

2021 ANNUAL REPORT

»» JOINT RESEARCH CENTRE WITH

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institute

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2021 ANNUAL REPORT

Director's Report

“ Research is to see what everybody else has seen, and to think what nobody else has thought. ”

- Albert Szent-Györgyi, Nobel Prize Winner



Professor Steve Wilton AO
Director, Centre for Molecular Medicine + Innovative Therapeutics & The Perron Institute for Neurological and Translational Science

Despite only being established in 2019, the Centre for Molecular Medicine and Innovative Therapeutics (CMMIT) is already having a significant impact both in Western Australia and beyond.

What sets CMMIT apart from other Murdoch University research centres is the partnership arrangement with the Perron Institute - Western Australia's oldest medical research institute, now in its 40th year - and Murdoch. As a consequence, it draws on the expertise of both organisations. CMMIT involves researchers from fields as diverse as molecular science, immunology, cognitive science, physiotherapy, neurology and health economics, creating a genuinely multi- and inter-disciplinary research centre with the breadth of skills to enable it to tackle some of the bigger challenges in medical research. The theme that links all of these parts together is personalised medicine, the Centre's ultimate aim being to develop safe and effective treatments uniquely tailored to the needs of individuals.

CMMIT continues on an upward trajectory. 2021 witnessed a greater than 20% increase in both scientific publications and research income, the Centre being involved in grant and industry-funded projects worth \$18.7 million. With links to over 100 institutions across Australia and almost 1,200 research organisations in 92 countries worldwide, CMMIT functions as a globally-connected centre in an era when collaboration across borders is often the key to success - colleagues from other institutions reach out to us as much as we reach out to them.

Balance and scope are important issues for any research organisation and CMMIT was fortunate in 2021 to be able to expand into three key areas of research through the addition of new research groups. Sepsis is a leading cause of death in hospitals in Australia, young children and the elderly being the most vulnerable.

What makes sepsis difficult to manage clinically is the lack of a rapid diagnostic test, and time is critical in sepsis as death can occur within hours of the first symptoms. Developing a rapid diagnostic test for sepsis is the focus of CMMIT's new Sepsis Diagnostic Research group led by Andrew Currie.

Clinical trial design is a growing issue for CMMIT as it moves forward in the development of antisense therapeutics. Against this background, CMMIT was fortunate in 2021 to recruit Kylie Sandy-Hodgetts to lead a new Skin Integrity Research group. Kylie's interest is wound management, particularly surgical site infection and burns, and she is overseeing six Phase I and II clinical trials with a combined value of \$2.3 million. As with clinical trials, developing capacity in health economics is crucial to the future of CMMIT. Health economics provides framework for assessing the effectiveness of any medical intervention and the establishment of the Economic Evaluation of Disease and Diagnostic group led by Khurshid Alam provides us for the first time with the capacity to integrate economics into our research programs.

Now in its second year, the COVID-19 pandemic has had a profound - and possibly lasting - effect on health and medical research in Australia. It is particularly gratifying that CMMIT has been able to contribute to Western Australia's COVID effort through research on antisense therapeutics, rapid antigen testing, high-throughput testing for SARS-CoV-2 and studies on immune mechanisms.

CMMIT's success hinges on the continuing support from the Perron Institute and Murdoch and I would like to thank the Perron Institute and its CEO, Steve Arnott. In addition, I must particularly acknowledge Murdoch's Deputy Vice-Chancellor Research, David Morrison for his ongoing support. David was the person who first suggested forming CMMIT and hence his contribution has been absolutely immense from the very beginning.

Achievement & Impact in 2021

147 SCIENTIFIC PUBLICATIONS

24.6% increase compared to 2020

66% in top quartile journals (SCImago Q1) with average journal ranking (SJR) of 3.2

95% of publications with co-authors from other institutions

64% of publications with overseas co-authors



EXTERNAL RESEARCH FUNDING \$18.7 MILLION

21% of research funding from industry, investors or for industry-sponsored clinical trials plus involvement in a \$15.6 million European psoriasis research program



COLLABORATIONS

In Western Australia, with all universities, research institutes and major hospitals

Nationally, with 104 institutions in all Australian States and Territories

Internationally, with 1,194 institutions in 92 countries spread worldwide

14 RESEARCH GROUPS

40% increase compared to 2020

21 Postdoctoral Research Scientists

44 PhD & Masters Students



FDA APPROVED DRUGS

A further drug, AMONDYS 45, was approved in the USA in 2021, adding to two medicines already approved - EXONDYS 51 and VYONDYS 53 - for the treatment of certain types of Duchenne muscular dystrophy. Initial development of these medicines was conducted by Perron researchers (now at CMMIT)

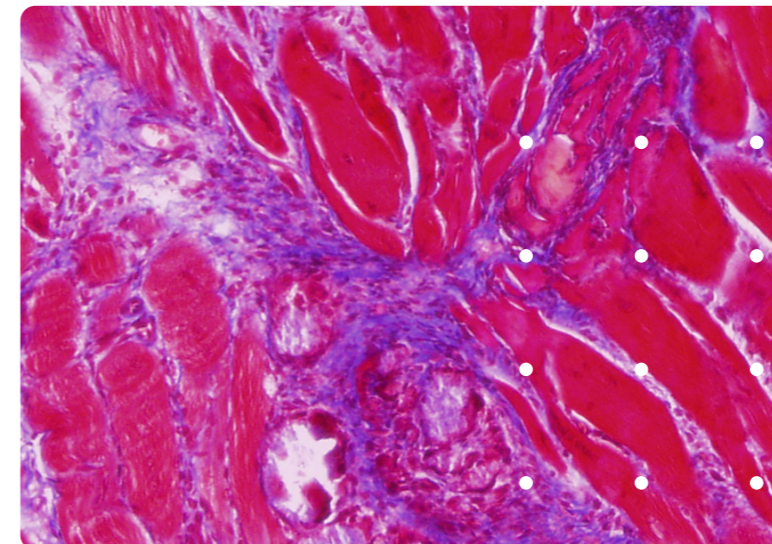
PATENTS AND SPIN-OFFS COMPANIES

Involvement in 3 spin-offs, SynGenis, Black Swan Pharmaceuticals and RAGE Biotech plus 4 PCT patent applications



