IOGT
INSTITUTE OF OBSTETRICS & GYNAECOLOGY TRUST

Progress

Issue 1

Professor Robert Winston needs your help

Why do we need your help with vital medical research?

1 in 18 babies in the UK is born prematurely

This is a rate that has barely changed since the 1930s.

1 in 4 babies are miscarried

This rate has also remained the same since the 1930s. No matter how early in pregnancy a child is lost, the parents' grief is terrible.

1 in 175 babies is stillborn

This rate has remained almost unchanged since 1995.

The aim of the IOGT is to save lives

The IOGT was set up in 1985 to provide vital financial assistance for medical research and teaching, in gynaecology obstetrics and related fields in paediatrics.

Donating funds to the IOGT and Women for Women will help more scientists and clinicians to specialise in the prevention, diagnosis and treatment of a range of devastating conditions affecting women and their babies.

All of us can imagine the desperation and sadness of parents who lose a baby, and the life-shattering impact that a seriously ill child has on a family.

It is remarkable how little money is available for research into women's health, given that conditions which affect conception, pregnancy and birth are so extraordinarily common.

Problems such as miscarriage and infertility affect a vast number of people; every couple worries whether their much wanted baby will be healthy; more than one in fifty children is born with a birth defect; premature delivery is the commonest reason for brain damage, causing irreversible disability for the rest of life.

These are only some of the crucial endeavours the IOGT aims to alleviate with its research. And ours is a truly unique cause for another reason. The IOGT is also committed to empowering women in other ways.

For example, by ensuring that our leading young female scientists have proper financial support to do their research, we help them continue to make a massive contribution to the welfare of people everywhere whilst raising their own families. Needless to say, the IOGT employs top male scientists, too, and the work of all the research groups in our building is of the highest calibre and is respected worldwide. Our work often has surprising benefits well beyond just those surrounding birth.

For example, the project that I am conducting with my own research group should lead to ensuring that the shortage of donor organs for people with heart, liver or kidney failure is a thing of the past.

In this newsletter you will get just a taste of some of my colleagues' projects. All these have surprisingly important implications for the health of people frequently going well beyond conventional ideas of gynaecology or obstetrics. We are proud that we are doing work which has such an important impact on the health of people everywhere and the well-being of the next generation.

Robert Winston.

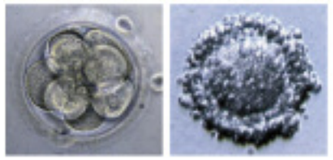
Professor Robert Winston
Chairman of the IOGT

Women for Women
Official IOGT fundraisers

Current research being funded by IOGT & Women for Women

Genetics of Polycystic Ovary Syndrome

Professor S Franks



Polycystic ovary syndrome (PCOS) is a very common hormone disturbance, which affects nearly one in ten women during their child-bearing years.

The ovaries (normally about the size of an average plum) are typically a bit larger than average and contain many small cysts. Small cysts are normally present in the ovaries (they contain the eggs) but there are more of them in women with PCOS ('polycystic' meaning 'many cysts').

PCOS is often associated with irregular, infrequent or absent periods and this may affect a woman's chances of getting pregnant. It can also be a cause of unwanted body hair. In women with PCOS who are overweight there is an increased risk of developing diabetes in later life.

The cause of PCOS is still not clear but it is really interesting that a disease process causing infertility looks as if it has a major genetic component.

The project funded by the IOG Trust is designed to help identify the genes involved in causing PCOS. We have employed a research nurse (Anne Valentine) who is supervising the recruitment of patients with PCOS and collecting blood samples so that we can prepare (anonymised) DNA samples for genetic analysis. Understanding the role of these genes will help us to devise new methods of diagnosis and treatment for this distressing disorder.

Hormonal control of reproduction

Professor M Parker

The female hormones oestrogen and progesterone are essential because they control how we reproduce. The way the ovary produces an egg, the remarkable process of how the developing embryo implants in the mother's womb, the maintenance of pregnancy and the processes of labour and birth are all regulated by these crucial hormones. The way they work is complex and somewhat mysterious, and the science is still being unraveled.

Essentially these hormones combine with special proteins which then send messages to the various genes which are crucial to these processes.

We study how this is all achieved and have found that it is necessary not only to switch genes on in specific cells but to switch them off at precise times. One of the remarkable proteins we have discovered is essential for ovulation. It functions by switching on some genes and switching off others. Certain mice do not have this protein so they provide a wonderful model for what happens in some women who do not ovulate properly.

