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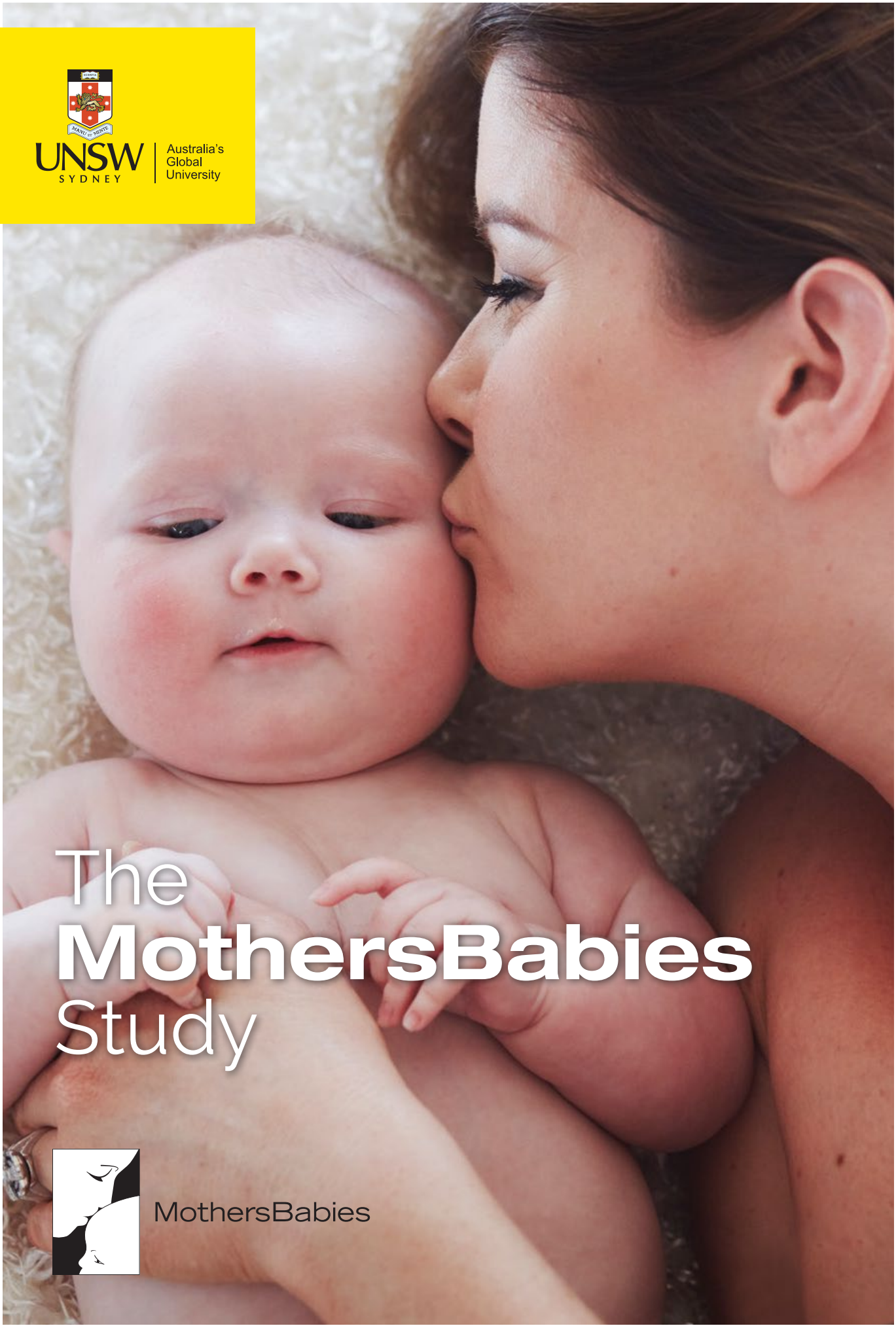


The MothersBabies Study

MothersBabies

“We owe it to **Humanity** to do this study.”

PROFESSOR
EMAD EL-OMAR

Director Microbiome
Research Centre UNSW Medicine

The future of our health **starts in the gut**

Emerging evidence reveals that the gut plays a crucial role in many common and serious health conditions. There is an inextricable link between the diversity and balance of our gut bacteria and our susceptibility to disease – yet the nuances and specifics of how this relationship works remain largely unknown.