NATIONAL HONOURS

Orders of Australia - AOs awarded to Sue Fletcher and Steve Wilton and Frank Mastaglia awarded an AM



New Research Groups in 2021

Skin Integrity Research

The Skin Integrity Research group is headed by Associate Professor Kylie Sandy-Hodgetts, a high-profile researcher in the field of skin integrity and wound management, particularly in relation to surgical wound complications. Kylie is also Founder and President of the International Surgical Wound Complications Advisory Panel and Executive Board Member of the World Union of Wound Healing Societies.

The group's research program is multi-centred, multidisciplinary and conducted across national and international healthcare settings. Some years ago, Kylie founded the Skin Integrity Research Institute (SKINRI) as a means of conducting Phase I-IV clinical trials.

Kylie currently oversees \$2.3 million in industry-funded clinical trials focusing on the early detection and prevention of surgical wound complications and burns. She was previously a co-investigator on a BMTH3 innovation grant for \$2 million. Her research program is conducted in public and private hospitals across the acute and primary health sector in Western Australia.

Kylie recently founded the International Surgical Wound Complications Advisory Panel (ISWCAP), a global not-for-profit organisation that aims to raise awareness of the need for early identification and prevention of surgical wound complications. ISWCAP spans the globe with members from the Asia-Pacific Rim, Australasia, Canada, Europe, UK, India, Africa, US and the UAE. ISWCAP partners with other global organisations to develop clinical education and resources with a focus on low-middle resource settings.

Kylie's research impact is far reaching - her work on surgical wound healing feeding clinical guidelines worldwide. Kylie is currently overseeing a mix of clinical trials focusing on the use of advanced wound dressings, BLUE light photomodulation and fluorescent imaging in the detection and prevention of surgical wound complications such as surgical site infection and surgical wound dehiscence.



The SDR group's research combines current cellular and molecular 'omics' methodologies with primary human neonatal samples, and more recently adult studies, to understand how the innate immune system contributes to defence against infection in early life.

The group's goal is to translate key research findings into cost-effective and safe innate immune therapies for preventing and limiting infection and inflammation in preterm infants, particularly in the area of neonatal sepsis. Sepsis—organ dysfunction due to an infection such as Streptococcus—is a major cause of morbidity and mortality worldwide. The very young, the elderly and immunocompromised are particularly vulnerable.

Sepsis Diagnostic Research

The Sepsis Diagnostic Research (SDR) group is headed by Dr Andrew Currie, Senior Research Fellow and Senior Lecturer in Immunology at Murdoch. His background is in the fields of paediatric innate immunity, inflammation, and infectious disease. In 2021, the SDR team comprised a postdoctoral research fellow, seven PhD, one Masters and five honours students as well research assistants and clinical research nurses. The group's overarching goal is better and more rapid sepsis diagnosis and involves research in the area of neonatal infection and immunity, antimicrobial protein and peptide immunobiology and systems biology.



GROUP LEADER DR ANDREW CURRIE WITH THE SEPSIS DIAGNOSTIC TEAM

The global burden of sepsis is difficult to ascertain, but recent data suggest that almost half of all global sepsis cases are in children, with an estimated 2.9 million global deaths in children under five years of age in 2017. Sepsis kills more than 8,700 people every year in Australia.

Early diagnosis of sepsis is absolutely critical. Current tests are too slow and often not definitive, which can prove fatal due to the extremely rapid progression of the disease, mortality increasing by 8% every hour.

The SDR group's ultimate goal is to develop a rapid, one-step, point-of-care test for sepsis using omics-identified blood biomarkers. This goal has moved one step closer with award of NHMRC grants, including a recent grant with Associate Professor Rakesh Veedu.

The group works closely with colleagues from WA Child and Adolescent Health Service, Perth Children's Hospital, Telethon Kids Institute, South Metropolitan Health Service and Murdoch University's Veterinary College and Hospital towards this aim.

Economic Evaluation of Disease & Diagnostics

The Economic Evaluation of Diseases and Diagnostics (EEDD) group led by Associate Professor Khurshid Alam from Murdoch Business School adds an important new dimension to CMMIT's research profile. Against a background of increasing pressure on health resources, health economics is exerting a growing influence on decision making at all levels of healthcare. Health economics as a discipline seeks to facilitate decision making by offering an explicit decision-making framework based on the principle of efficiency. Health economists are in high demand around the globe and there is a shortage of health economics expertise in Australia's universities. Consequently, Khurshid Alam's experience in the field of health economics and health financing is a particularly welcome addition to CMMIT's expertise base.

Khurshid is one of the leading health financing experts in the Asia Pacific region and his research has a strong international flavour. His key expertise lies in rigorous quantitative and qualitative research design, economic evaluation to determine the value for money (VfM), health financing and health equity with the aim of determining demand- and supply-side resource-flows and long-term impacts. His research has been supported by the NHMRC, Department of Health, Global Fund, and Bill & Melinda Gates Foundation to a total value of over \$5 million.

He is a member of the Global Burden of Disease Health Financing Collaborator Network, a consortium of experts from around the world that tracks worldwide patterns in health financing across countries, including tracking progress towards the achievement of United Nations health-related sustainable development goals. His other current projects are diverse and include the cost-effectiveness of aptamer-based diagnostics for sepsis (with Andrew Currie and Rakesh Veedu) and molecular paper strip tests for neurodegenerative conditions, achieving better outcomes Western Australian Aboriginal children and families, the mental health impact of COVID-19 on older adults and evaluation of the Residential Care Line (RCL) outreach service model.

