

Centre for Stem Cell Research E-news



March 2009 Volume 2, issue 1

The University of Adelaide, Australia

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Director's Report

With a new year come changes, as well as another round of grant writing! Leanne Srpek is the new Centre Manager and brings to the position a wealth of experience. Welcome Leanne. Also there are a number of new initiatives that members need to be aware of. Firstly those who have not taken advantage of The Robinson Infrastructure grants need to do so ASAP. See inside for details. Also the Robinson Institute has provided a number of new funding initiatives which members have applied for and been successful in obtaining including Honour scholarships, PhD top ups and Early Career Research Grants. Hopefully you will have received an email about these, if not please make sure Leanne has your details. This year also sees the introduction of Networking Forums and an Annual Research Meeting designed to further collaboration within the Centre. Speaking of collaboration can everybody forward a PDF of any paper or abstract accepted for publication to Leanne. These will be attached to end of the newsletter as a way of better understanding what we're all doing. Finally don't forget the Robinson Launch in March.

Stan and Mark

The Robinson Institute Official Launch

The University of Adelaide has established The Robinson Institute to focus on reproductive health, stem cell research and health across generations and to tackle some of the big issues of prevention of illness for individuals and their children.

Named after renowned obstetrician, Emeritus Professor Jeffrey Robinson



Professor Jeffrey Robinson

CBE, The Robinson Institute encompasses the University's Research Centre for Reproductive Health, Centre for Stem Cell Research and Centre for the Early Origins of Health and Disease.

Read more on pages 2.

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ROBINSON INSTITUTE LAUNCH



The Robinson Institute

Research in reproductive health and regenerative medicine

- Research Centre for Reproductive Health
- Centre for Stem Cell Research
- Centre for the Early Origins of Health and Disease

OFFICIAL LAUNCH

The Vice-Chancellor and President, Professor James McWha, is delighted to invite you to the official launch of The Robinson Institute on Wednesday 11 March, 2009.

Continued from page 1.



Guest Speaker:
Professor Roger Valentine Short
Honorary Professorial Fellow,
Faculty of Medicine, Dentistry and
Health Sciences, The University of
Melbourne.

Professor Roger Short

Professor Short has been involved in contraceptive research and development for four decades. One of his main research interests has been the evolution of human reproduction, shedding new light on the causes of the human population explosion.

| | |
|--------|--|
| Date: | Wednesday 11 March, 2009 |
| Time: | 5.30-7.30pm |
| Venue: | Adelaide Convention Centre, Riverbank Rooms |
| RSVP: | by Wednesday 4 March |

| | |
|----------|---|
| Contact: | Anne Jurisevic, phone: 08 8303 8222, email: anne.jurisevic@adelaide.edu.au |
|----------|---|

| | | |
|-----------------|--------|--------------------|
| Order of events | 5.30pm | Guest arrival |
| | 6.00pm | Ceremony |
| | 6.30pm | Cocktail reception |
| | 7.30pm | Close |

**** REMINDER ****
RSVP by Wednesday 4 March to Anne Jurisevic
Anne.jurisevic@adelaide.edu.au

ROBINSON INSTITUTE

PROCEDURE FOR INFRASTRUCTURE REIMBURSEMENT

HAVE YOUR SPENT YOUR \$7000

If you haven't done so already...

- 1) You must **purchase** the item through your normal channels.
- 2) Once the goods are received and paid for, you then need to **generate an invoice** addressed to the 'Centre for Stem Cell Research' and attached a **copy of the receipt**. (value must be \$7000 or less for each group)
- 3) Please **email or send** the Invoice with the attached receipt for reimbursement to Leanne.

TIME IS RUNNING OUT

Leanne Srpek

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WANTED: STORIES FOR THE ADVERTISER'S *CAN YOU BELIEVE IT* SERIES

The Advertiser is looking for new stories for their weekly popular science column in their Saturday paper called 'Can you Believe It'.

The series intends to highlight science stories of public interest, reviewing an area, rather than publishing raw data.

This is an excellent opportunity for groups within the Centre to gain some public exposure for their field, and pieces from all levels of experience including Postgraduate Students and

Early Career Researchers have been published. Many of the student contributors have continued on to win science communication awards such as the Young Investigator of the Year for their ability to communicate the excitement about what they do.

If you love your area of research and would like to share your enthusiasm with the wider public, we would love to hear from you.

Please contact us at the Centre via email stemcell@adelaide.edu.au to register your interest and for more information.

QUARTERLY NETWORKING AND SEMINAR SERIES

On March 17 2009 the Centre will commence its quarterly Networking and Seminar Series.

The series will be held in conjunction with the Discipline of Obstetrics and Gynaecology on Fridays at 4.00pm (Venue TBA). Session days may change due to availability of the speakers.

