

NGED Epigenetics Workshop

Due to popular demand, organisers Emma Whitelaw, Suyinn Chong and Nathan Oates held two workshops in October at the Queensland Institute of Medical Research to transfer their knowledge and skills in Epigenetics to other members of the Network, who represented a total 17 research groups. In her workshop report, participant Pat Grant (O&G, University of Adelaide) summarised the workshop as follows:



"The NGEG Epigenetics Workshop covered in depth techniques used to study and determine DNA methylation of genomic DNA. The workshop included a hands on approach in the laboratory coupled with relevant seminars. Initially, we were given genomic DNA of human Synapsin III gene to determine its methylation status. We followed SOP for the bisulphite conversion of cytosines in the original sequence to be converted to uracils, but methylated cytosines are resistant to this conversion and thus remain unchanged. The whole process of bisulphite conversion involved the bisulphite conversion reaction, desalting and alkali desulfonation, PCR and combined bisulphite restriction analysis using methylation-sensitive restriction digestion enzymes. In performing our own bisulphite conversions the pitfalls associated with this method became clear and we were able to problem solve with the expert advice from Suyinn Chong and Nathan Oates. The seminars presented were very informative covering all aspects involved in the study of DNA methylation including primer design for bisulphite sequencing, CpG island microarrays, bias and contamination and an in depth seminar from Sequenom on the MassARRAY EpiTYPER.

This workshop was invaluable in providing the necessary skills both practically and theoretically to enable me to apply these techniques to my own project and other projects within our research group and also teach other groups in our discipline. Thankyou to Emma Whitelaw, Suyinn Chong, Nathan Oates and members of her laboratory for the opportunity to work in their facilities and to draw on their invaluable expertise."

Workshop participants gave overwhelmingly positive feedback and have suggested to set up an online-discussion forum, which we have organised since. If you wish to be added to the NGED Epigenetics Online Discussion Group to post your Epigenetics related questions to other members of the Network, please contact [Helli Meinecke](mailto:Helli.Meinecke@adelaide.edu.au).

Fetal & Neonatal Workshop

What: Fetal and Neonatal Workshop of Australia & New Zealand

Where: Yvonne Bowden Auditorium
Royal Women's Hospital, Melbourne

When: 31 March – 1 April 2007

Registration and abstract submission details will follow soon.

For further details please contact [Richard Harding](mailto:Richard.Harding@unimelb.edu.au).



NGED Annual Report



As an ARC/NHMRC Research Networks we are required to submit a report to the ARC each year.

Whilst we will be reporting on the structure, management and finances of the Network as well as on the initiatives and programs run throughout the year, we would like to invite your help to finalise the report. It would be greatly appreciated if you could provide a paragraph or two....

- 🌐 If the Network has enabled you to establish new linkages to other groups
- 🌐 If you have started collaborative work with a scientist you met through the Network
- 🌐 How the NGED contributed to education / training in your area?
- 🌐 Any benefits you had through your involvement with the Network

Please email your contribution to the report to [Helli Meinecke](#). Thank you.

NGED Forum 2007

The 2007 NGED Forum will be held at the Novotel Palm Cove Resort in Queensland on 13 June 2007 – 15 June 2007.

The Steering Group is in the process of preparing the program for this annual meeting and we would like to invite your suggestions for talks, topics (i.e. research, technologies), speakers and discussions.

Please send your suggestions by email to the [Network Office](#). Thank you ☺



Vacancies

POST-DOCTORAL RESEARCH FELLOWS
(Two positions)
Colon Molecular and Cell Biology Laboratory
Ludwig Institute for Cancer Research
Melbourne Branch

Applications close
15 January 2007

The Ludwig Institute for Cancer Research (LICR) is an international not-for-profit Medical Research Institute with strong laboratory and clinical research programs in Melbourne. The Colon Molecular and Cell Biology Laboratory (located at the Royal Melbourne Hospital, Parkville) has two exciting opportunities for Post Doctoral Research Fellows to contribute to genetic studies of intestinal development and colorectal cancer, using zebrafish and mouse models.

The specific focus of the research will be to analyse the function of three novel genes that we have shown in zebrafish to be indispensable for normal intestinal development. Our hypothesis is that the aberrant expression of these genes in the adult will also perturb the normal behaviour of the intestinal epithelium and contribute to colon tumour development. A number of in vivo and in vitro approaches are envisaged to explore the biological activities of the encoded proteins and to analyse the genetic pathways in which they participate. The scope of the research will also take advantage of the existing capability in our laboratory to undertake conditional reverse genetic experiments in mice to reveal whether the aberrant expression of the mouse orthologues of the cloned zebrafish genes can contribute to colon tumourigenesis.