The EEDD group in 2021 was small with just three PhD students and three Masters students but highly productive—three papers in the world-leading medical journal, Lancet and four new research grants worth approaching \$1.7 million.



ASSOCIATE PROFESSOR KHURSHID ALAM

Established Group Highlights



Clinical Exercise and Cognition

Group of 6 senior researchers headed by Dr Yvonne Learmonth

- » New group member, clinical psychologist, Dr Danielle Mathersul, formerly at Stanford University
- » Over 20 students (PhD, Masters and Honours)
- » New Multiple Sclerosis Australia grant led by Yvonne Learmonth
- » 25 publications, incl. ones with impact factors of >5 (incl. Advances in Nutrition, Nutrition Reviews and Multiple Sclerosis and Related Disorders)



Blood Disorders

Heads: Professor Ross Baker & Dr Jim Tiao

- » Publications in highly prestigious journals: The Lancet (IF 79.32), and Lancet Oncology (IF 41.32), plus one in Thrombosis and Haemostasis (IF 4.95) with article featured on journal cover
- » Two Higher Degrees by Research (HDR) student completions
- » Completed Australian and New Zealand laboratory study critical for screening rare clotting disorders



Functional Genomics

Head: Dr Sarah Rea

- » Identification of three compounds that increase expression of the TBK1 gene important in the genesis of amyotrophic lateral sclerosis (ALS) and frontotemporal lobar degeneration
- » New funding from the Sir Charles Gairdner Hospital Research on the processing of the calcium-sensing receptor
- » Innovative and entertaining 3 Minute Thesis presentation by Yuval Gurfinkel at the Mundaring Weir Conference



Cell-Tissue Systems Modelling

Head: Professor Bruce Gardiner

- » Publications in leading scientific journals in the field including the American Journal of Physiology (Renal Physiology) and Computer Methods and Programs in Biomedicine
- » Well received presentation 'Integrative biology of molecular interactions and tissue remodelling' at the Perron Institute Symposium

Motor Neurone Disease

Head: Professor Anthony Akkari

- » Two grants awarded by FightMND worth in total \$500,000
- » Featured articles in the Sunday Times and West Australian
- » Breakthrough culture of stem cell-derived neuronal cells as critical next step towards being able to test the efficacy of AO drugs in motor neurone disease
- » Continuing links with Sydney-based company, GenieUs Genomics in its search for therapies for neurodegenerative diseases



Precision Nucleic Acid Therapeutics

Head: Associate Professor Rakesh Veedu

- » Successful launch of spin-off company, SynGenis, now established in its own facilities in Bentley and focusing on the manufacture and sale of research-grade oligonucleotides
- » A further patent, this one focused on the treatment of axonal degeneration-related conditions
- » Continuing funding from the Caruthers Family Foundation for research on novel thiomorpholino oligonucleotides



Demyelinating Disorders

Head: Clinical Professor Allan Kermode

- » Allan Kermode appointed by Minister as Deputy Director of the Professional Services Review, and Member of the Professional Services Review Panel
- » Eyewall Foundation funding for the Eyewall Post-Doctorate Development Program for Dr Belinda Kaskow
- » 18 scientific publications, including ones in the high-profile journals, Neurology (IF 9.9) and Multiple Sclerosis Journal (IF 6.31)

Neurodegenerative Disorders

Head: Professor Sulev Kõks

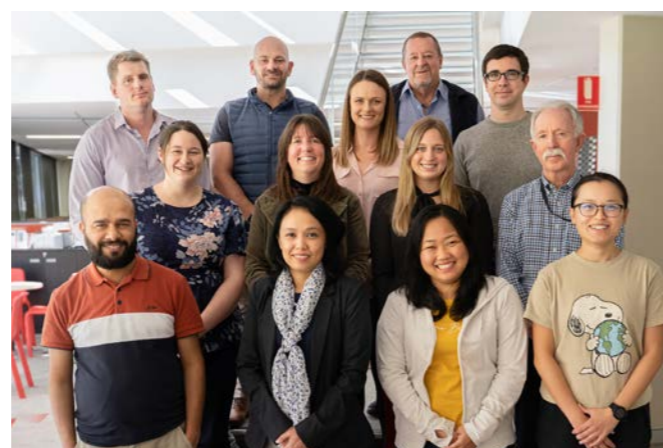
- » Source of idea for a rapid, saliva-based, and ultra-sensitive SARS-CoV-2 screening system for pandemic-scale infection surveillance that has formed the basis for a commercial screening system manufactured by the Perth-based company, Avicena Systems
- » 29 scientific publications, including papers in the world-leading journals, Nature Biotechnology (IF 54.91) and Nature Genetics (IF 38.33) in the areas of genomic medicine and marker genes for Parkinson's disease dementia
- » Continuing collaboration with colleagues worldwide with 86% of publications with overseas co-authors



Molecular Therapy

Heads: Professor Steve Wilton & Dr May Aung-Htut

- » FDA approval for a third AO drug for the treatment of Duchenne muscular dystrophy, Amondys 45
- » Officer of the Order of Australia (AO) awarded to Steve Wilton for his work on Duchenne muscular dystrophy
- » Presentation in Science Lands in Parliament in November



“The hardest problems of pure and applied science can only be solved by the open collaboration of the worldwide scientific community.”