These events will serve to showcase the work being done at the Centre, and to allow the chance for members to build research and collegial connections in a social environment, with drinks and nibbles following the formal seminar.

The first speaker for 2009 on **March 17**, will be **Professor Andrew McMahon** from the Department of Molecular and Cellular

Biology, Harvard University, and The Harvard Stem Cell Institute.

The seminar will be held at The University of Adelaide in the Florey Lecture Theatre on the 1st floor of the **Medical School at 4pm**. Food and drinks will be supplied afterward during the Networking part of the afternoon.



Prof Andrew McMahon

Professor Andy McMahon will also be presenting the following seminars:

Monday 16th March 11.30-12.30pm

“Sonic hedgehog morphogen signalling and the regulation of neural diversity”

Robson lecture Theatre, Level 1, Eleanor Harrald Building, RAH, Frome Road Adelaide

Monday 16th March 5.30 – 7pm followed by networking to 8.30pm (Bio Innovations SA)

“The Science of Stem Cells”

BioSA Business Incubator, 40-46 West Thebarton Road, Thebarton SA **Cost:\$20 or \$10 for students**

Tuesday 17th March 11.00-12.00pm

“From progenitor to product: development and repair of the mammalian kidney”

The Basil Hetzel Research Institute Seminar Room, TQEH, Woodville Road, Woodville

Tuesday 17th March 4-5pm followed by networking to 6pm ([Centre for Stem Cell Research](#))

“Developmental Programs and Stem Cells in Regenerative Medicine”

Florey lecture Theatre, The University of Adelaide Medical School, Frome Road, Adelaide

****Food and drinks provided during the Networking part of the afternoon****

CONGRATULATIONS BOARD

Congratulations to the successful applicants

ROBINSON INSTITUTE SCHOLARSHIP PROGRAM - Honours

- Grant Engler, supervised by Dr Simon Koblar and Dr Stan Gronthos ****Congratulations****
- Samuel Tim-Ming Lee, supervised by Dr Helen Irving-Rodgers, Dr Katja Hummitzsch and Prof Ray Rodgers **** Congratulations****
- Jessica Laurance, supervised by A/Prof Clair Roberts and Dr Denise Furness
- Joshua Fanning, supervised by Prof Stefan Hiendleder and Dr Karen Kind
- Kam PanhTruong, supervised by A/Prof Mark Nottle and Dr Ivan Vassiliev ****Congratulations****
- Nurulaini abu Shamsi, supervised by A/Prof David Kennaway
- Nur Shahrin, supervised by Dr Anna Brown and A/Prof Richard D'Andrea ****Congratulations****
- Zhu Mao, supervised by A/Prof Richard D'Andrea and Dr Michelle Perugini ****Congratulations****
- Noor Lookman, supervised by Dr Carmela Ricciardelli and A/Prof Martin Oehler

ROBINSON INSTITUTE SCHOLARSHIP PROGRAM - Postgraduate

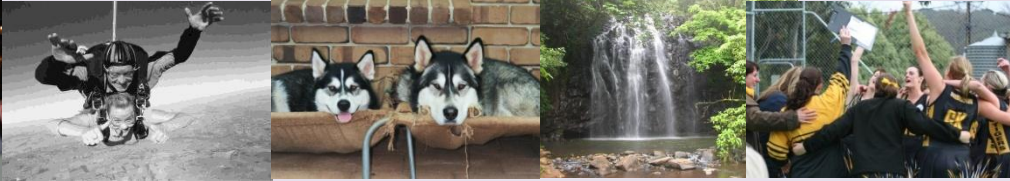
- Lisa Akison, supervised by Dr Rebecca Robker, Prof Richard Ivell
- Wing Hong Vincent Chu, supervised by Prof Julie Owens
- Dale McAninch, supervised by Paul Thomas **** Congratulations****
- Teresa Sadras, supervised by Assoc Prof Richard D'Andrea, Dr Michelle Perugini ****Congratulations****
- Izza Tan, supervised by Darryl Russell

ROBINSON INSTITUTE - Early Career Fellowship

APPLICATIONS CLOSED 9/2/09

- To be announced

MEMBERS UPDATE – LEANNE SRPEK



Dear Members,

As of the beginning of this year I was appointed as the new Manager for the Centre of Stem Cell Research. I am very excited to be a part of the centre and to have the opportunity to take on the challenges that lay ahead.

I have been involved in research for over 15 year. I started as a laboratory assistant at Gilles Plains Tafe where I gained experience supervising and assisting students in the lab. *An experience indeed!* I then went on to become technical officer/animal technician at the Child Health Research Institute and continued working there for 7 years with the Gut Group lead by researcher Dr Gordon Howarth and Dr Tim Rayner who lead the Wound Healing Group. This positioned enabled me to gain a large range of technical and surgical skills.

