

Opportunities for Research Projects in The Adelaide Proteomics Centre

Director: Dr Peter Hoffmann
Email: peter.hoffmann@adelaide.edu.au
Room 1.49, Molecular Life Sciences Building
School of Molecular and Biomedical Science
The University of Adelaide
Phone: +618 8303 5507

Exploring Candidate Biomarkers of Early-Stage Gastric Cancer Co-supervised by Dr Megan Penno (megan.penno@adelaide.edu.au)

Late diagnosis of gastric cancer (GC) results in a significant reduction in average survival times. New non-invasive strategies for early detection that could be used for screening in high risk individuals are sorely needed. Genetically engineered mice containing a mutation in the signal transduction receptor gp130 (gp130^{57F/F}) spontaneously and reproducibly develop a form of GC that resembles human intestinal-type adenocarcinoma ¹. At the Adelaide Proteomics Centre, we have developed a GC biomarker discovery strategy based on this mouse model with the expectation that identified serum biomarker candidates will translate to humans. Using comparative two-dimensional difference in-gel electrophoresis (2D DIGE) in association with mass spectrometry, we have already identified 31 candidate murine serum biomarkers of early-stage GC corresponding to 28 human proteins (unpublished). The project herein will involve the verification and validation of several of these candidates in mouse and human samples at Phase I of the ongoing biomarker trial ². The biological significance of the proteins in the context of the mouse model and GC progression will also be explored. Overall, the aim is to determine whether or not specific candidate markers will be suitable for further exploration at Phase II of the biomarker trial. Techniques will include, but are not limited to:

- SDS and isoelectric focusing (IEF) polyacrylamide gel electrophoresis (PAGE)
- Western blotting
- Enzyme linked immunosorbent assays
- Immuno-capture MALDI-TOF mass spectrometry
- Multivariate statistical testing/machine learning
- Data mining and bioinformatics

1. Tebbutt NC, Giraud AS, Inglese M, Jenkins B, Waring P, Clay FJ, Malki S, Alderman BM, Grail D, Hollande F, Heath JK, Ernst M. Reciprocal regulation of gastrointestinal homeostasis by SHP2 and STAT-mediated trefoil gene activation in gp130 mutant mice. *Nat Med* 2002;8:1089-97.
2. Pepe MS, Etzioni R, Feng Z, Potter JD, Thompson ML, Thornquist M, Winget M, Yasui Y. Phases of biomarker development for early detection of cancer. *J Natl Cancer Inst* 2001;93:1054-61.