- Kenneth G Wilson



Myositis

Head: Professor Merrilee Needham

- » Connected with community via Myositis Research Consumer Panel and annual patient information events
- » Opened the first site worldwide for the Abcuro Phase 1 study of ABC-008 in inclusion body myositis
- » Merrilee Needham recognised as Notre Dame School of Medicine Educator of the Year and MNDWA Health Professional of the Year in 2021
- » 21 publications, incl. high profile journals such as Nature (IF 49.96), Lancet Neurology (IF 44.18), Nature Genetics (IF 38.33) and Genome Biology (IF 13.54)

Molecular Therapy

Head: Professor Sue Fletcher

- » FDA approval for a third AO drug for the treatment of Duchenne muscular dystrophy, Amondys 45
- » Officer of the Order of Australia (AO) awarded to Professor Sue Fletcher for her work on Duchenne muscular dystrophy
- » Vision Pharma (Lions Eye and PYC Therapeutics start up) wins WA Innovator of the Year for Retinitis Pigmentosa drug designed by CMMIT/Lions Eye joint PhD candidates



CMMIT Spotlight

CMMIT researchers in 2021 were involved in research on a surprisingly wide array of different topics reflecting the multidisciplinary nature of the Centre. The involvement of researchers from such diverse disciplinary backgrounds - from genetics and molecular science through to physiotherapy, clinical medicine and health economics - is arguably CMMIT's greatest strength. Some examples of this diversity are shown below.

The impact of COVID-19 on health behaviours and access to healthcare for people living with multiple sclerosis

Recent research led by Dr Yvonne Learmonth, from CMMIT's Clinical Exercise and Cognition group has explored how the COVID-19 crisis affected health behaviours and access to healthcare for people living with multiple sclerosis (MS).

Funding from MS Research Australia and MSWA has supported Yvonne in a collaborative project with Clinical Professor Allan Kermode and researchers from across Australia. Their work involves consumers and patient-views to understand the changes seen in health behaviours as a result of the COVID-19 pandemic. Reduced levels of physical activity, increased addictive behaviours towards unhealthy eating and alcohol, and increased levels of anxiety and depression were identified as behavioural changes.



All these areas may require focal targeting of treatments to assist persons with MS now and in the future. Further, the well-documented changes in access to medical and healthcare experienced during the pandemic were explored in the study. The research investigated the benefits of accessing treatment via telehealth, and also highlighted some limitations in terms of access equity that must be considered for the future.

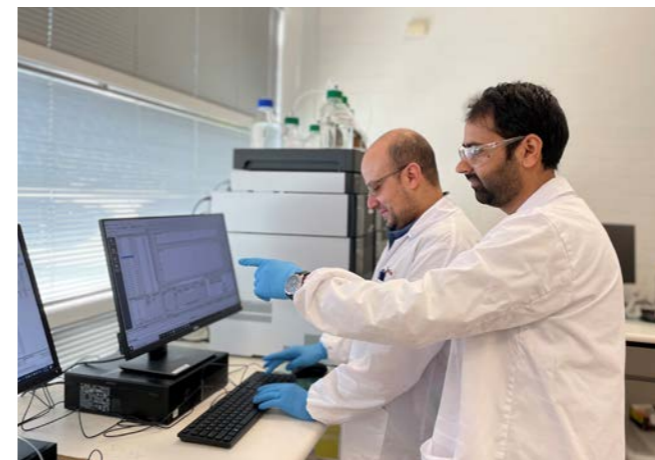
Aptamer-based Sepsis Point of Care (aSPOC) – A new paradigm in rapid sepsis diagnosis

The Sepsis Diagnostic Research Group led by Dr Andrew Currie, in partnership with the Precision Nucleic Acid team led by Associate Professor Rakesh Veedu, have joined forces with a local diagnostic specialist start-up, Biotome Pty Ltd, to pioneer a new way to tackle sepsis diagnosis, right where it's needed most - in the Emergency Department or GP's office.

Sepsis kills more than 8,500 Australians each year, and mortality is tragically linked to the difficulty in identifying sepsis rapidly and in its earliest stages. The team has been awarded a \$1.043 million NH&MRC Ideas grant from the federal government to combine their resources and skills in sepsis biomarker discovery, precision aptamer development and advanced diagnostic platforms to develop the



world's first accurate POC test for sepsis in infants, children and adults right here in Perth. The work builds on recent support and funding for the SDRG to establish clinical sepsis studies in WA's paediatric and adult hospitals.



SynGenis – a new startup company focusing on the manufacture of research-grade nucleic acids

The startup company, SynGenis – the brainchild of Associate Professor Rakesh Veedu – was established in late 2020 and moved into its own larger facility in the Bentley Technology Park in 2021.

SynGenis builds on Rakesh's many years of experience in the field of oligonucleotide chemical biology and specialises in the production and supply of high-quality oligonucleotides including DNA, RNA and modified oligonucleotides for use in RNA therapeutics, diagnostics and drug delivery applications. Sales have continued to increase since the launch of the company reflecting growing demand for high-quality oligonucleotide products in Australia and around the world. SynGenis has entered into a partnership with the Sydney-based molecular diagnostics company, SpeedX, which has the potential to further expand SynGenis' manufacturing capabilities.

Influencing health policy through involvement in the Global Burden of Disease Health Financing Collaborator Network

Associate Professor Khurshid Alam, whose Economic Evaluation of Diseases and Diagnostics (EEDD) group joined the Centre in 2021 adds a brand-new dimension to CMMIT's research profile bringing in expertise in the field of health economics and health financing.

Khurshid is one of the key health financing experts in the Asia Pacific region and his research has a strong international flavour. For several years, he has been a member of the Global Burden of Disease Health Financing Collaborator Network, a consortium of experts from around the world that tracks worldwide patterns in health financing. Khurshid's involvement in the Network resulted in three papers in 2021 in the journal, The Lancet, which with an Impact Factor of 79.32 ranks as one of the world's leading medical journals.



