

An attractive uterus key to leading embryos in the womb

A scientist at Prince Henry's Institute (PHI) has discovered a new protein that plays an important role in attracting human embryos to the womb, supporting the establishment of a healthy pregnancy and leading to improved infertility treatments.

Approximately one in six Australian couples will experience infertility. A large part of this may be due to faulty coordination and guidance of the embryo to the mother's womb.

PhD student Natalie Hannan, part of the Uterine Biology Group at PHI, has found that the protein fractalkine, which attracts white blood cells to areas of inflammation, is also produced by the uterus.

"To ensure a healthy pregnancy, the lining of the uterus must produce factors that attract the embryo to implant and begin to grow. Fractalkine may help the placenta to form and tap into the mother's blood supply, by guiding the developing cells to their right destination," said Miss Hannan.

"The problem for many infertile couples lies in the failure of the embryo to

become properly embedded in the mother's womb. A better understanding of this complicated process should advance treatments for infertility.

"Despite remarkable advances in infertility treatment over the past few years, more than 75 per cent of in vitro fertilisation (IVF) attempts fail. A large part of this may be due to miscommunication between the mother and the baby, involving proteins such as fractalkine."

Miss Hannan said that fractalkine is produced by the lining of the uterus at the time of implantation. Using advanced technology, she discovered that human placental cells migrate towards fractalkine.

"Without fractalkine and many other similar proteins involved in the control of the essential processes of early pregnancy, implantation will fail.

"This exciting finding may improve IVF success rates by providing new targets for infertility treatment. It also aids our understanding of what makes a healthy pregnancy, which is ultimately a successful start to life," said Miss Hannan.



*Fresh Science Finalist, PhD student
Natalie Hannan*

Miss Hannan presented her research discovery to the public as one of 16 young scientists chosen from across Australia for the renowned Fresh Science competition.

Miss Hannan participated in a number of key media and social events during the three day program, which is designed to publicise the work of early-career scientists.

Professor Lois Salamonsen, head of the Uterine Biology Group at PHI, said the Institute was extremely proud of Miss Hannan's research success.

"Natalie is a promising young scientist who combines enthusiasm, talent and hard work to achieve her goals of improving women's health," she said.

PHI Awards

Androgen Research



Professor Henry Burger, Emeritus Director at Prince Henry's Institute, has been selected as the recipient of the 2006 NAMS/

Procter & Gamble Pharmaceuticals Morrie M. Gelfand Leadership Award in Androgen Research.

The award recognises an individual whose outstanding research has advanced our understanding of the role of androgens in postmenopausal women.

Professor Burger said he was honoured to be selected for the prestigious Leadership Award.

"It is with great pleasure that I accept this award, which recognises many years of work by a whole team of colleagues in Melbourne, particularly the late Jean Hailes, as well as Professors Lorraine Dennerstein and Susan Davis," he said.

A pioneer in reproductive endocrinology, Professor Burger has worked in the field for more than 30 years. He has received countless accolades for his research into the management of the peri and postmenopause, female and male infertility, hirsutism and the role of the hormone, inhibin, in ovarian cancer.

Myth or Fact?

Myth: "Infertility is a women's problem".

Fact: This is untrue. It surprises most people to learn that infertility is a problem that affects both men and women equally - and is often a combination of male and female factors.

Serono New Investigator Award



L to R: Serono New Investigator Award finalists PhD students Premila Paiva, Saleela Ruwanpura and Natalie Hannan

Three of the Institute's young female scientists were amongst six finalists chosen from across Australia for the prestigious 2006 Serono New Investigator Award for research into reproduction.

PhD students Natalie Hannan, Saleela Ruwanpura and Premila Paiva travelled to the Gold Coast in August for the 37th Annual Conference of the Society for Reproductive Biology.

The girls each earned a nomination for their outstanding research into male and female reproduction.

Natalie was recognised for her studies into early pregnancy. A member of the Uterine Biology Group at PHI, Natalie has discovered a new protein called fractalkine, which is crucial to a healthy pregnancy and could lead to improved fertility treatments (See page 1 for more details).

The development of the placenta is also key to a successful pregnancy. Premila's research examines the role of a factor called interleukin-11 in the formation of the placenta during early pregnancy. Her studies could have implications for the treatment of infertility and the prevention of miscarriage.

Saleela has spent the past two years investigating the complex role of hormones in sperm development and survival in a bid to uncover why one in 20 Australian men suffer fertility problems. Saleela said she hoped her work would one day lead to men being able to regulate their own fertility.

Congratulations to our talented students who have shown what can be achieved through hard work and dedication. We look forward to following their future accomplishments.

