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Research to unlock the secrets of muscle loss in ageing

The Centenary Institute and the University of Technology Sydney will lead pioneering research into age-related muscle loss, called sarcopenia, with a [Dynamic Resilience Program](#) contract from Wellcome Leap.

A natural process, sarcopenia is where muscles become smaller and weaker due to ageing. This can lead to reduced mobility, increased frailty and overall decreased quality of life among older adults. Sarcopenia can also result from short term hospitalisation and bed rest in older individuals where inactivity leads to rapid and severe musculoskeletal wasting.

The research aims to shed light on why short-term hospitalisation in older adults leads to profound loss of muscle mass and strength, accelerating conditions of sarcopenia and frailty. The researchers will harness brand new technologies and techniques to explore the impacts of ageing on muscle function and develop potential interventions to enhance the quality of life for older individuals.

At the heart of the research investigation lies a novel model for studying human muscle ageing – tiny laboratory-grown human skeletal muscles, called micro-muscles.

Principal Investigator of the project, Associate Professor Andy Philp, Head of the Centenary Institute’s Centre for Healthy Ageing and Adjunct Associate Professor at the University of Technology Sydney said that their advanced micro-muscle model would be able to simulate age-related conditions like sarcopenia and hospitalisations to help unlock the secrets of skeletal muscle's resilience to ageing and inactivity.

“Use of our novel bioengineered muscle platform in combination with patient-derived blood samples and advanced molecular analysis techniques, will help us decipher the intricate biological mechanisms underlying muscle ageing and wastage, as well as the muscle’s capacity for recovery,” said Associate Professor Philp.

The bioengineered micro-muscles, being developed by Co-Principal Investigator and Group Leader Associate Professor Richard Mills from the Murdoch Children's Research Institute and Melbourne node of reNEW, are set to provide a revolutionary approach.

“These micro-muscles offer an unprecedented lab-based platform for in-depth exploration of the intricate biological processes involved in sarcopenia,” said Associate Professor Mills.

Aspects that will be investigated include the role of age, gender, inactivity and inflammation-related stress on muscular function.

Associate Professor Philp said that the research holds the promise of transforming the way age-related muscle wasting is treated.

“We believe our innovative approach has the potential to lead to new therapeutic approaches to promote muscle strength and resilience, to ultimately enhance the well-being and vitality of ageing individuals,” he said.

The collaborative research program will be undertaken by researchers at the Centenary institute, University of Technology Sydney, Murdoch Children’s Research Institute, University of Sydney and the University of Leicester (UK).

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Image:

Associate Professor Andy Philp and Associate Professor Richard Mills (Co-Principal Investigator, Murdoch Children’s Research Institute)

<https://drive.google.com/file/d/17TPZ7f-VhDsAAToPP5p0bnS256LWZ55q/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.

For more information about the Centenary Institute, visit centenary.org.au

About the University of Technology Sydney (UTS)

The University of Technology Sydney (UTS), located in central Sydney, is one of Australia’s leading universities of technology. It is known for fusing innovation, creativity and technology in its teaching and research and for being an industry-focused university.

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