Rapid high-throughput screening for COVID-19

Professor Sulev Köks played a pivotal role in the development of a high-throughput testing technology for COVID-19 detection in saliva samples for use in population-wide and pandemic-wide screening to control and prevent the spread of the SARS-CoV2 infection. Work on the technology began at the height of the COVID-19 pandemic in 2020.

The idea for the test emerged out of Sulev's lab, which established proof-of-concept. This set the scene for a partnership with the Perth-based advanced robotics company, Avicena Systems, which then developed Sentinel, an integrated robotic system capable of testing more than 90,000 people daily and giving results within 25 minutes. The system is ideal for tackling major outbreaks of COVID-19 or being deployed in busy settings such as at airports. Avicena received a 2021 National iAward for its technology and the Sentinel system is currently being deployed in Australia and overseas. The system has been independently validated to be as sensitive and accurate as the gold-standard PCR test and more accurate than RAT tests in detecting asymptomatic patients.



These papers tracked differences in health expenditure across over 200 countries and focused on achieving United Nations health-related sustainable development goals (SDGs). These are major issues that can only be addressed through international collaboration.

National Recognition



Three of CMMIT's researchers were recognised in the Queen's Birthday 2021 Honours List for their extraordinary service over many years to research on neuromuscular disorders.

Professor Sue Fletcher AO

Sue Fletcher received the award of Officer of the Order of Australia (AO):

'For distinguished service to medical research, to neurological science, and the treatment and support of those with Muscular Dystrophy.'



Professor Steve Wilton AO

CMMIT'S Director, Steve Wilton received the award of Officer of the Order of Australia (AO):

'For distinguished service to medical research, to neurological science, and the treatment and support of those with Muscular Dystrophy.'



Professor Frank Mastaglia AM

Professor Frank Mastaglia received the award of Member of the Order of Australia (AM):

'For significant service to neuromuscular disease, and to professional associations.'





Consumer & Community Engagement

CMMIT's Consumer Advisory Group (CAG) met twice in 2021 and it continues to positively influence the way CMMIT conducts its research. The group is comprised of individuals with lived experience of some of the debilitating medical conditions under investigation by CMMIT researchers.

The aim so far has been educate members on the breadth of CMMIT's research program. At its April meeting, the group enjoyed two presentations from CMMIT research groups - Motor Neurone Disease and Sepsis Diagnostic Research.

At the second meeting held in December, the group heard about the research of the Precision Nucleic Acid Therapeutic and Economic Evaluation Disease and Diagnosis research groups. At CMMIT, we believe we are stronger together and we have much to learn from consumers.

With the help of the Western Australia Health Translation Network Community Involvement Program (CCI), we advertised and successfully formed a Parent Advisory Panel for CMMIT. This will allow us to be in touch with a community we currently work to support, as much of our research focuses childhood diseases. We look forward to their first meeting in early 2022.

CMMIT was part of the Perron Institute (our joint centre partner) Review in December, hosting an external panel of assessors and presenting CMMIT's work. There was a section on Community Engagement on which Renee Brown represented the CAG.

Members of the CAG have assisted in reviewing grant applications for several research groups, we plan to expand this in 2022 and hold a community event.

Rounding off the Community Engagement Program, CMMIT hosted work experience students from Rehoboth Christian College, Willetton Senior High School and a number of Murdoch University students through the Work Integrated Learning Program.

“ The establishment of the Consumer Advisory Group in CMMIT is emerging as a catalyst for real change, making our research more relevant to consumers and the broader community. ”

- Professor Steve Wilton, CMMIT Director



Inaugural CMMIT Munding Weir Symposium Sponsored by the Perron Institute

Sixty-five staff and students from the Centre for Molecular Medicine and Innovative Therapeutics (CMMIT) spent a day of networking, collaboration and inspiration at the inaugural Munding Weir Symposium proudly sponsored by the Perron Institute.

Highlights of the day included a keynote address by internationally recognised clinician-scientist Professor Merlin Thomas, who works on the diabetic complications and a Three Minute Thesis Competition (3MTC). First Place in the 3MTC was awarded to Julie Hibbert, second place to Julia Pytte and third place to Di Huang. Three commendations were also given to Yuval Gurfinkel, Akila Balachandran and Khine Zaw. We would like to thank Hayley Lethlean, Corinna Musgrave and Kerry Mace for their help in judging the 3MTC.

The symposium that followed the 3MTC aimed to open lines of communication across CMMIT's groups to foster further collaboration across Murdoch and the Perron.

