Research

- Lung Therapy
- Artery Diagnostics

Centre for Respiratory Therapy

OSA
- Humidifier and heater plate design
- Nasal interface design optimisation
- Condensation and back flow analysis
- Noise and vibration optimisation
- Next generation CPAP development

RDS
- 5 lobe lumped model of the neonatal lung
- Model of surfactant dynamics

Asthma
- Wave propagation in the bronchial tree
- FEM modelling of ASM dynamics
- Myosin-Actin cross bridge dynamics
- ASM response to vibration
- ASM relaxation by combined drug and vibration

Chronic Rhinosinusitis
- Vibration therapy
- Ultrasound therapy
- Electrical field therapy

In collaboration with Fisher & Paykel Healthcare & University of Western Australia

In collaboration with Mayo Clinic

In collaboration with Counties-Manukau DHB

Centre for Cardiovascular Diagnostics

Blood pressure measurement
- Cuff design for compensation of motion artefact
- ANN for accurate BP measurement
- ANN for accurate BP measurement (at-risk subgroups)
- NIBP measurement safety system
- Capatitive tactile sensor design

Disease state identification
- Non-invasive estimation of central BP
- Carotid-femoral pulse wave velocity measurement
- Non-invasive detection of aortic plaque deposits
- Non-invasive location and severity prediction
- Physical test rig mimicking the arm-central arterial tree

Medical Imaging & Signal Processing
- Monitoring for hypovolaemia Onset
- Vibro-acoustography imaging
- Intelligent monitoring
- Sensor network

In collaboration with Pulsecor , Imperial College of London, Warsaw University of Technology & University of Chile

In collaboration with Mayo Clinic

Centre for Biomedical Materials

Smart Optics
- Characterisation of electrostrictive polymers
- Modelling ionic polymer hydrogels

Bio-Smart materials
- Characterisation of Carbon Nano-composites
- Cyclic Olefin Copolymers (COC)
- Design of biodegradable polymer micro-needle arrays
- Actuation using Ionic Polymer Metal Composites

In collaboration with Materials Optimization & NZ Institute for Plant & Food Research