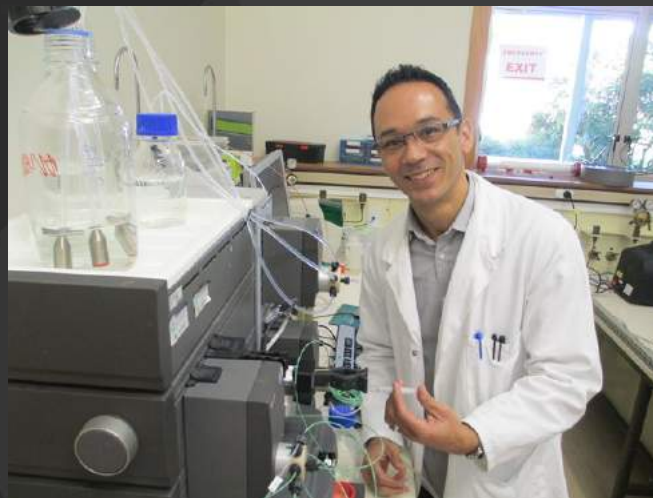


Protein Chemistry & Enzymes

Enzyme process development: Industrial use of enzymes, Immobilisation and formulation, Extraction and purification: Recombinant E. coli expression, AKTA FPLC/HPLC purification

Analytical services: Quantitative techniques, assay development

Proteins and bioactive peptides: Natural sources, plant, marine, agriculture, honey and meat



Process Engineering

Industrial process development: Extraction, Drying, membrane separation, evaporation, crystallisation, encapsulation, chemical and enzymatic processing, adsorption separations.

Preparation of prototype product samples: multi kg production facility

Product characterisation: rheological, thermal, morphological properties

Technology transfer: Scale-up, Process cost estimation, Process feasibility and optimisation



Supercritical Fluid Technologies

- Pressurised solvent processing
 - Supercritical CO₂
 - Liquefied gases (propane, dimethyl ether)
 - Lab scale (100 mL) to pilot scale (200 L)
 - Extraction of solid or liquid feeds possible
- Drying, crystallisation, encapsulation in supercritical fluids



Fermentation/Bioprocessing

Small molecule and secondary metabolite production optimisation: Large scale production, downstream processing, tricothecenes, alkaloids

Fermentation scale up and production: 1, 20, 50, 200, 1000 L bioreactor, tangential flow filtration, continuous centrifugation

Transitional and containment facility for restricted biologics: MPI registered containment and transitional facility, importation of biological material for extraction and testing, importation of risk goods



NZ Pilot Plant Network

Foodtech Network Processing Pilot Plants include:

- In-house supercritical, fermentation, solvent extraction plant
- The Food Bowl in Auckland – *pilot to production scale*
 - Freeze dry, HPP, liquid and solid aseptic fill, general food
- Waikato Innovation Spray Dryer – *production scale*
- South Island NZFINZ pilot plant
- Massey University scale-up facility



The **Pilot Plants** provide facilities for NZ manufacturers to develop new processing capability, new products and obtain expert advice e.g. regulatory

Virtual Pilot Plant Network – a new on-line initiative whereby companies can search for appropriate pilot plant for their needs

Virtual Pilot Plant Network

<https://vppn.bioresourceprocessing.co.nz/VPPN>

The screenshot shows a web browser window displaying the VPPN interface. The address bar shows the URL: <https://vppn.bioresourceprocessing.co.nz/VPPN/HTMLClient/default.htm#/ViewPilotPlant/126/{aEe41985d}>. The browser tabs include 'VPPN Log In' and 'Pilot Plant: The FoodBowl'. The page title is 'Pilot Plant: The FoodBowl'. The interface is divided into several sections:

- Main Information:**
 - Organisation:** NZ Food Innovation Network
 - Description:** The FoodBowl
 - Industries:** Food and Beverage, Horticulture, Natural Products
 - Process category:** Auxiliary Processing, Biotechnology, Sterilization, Thermal Processing, Water removal. A 'List all processes' button is located below this list.
- Technical Information:**
 - Equipment Available:** High Pressure Processing: 55 L, 7000 bar, 6-12 mins per cycle
 - General Processing & Retorting:** Liquids/Beverages: Mixing Tanks, Homogeniser, Pumps, UHT Plant (220 L/h), Aseptic Filler, Induction Sealer, Steam Tunnel, R/O Plant; Extrusion & Dry Processing: Cletral twin screw extruder, V-Blender, Dehumidifying room; Freeze Drying: Cuddon LT 80 Freeze Dryer; Packaging: Flow Wrap Machine, Vacuum Chamber Machine, Thermoformer, Tray Sealer, Gusseted Pouch Filler, Carton Sealer; Freezing: Storage Freezers -23C, Blast Freezers -40C, Blast Chillers -5C
 - Auxiliary Equipment:** Co-Extruder, Pumps, Slicing/Dicing, Centrifuge, Filling Machine, Chocolate Enrober, Can Seamer, Pouch Sealer, Tray Sealer

The Windows taskbar at the bottom shows the system tray with the time 2:29 p.m. and date 28/11/2014.

Working with Industry

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