Applicants must possess a Ph.D degree and have a track record in developmental or cell biology and/or genetics. We are looking for dedicated and enthusiastic individuals capable of working with drive and independence. Salary will be in accordance with experience and qualifications and the positions are available for a period of three years in the first instance. The appointees will be eligible for generous superannuation and salary packaging benefits. Further information is available from [Associate Professor Joan Heath](#) on (03) 9341 3155.

Grant success

“Discovery and analysis of vertebrate intestinal development genes that may play a role in colon cancer “. NH&MRC Project Grant 433614 (\$719,000/ 4 years), 2007 – 2010, Heath JK (CIA), Lieschke G (CIB), Ernst M (CIC)

“Development of drug-loaded antibody-targeted nanoparticles to kill colorectal cancer cells”. NH&MRC Project Grant 433613 (\$493,500/ 3 years), 2007 - 2009 , Heath JK (CIA), Caruso F (CIB), Nice EC (CIC)

Conference Report

The **Annual Conference of the Endocrine Society of Australia and Society for Reproductive Biology** was held at the Gold Coast Convention Centre in August 2006. The NGED sponsored a symposium entitled “Epigenetic Mechanisms in Programming Pre-implantation Embryos” chaired by Drs Sarah Robertson and Chris O'Neill. The speakers were Dr Lorraine Young (University of Nottingham, UK) who presented her research on 'Environmental influences on DNA methylation in embryonic cells: investigating mechanisms and phenotypic consequences'; Dr Josie McConnell (University of London, UK) whose presentation was 'A mitochondrial component to developmental programming', and Dr Hugh Morgan (Babraham Institute, Cambridge UK) who spoke on 'Methylcytosine deamination by DNA deaminases and expression in reprogramming tissues'. The symposium was attended by approximately 100 delegates of the Annual Conference of the Endocrine Society of Australia and Society for Reproductive Biology, comprising Australian and overseas scientists working in the areas of human and animal reproductive science and medicine, pregnancy and placental physiology and perinatology, and developmental biology. The speakers each presented their most recent research on the molecular basis by which nutrition and environmental stressors including assisted reproductive techniques and cloning can cause permanent genetic modifications in the gametes and embryo, subsequently influencing fetal and placental development, and viability and growth in postnatal life. Between the three speakers, current major themes relevant to epigenetics of early development were covered, including environmental regulation of mitochondrial turnover in the embryo (McConnell), the role of DNA methylation in epigenetic changes in embryonic stem cells (Young), and the molecular regulation of deaminase enzymes in the demethylation process involved in epigenetic programming (Morgan).

The symposium focussed on a central theme of the NGED - the molecular mechanisms by which epigenetic programming occurs in the pre-implantation embryo. This is a key event in linking early life environment with adult health and disease. The period around conception and embryo implantation has emerged as centrally important in early development, with a substantial literature now showing that insults at this vulnerable time are reflected in compromised placental morphogenesis and fetal growth, with adverse consequences for the individual after birth. This symposium addressed a major knowledge gap, the mechanism by which the 'memory' of early life experience is programmed in the pre-implantation embryo to be carried forward into fetal and postnatal life. The three world-class speakers together provided an excellent update on their latest research in this important area, providing new insights into the processes controlling DNA methylation and mitochondrial turnover as key mechanisms by which epigenetic programming occurs. The symposium contributed to advancing expertise and maintaining Australia's research capacity in the biology of epigenetics. Our expanding knowledge in this area will contribute to internationally competitive basic research in embryology and developmental biology, and in the clinic, will inform strategic interventions to avoid adverse consequences of assisted reproductive technology. The symposium was also a success from the perspective of building international collaborations: both Drs McConnell and Young spent considerable time at the meeting networking and discussing common research interests with other delegates. Both have made arrangements to return to Australia in 2007 in order to visit laboratories and initiate collaborative research in Adelaide, Sydney and Perth. Dr Hugh Morgan has commenced a research post at the Royal North Shore Hospital in Sydney.