The MothersBabies Study aims to change that. A bold initiative with promising implications, the Study will harness the emerging science of the 'microbiome' (the complex and dynamic ecosystem of gut microorganisms and its genetic material), exploring its link to immune and brain function.

Our goal is both urgent and ambitious, but with philanthropic investment it is wholly achievable. We want to create a safe, personalised and proven intervention that optimises gut health for mothers and their babies. And in doing so, we want to optimise their overall wellbeing for life. With this study, we have the potential to significantly contribute to disease prevention, in turn reducing the burden on our community and healthcare system. With your support, we can reverse the trend on declining health and create better outcomes for future generations.

THE MICROBIOME EXPLAINED

The human gastrointestinal tract is host to an invisible ecosystem of microorganisms, which includes trillions of bacteria, fungi and viruses. Collectively, this community of microorganisms as well as its genetic material is referred to as the 'microbiome'.

Where the **gut fits in**

There is a crucial relationship between the microbiome and the health of mothers and their babies.

We know that babies acquire their gut bacteria from their mother and that a baby's biological platform is created in the first few days of pregnancy. From the age of three, the basic building blocks of a baby's gut bacteria are established for life. The links and significance of the microbiome in pregnancy are starting to become apparent, but they are far from definitive.

We still don't know when to influence the gut to have the best possible impact on babies – whether it is pre-pregnancy, during pregnancy or in the first 12 months of a baby's life, but we want to find out. In fact, gaining this knowledge is an imperative. The discoveries that arise from the MothersBabies Study may hold the key to reducing the incidence of a range of common and in many cases serious and debilitating conditions.

We are heading to **'gut full' levels**

If our gut does not have enough healthy bacteria then we have gut dysbiosis.

Gut dysbiosis has a significant impact on our immune system, and our ability to fight common diseases such as asthma, hay fever, obesity, eczema and IBS.

It also has an effect on brain function, with emerging evidence linking it to depression, anxiety, autism and ADHD.

Today, millions of Australians are suffering from illnesses and conditions that may, in fact, be preventable. Alarmingly, many of these diseases are on the rise.

1 in 20 children have food allergies

8.6% of babies are born premature

1 in 4 children are considered obese

2.5 million children have asthma

22.8% Australians experience mental health issues

What if we could reverse the trend on these prevalent conditions and significantly decrease their incidence and severity? Instead of 'What if', the MothersBabies Study asks 'How?' You can help us answer this important question.

ESTELLE'S STORY

My husband and I have always known we wanted to start a family one day. The majority of my life I had taken conceiving and having children for granted. This changed when, after stopping oral contraception, my menstrual and ovulation cycle didn't return.

After some investigation, I learned that I had both Polycystic Ovary Syndrome and acute Irritable Bowel Syndrome (IBS). While the doctors couldn't conclusively determine whether it was the Syndrome or IBS preventing me from getting pregnant, it seemed that there was little possibility I would be able to conceive naturally.

Having learned about the MothersBabies organisation and their focus on improving our understanding of the relationship between the microbiome and health, I started following a strict diet with the aim to improve my gut bacteria.

Within months, my health was the best it had ever been and my menstrual and ovulation cycle returned of its own accord. When my husband and I decided to start trying for our family we fell pregnant with a healthy baby girl within the first cycle. Throughout my pregnancy and nursing I continued to follow my diet, hoping to properly nourish my baby and ensure that the microbiome I passed on to her would be as healthy as possible.

I do not wish for my daughter to struggle with the same conditions I have and hope that through my awareness and actions she will benefit.


A healthy pregnancy producing a healthy baby is a **fundamental tenet** of a strong and thriving community.

The **MothersBabies** Study

The MothersBabies study will examine the link between the state of the microbiome that a baby acquires from its mother and the potential for diseases to arise.

It will demonstrate that the biology of a microbiome, either pre-pregnancy or during pregnancy – or both, contains critical preconditions for both the mother and her baby's health. We seek to determine whether the composition of the maternal microbiome can predict a healthy or unhealthy outcome for mother and baby. And we plan to unravel the mechanisms involved in each of these outcomes.

Once these mechanisms are understood, the MothersBabies Study aims to discover an appropriate intervention to optimise the microbiome of mothers, so as to prevent adverse health outcomes during pregnancy and improve the health of their babies.

OUR AIMS

- To identify microbiome signatures that lead to certain favourable and unfavourable health outcomes in mothers and babies.
- To determine if interventions can be made to alter a mother's microbiome to prevent adverse health outcomes.
- To identify which intervention can restore the microbiome to a normal state and improve healthy outcomes for mothers and babies.

