



THE UNIVERSITY
OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

Ending endometriosis pain

Finding answers for endometriosis in genetic markers

Inside one in 10 women is an invasive disease ravaging their reproductive and surrounding organs. Endometriosis is silent and complex, disabling women in their prime years of development and productivity.

It causes severe pain and sometimes infertility. It can be extremely debilitating, physically and emotionally.

And dealing with endometriosis is more than a drain on a young woman's energy; it's estimated to cost the Australian economy around \$6 billion a year.

We know the risk factors are 50 per cent genetic and 50 per cent environmental. We know there are delays in diagnosis, often because the disease presents itself differently in every woman, and right now the available treatments only work for some.

When we know more about the causes of endometriosis, we can do more to relieve the pain, the fear and the loss.

With an innovative approach to studying both genetic and environmental factors, UQ researchers are committed to end the battle against this crippling chronic condition for our sisters and daughters.

Revealing the reasons for endometrial cells taking hold elsewhere

Endometriosis is a progressive, invasive disease in which uterine-similar cells grow in other parts of the body, continuing and intensifying the cycles of pain and bleeding.

Professor Grant Montgomery from UQ's Institute for Molecular Bioscience (IMB) and his team are investigating why these cells develop and attach to other pelvic and abdominal organs, and what triggers could be targeted for effective treatment.

Working with international teams, they have studied the genomes of 200,000 people, focusing on eight million sites across the genome for each person. Their efforts have produced the most comprehensive data about endometrial cell characteristics to date.

Knowing now that this complex disease is caused by multiple genetic variants that contribute to incrementally increased risk, Professor Montgomery's research has turned to uncovering how each risk factor contributes to how the disease presents in different patients. The question now asked is if, like cancer, there are actually different types of this disease.

Impact and outcomes

Breaking down the complexity of endometriosis will transform knowledge about this silent epidemic. Isolating the different causes will ensure the right therapies are chosen to relieve each woman's symptoms. Understanding the exact environmental triggers for genetic responses may even prevent the disease from developing.

"We aim to find the genetic targets—*inherent and environmental—that will respond to new treatments for different subtypes of endometriosis."*

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Researcher profile

Professor Grant Montgomery

Professor Grant Montgomery is an NHMRC Principal Research Fellow and an Australian pioneer of genome mapping for complex human diseases.

He's also the patron of Queensland Endometriosis Association (QENDO).

At UQ, Professor Montgomery holds joint appointments with the IMB and the Queensland Brain Institute (QBI), leading a team of scientists seeking genomic factors that explain variations in reproductive traits and increased risk for reproductive diseases, including endometriosis.

Looking at the environmental factors contributing to this disease alongside the genomic studies is an innovative approach, based on the idea that while you can't change genetics, you can influence environmental factors.

That's why his team is studying how human interaction with environmental factors can leave information on our DNA. If the environmental signature is there, working backwards—finding the signatures and then designing experiments to determine what caused them—could reveal the trigger for the genetic response.

If this frontier methodology works, a whole new world of possibilities will open up for exploring many other common diseases that have a combination of genetic and environmental risk factors.

Your opportunity to support game changing research at the Institute for Molecular Bioscience

Together, our greatest days lie ahead.

Here are just a few ways that giving to IMB's research can support our drive to end endometriosis pain.

- \$2,500 Supports travel costs for researchers to connect with clinicians for multi-disciplinary initiatives.
- \$10,000 Contributes to collaborative projects with pain research teams.
- \$50,000 Funds more targeted research into the genetic causes of endometriosis.
- \$100,000 Accelerates the discovery-to-delivery process of a non-invasive method for diagnosing endometriosis.

We welcome your suggestions for other ways to support IMB's research and help accelerate the translation of discoveries into hope for women with this invasive, debilitating disease.

For more information contact:

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“Although there is still a long road ahead before endometriosis can be diagnosed without laparoscopic surgery, or new treatments are created to better treat the disease, we have made significant progress over the past five years.

It’s not going to be easy and there are no shortcuts, but now is the time to capitalise on this success.”

Professor Grant Montgomery

Institute for Molecular Bioscience

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