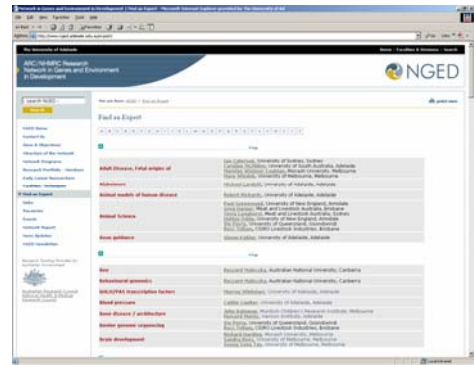
Dr Josie McConnell (left) with Dr Lorraine Young (right) and Professor Marilyn Renfree

NGED Website



The content of your member profile has been used to compile information for a new menu item on the NGED website: '[Find an Expert](#)'. Please visit the list to ensure that your details are displayed correctly. Current menu items on our website are:

[Contact Us](#)
[Aims & Objectives](#)
[Structure of the Network](#)
[Network Sponsors](#)
[Research Portfolio - Members](#)
[Early Career Researchers](#)
[Facilities/Techniques](#)
[Find an Expert](#)

[Links](#)
[Network Programs](#)
[Vacancies](#)
[Events](#)
[Network Report](#)
[News Updates](#)
[NGED Newsletter](#)



Who is who? Introducing NGED Laboratories...

	<p>Eleanor Mackie Laboratory <i>(click on the name to view the full member profile)</i></p> <p>University of Melbourne, Veterinary Science</p> <p>Email: ejmackie@unimelb.edu.au / Phone: 0 3 8344 7360</p>
<p>Research interests</p>	<ul style="list-style-type: none"> • Development and pathology of the musculoskeletal system • Regulation of bone, cartilage and muscle cell function • Extracellular matrix • Thrombin and protease-activated receptors • Regulation of osteoblast and myoblast apoptosis
<p>Facilities/ techniques</p>	<ul style="list-style-type: none"> • Scanning and Transmission Electron Microscopy • Quantitative PCR • Primary osteoblast, myoblast and chondrocyte culture • Osteoclast differentiation and bone resorption assays • Three-dimensional chondrocyte culture (to allow hypertrophy) • Single muscle fibre culture • Mineralised tissue histology
	<p>Peter Koopman Laboratory <i>(click on the name to view the full member profile)</i></p> <p>University of Queensland, Institute for Molecular Bioscience</p> <p>Email: p.koopman@imb.uq.edu.au / Phone: 07 3346 2059</p>
<p>Research interests</p>	<ul style="list-style-type: none"> • Sex Determination and Gonadal Development • Sox Gene Function and Evolution • Molecular Genetics of Vascular Development • Development of Germ Cells
<p>Facilities/ techniques</p>	<ul style="list-style-type: none"> • SRC Microarray facility • SRC protein expression facility • Transgenic Animal Service of Queensland • Confocal and Electron Microscopy facilities

NGED Programs

The Network has introduced a number of programs to support the interaction amongst Network Members and with other researchers and research organisations from Australia and overseas. Award rules and application forms are available on the [NGED website](#). The table below provides a brief description of the programs and the application closing dates for 2006.

Closing Dates	Programs
31.01.2007	<p>NGED Conference Support Awards</p> <p>The purpose of the NGED Conference Support Program is to assist conference organisers to provide high profile meetings in the areas of developmental biology / developmental physiology. Preference will be given to international conferences held in Australia with an emphasis on promoting multidisciplinary interactions in order to provide the greatest benefit to NGED members from different scientific backgrounds.</p>
31.01.2007 for travel in Feb-Apr 07	<p>NGED Conference Participation Awards</p> <p>The purpose of the NGED Conference Participation Award is to provide young scientists with an opportunity to present their work at a scientific forum, which they otherwise may not have been able to. Preference will be given to the Network's PhD students and early career researchers. Awards will not normally exceed \$500 (for meetings in Australia) or \$1,000 (for overseas meetings).</p>
31.01.2007	<p>NGED Laboratory Interchange Award</p> <p>The NGED Laboratory Interchange Award is available to assist NGED students, early career scientists and other members of the Network to visit other NGED laboratories to work on collaborative interdisciplinary projects, learn specialised techniques or access specialised equipment.</p>
Ongoing	<p>NGED Cross-Disciplinary Workshop Attendance Award</p> <p>To facilitate research interactions and research training activities, which cross discipline boundaries, the Cross-Disciplinary Workshop Attendance Award will assist NGED students, early career scientists and other members of the Network to attend cross-disciplinary workshops (i.e. a physiology student attending a developmental biology workshop).</p>
31.01.2007	<p>NGED Focus Group Award</p> <p>The purpose of this award is to support 'Focus Group/Think Tank Meetings' that lie within the objectives of the Network (i.e. strategic planning across the fields, Centre of Excellence planning, or establishment of collaborations between NGED groups that cross disciplinary boundaries).</p>

Merry Christmas!



Wishing you and your families
a Wonderful Christmas and a Happy New Year.

The NGED Steering Group.