"WE BELIEVE THIS THERAPY WILL CHANGE THE FUTURE HEALTH OF MOTHERS, BABIES AND CHILDREN IN AUSTRALIA AND WILL BE AT THE FOREFRONT OF PREVENTATIVE MEDICINE WORLDWIDE. IT IS THE NEW FRONTIER OF MEDICINE,"

Professor Emad El-Omar

The MothersBabies Study is a three-part initiative, with the initial phase (the pilot study) already underway. Philanthropic investment is required to get the Stage One study off the ground and set our important investigations in motion.

This support will be leveraged to attract state and federal government funding for Stage Two, which will see the Study through to its completion.

PILOT STUDY

The Microbiome Understanding in Maternity Study (MUMS) is our pilot study already underway at St George Hospital. MUMS is the first comprehensive Australian pregnancy microbiome study analysing the microbiome during pregnancy, birth and one year postpartum. MUMS will result in high impact publications but more crucially, will form the basis for the analyses and methodology for the MothersBabies Study.

STAGE ONE

The objective of Stage One is to determine the microbiome signatures that could predict the outcomes of pregnancy for women and their babies, and to unravel the mechanisms involved in each of these outcomes. This phase examines what the signatures for healthy outcomes look like as well as the signatures for adverse outcomes – such as pre-term labour and pre-eclampsia in mother, asthma, allergies, autism, eczema, obesity and diabetes in babies and children.

As part of the study, we will recruit 2,000 women from across NSW to follow from pre-conception to one year postpartum. Infants will be followed from birth to one year of age. We will collect regular samples from mother, infant and a baseline sample from participant partners and conduct detailed microbiome and physiological analysis of samples to identify microbiome signatures and their influence on mother and baby.

Stage One lays important foundations for Stage Two as it identifies the microbiome signatures for different pregnancy outcomes and sets the scene for testing the efficacy of altering the microbiome with interventions.

STAGE TWO

Stage Two will combine the learnings from Stage One to look for an appropriate intervention to manipulate the microbiome to a healthy state, prevent adverse microbiome signatures and improve the health outcomes of mothers and babies.

For this stage of the study, we will recruit 2,000 women from across NSW who are planning pregnancy and assess their microbiomes in the preconception stage. We will conduct blind, randomised, placebo-controlled trials of various interventions and examine the changes in microbiome. Next, we will assess if interventions (prebiotics, probiotics, symbiotic, lifestyle modifications, or a combination of all therapies) can effectively modify the microbiome to reduce the incidence of adverse pregnancy outcomes.

A **powerful** collaboration

Unparalleled both for its size and scope, and for its potential to provide the evidence base to transform global health, the MothersBabies Study is a collaborative effort drawing on the combined capabilities and research strengths of:

- The University of New South Wales, Sydney
- St George Hospital
- St George & Sutherland Medical Research Foundation
- MothersBabies Ltd

