

# insight

prince henry's institute  
quarterly NEWSLETTER



Message from  
the Director



Dear Friends,

Our mission at Prince Henry's Institute is to improve quality of life through the investigation of hormones in the fields of reproductive health, cancer, diabetes, obesity and cardiovascular disease. Insight is a quarterly newsletter which provides information on the Institute's latest research discoveries and achievements. We hope that you enjoy reading this latest issue. For more information on our research visit [www.princehenrys.org](http://www.princehenrys.org)

Happy reading!

Professor Evan Simpson  
Director

## Pregnancy Research wins Young Scientist of the Year

Christine White from Prince Henry's Institute has won the 2005 Young Scientist of the Year Award for her account of research into how the embryo communicates with the womb.

The national award, organised by The Australian newspaper and the British Council Australia, aims to recognise research excellence and assist scientists to communicate more effectively with the public.

Christine was recognised for her research into the growth factor interleukin-11 and how it helps an embryo to implant in its mother's womb.

It is estimated that 40 – 50% of pregnancies end in miscarriage, and 75% of these miscarriages are due to

failure of the embryo to implant into the womb.

"For just a few days each month the womb is receptive to pregnancy. The embryo implants and buries into the womb and 'talks' with the mother in an exchange of chemical messages that trigger the growth of the placenta."

"Our research has shown that interleukin-11 plays a critical role in this process and may provide new targets for an infertility test or treatment," said Christine.

"This important discovery into how the womb communicates with the embryo could not only help women to become pregnant but also to create healthy babies," said Professor Lois Salamonsen, Head of Uterine Biology

and Christine's supervisor at Prince Henry's Institute.

Christine receives a trip to the UK and Ireland and will undertake science journalist training in the Sydney office of The Australian and the London office of The Times newspapers.



Jacqui Schade (left) and her son Sean Queantal with Christine White, 2005 Young Scientist of the Year Award winner  
(Source: The Australian)

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# Proteomics Leading Ovarian Cancer Research

insight

The SELDI proteomics system scans the complex mix of proteins in the blood to identify patterns indicating the early stages of ovarian cancer

Latest proteomics technology at Prince Henry's Institute will boost scientists' hopes of finding an early detection test for ovarian cancer.

Ovarian cancer is the sixth most common cancer affecting Australian women. Across Australia one woman dies every ten hours from this disease. The key to improving the survival rate of ovarian cancer is early detection.

Funds raised from the National Australia Bank Ovarian Cancer Research Foundation 2004 Silver Ribbon campaign have helped to purchase a SELDI proteomics system.

"This is a very exciting direction for ovarian cancer research and the Institute," said Dr Martin Oehler, the NAB Ovarian Cancer Research Foundation Fellow.

It is hoped the technology will greatly assist Dr Oehler and his team in the search for an early detection test.

Proteins that are over expressed by cancer cells and then released into the bloodstream are ideal markers for early diagnosis.

The SELDI proteomics system scans the complex mix of proteins in the blood looking for patterns which are signatures of early stage ovarian cancers and which can be used as a tool for diagnosis.



*Dr Martin Oehler and Associate Professor Thomas Jobling of the National Australia Bank Ovarian Cancer Research Foundation with the SELDI proteomics system*

By comparing different tissues (ie normal vs. cancer), identification of changes in protein expression may indicate why a cancer develops.

The SELDI proteomics system has the potential to advance the understanding and early detection of ovarian cancer.

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## **Buy a Silver Ribbon and Support Ovarian Cancer Research**

Silver Ribbons are available from all National Australia Bank branches from 5 September to 28 October which includes Ovarian Cancer Research Week, 5 -11 September.

Ribbons cost \$2 each, with all monies raised going directly towards finding an early detection test for this insidious disease.

Donations may also be made at any National branch, on-line at [www.national.com.au](http://www.national.com.au) or by calling 1800 00 55 14 (between 8am and 8pm – Monday to Friday).

For further information about the National Australia Bank Ovarian Cancer Research Foundation, please telephone 03 9296 2040 or visit [www.ocrf.com.au](http://www.ocrf.com.au)

For more information about ovarian cancer research at PHI visit [www.princehenrys.org](http://www.princehenrys.org)

# Novel transport of SRY provides clue to sex determination

A recent discovery at Prince Henry's Institute may provide the clue to the cause of the intersex condition, Swyer Syndrome.

Usually, boys' sex chromosomes are XY and girls are XX. Intersex children are born with reproductive organs/genitalia that do not match their sex chromosomes. This condition affects about one in 4,000 Australians.

In Swyer Syndrome, a type of intersex condition, individuals with male chromosomes develop as females but lack ovarian function and also have a high incidence of gonadal cancer.

Previous research by Prince Henry's Institute and Monash University established that the transport of the testis-determining-protein SRY into the nucleus of the cell is a critical step in typical sex organ development.

The recent discovery published in the July issue of the international journal *Molecular Endocrinology* describes how the protein Calmodulin helps SRY induce sexual development.

