

The Bernard O'Brien Institute (BOBI) pursues leading edge and vital research programs in regenerative medicine and tissue engineering, with a primary focus on translating advances in laboratories into clinically successful therapies and treatments to patients afflicted by injury, disease and abnormalities.

About us

Having led the way in clinical and experimental research over the past 30 years, the Institute today consists of a core of microsurgeons, research scientists, surgical Fellows, students and administrative staff working under the direction of Prof Wayne Morrison.

The Institute has made striking advances in the delicate craft of replantation surgery and the transfer by microsurgical techniques of body parts and tissue to reconstruct people maimed by trauma, cancer, burns and congenital deformity.

The Institute carries out internationally recognised scientific research in the fields of Tissue Engineering and Vascular Biology, as well as studies on wound healing, nerve regeneration, inflammation,

pain, the effects of trauma on tissue, and more recently, prostate cancer.

There has been significant change to the Institute during the past twelve months, with continuing growth and some restructuring. We have progressed from research in microsurgery to now include the latest cell-based sciences and the multidisciplines of tissue engineering.

Projects in progress or completed

Year at a glance:

- We made human fat cells turn into beating heart muscle cells
- A significant number of peer-reviewed grants support our innovative research
- Our sponsored Women in Science forum leads the way on how to be an employer of choice
- Dr Phillip Marzella was appointed as COO of BOBI and CEO of the Microsurgery Foundation

The team

Prof Wayne A. Morrison, Director; Dr Keren Abberton, Senior Research Officer; Sandeep Arunotharayaraj, Student; Monna Ayad, Student; Lin Bin, Student; Dr Susan Bortolotto, Research Officer; Dr Elsa Chan, Research Officer; Catherine Chang, Research Assistant; Li C. Chin, Volunteer; Yu Suk Choi, Student; Srinivasu Datla, Student; Dr Rodney J. Dilley, Senior Research Officer; Aaron Dingle, Research Assistant; Prof Gregory J. Dusting, Prof-Director of Tissue Engineering

(Principal Research Fellow); Irene Esquivel, IT Manager; Dr Sandra Feeney, Senior Research Officer; Dr Laurence Galea, Research Fellow; Dr Giovanni Di Gennaro, Research Fellow; Yi-wen Gerrand, Laboratory Assistant; Dr Jorge L. Gonez, Senior Research Officer; Nancy Guo, Research Assistant; Lian X. Han, Research Assistant; Sarah Hsiao, Student; Rejhan Idrizi, Student; Dr Fan Jiang, Senior Research Officer; Effie Keramidaris, Laboratory Coordinator; Min Kim, Student; Dr Kenneth Knight, Senior Research Officer; Jennifer Knowlson, Administration – Senior; Dr Heidy Lilja, Research Fellow; Michelle Marchionna, Research Assistant; Dr Phillip Marzella, Chief Operating Officer; Dr Ken Matsuda, Research Fellow; Sarah McCann, Student; Dr Aurora Messina, Senior Research Fellow; Dr Geraldine Mitchell, Senior Research Officer; Paul Mulheron, Financial Controller; Sorel Old, Communications Manager; Jason Palmer, Research Assistant; Anthony Penington, Deputy Director; Dr Hitesh Peshavariya, Research Officer; Anna Philosofo, Legal Officer; Dr Carli Roulston, Senior Research Officer; Julia Runnalls, Administration; Dr Philippa Rust, Research Fellow; Betty Scardaville, Assistant Accountant; Tanida Srisuwan, Student; Samantha Stubbs, Student; John Tai, Student; Eria Tandiono, Student; Dr Caroline Taylor, Research Officer; Dr Richard Tee, Student; Dr Sebastien Tourbach, Research Fellow; Tiffany Tran, Executive Assistant; Aditya Vashi, Research Assistant; Mary Wilcox,

Administration; Michael Williams, Student; Henry Wong, Student; Dr Alan Woods, Research Officer

