

Established in the 1960s, the mission of the University of Melbourne's Department of Surgery is to foster academic surgery within the St. Vincent's campus, by undertaking basic and clinical research, research training and contributing to the teaching and assessment of medical students.

About us

Since 1992, the Department of Surgery at St. Vincent's has been led by the Hugh Devine Chair of Surgery, Prof Wayne Morrison, who stepped down from this role at the end of 2008.

The department employs 13 staff and hosts research students enrolled in PhD and MD programs, including the Faculty of Science's Master and Honours programs as well as the specialist Master of Surgery. The department recognises and values the contributions of its honorary staff (numbering more than 60) to its teaching, research and community engagement activities.

The department's mission is to foster academic surgery within the St. Vincent's campus, by undertaking basic and clinical research and contributing to the teaching and assessment of medical students

of the University. Its staff bring significant clinical expertise in the areas of microsurgery, reconstruction (particularly following cancer resection), head and neck surgery, orthopaedics, neurosurgery, general surgery and hand surgery.

Through its relationship with the Bernard O'Brien Institute (BOBI) the Department of Surgery also contributes to research in tissue engineering and organogenesis, involving the disciplines of vascular biology, trauma and wound healing, nerve and muscle regeneration, inflammation and prostate cancer. Studies in breast cancer invasion and metastasis form a key component of its basic science research, led by Associate Prof Rik Thompson and conducted in collaboration with St Vincent's Institute and the Victorian Breast Cancer Research Consortium.

The Department of Surgery plays a pivotal role in the life of St. Vincent's with its members being actively involved in various management committees.

Projects in progress or completed

The department's basic research covers:

- reconstructive surgery, including tissue engineering, stem cell research, ischaemia, wound healing and nerve regeneration (directed by Prof Wayne Morrison and Dr Anthony Penington and largely carried out at the Bernard O'Brien Institute – see separate report on BOBI).

- breast cancer invasion and metastasis (directed by Assoc Prof Erik Thompson and carried out collaboratively with St Vincent's Institute).

During 2008 Department of Surgery staff have been invited to share their expertise at the following international events:

Prof Wayne Morrison

- Opening ceremony guest speaker, International Society of Aesthetic Plastic Surgery Congress, Melbourne, January 2008.
- Plenary lecturer, European Association for Cranio-Maxillo-Facial Surgery Bi-annual Conference, Bologna, Italy, September 2008
- Keynote lecturer, American Society of Plastic Surgeons Annual Congress, Chicago, USA, November 2008

Assoc Prof Anthony Penington

- Visiting Professor, Conjoint ASC, Royal Australasian College of Surgeons and Hong Kong College of Surgeons, Hong Kong, May 2008

Assoc Prof Erik (Rik) Thompson

- Invited speaker and Chair, Cold Spring Harbor Laboratory Conference on the Epithelial-Mesenchymal Transition, New York, USA, March 2008
- Invited speaker, American Association for Cancer Research Conference on Frontiers in Cancer Prevention Research, National Harbor, USA, November 2008

Research applications in the clinical setting

A clinical trial (pilot study) in tissue engineering approaches to breast reconstruction is commencing in 2009. This could lead to changes in the way breast reconstruction is performed.

Work by Assoc Prof Thompson is geared towards the identification of novel diagnostic markers and therapeutic targets for breast cancer that may ultimately impact patients, but to date is still in the laboratory. However, collaborative work with Assoc Prof Prue Hill from St. Vincent's Pathology and Keith Stanley from Ausdiagnostics Pty Ltd, Sydney, is testing Multiplex Tandem PCR as a potential new tool for diagnosing breast cancer. We have compared the results with those generated from routine tests currently available and this will be extended to markers coming from the laboratory. This work could ultimately improve clinical practice through the development of new diagnostic tests for breast cancer.

The team

Prof Wayne A Morrison, Head of Department up to 31 December 2008; Academic Staff: Wayne Morrison; Anthony Penington; David McCombe; Erik Thompson; **Honorary Members:** Prof Peter Choong; Prof Greg Dusting; Dr Keren Abberton; Dr Ahmed Nuzhat; Assoc Prof David Allen; Simon Banting; Dr Susan Bortolotto; Dr Elsa Chan; Dr Michael Denton; Dr Rodney Dilley; Dr George Dimitroulis; Dr John Gurry; Assoc

Prof Michael Henderson; Alexander Heriot; Dr Fan Jiang; John Kennedy; Dr Kenneth Knight; John Mackay; Dr Geraldine Mitchell; Michael Murphy; Dr Wayne Phillips; Assoc Prof David Scott; Assoc Prof Brendan Silbert; Gregory Thomas; Dr James Thomas; Dr Phillip Thompson; Dr Daniel Tilkorn; Dominic Vellar; Dr Mark Waltham; Rodney Woods; Gavin Wright; Dr Michael Yii; **Students:** Dr Jonathan Clark; Dr David Moses; Dr Anand Ramakrishnan; Edwin Widodo; Lorenzo Galea; Chao Han; Monna Saadeddine Ayad; Dr Kristian Bulluss; Yu Suk Choi; George Dimitroulis; Michelle Dowsey; Eugene Ek; Lisbeth Evered; Michael William Findlay; Devika Gunasinghe; Sarah Hsiao; Sarah Kate McCann; Ben Hugh McKelvey; Srinivasa Raju Datla; Tanida Srisuwan; Samantha Licy Stubbs; Richard Tee; Razan Wafai

