

22 October 2021

\$5M grant to investigate relationship between gut and lung in respiratory disease

Australian researchers have been awarded a \$5 million National Health and Medical Research Council (NHMRC) Synergy Grant for a project that will advance knowledge of the gut, microbiomes, metabolites and diet, and their role in both causing and potentially treating inflammatory respiratory diseases, particularly chronic obstructive pulmonary disease (COPD).

A respiratory disease also known as emphysema, COPD is the third leading cause of illness and death worldwide.

Involving investigators from leading medical research organisations and universities, the project will explore ways in which microbiomes, metabolites and immunity in the gut can be therapeutically manipulated to treat COPD.

Chief Investigator of the project, Professor Phil Hansbro, Director, Centenary UTS Centre for Inflammation (a joint initiative between the Centenary Institute and University of Technology Sydney) said COPD and lung diseases are enormous clinical issues and effective treatments are urgently needed.

“Most respiratory disease studies focus predominantly on the lung. We know, however, that there is microbial and immune crosstalk between the gut and the lungs. Gut diseases induce lung inflammation and are linked to COPD and asthma, and vice versa. New approaches that manipulate gut microbiomes have enormous potential as new therapies for lung diseases,” said Professor Hansbro.

The project will be led by three world-renowned senior investigators in addition to Professor Hansbro. They are Professor Emad El-Omar (UNSW Sydney), Professor Lisa Wood (The University of Newcastle) and Professor Meg Jardine (The University of Sydney).

“Such an ambitious project requires expertise in respiratory disease, gut disease, microbiology, immunology, nutrition and dietetics, clinical studies and trials, engineering, bioinformatics, statistics and multi-omics. We have brought together a top-class team with expertise across a diverse set of research disciplines,” said Professor Hansbro.

Stage one of the project will investigate the physiological linkages within the gut-lung axis— involving organ, microbe, metabolite and immune response interactions. The project will then determine ways in which the gut microbiome can be modulated as potential new therapies for COPD. Treatments could include the ingestion of certain microbes, antibiotics or specifically modified diets. These will then go into clinical trials and the roles of microbiomes and the metabolites that they produce will be defined.

Professor El-Omar, UNSW Microbiome Research Centre said, “This Synergy Grant is a great opportunity to deliver translational benefit to millions of COPD sufferers and demonstrates the emerging power of the microbiome revolution in medicine.”

“Projects like this will identify multiple potential treatments that need to be rigorously evaluated to determine their effectiveness in improving human health. We are excited to apply innovative trial solutions that can handle this complexity and allow us to systematically discover the most effective ways for improving health outcomes,” said Professor Jardine, Director of the University of Sydney’s NHMRC Clinical Trials Centre.

“Understanding the interplay between gut and lung health is critical to the development of new and innovative strategies for managing COPD. This project has the potential to lead to a paradigm shift in how we understand COPD,” said Professor Wood, University of Newcastle.

Supporting outstanding multidisciplinary teams of investigators working together, Synergy Grants are awarded by the NHMRC and look to answer major questions that cannot be answered by a single investigator.

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Project Title:

Defining the role and therapeutic manipulation of the gut-lung axis in respiratory disease.

Images:

Professor Phil Hansbro.

https://drive.google.com/file/d/1HxYmrmqAU_YM6fx6p5eGJtnGpIAUY--/view?usp=sharing

Professor El-Omar.

https://drive.google.com/file/d/1W-t8cvxdOoMYiS4NhUWD_NI2BDDubkt8/view?usp=sharing

Professor Lisa Wood.

<https://drive.google.com/file/d/13mhsYZrz7AjPqhx2oyPK72s1Xk6R2uNg/view?usp=sharing>

Professor Meg Jardine.

<https://drive.google.com/file/d/11SA-41DChiVMSseoGwIOKOtu25-jGR6P/view?usp=sharing>

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About The Centenary Institute

The Centenary Institute is a world-leading independent medical research institute, closely affiliated to the University of Sydney and the Royal Prince Alfred Hospital. Our research focuses on three key areas: cancer, inflammation and cardiovascular disease. Our strength lies in uncovering disease mechanisms and applying this knowledge to improve diagnostics and treatments for patients.

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