Grants

Bortolotto S, Dusting GJ

Growing cardiac tissue for transplantation. National Research Foundation – Cass Foundation, (2007-2008), \$66,000

Duan E, Chan E

Contribution of oxidative stress to prostacyclin – mediated cytoprotective actions in cardiac fibrosis. National Research Foundation – National Heart Foundation, (2007-2008), \$1,188

Dusting GJ

Appointment of Prof Director of Tissue Engineering at the Bernard O'Brien Institute of Microsurgery. ANZ Trustees – JO and JR Wicking Trust, (2006-2010), \$1,481,437

Dusting GJ, Dilley RJ

Cardiac muscle tissue engineering. National Research Foundation – ANZ Trustees – Hector Waldron Pride Charitable Trust, (2008), \$20,900

Dusting GJ, Dilley RJ, Mitchell G

The use of fluorescence microscopy in cardiac muscle tissue engineering. National Research Foundation – ANZ Trustees – MR and TECH VIC – VCF – Dean Robert Winter Trust, (2008), \$20,000

Dusting GJ, Morrison WA

Optimising vascularisation of tissue engineering chambers for tissue construction. Commonwealth Government – ARC, (2008-2010), \$470,500

Genetic manipulation to enhance blood flow in newly grown tissue. National Research Foundation – Joe White Bequest, (2007-2008), \$57,000

Dusting GJ, Dilley RJ, Keramidaris E

Motorised stage and incubator, triple gas incubator, data management. National Research Foundation – Joe White Bequest, (2008), \$60,000

Dusting GJ, Peshavariya H, Datla S

Research Fellowships. Commonwealth Government – NHMRC, (2006-2010), \$638,750

Dusting GJ, Roulston C, Callaway J

Targeting oxidative stress in brain injury following ischaemic stroke. National Research Foundation – National Heart Foundation, (2006-2008), \$123,000

Dusting GJ, Roulston C

Oxidative stress, cell signalling and angiogenesis in recovery from ischaemic stroke. National Research Foundation – National Heart Foundation, (2008-2009), \$129,000

Gonez JL

Characterisation of putative stem cells isolated from adult mouse and human pancreas: a cellular source to generate insulin-producing cells for diabetes therapy. National Research Foundation – Diabetes Australia

Research Trust (DART), (2008), \$54,407

Gonez JL, Morrison WA, Dusting GJ, Abberton K, Knight K, Mitchell G

Tissue engineering of pancreatic B cells for the treatment of Type 1 diabetes. National Research Foundation – Rebecca L Cooper Medical Research Foundation, (2008), \$21,472

Jiang F, Dilley RJ, Dusting GJ

Modulation of NADPH oxidase function by prostacyclin and thromboxane receptor signalling in arteries. National Research Foundation – National Heart Foundation, (2007-2008), \$124,218

Knight K, Abberton K, Thompson EW, Feeney S

Islet transplantation in a novel matrix and tissue engineering chamber. International Sources – JDRF, (2008-2009), (USD)\$110,000

Knight K, Jiang F, Penington A, Abberton K, Morrison WA

Optimising islet transplantation with vascularised tissue engineering chambers. Commonwealth Government – NHMRC, (2006-2008), \$441,750

Morrison WA, Abberton K, Cook A

Developing in vivo methods of adipose tissue engineering. Commonwealth Government – NHMRC, (2007-2009), \$360,000

Morrison WA, Bortolotto S, Dusting GJ

Tissue Engineering of Cardiac Muscle – towards a new heart. National Research Foundation – Lew Carty Charitable Fund, (2007-2009), \$82,125

Morrison WA, Dusting GJ, Dilley RJ

Fluorescent microscopy for illumination and observation in cardiac tissue engineering. National Research Foundation – Jack Brockhoff Foundation, (2008), \$34,474

Cardiac muscle tissue engineering. Commonwealth Government – NHMRC, (2008-2012), \$1,162,580