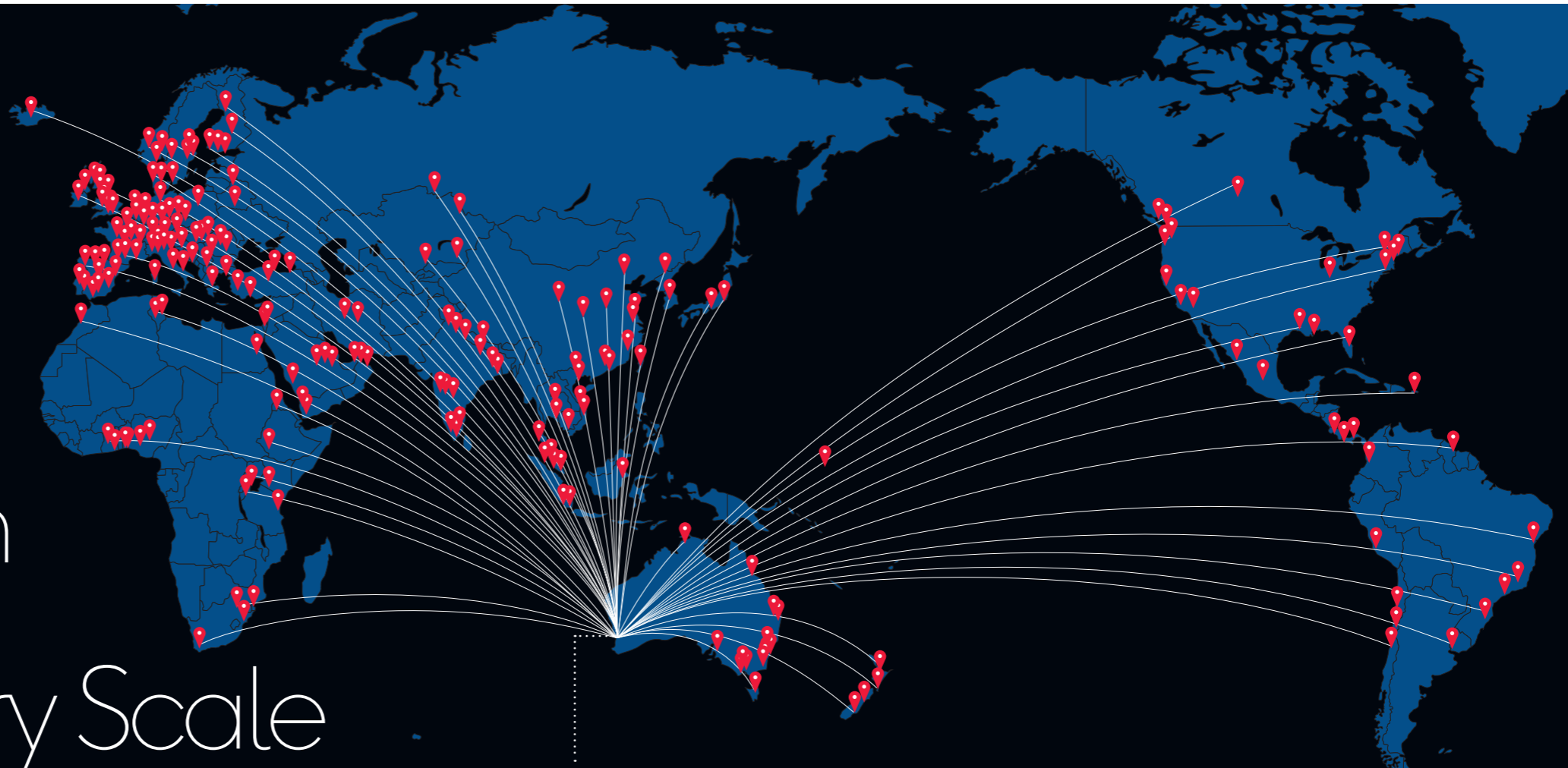


STAFF AND STUDENTS OF CMMIT AND THE PERRON INSTITUTE AT THE MUNDARING WEIR SYMPOSIUM



THIRD PLACE 3MTC WINNER DI HUANG WITH ONE OF HER SUPERVISORS, DR MAY AUNG-HTUT

Collaboration on an Extraordinary Scale



Centre for Molecular Medicine + Innovative Therapeutics,
Perth WA

It is increasingly recognised that there is a strong degree of correlation between the quality and impact of an organisation's or individual's research and the extent to which it has involved collaboration with scientists across Australia and internationally. As a consequence, measures of collaboration are increasingly used as metrics of research performance. By these measures, CMMIT has been extraordinarily successful.

Collaboration can be measured in a variety of ways but arguably one of the most robust measures is the number of publications co-authored with colleagues from other institutions.

By this benchmark, CMMIT collaborated in 2021 with:

- » **ALL** Western Australia's universities, research institutes and major hospitals;
- » **NATIONALLY** with 104 institutions across all Australian States and Territories; and,
- » **INTERNATIONALLY** - with 1,194 institutions in 92 countries spread worldwide

The world map above shows the vast geographical spread of CMMIT's collaborative links with collaborations in all continents, except Antarctica.

96% of CMMIT's 2021 publications were collaborative, 64% involving overseas co-authors. Four of CMMIT's research groups stand out in particular in terms of the level of collaboration - Neurodegenerative Disorders, Clinical Exercise and Cognition, Demyelinating Disorders and Myositis.

CMMIT researchers are increasingly involved in international research consortia focusing on specific diseases or issues. Some examples are the International Parkinson's Disease Genomics Consortium, MSBase, a global data registry for multiple sclerosis and other neuro-immunological diseases, and the Global Burden of Disease Health Financing Collaborator Network.

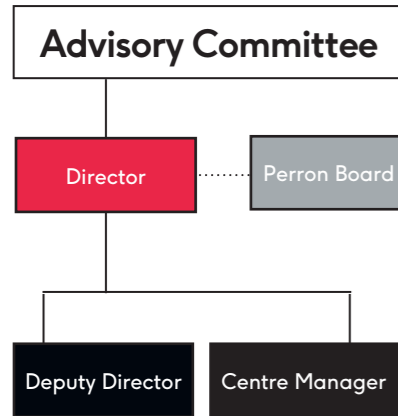
In addition, CMMIT draws many of its HDR students from overseas, including through partnership arrangements with institutions in countries such as Thailand and Nepal.



“Australia's remoteness from the world's major centres of medical research in North America and Europe makes it imperative that Australian researchers connect and collaborate with colleagues worldwide. Only through collaboration can we reach our full potential.”