Ovarian Fountain of Youth

Scientists at PHI, in collaboration with Monash University, have found that female mice have a renewable egg supply in their ovaries, paving the way for potential female fertility treatments.

The discovery, by Professor Jock Findlay from PHI and Associate Professor Jeff Kerr from Monash's Department of Anatomy and Cell Biology, challenges the long held theory that female mammals are born with a finite number of oocytes (eggs).

In humans, the eggs are believed to die off from late in foetal life, after birth and into adult life. When egg numbers decline towards zero females can no longer reproduce – resulting in the condition known as menopause.

However Professor Findlay, Dr Kerr and their colleagues have found that the total number of eggs in young and healthy adult female mice do not decline over time and that overall egg number is maintained for longer than previously thought.

Professor Findlay said this suggested that mice may have a source of renewable oocytes.

"The mechanism behind renewable oocytes is still unknown," he said.



Professor Jock Findlay (right) and Associate Professor Jeff Kerr's discovery that female mice have a renewable egg supply in their ovaries could have implications for future fertility treatments

"Although other scientists have suggested that the new eggs come from stem cells in the bone marrow or the ovary, we really don't know and further experimentation is needed to find out."

Professor Findlay said egg regeneration in mice did not necessarily mean the same happened in humans but claimed this mechanism could provide direction for ovarian stem cell research and help women with fertility conditions.

COO Appointment

Prince Henry's Institute would like to welcome Dr Jane Glatz to the new role of Chief Operating Officer.



Dr Glatz has a medical research background (PhD) combined with an MBA and strong administrative experience, including the demanding role of establishing Research Australia.

Her combined research and business experience will provide strategic leadership and a valuable interface between the Institute's researchers and administration team. One of Jane's priorities is developing a strategic plan that sets out the future direction and imperatives for the Institute.

Prince Henry's wakes up to Sunrise

Scientists at Prince Henry's enjoyed a taste of national fame when popular television breakfast program Sunrise broadcast live from the Institute recently.

Charismatic weatherman and Channel 7 personality Grant Denyer joined former Olympian Raelene Boyle and ovarian cancer patient Katia Kecse-Nagy for the launch of the 2006 NAB Ovarian Cancer Research Foundation (OCRF) Silver Ribbon campaign.

The annual campaign kicked off with a bang in the Institute's new state-of-the-art precinct building, with the Sunrise crew teaming with NAB OCRF and Prince Henry's scientists to help raise vital funds for ovarian cancer research.

PHI scientists Natalie Hannan, Tu'uhevaha Kaitu'u, Louisa Ludbrook and NAB OCRF Research Fellow Andrew Stephens enjoyed their 15 minutes of fame, featuring in two of the live weather crosses aired throughout the morning. A big thank you to everyone at PHI who braved the early morning chill to come down and support the launch.



L to R: Former Olympian Raelene Boyle, PHI scientists Louisa Ludbrook, Natalie Hannan, Tu'uhevaha Kaitu'u and Sunrise weatherman Grant Denyer

Ovarian cancer claims the life of one Australian woman every ten hours. When diagnosed, the disease is usually well advanced and has spread to other parts of the body, decreasing chances of survival. The key to improving these alarming statistics is early detection.

The NAB OCRF, in collaboration with Prince Henry's Institute, is working to find an early detection test for ovarian cancer.

The \$5 Silver Ribbon Lapel Pins are available for purchase from NAB branches across Australia until Friday 29 September 2006. Ribbons are also sold at Witchery retail stores throughout the year. All funds raised from the sale of the ribbons go directly toward research into an early detection test for ovarian cancer.

Donations can also be made at any NAB branch or online at www.ocrf.com.au

The PHI Karate Kid

Talented scientist Maria Alexiadis has been selected as one of only 13 athletes to represent Australia at the upcoming World Karate Championships in Finland.

A member of the Endocrine Genetics group at PHI, Maria will spend four weeks training and competing with some of Europe's best fighters before the World Championships in October.

Maria has been involved in karate for 18 years, boasting a career of four Oceania titles, four National titles, three Australian Open titles, six Victorian State titles and the 2003 English Open Champion.

She has won one gold and two silver medals in the Commonwealth Karate Championships and represented Australia in the World Karate Championships in Spain in 2002.

Maria juggles a hectic schedule of tournaments and training six days a week, while working as a research assistant in the field of ovarian cancer research.

After months of intensive training, Maria believes she is well prepared for the event.

"To win gold at the World Championships is my ultimate goal and I feel ready to take on the best in the world," she said.



PHI scientist and karate champion Maria Alexiadis

PHI is proud of Maria's extraordinary achievements and wishes her all the best as she fights for gold.