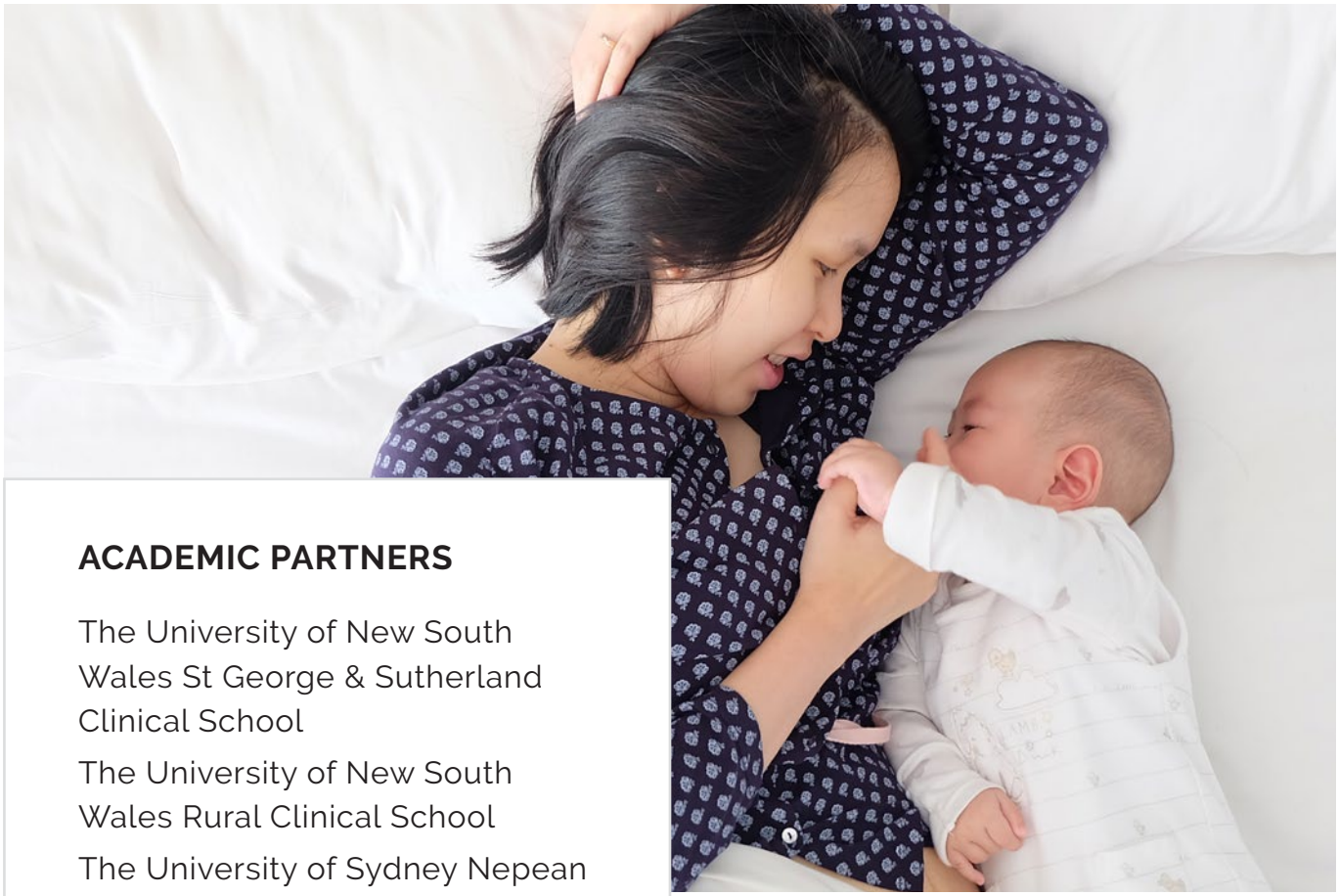
As well as our vast network of hospital and academic partners, listed below.

The UNSW Sydney Faculty of Medicine's St George and Sutherland Clinical School at St George Hospital have shared a long-standing partnership with the St George and Sutherland Medical Research Foundation (SSMRF) to translate innovative education and research into excellence in clinical care. Together, this partnership has endeavoured to provide the best care for patients through teaching and the clinical translation of research into exceptional care.

MothersBabies Ltd is a not-for-profit DGR entity that was established by parents, doctors and professors of medicine as an organisation solely for the purpose of working with the Microbiome Research Centre and UNSW Sydney to attract funds for the MothersBabies Study. Once this research is undertaken, MothersBabies Ltd will play a crucial role in translating the clinical findings to knowledge amongst the medical sector, general practitioners and families-to-be.

THE MICROBIOME RESEARCH CENTRE

Led by Professor El-Omar as Director, the MothersBabies Study will be coordinated from the Microbiome Research Centre (MRC), at the UNSW Sydney clinical campus at St George Hospital – the only centre of its kind in Australia that is dedicated to investigating the role of the microbiome in health and in disease. The MothersBabies Study will harness the leading facilities, technology, collaboration and expertise of the MRC to maximise the impact of the study.



ACADEMIC PARTNERS

The University of New South Wales St George & Sutherland Clinical School

The University of New South Wales Rural Clinical School

The University of Sydney Nepean Clinical School

The University of Newcastle Central Coast Clinical School

HOSPITALS

- St George Hospital
- The Royal Hospital for Women
- Nepean Hospital
- Wagga Wagga Hospital
- Gosford Hospital
- The Wollongong Hospital School

So that all women from across NSW can participate, regardless of location, we are also working towards opening sites in locations such as Dubbo, Newcastle, Tamworth and Lismore. Additional locations will be listed as they are confirmed.

Led by Professor El-Omar as Director, the Microbiome Research Centre has received $16 million of committed funds from Federal and State Governments, UNSW Sydney, South Eastern Sydney Local Health District (SESLHD) and philanthropists, with $1 million of this already directed to the MothersBabies Study. This level of investment demonstrates that the microbiome is the new frontier of medicine.

