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

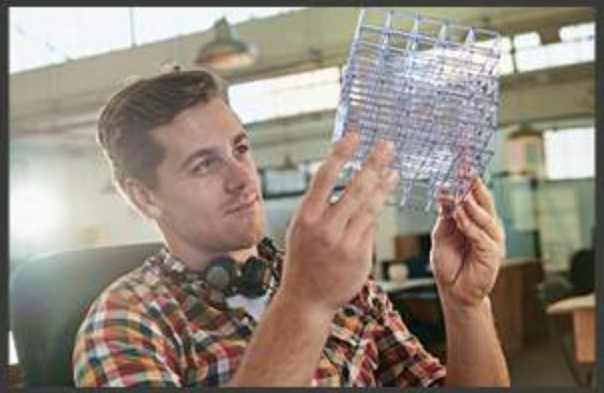
- Technology & product development

- Access to experts

- Innovation skills

- Business collaborations

- R&D grants



R&D services for the natural products industry

Chemistry

- Analysis method development
- Identification of compounds
- Activity testing
- Chemical and enzymatic modification
- Isolation and preparation of standards

Engineering

- Process development and recommendations
- Pilot evaluation
- Cost projections and scale up
- Prototype product manufacture

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

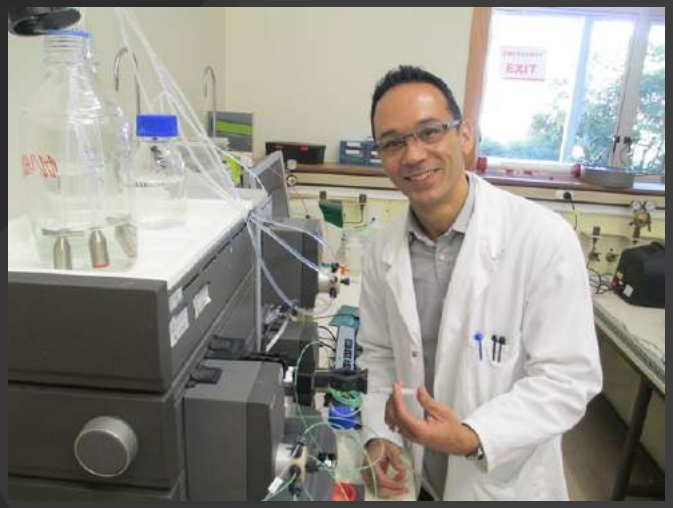
Adding value to lipids via: enzymatic / chemical modifications, enrichment, fractionation and purification, encapsulation (liposomes)

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 protoype 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 CO_2
  - 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, alkoloids

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

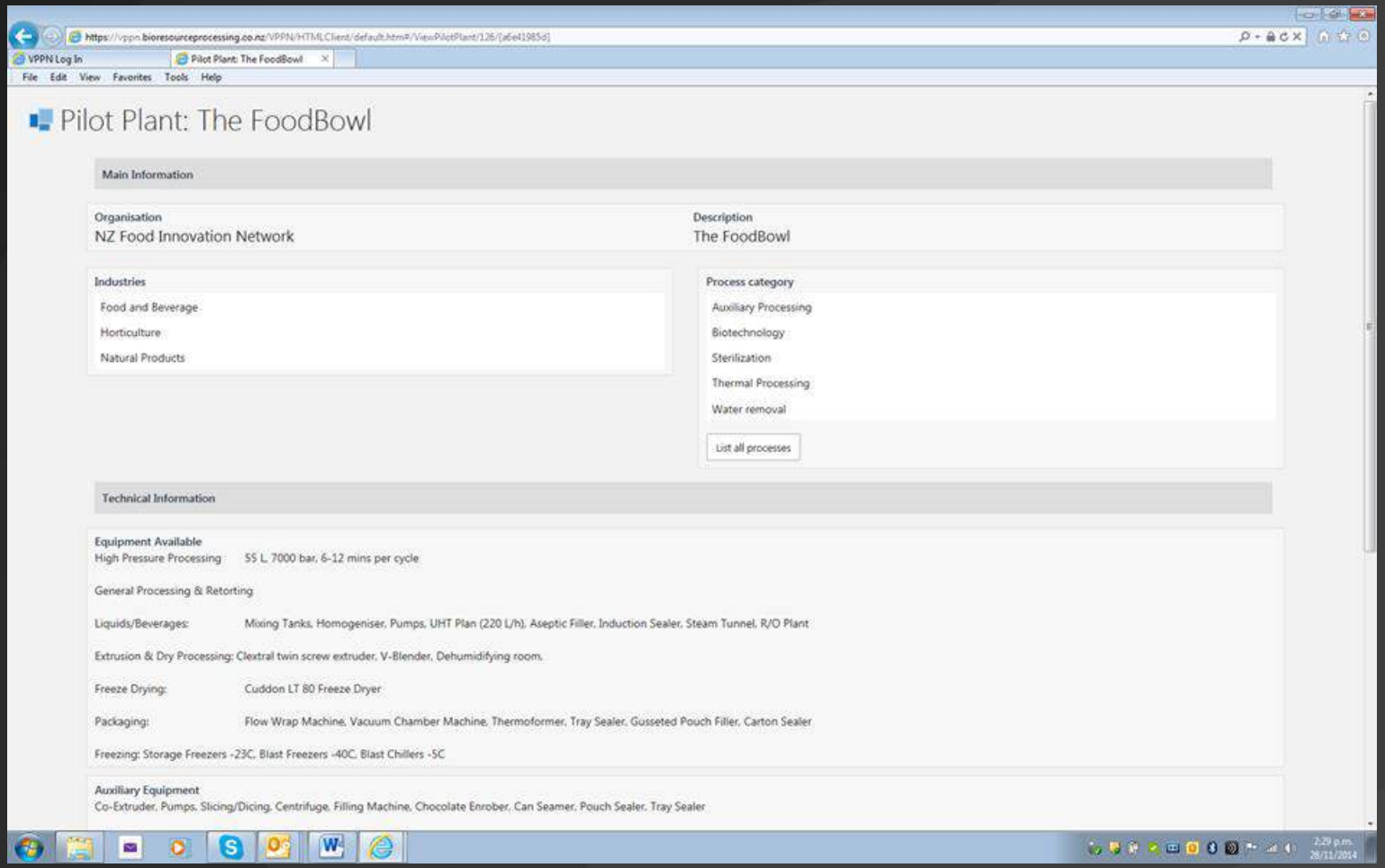
- Waikato Innovation Spray Dryer – *production scale*
- South Island NZFINZ pilot plant
- Massey University scale-up facility

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



Bioresource Processing Alliance

Working with Industry

Stephen Tallon
Stephen.Tallon@CallaghanInnovation.govt.nz

Catherine Andrews
Catherine.Andrews@CallaghanInnovation.govt.nz

CallaghanInnovation