- Professor Steve Wilton, Director of CMMIT

Organisational Structure



Administration

Professor Steve Wilton
Director

Professor Norman Palmer
Deputy Director

Jodie Williamson
Centre Manager

Brianna O'Donnell
Administrative Officer

Cell-Tissue Systems Modelling

Professor Bruce Gardiner
Group Leader

Dr Chang-Joon Lee
Postdoctoral Scientist

Azin Azadi
PhD Student

Allan Millstead
Honours Student

Functional Genomics

Dr Sarah Rea
Group Leader

Nikki Polain (until May 2021)
Research Assistant

Penny Nice (from Aug 2021)
Research Assistant

Yuval Gurfinkel
PhD Student

Alaisdair Wood
Masters Student

Motor Neurone Disease

Professor Patrick Anthony Akkari
Group Leader

Dr Loren Flynn
Postdoctoral Scientist

Dr Dunhui (Oliver) Li (from Apr 2021)
Postdoctoral Scientist

Nik Gavriel
Breeanne Bell
Research Assistants

Rita Mejzini
Julia Pytte
Frances Theunissen
Leanne Jiang
PhD Students

Bradley Roberts
Natasha Berthold
Caitlyn Vicars
Honours Students

Demyelinating Diseases

Clinical Professor Allan Kermode
Group Leader

Clinical Professor William Carroll
Consultant Neurologist

Dr Jason Burton
Consultant Neurologist

Dr Marzena Fabis-Pedriani
Senior Research Fellow

Dr Stephanie Trend
Postdoctoral Fellow

Dr Belinda Kaskow
Postdoctoral Scientist

Katherine Roberts
Research Assistant

Dr Xiaonan Zhong
PhD Student

Linh Le-Kavanagh
MSBase Research Coordinator

Molecular Therapy

(Wilton/Aung-Htut)

Professor Steve Wilton
Group Leader

Dr May Aung-Htut
Group Leader/Senior Research Fellow

Dr Craig McIntosh
Postdoctoral Scientist

Dr Dunhui (Oliver) Li (until Mar 2021)
Postdoctoral Scientist

Dr Jessica Cale
Postdoctoral Scientist

Abbie Adams
Senior Research Officer

Russell Johnsen
Senior Research Officer

Kane Greer
Research Officer

Kristin Ham
Research Officer/PhD Student

Maria Van Loenhout
Research Assistant

Di Huang
Khine Zaw
Bal Hari Poudel
Janya Grainok
Sasiwimon (Fern) Utama
Sarah Leishman
PhD Students

(Fletcher)

Professor Sue Fletcher
Group Leader/Principal Senior Research Fellow

Dr Ianthe Pitout
Postdoctoral Scientist

Alanis Lima
Research Assistant/Honours Student

Niall Keegan
Leon Larcher
PhD Students

Skin Integrity

Associate Professor Kylie Sandy-Hodgetts
Group Leader

Neurodegenerative Diseases

Professor Sulev Kõks
Group Leader

Dr Abi Pfaff
Postdoctoral Scientist

Dr Vidya Saraswathy Krishnan
Postdoctoral Scientist

Lewis Singleton
Research Assistant

Emel Rothzerg
PhD Student

Nikitha Malvathu
Honours Student

Talya Conradie
Masters of Systems Medicine (Research)

Myositis

Professor Merrilee Needham
Group Leader

Dr Jerome Coudert
Postdoctoral Reserach Fellow

Dr Anuradha Sooda
Research Assistant

Kelly Beer
Clinical Research Manager

Annik Panicker
Clinical Research Coordinator

Ian Cooper
Physiotherapist

Professor Frank Mastaglia
Senior Advisor

Althea Doerty
Clinical Research Assistant

Dr Catherine Ashton
Neurology Fellow

Dr Shereen Paramalingam
Nataliya Slater
Emily McLeish
PhD Students

Andrew Wallhead
Honours Student

Melanie Cusso
UNDA Medical Student

Precision Nucleic Acid Therapeutics

Associate Professor Rakesh Veedu
Group Leader

Dr Bao Le
Postdoctoral Scientist

Dr Tao Wang (until July 2021)
Postdoctoral Scientist

Dr Tamer Kosbar
Postdoctoral Scientist

Akila Balachandran
Prithi Raguraman
Arpitha Chikkanna
PhD Students

Isaac Ronyo
Honours Student

Blood Disorders

Professor Ross Baker
Group Leader

Dr Jim Tiao
Scientific Lead, Laboratory Manager

Grace Gilmore
Senior Research Assistant

Dr Christopher Chin Keong Liam
ISTH Reach World Fellow

Jiayin Tian
PhD Student

Elijah Callis
Madison Hagger
Honours Students

Economic Evaluation of Disease & Diagnostics

Associate Professor Khurshid Alam
Group Leader

Taslima Rahman (from Oct 2021)
Tauhidul Islam (from Oct 2021)
Farjana Misu (from Nov 2021)
PhD Students

Minh Le
Mai Nguyen
Adelakun Edward Odunyemi
Shedrick Guss Singip
John Akwesi Maiko
Masters Students

Clinical Exercise & Cognition

Academic Staff, Psychology & Exercise Science

Dr Yvonne Learmonth
Group Leader/Senior, Lecturer Exercise Science

Associate Professor Tim Fairchild
Associate Professor, Sport & Exercise Science

Dr Alasdair Dempsey
Interim Dean, Learning & Teaching, Exercise Science

Dr Ann-Maree Vallence
Senior Lecturer, Discipline of Psychology

Dr Hakuei Fujiyama
Senior Lecturer, Discipline of Psychology

Dr Danielle Mathersul
Lecturer, Discipline of Psychology

Dr Shaun Teo
Postdoctoral Scientist

Steve Smith
Nathan Smith
Kym Wansbrough
Brittany Rurak
Lucy Schouten
Jane Tan
Khaya Morris-Binelli
Auretta Kumar
PhD students

Sepsis Diagnostic Research

Dr Andrew Currie
Group Leader

Dr Christopher Mullally
Postdoctoral Scientist

Eva Mowe
Clinical Research Officer

Julie Hibbert
Laura Brookes
Isabella Joubert
Mariam Doualeh
Nipa Gupta
PhD Students

Hayley Morcom
Liam Buckley (Curtin)
Chloe Wain (Curtin)
Aviv Cohen
Chelsea Nielsen
Honours Students

Sara Natale
Accelerated Research Masters Training Student

Research Income



2021 CMMIT LEADERSHIP GROUP. BACK L-R DR YVONNE LEARMONTH, DR LOREN FLYNN, PROFESSOR STEVE WILTON & PROFESSOR SULEV KÖKS. FRONT L-R MRS JODIE WILLIAMSON, PROFESSOR ANTHONY AKKARI, MRS NATALIYA SLATER & PROFESSOR NORMAN PALMER

CMMIT continued to exceed expectations in terms of research funding. CMMIT researchers were involved in research grants and industry-funded projects worth over \$18.7 million in 2021.