Research team

Professor Emad El-Omar, Director
Microbiome Research Centre, UNSW Medicine

Dr Amanda Henry,
Senior Lecturer in Obstetrics and Gynaecology, School of Women's and Children's Health, UNSW Medicine. Obstetrician at St George Public Hospital

Dr Daniella Susic,
RANZCOG Core Trainee, employed by SESLHD; Conjoint Associate Lecturer, School of Women's and Children's Health, UNSW Medicine; PhD Student – MUMs

Naomi Strout,
Executive Officer & Project Manager, MothersBabies Study

PROFESSOR EMAD EL-OMAR

Our study will be led by renowned expert on the microbiome, Professor Emad El-Omar. Chair of Medicine at St George & Sutherland Clinical School for UNSW Sydney and Editor in Chief of widely recognised journal GUT, Professor El-Omar brings expertise and international recognition to the program.

Leading the initiative to establish the Microbiome Research Centre, of which he is the Director, Professor El-Omar is passionate about the role of the microbiome on our wellbeing and the practical implications of the gut's relationship to health.

"THESE STUDIES WILL CHANGE THE FACE OF ANTENATAL CARE, SCREENING OPTIONS AND TREATMENT FOR THESE COMMON CONDITIONS THE WORLD OVER."

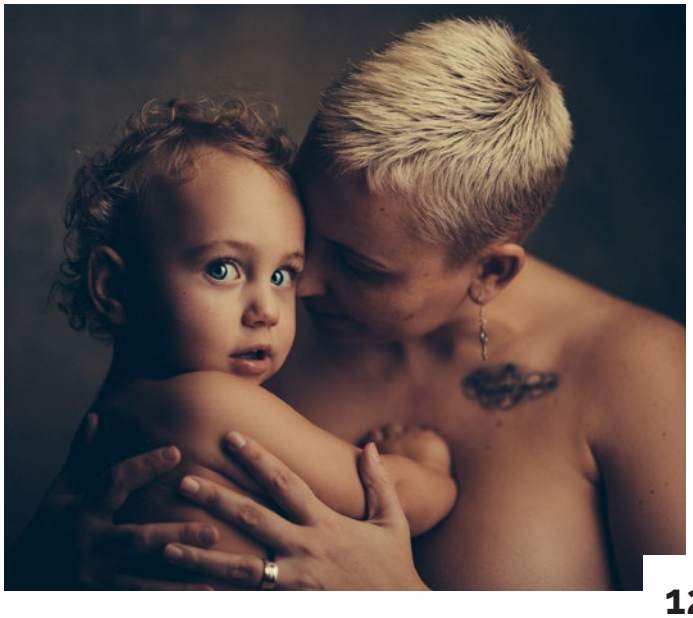
Our researchers are among the world's leading experts on the microbiome, and are ready to apply their extensive skills to unlock the mysteries of the relationship between this complex microbial system and maternal and infant health. Yet, their ability to progress our understanding and advance preventative healthcare in leaps and bounds is contingent upon philanthropic funding.

Philanthropic investment

Given the surging popular interest in gut health, now is the opportune time for philanthropists to invest in this globally significant pursuit. Together, we can break new medical ground and pave a healthier start to life for future generations.

Recognising its potential to reduce the economic burden of disease and improve national health outcomes, the Federal Government has already invested $1 million into this study.

Now, another $4 million is needed – and we look to the philanthropic community for this support. We hope you will join us on this exciting journey of discovery, and empower our talented researchers to unlock an intervention that can prevent or reduce adverse health outcomes for mothers and their babies.



THE IMPACT OF YOUR INVESTMENT

With your support we will change the face of antenatal care and preventative health, with significant scope to **reduce the prevalence and severity** of a range of conditions and illnesses including:

- Preeclampsia
- Diabetes
- Depression
- ADHD
- Premature birth
- Asthma
- Eczema
- Autism
- Allergies

By helping us spearhead innovations in preventative healthcare, your investment will, in turn, reduce the burden on our community and healthcare system – while contributing to happier, healthier outcomes for future generations.

FOR MORE INFORMATION OR TO
GET INVOLVED, PLEASE CONTACT:

Catherine Oates Smith
Founder & Director
MothersBabies Ltd
M: 0421 563 197
E: cat@mothersbabies.org

MothersBabies