One of the common causes of infertility is a condition called 'luteinised unruptured follicle syndrome' where this protein is involved. The protein is also important for regulating fat storage and metabolism in the liver and in muscles. We have identified the genes regulated by protein and so now have a very good idea about how ovulation and metabolism are controlled. This project, which has the highest international reputation, has been helped by the money raised by the IOGT.

What happens in the womb can last a lifetime

Professor V Glover

It is now clear that the way the baby develops in the womb can affect them for the rest of their life. Our research is especially focussed on how the emotional state of the mother affects the development of the fetal brain. We have shown that if the mother is especially stressed or anxious while pregnant her child is more likely to be anxious, to have symptoms of attention deficit/hyperactivity disorder or to learn more slowly. The risk for one of these adverse outcomes is doubled, from about 5 to 10%.

We are using the funds we have been given by the IOGT to further this research in various ways. We are studying whether women with medical disorders of pregnancy are more stressed and anxious than other women, and how this affects their hormonal profile. This seems likely but has never been studied. We are conducting an intervention study to determine whether we can reduce antenatal maternal stress and anxiety, and the relevant hormone levels.

We are also studying the mechanisms by which maternal stress or anxiety may affect the fetus. We have shown that if the level of the stress hormone cortisol is raised in the amniotic fluid, the child is more likely to have cognitive delay. We have some recent evidence that maternal anxiety can affect the function of the placenta and increase the amount of cortisol that passes from mother to fetus.

About one million children in the UK suffer from some form of neurodevelopmental disorder and about 15% of this appears due to antenatal stress. If we can understand more about this, there is the potential to help about 150,000 children.

Developing treatment for ovarian and breast cancer

Dr N Dibb

Women for Women help to support the research of three of my current PhD students, Nicola Brownlow, Elcie Chan and Alison Russell and two previous PhD students, who have since graduated and are now doing postdoctoral studies for Cancer Research UK.

Most of our research is concerned with kinase inhibitors, which are a new type of drug that are increasingly used for cancer treatment. The best known of these new drugs is Imatinib (also known as Gleevec or Glivec), which has been remarkably successful for the treatment of chronic myeloid leukaemia.

Our research indicates that Imatinib and a number of other drugs that are either being used or developed for the treatment of leukaemia may also be valuable for the treatment of ovarian or breast cancer.

For some of this work we collaborate with Dr Sadaf Ghaem-Maghami, who is a surgeon within our department who specialises in gynaecological cancer. The majority of this research has been completed by these PhD students who also contributed to other related projects, which include the development of better drugs for cancer treatment and furthering our understanding of how cancer cells grow and spread.

Uterine biology

Professor J Brosens

The early human fetus is deeply embedded in the lining of the womb (endometrium). To accommodate pregnancy, the endometrium must undergo profound changes and establish an effective blood supply to the placenta to ensure growth and survival of the baby in the later stages of pregnancy.

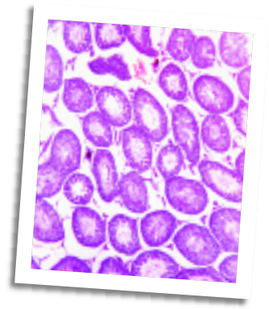
Substances called free radicals are inevitable by-products of these changes in blood supply and oxygen consumption. In the absence of adequate defences, free radicals damage and trigger the death of endometrial cells, which result in either miscarriage or late pregnancy complications such as pre-eclampsia and fetal growth restriction.

Funds awarded by the IOGT and Women for Women have allowed us to investigate the signals and factors that control this process of endometrial preparation and to determine how endometrial cells establish sophisticated defences to cope with free radicals in pregnancy. These defences include increased capacity to neutralise free radicals and, most importantly, disabling of the signaling pathways normally activated by free radicals.

Our studies have revealed new treatment targets for the prevention of common pregnancy complications, such as early pregnancy loss. Importantly, preparation of endometrial cells for pregnancy occurs in humans in each menstrual cycle. Future work will therefore also be focussed on developing tests capable of identifying patients at risk of obstetrical complications prior to pregnancy.