After 7 years in one area and grant money running out I decided, as did many others to seek work elsewhere, which lead me to O&G, so here I am!!! In 2002 I began working with A/Prof Sarah Robertson in the Reproductive Immunology Group as her research assistant and then after a year was employed as her personal assistant and laboratory manager. In 2009 I began working half time for A/Prof Robertson as her personal assistant, and half time in my new role as the manager of the Centre for Stem Cell Research.

Throughout my time in research I have developed a good understanding of the needs of researchers, supportive staff and students. In addition, I have gained understanding of the entwined web of the research world. My natural organisation skills, creativeness and research experience are assets enabling me to manage the Centre for Stem Cell Research.

Outside of work I like to keep active and enjoy being outside!! My parents brought me up to appreciate the great outdoors, camping, fishing and exploring. I enjoy spending time with my pets, playing a variety of sports, visiting wineries, eating oysters at holdfast shore and relaxing on Wedge Island where I like to escape the hustle and bustle. Very rarely you will see me jumping out of a plane but that is one box of many I have ticked!

*Looking forward to meeting you soon!
Leanne*



NEW STAFF AND STUDENT DETAILS

Forward on information
'New Staff and Students'
to fill this space
stemcell@adelaide.edu.au

CENTRE EVENTS AND DIARY DATES

MANAGEMENT COMMITTEE MEETINGS 2009

Tues March 3rd Tues September 8th
Tues June 2nd Tues December 1st

ADVISORY BOARD MEETINGS 2009

~~Tues March 10th - CANCELLED~~
Tues September 15th

Meetings are 1-3pm, in the Frome Rd Medical School North Building, Seminar Room 229.

2009 CENTRE EVENTS

Quarterly Networking Forum

Friday seminar followed by drinks and nibbles. March 17th, May, August and November, with other dates and venues TBA. See below for more information.

Honours and Postgraduate Information Day

Thursday July 23th, 12-2pm Med School North Seminar Room 229

Annual Research Meeting

To be held in late 2009.
More information will come as it is available.

GRANTS, FELLOWSHIPS AND ETHICS DEADLINES

ROBINSON INSTITUTE

Infrastructure Grants

has been allocated to each of the Centres.
See page 3 for information on how to spend it

NHMRC

Project Grant

Closing Date 17 March 2009

NHMRC

Career Development Awards

Internal Closing Date 20 March 2009

FACULTY OF HEALTH SCIENCE

2009 Mutual Community/FHS Postdoctoral Research Travel Grant

Closing Date 23 March 2009

FACULTY OF HEALTH SCIENCE

2009 Postgraduate Travelling Fellowship Round 2

Closing Date 1 September 2009

THE UNIVERSITY OF ADELAIDE Animal Ethics

| Animal Ethics Science Submission Deadline: | AEC Science Meeting: Tuesday |
|--|------------------------------|
| 6 March | 24 march |
| 17 April | 5 May |
| 29 May | 16 June |

IMVS VETERINARY SERVICES Animal Ethics

| Animal Ethics Science Submission Deadline: | AEC Science Meeting: Tuesday |
|--|------------------------------|
| 4 March | 18 March |
| 15 April | 29 April |
| 27 May | 10 June |

Development of CD4⁺CD25⁺FoxP3⁺ regulatory T cells from cord blood hematopoietic progenitor cells

Jonathon F. Hutton,* Tessa Gargett,* Timothy J. Sadlon,* Suzanne Bresatz,* Cheryl Y. Brown, Hedy Zola,^{†,‡} M. Frances Shannon,[§] Richard J. D'Andrea,^{‡,||,¶} and Simon C. Barry*^{‡,||,1}

*Molecular Immunology and [†]Leukocyte Biology Laboratories, Discipline of Paediatrics, and [¶]The Centre for Stem Cell Research, University of Adelaide, and [‡]Women's and Children's Health Research Institute, Women's and Children's Hospital, Adelaide, South Australia; ^{||}The Queen Elizabeth Hospital and the Institute of Medical and Veterinary Sciences, Adelaide, South Australia; and [§]The John Curtin School for Research, Australian National University of Adelaide, Canberra, Australian Capital Territory, Australia