Grants

Chaffer C

Dynamic cellular transitions in breast cancer metastasis. NHMRC, (2007-2011), \$306,880

Mitchell G, Thompson EW, Morrison WA

An in vivo tissue distraction chamber – a novel mechanism to significantly enhance tissue growth. University of Melbourne Research Grants Scheme, (2008), \$27,198

Morrison WA, Abberton K, Cook A

Developing in vivo methods of adipose tissue engineering. NHMRC, (2008-2009), \$360,000

Thompson E, Dobrovic A, Choong P, Hill P, Henderson M, Pantel K

Exploring epithelial – mesenchymal interconversions in the breast cancer metastatic cascade. Cancer Council Victoria, (2008-2010), \$285,500

Thompson E, Newgreen D, Ackland L, Waltham M, Henderson M

Molecular markers for epithelio-mesenchymal transition in human breast cancer. United States Department of Defense, (2003-2008), USD\$299,830

Thompson E, Shah M, Hill P, Cawson J, Morrison WA, Haviv I, Soon L, Henry R, Hopper J, Southey

Molecular profiling and epidemiological refinement of mammary gland density as a predictor of breast cancer risk. St. Vincent's Research Endowment Fund, (2008), \$30,000

Thompson E, Soon L, Braert F, Vallotton P

A new model for 3D migration involving claw structures and metalloproteinases. Australian Research Council, (2008-2010), \$498,071

Wafai R

Epithelial to mesenchymal transitions in human breast cancer. United States Department of Defense, (2005-2009), USD\$89,926

Publications

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- Ahmed N, Riley C, Quinn M 2008, 'An immunohistochemical perspective of PPAR α and one of its putative targets PDK1 in normal ovaries, benign and malignant ovarian tumours', *British Journal of Cancer*, 98
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- Blick T, Widodo E, Hugo, Waltham M, Lenburg, Neve, Thompson E 2008, 'Epithelial mesenchymal transition traits in human breast cancer cell lines', *Clinical and Experimental Metastasis*, 25
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- Dass C, Friedhuber A, Khachigian L, Dunstan D, Choong P 2008, 'Biocompatible chitosan-DNAzyme nanoparticle exhibits enhanced biological activity', *Journal of Microencapsulation*, 25
- Dass C, Khachigian L, Choong P 2008, 'c-Jun knockdown sensitises osteosarcoma to doxorubicin', *Molecular Cancer Therapeutics*, 7
- Dass C, Galloway S, Clark J, Khachigian L, Choong P 2008, 'Involvement of c-jun in human liposarcoma growth', *Cancer Biology & Therapy*, 7
- Dass C, Ek E, Choong P 2008, 'PEDF as an emerging therapeutic candidate for osteosarcoma', *Current Cancer Drug Targets*, 8
- Dass C, Choong P 2008, 'The use of chitosan formulations in cancer therapy', *Journal of Microencapsulation*, 25
- Dass C, Choong P 2008, 'uPAR mediates anticancer activity of PEDF', *Cancer Biology & Therapy*, 7
- Davey, Heriot A, Mackay J, Drummond, Hogg, Ngan, Milner, Hicks 2008, 'The impact of 18-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography on the staging and management of primary rectal cancer', *Diseases of the Colon and Rectum*, 51
- Di Bella C, Farlie P, Penington A 2008, 'Bone regeneration in a rabbit critical-sized skull defect using autologous adipose-derived cells', *Tissue Engineering*, 14
- Dimitroulis G, Trost N, Morrison W 2008, 'The radiological fate of dermis-fat grafts in the human temporomandibular joint using magnetic resonance imaging', *International Journal of Oral and Maxillofacial Surgery*, 37
- Dowsey M, Choong P 2008, 'Obesity is a major risk factor for prosthetic infection after primary hip arthroplasty', *Clinical Orthopaedics and Related Research*, 466
- Ek E, Dowsey M, Tse, Riazi A, Love, Stoney J, Choong P 2008, 'Comparison of functional and radiological outcomes after computer-assisted versus conventional total knee arthroplasty: a matched-control retrospective study', *Journal of Orthopaedic Surgery*, 16
- Friedhuber A, Khachigian L, Dunstan D, Choong P 2008, 'Downregulation of c-jun results in apoptosis-mediated anti-osteosarcoma activity in an orthotopic model', *Cancer Biology & Therapy*, 7
- Hackisuka H, Dusting G, Abberton K, Morrison W, 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
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- Jiang F, Zhang G, Hashimoto, Kumar B, Bortolotto S, Morrison W, Dusting G 2008, 'Neovascularisation in an arteriovenous loop-containing tissue engineering chamber: role of NADPH oxidase', *Journal of Cellular and Molecular Medicine*, 12
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- Lokmic Z, Thomas J, Morrison W, Thompson E, Mitchell G 2008, 'An endogenously deposited fibrin scaffold determines construct size in the surgically created arteriovenous loop chamber model of tissue engineering', *Journal of Vascular Surgery*, 48
- Mccann S, Dusting G, Roulston C 2008, 'Early increase of Nox4 NADPH oxidase and superoxide generation following endothelin-1-induced stroke in conscious rats', *Journal of Neuroscience Research*, 86

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- Plummer C, Vellar I, Murphy M, Cook M 2008, 'A twist in the tale of a surgeon and his patient: an Australian first in seizure localisation', *Journal of the History of the Neurosciences*, 17
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