Finding reasons for infertility

Professor I Huhtaniemi



The pituitary gland at the base of the brain is responsible for the secretion of two hormones that control the development and function of the gonads. These so-called gonadotrophins, follicle-stimulating hormone and luteinising hormone can be considered master switches for the regulation of female and male reproduction.

Their actions are of crucial importance for the production of eggs by the ovary and sperm by the testes, as well as the production of female and male sex hormones. We are studying how these hormones function, using cell cultures and genetically modified mice, and how disturbances in their action can result in infertility. We have identified genes and cell signalling pathways that cause premature ovarian failure, ovulation disturbances, ovarian and pituitary gland tumours, poor production of sperm and disturbances in pubertal development. By understanding the role of these hormones in these processes it is possible to devise better diagnostic procedures and treatments of infertility, as well as novel strategies to develop new contraceptive methods.

The IOGT awards we have received have been used to support the research work of the young scientists and students that are working in our team.

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The power of Women for Women

Women for Women

Women for Women goes on uniting women to raise funds for the IOGT. Since the first ride there have been sponsored cycling rides in Turkey, Cuba, Egypt and India – with over 1000 women raising more than £1.5 million. The 8th Women for Women challenge in Cuba is a record-breaker with four events being held in 2008/2009. Plans for the 9th Women for Women challenge in China in 2009 are already underway.

Professor Robert Winston, Chairman of the IOGT and the fundraising arm Women for Women, said, "We are incredibly grateful to all the women who have taken part in our rides, they have done a huge amount to benefit our research and play a very active part in safeguarding future generations."

To receive full information and an application form, email event organisers Action for Charity on *events@actionforcharity.co.uk*

FUNDRAISING EVENTS

The magic of India

Hundreds of women have followed the lead of *This Morning* TV presenter Fern Britton and taken a passage to India for Women for Women cycle challenges with the most recent team arriving back in February 2008.

Fern and two viewers from the *This Morning* programme were among nearly 200 women who took part in last year's Cycle India – a 390km cycle ride through Rajasthan. Their adventures were screened on the daytime television programme. Three Cycle India events in 2007/8 followed the same route and were, as before, challenges to test the best as the women cycled on and off-road through rural India, through towns and villages untouched by the 21st century and on terrain that ranged from poor quality roads to challenging dirt tracks, sand and mud. A total of nearly 400 women have now taken part in the Cycle India challenges.

Return to Cuba

Women for Women is returning to the Caribbean island of Cuba for its 8th women-only challenge.

A fourth date for Cycle Cuba was recently announced as hundreds of women follow the lead of *This Morning* TV presenter Fern Britton and sign up for the challenge. Fern is getting back on her bike for her third Women for Women event having completed challenges in Egypt and India.

Three dates for Cycle Cuba rides in November 2008 and March 2009 are now full with applications being taken for the fourth ride from 13-22 March 2009. The challenge is to cycle 370km through Cuba. To take part you need to pay a registration fee of £250 and raise minimum sponsorship funds of £3000 for Women for Women. The cost of flights, food, accommodation, use of bikes, guides and so on, will all be paid from these funds.

Next stop China...

The 9th Women for Women cycling challenge will be held in China with three events planned in September and October 2009.

It is an opportunity of a lifetime for anyone who has ever wanted to visit China and experience the mix of culture, people and history away from the usual tourist trails. It will be a ride of fun and friendship as our cyclists unite to support the IOGT.

The 440km ride will take the group through the Beijing countryside, along riverbanks, through steep gorges, past tiny villages, ancient tombs and historical landmarks, visiting both restored and unrestored parts of the Great Wall. There will be opportunities to visit The Forbidden City, the Summer Palace and Tiananmen Square. To take part in the ride women will need to pay a registration fee and pledge to raise minimum funds for Women for Women.

It's easy to donate!

Title	*Surname*
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I am enclosing a cheque for the sum of £

The IOGT is registered charity 292518

To make a donation

- Simply fill in your details below and send this panel with a cheque made payable to *The Institute Trust Fund* to the IOGT address on the right
- Or go online at www.iogt.org.uk and click 'Donations' to pay by debit or credit card
- Or telephone us on 020 7594 2143 if you'd like to discuss how you could help the IOGT further

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Gwen Young
IOGT
Wolfson & Weston Research Centre
Imperial College London
Hammersmith Hospital
Du Cane Road, London W12 0NN

Contact us on

020 7594 2143
g.young@imperial.ac.uk
www.iogt.org.uk

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