Abstract: Adult stem cells are capable of generating all of the cells of the hematopoietic system, and this process is orchestrated in part by the interactions between these cells and the stroma. T cell progenitors emerge from the stem cell compartment and migrate to the thymus, where their terminal differentiation and maturation occur, and it is during this phase that selection shapes the immune repertoire. Notch ligands, including δ -like 1 (DL1), play a critical role in this lymphoid differentiation. To mimic this in vitro, stroma-expressing DL1 have been used to generate CD4⁺CD8⁺ double-positive and single-positive T cells from hematopoietic stem/progenitor cells. This system provides a robust tool to investigate thymopoiesis; however, its capacity to generate regulatory T cells (Tregs) has yet to be reported. Natural Tregs (nTregs) develop in the thymus and help maintain immune homeostasis and have potential clinical use as a cell therapy for modulation of autoimmune disease or for transplant tolerization. Here, we describe for the first time the development of a population of CD4⁺CD25⁺ low levels of CD127 Forkhead box P3⁺ cells that emerge in coculture of cord blood (CB) CD34⁺ progenitors on OP9-DL1 stroma. These hematopoietic progenitor-derived CD4⁺CD25⁺ Tregs have comparable suppressor function with CB nTregs in vitro. The addition of IL-2 to the coculture enhanced the expansion and survival of this population significantly. This manipulable culture system, therefore, generates functional Tregs and provides a system to elucidate the mechanism of Treg development. *J. Leukoc. Biol.* 85: 000–000; 2009.

Key Words: stem cell differentiation · suppressor · ex vivo differentiation · OP9-DL1

INTRODUCTION

Cord blood (CB) hematopoietic stem cells (HSC) have the capacity to form all of the mature cell types of the blood, and

CB is a readily available source of cells for stem cell transplantation [1]. Although the potential of stem/progenitor cells to generate a broad range of hematopoietic cells has been shown in vitro by coculture of hemopoietic progenitor cells (HPC) on unmodified stromal feeder cells, commitment to the lymphocyte lineage is poorly represented [2]. The development of stromal coculture systems such as the OP9 system, which is derived from the M-CSF-deficient op/op mouse, supports extensive B lymphocyte, but not T lymphoid, development. When OP9 cells are engineered to display the Notch ligand δ -like 1 (DL1), differentiation of HPC cultured on these cells is switched from B cell to T cell development [3–5]. This mimics the thymic maturation and development process in vivo, which is dependent on Notch signaling for thymocyte development [6] and T cell commitment [7]. T cells generated in this culture system are functionally similar to normal T cells, and their development appears to occur in stages that correspond with checkpoints observed during in vivo thymopoiesis [8, 9]. Of the lymphoid cells that could be generated from stem/progenitor cells using this system, little focus has been given to generating tolerance-inducing regulatory T cells (Tregs). In vitro systems to generate Tregs would be of significant clinical relevance, and although there is great interest in natural Tregs (nTregs) as a potential cellular therapy, the ex vivo generation of nTregs from CD34⁺ stem/progenitor cells has not hitherto been demonstrated.

nTregs represent 1–5% of circulating CD4⁺ T cells [10]. These nTregs are able to suppress a broad range of immune cells through multiple mechanisms (reviewed by Miyara and co-workers [11]). The cell-surface phenotype, transcription factor profile, and cytokine secretion properties of Tregs are now well defined. In particular, nTregs require the constitutive expression of the transcription factor *Forkhead box P3* (*FOXP3*) [12], are characterized by high levels of CD25 (CD25^{hi}) and/or low levels of CD127 (CD127^{lo}) [13, 14], and do

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CONFERENCES 2009

Keystone Symposium: Stem Cell Niche Interactions (D5)

April 21-26, 2009

Whistler, BC Canada

Abstract submission deadline: Dec. 22, 2008

Late abstract submission deadline: Jan. 26, 2009

Scholarship deadline: Dec. 22, 2008

Early registration deadline: Feb. 23, 2009

<http://www.keystonesymposia.org/Meetings/viewMeetings.cfm?MeetingID=974>

Human Pluripotent Stem Cells: Interrogating Disease and Development

April 22-24, 2009

Dublin

Poster abstract deadline: Feb. 27, 2009

<http://www.abcam.com/index.html?pageconfig=resource&rid=11610>

World Stem Cells and Regenerative Medicine Congress

May 12-14 2009

London UK

Translating stem cell research from bench to business

Registration closes: May 12 2009.

<http://www.terrapinn.com/2009/stemcells/conf.stm>

ISSCR 7th Annual Meeting

July 8-11, 2009

Barcelona, Spain (CMRB)

Co-sponsored by the Centre for Genomic Regulation (CRG) and the Center of Regenerative Medicine in Centre Convencions Internacional Barcelona

<http://www.isscr.org/meetings/index.cfm>

2nd World Congress on Tissue Engineering and Regenerative Medicine International Society (TERMIS)

Aug 31 - Sept 3, 2009

Seoul, Korea

<http://www.termis.org/wc2009/>

Stem Cells & Cancer

Sept 13-18, 2009

Switzerland

Les Diablerets Conference Center

Les Diablerets, Switzerland

Abstract Deadline: Aug 23 2009

<http://www.grc.org/programs.aspx?year=2009&program=stemcells>