Morrison WA, Dusting GJ, Thompson EW, Kelly D

Fluorescence imaging microscope for cell tracking in tissue engineering. University of Melbourne, (2008), \$10,000

Morrison WA, Mitchell G, Penington A

Optimising implanted cell survival using a tissue engineering model. Commonwealth Government – NHMRC, (2008-2010), \$565,500

Morrison WA, Mitchell G, O'Connor A, Thompson EW

Cell distraction – a novel mechanism to cell growth. University of Melbourne, (2008), \$27,198

Penington A, Mitchell G

Establishing a vascular anomalies research program. National Research Foundation – ANZ Trustees – The William Buckland Foundation, (2007-2008), \$98,000

Peshavariya H

Mechanisms of cytoprotection from oxidative stress in endothelial cells. Commonwealth Government – NHMRC, (2005-2008)

Tee R

Optimising vascularisation of tissue engineering chambers for cardiac tissue engineering. National Research Foundation – National Heart Foundation, (2008-2011), \$97,602

Publications

Abberton KM, Bortolotto SK, Woods AA, Findlay M, Morrison WA, Thompson EW, Messina A 2008, 'Myogel, a novel, basement membrane-rich, extracellular matrix derived from skeletal muscle, is highly adipogenic in vivo and in vitro', *Cells Tissues Organs*, 188, 4, 347-58

Chan E, Jiang F, Peshavariya H, Dusting GJ 2008, 'Regulation of cell proliferation by NADPH oxidase-mediated signalling: a potential target for regenerative medicine and tissue engineering', *Pharmacology & Therapeutics*, In Press 9 Feb 09

Chan E, Jones GT, Dusting GJ, Datla S, Jiang F 2008, 'Prevention of aortic elastic lamina defects by losartan in apolipoprotein (E)-deficient mouse', *Vascular Pharmacology*, Submitted 29 July 2008

Craft RO, Rophael J, Morrison WA, Vashi AV, Mitchell GM, Penington AJ 2008, 'Effect of local, long-term delivery of platelet-derived growth factor (PDGF) on injected fat graft survival in severe combined immunodeficient (SCID) mice', *Journal of Plastic Reconstructive and Aesthetic Surgery*, In Press 4 January 2008

Di Bella C, Farlie P, Penington AJ 2008, 'Bone regeneration in a rabbit critical-sized skull defect using autologous adipose-derived cells', *Tissue Eng Part A*, 14, 4, 483-90

Francis D, Abberton K, Thompson E, Daniell M 2008, 'Myogel supports the ex-vivo amplification of corneal epithelial cells', *Exp Eye Res*

Hachisuka H, Dusting GJ, Abberton KM, Morrison WA, Jiang F 2008, 'Role of NADPH oxidase in tissue growth in a tissue engineering chamber in rats', *Journal of Tissue Engineering and Regenerative Medicine*, 2, 7, 430-5

Hussey AJ, Winardi M, Han X, Thomas GP, Penington A, Morrison WA, Knight KR, Feeney SJ 2008, 'Seeding of pancreatic islets into pre-vascularised tissue-engineering chambers results in reversal of diabetes', *Tissue Engineering*, Submitted 5 December 2008

Jiang F, Guo N, Dusting GJ 2008, 'Modulation of nicotinamide adenine dinucleotide phosphate oxidase expression and function by 3',4'-dihydroxyflavonol in phagocytic and vascular cells', *J Pharmacol Exp Ther*, 324, 1, 261-9

Knight KR, Uda Y, Findlay MW, Brown DL, Cronin KJ, Jamieson E, Tai T, Keramidaris E, Penington AJ, Rophael J, Harrison LC, Morrison WA 2008, 'Vascularised tissue-engineered chambers promote survival and function of transplanted islets and improve glycemic control', *Diabetes*, 57, 10, 3747