The research by PHI scientist Dr Helena Sim, showed that

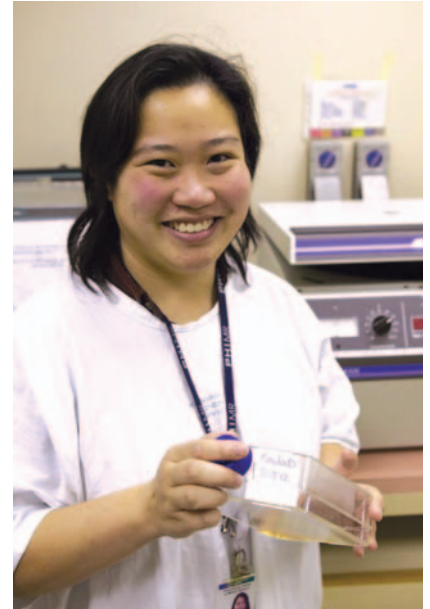
Calmodulin provides an avenue for transport of SRY into the nucleus of the cell, where it switches on other genes required to form a testis.

These novel findings were clarified in human studies where SRY variations resulted in a reduced function of Calmodulin.

"This discovery further assists us to better understand the cause of intersex conditions and to provide the basis for better clinical management for patients," said Associate Professor Vincent Harley, Head of Human Molecular Genetics at Prince Henry's Institute.

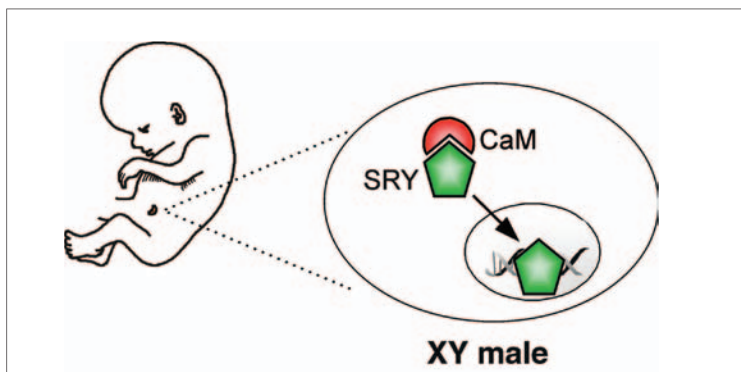
## PHI on Four Corners

Associate Professor Vincent Harley recently featured on the ABC's Four Corners program "The Gender Puzzle" (25 July 2005). The program discussed the complexities of sex determination and the difficulties facing people with conditions such as intersex and transsexualism. For more information see the ABC website <http://www.abc.net.au/4corners>



*Dr Helena Sim discovers a new avenue for sex determination in males*

Usually, boys' sex chromosomes are XY and girls are XX. Intersex children are born with reproductive organs/genitalia that do not match their sex chromosomes. This condition affects about one in 4,000 Australians



*Diagram: Calmodulin provides a second avenue for SRY to perform its function in sex organ development*

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# Hormones and family fun at Federation Square

Hundreds of visitors were fascinated by science at the Australian Society for Medical Research (ASMR) Medical Research Week EXPO at Federal Square in Melbourne on Sunday 5th June.

The EXPO was part of a week dedicated to promoting medical research. The week involved a range of educational and family activities in each state. Prince Henry's participated at the EXPO with an interactive and educational display.

Knowledge of the hormones, oestrogen and testosterone, was tested in a competition with prizes awarded throughout the day. Children enjoyed playing "Pin the Hormone on the Human" and looking at cells through a microscope.



Members of the Geelong Scottish Dance Inc play "Pin the Hormone on the Human" at the ASMR Medical Research Week EXPO

Radio 3RRR, Einstein A Go Go presenter Dr Fi Fi announced Prince Henry's Institute stall as the best of the day. Scientists Dr Sarah Meachem and Pavel Sluka who are researching sperm

production, male infertility and targets for a male contraceptive, provided lively topics of discussion during an interview at a special outside broadcast on the day.

# Top science students gain research skills at PHI

Prince Henry's Institute has joined a state-wide program to assist science students in gaining valuable laboratory experience before embarking on a scientific career.

Third year science students Marnie Sparrow from Melbourne University and Yinan Zhang from Monash University have been selected to participate in the Undergraduate Research Opportunities Program (UROP).

Coordinated by Bio 21 Australia Ltd, UROP provides high performing students with opportunities to gain essential hands-on experience and contribute to a research project at leading research institutes. Selection into the program is

based on academic performance and an interview process.

Supervised by Dr Kaye Stenvers of the Female Reproductive Group, Marnie's project focuses on how an embryo grows into a healthy baby. In particular she is investigating the role of growth factors, the TGF beta family, in the formation of the placenta. This research project hopes to assist in our understanding of problems in fertility and pregnancy.

Yinan has joined Professor Peter Fuller's research team and the Endocrine Genetics Group. Her project will focus on the molecular basis of granulosa cell tumours. This research hopes to contribute to a better understanding of ovarian cancer.



Science student Marnie Sparrow

"This is a fantastic opportunity for students to understand a research working environment. It not only provides them with a great experience but the Institute benefits from recruiting some of the best students in Victoria," said Professor Evan Simpson.

For more information about UROP – visit <http://www.bio21.com.au/urop.asp>