ENDOCRINOLOGY AND DIABETES

St. Vincent's Department of Endocrinology and Diabetes is actively involved in research examining insulin resistance, islet transplantation, biology of cortisol action, pituitary disease and mechanisms regulating bone formation.

About us

The department is fortunate to be staffed by members with diverse research interests. We collaborate closely with St Vincent's Institute and the University of Melbourne's Department of Medicine. Assoc Prof Kong Wah Ng's research interest lies in the study of clinical bone disease and in the study of regulation of osteoblast differentiation and bone formation. Prof Frank Alford, former Director of the department, has pioneered research in insulin resistance, the management of pituitary conditions and is still involved in an advisory capacity. Assoc Prof Glenn Ward's research interest is in insulin action and islet transplantation. Recently with Prof Ray Boston, he has extended computer modelling of insulin secretion and insulin action to include free fatty acid metabolism and tracer glucose kinetics in islet transplantation. They have formed a large network of collaborators in Victoria and overseas which include Prof Tom Kay, Prof Trish Dunning, Assoc Prof Alicia Jenkins, Dr Jan-erik Henricksen and Dr Bodil Rasmussen. Dr Warrick Inder's main interests are in disorders of the pituitary and adrenal glands.

Projects in progress or completed

- 11 beta-hydroxysteroid dehydrogenase I. Expression and biological activity in skeletal muscle in normal individuals and Type 2 diabetes and the effect of stress and dexamethasone on its activity.
- Metabolic monitoring of pancreatic islet transplantation in Type 1 diabetes.
- Cortisol in health and disease.
- Determination of a normal range of response for the intravenous dexamethasone suppression test, comparing this to subjects with proven Cushing's syndrome.
- Cortisol measurements in women longitudinally across pregnancy, and comparing plasma, urine and saliva cortisol levels to determine which is best to monitor adequacy of glucocorticoid replacement.
- Determination of the interaction between Wnt signalling and the anabolic actions of PTH as well as the differentiation effects of retinoic acid on osteoblasts.
- Insulin sensitivity and glucose effectiveness in insulinoma.
- Insulin-mediated versus glucose-mediated glucose disposal in fatty acid suppression by glucose load.
- Modification by thiazolidinedione of the impact of adrenaline on Type 2 diabetes.
- Preservation of beta cell function across a range of glucose tolerance.
- Trialnet detection of islet antibodies in relatives of Type 1 diabetes.
- Measurement and appraisal of methods employed to quantify insulin resistance.

Research applications in the clinical setting

The establishment of the Islet Transplantation Program in collaboration with the St Vincent's Institute, has resulted in the availability of this innovative therapy to a small group of 'brittle' Type 1 diabetic patients who are at serious risk from unpredictable life-threatening major hypoglycaemia.

Publication of the book 'Managing Clinical Problems in Diabetes' has enabled translation of some research into clinical practice for the multidisciplinary team.

Research outcomes in relation to patient care

Following the clinical trial of Islet Transplantation in patients with "brittle" Type 1 diabetes, three such patients are now free of major life-threatening hypoglycaemia while maintaining near-normal blood glucose control. Two of them are now free of insulin injections.

The team

Assoc Prof Kong Wah Ng, Director, Department of Endocrinology and Diabetes; Prof Frank Alford, Former Head of Department; Dr Carmela Caputo, Research Fellow; Anne Ferguson, Research Nurse; Judith Gooley, Research Scientist; Dr Warrick Inder, Consultant Physician and Endocrinologist, Head of Clinic; Dr Christina Jang, Consultant Endocrinologist; Dr Caroline Jung, MD Research Fellow; Dr Frances Milat, MD Research Fellow; Varuni Obeyesekere and Judith Gooley Research Scientists; Dr Nirupa Sachithanandan, PhD Research Fellow; Dr Shireene Vethakkan, GSK International Research Fellow and MD Research Fellow (from University of Malaya); Dr Jacqueline Walters, Research Fellow; Assoc Prof Glenn Ward, Deputy Director of the Department and Head of Diabetes Services

Highlights

Assoc Prof Glenn Ward

As endocrinologist to the Islet Transplantation Clinic, managed the endocrine aspect of the first two islet transplants in Victoria resulting in insulin independence in these Type 1 diabetics, as well as the metabolic monitoring of these patients as part of the Juvenile Diabetes Research Foundation project.

Higher degrees conferred in 2008

Dr Christina Jang, a consultant endocrinologist, was recently awarded her MD postgraduate degree from the University of Melbourne.

Grants

Lamoureux E, Audehm R, Ward G

Screening for diabetic retinopathy in pathology collecting centres. University of Melbourne Development Grant, $100,000

Martin TJ, Gillespie MT, Ng KW, Sims N

Regulation of bone resorption and formation in health and disease. Commonwealth Government – NHMRC, (2005-2009), $5,000,000

Rasmussen B, Ward G, Jenkins A

Transitions in diabetes. ADS-Servier Grant, (2008), $50,000

Ward G, Jenkins A

Metabolic monitoring of islet transplantation. Juvenile Diabetes Research Foundation, (2006-2010), $400,000

Weilland T, Ward G, O'Dea K, Jelinek G

Incidence of diabetes in emergency department. Diabetes Australia Research Trust, $50,000

Selected presentations

Jung C

– Invited speaker, *'The intravenous dexamethasone suppression test in differential diagnosis of Cushing's syndrome'*, Annual Scientific Meeting, Endocrine Society of USA

Publications

Boston RC, Roche JR, Ward GM, Moate PJ 2008, 'A novel minimal model to describe non-esterified fatty acid kinetics in Holstein dairy cows', ***J Dairy Res***, 75, 1, 13-8

Dunning T, Ward G 2008, ***'Managing clinical problems in diabetes'***, Blackwell Pub, Oxford; Malden, MA, xviii, 209 p.

Gome JJ, Paltridge D, Inder WJ 2008, 'Review of intern preparedness and education experiences in General Medicine', ***Intern Med J***, 38, 4, 249-53

Jang C, Inder WJ, Obeyesekere VR, Alford FP 2008, 'Adiponectin, skeletal muscle adiponectin receptor expression and insulin resistance following dexamethasone', ***Clin Endocrinol (Oxf)***, 69, 5, 745-50

Jung C, Inder WJ 2008, 'Management of adrenal insufficiency during the stress of medical illness and surgery', ***Med J Aust***, 188, 7, 409-13

Kartsogiannis V, Sims NA, Quinn JM, Ly C, Cipetic M, Poulton IJ, Walker EC, Saleh H, McGregor NE, Wallace ME, Smyth MJ, Martin TJ, Zhou H, Ng KW, Gillespie MT 2008, 'Osteoclast inhibitory lectin, an immune cell product that is required for normal bone physiology in vivo', ***J Biol Chem***, 283, 45, 30850-60

Martin TJ, Sims NA, Ng KW 2008, 'Regulatory pathways revealing new approaches to the development of anabolic drugs for osteoporosis', ***Osteoporos Int***, 19, 8, 1125-38

Ng KW, Martin TJ 2008, 'Future therapies for osteoporosis', ***Primer on the metabolic bone diseases and disorders of mineral metabolism***, 7th edition, 260-64

Rantzau C, Christopher M, Alford FP 2008, 'Contrasting effects of exercise, AICAR, and increased fatty acid supply on in vivo and skeletal muscle glucose metabolism', ***J Appl Physiol***, 104, 2, 363-70