Kong GY, Rudiger HA, Ek ET, Morrison WA, Choong PF 2008, 'Reconstruction after external hemipelvectomy using tibia-hindfoot rotationplasty with calcaneo-sacral fixation', *International Seminars in Surgical Oncology*, 5, 1, 1

Lilja HE, Leppaniemi A, Kempainen E 2008, 'Utilisation of intensive care unit resources in severe acute pancreatitis', *Jop*, 9, 2, 179-84

Lokmic Z, Mitchell GM 2008, 'Engineering the microcirculation', *Tissue Eng Part B Rev*, 14, 1, 87-103

- Lokmic Z, Thomas JL, Morrison WA, Thompson EW, Mitchell GM 2008, 'An endogenously deposited fibrin scaffold determines construct size in the surgically created arteriovenous loop chamber model of tissue engineering', *J Vasc Surg*, 48, 4, 974-85
- McCann SK, Dusting GJ, Roulston CL 2008, 'Early increase of Nox4 NADPH oxidase and superoxide generation following endothelin-1-induced stroke in conscious rats', *J Neurosci Res*, 86, 11, 2524-34
- Morrison WA 2008, 'Article retraction', *Cell Transplant*, 16, 10, 1071
- Morrison WA 2008, 'Retraction. Transgenic expression of human complement regulators reduces skeletal muscle ischaemia/reperfusion injury in mice', *Clin Sci (Lond)*, 115, 8, 263
- Roulston CL, Callaway JK, Jarrott B, Woodman OL, Dusting GJ 2008, 'Using behaviour to predict stroke severity in conscious rats: post-stroke treatment with 3', 4'-dihydroxyflavonol improves recovery', *European Journal of Pharmacology*, 584, 1, 100-10
- Simcok J, Penington A, Morrison WA, Thompson EW, Mitchell GM 2008, 'Endothelial precursor cells home to a vascularised tissue engineering chamber by application of the antiogenic chemokine CXCL12.', *Tissue Engineering*, Submitted 19 June 2008
- Srisuwan T, Abberton K, Penington A, Messer HM, Thompson EW 2008, 'Dental pulp stem cell differentiation in a vascularised tissue engineering model – effects of extracellular matrices', *Tissue Engineering*, Submitted 11 July 2008
- Srisuwan T, Abberton K, Chivatxaranukul P, Messer HM, Thompson EW 2008, 'Differentiation of dental pulp stem cells in the presence of dentin matrix extract', *Archives of Oral Biology*, Submitted 30 July 2008
- Stynes G, Kirroff GK, Morrison WA, Kirkland MA 2008, 'Tissue compatibility of biomaterials: benefits and problems of skin biointegration', *ANZ J Surg*, 78, 8, 654-9
- Thomas GP, Hemmrich K, Abberton KM, McCombe D, Penington AJ, Thompson EW, Morrison WA 2008, 'Zymosan-induced inflammation stimulates neo-adipogenesis', *International Journal of Obesity*, 32, 2, 239-48
- Tilkorn D, Messina A, Bedogni A, Keramidaris E, Han X, Palmer J, McKay S, Pepe L, Deftereos A, Penington A, Mitchell G 2008, 'Implanted myoblast survival is dependant on the degree of vascularisation in a novel delayed implantation/ prevascularisation tissue engineering model', *Journal of Cellular and Molecular Medicine*, Submitted 5 December 2008
- Vashi AV, Keramidaris E, Abberton KM, Morrison WA, Wilson JL, O'Connor AJ, Cooper-White JJ, Thompson EW 2008, 'Adipose differentiation of bone marrow-derived mesenchymal stem cells using Pluronic F-127 hydrogel in vitro', *Biomaterials*, 29, 5, 573-579
- Wang S, Thomas CJ, Dusting GJ, Woodman OL, May CL 2008, '3', 4'-Dihydroxyflavonol improves post-ischemic coronary endothelial function following 7 days reperfusion', *Cardiovascular Research*, Submitted August 2008