Much of this funding was over multiple years and involved researchers from multiple institutions, so only a fraction of the funds directly flowed to Murdoch or Perron in 2021. The funds generated annualised income of approximately \$6.6 million – an increase of 27% compared to 2020. In addition to the above funding, Sulev Köks continued to be involved in \$15.6 million European Commission ERA program on psoriasis. 21% of CMMIT’s funding came from industry, investors or from industry-sponsored clinical trials, reflecting CMMIT’s strong commercialisation focus.

Some headline successes in research funding in 2021 were:

- » Continuing support from the US pharmaceutical company, Sarepta Therapeutics for a research program involving the Molecular Therapy group focusing on the development of novel antisense oligonucleotide-based therapeutics.
- » The addition of Andrew Currie’s sepsis group to CMMIT has been a decided boost to the Centre’s NHMRC funding, the group bringing in two NHMRC Ideas grants awarded in successive years with a total value of almost \$2.6 million.
- » CMMIT was a beneficiary of the Department of Health’s Biobank support program with funding for biobanks for both myositis and motor neurone disease.
- » Yvonne Learmonth from the Cognition and Clinical Exercise group secured multiple grants from Multiple Sclerosis Research Australia grants to continue her research on physiotherapy strategies for patients with MS, including remote delivery.
- » CMMIT researchers continued to be involved in COVID-19 research with Merrilee Needham securing funding from the WA Department of Health for a project to build a digital research platform to provide access to quality data on COVID-19 patients for research purposes.

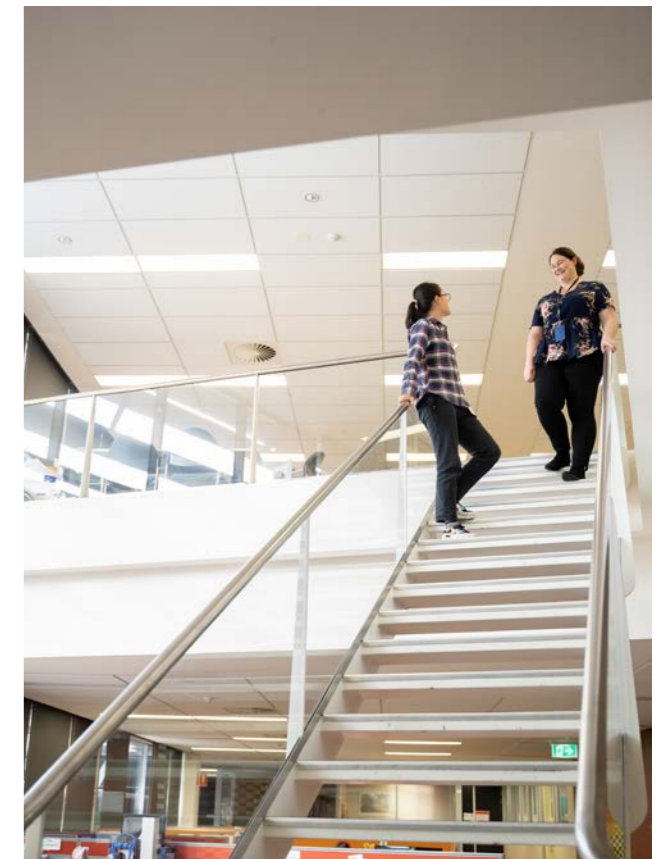
“ Aside from research grants and industry funds, CMMIT’s core funding comes from its joint research centre partners, Murdoch University and the Perron Institute as well as Notre Dame University and the Perth Blood Institute, which provide targeted support for research by the Myositis and Blood Disorders groups, respectively. ”

- Professor Steve Wilton, Director of CMMIT

Core Funding

Aside from competitive research grants and industry funds, CMMIT’s core funding comes from its joint venture sponsors, the Perron Institute and Murdoch University. Notre Dame University also makes a small contribution through its support for Professor Merrilee Needham and the Myositis group.

The Perron Institute provided core funding of \$1.983 million in 2021 in support for researcher salaries, student scholarships and research consumables and equipment, coupled with Murdoch’s \$992,772 contribution. This is in addition to the university’s contribution to salary and other costs associated with the Clinical Exercise and Cognition, Sepsis Diagnostic Research, Cell-Tissue Modelling Systems and Economic Evaluation of Disease and Diagnostics groups as well as its contribution to facility maintenance costs. In broad terms, the contributions of the two joint centre partners, Perron and Murdoch are approximately equivalent.





2021 CMMIT Grants & Industry Funds

MND GROUP

Fight MND
Amount & Years: \$996,808 (2020-2022)
CIs: Akkari & Flynn
Pre-clinical development of a SOD1 genetic therapy in sporadic ALS: enabling investigational new drug submission

GenieUS - Research Contract
Amount & Years: \$312,000 (2020-2021)
CI: Akkari & Flynn
Investigation of MicroRNA's as therapeutic targets for sporadic Motor Neuron Disease

GeniUs
Amount & Years: \$450,000 (2021-2022)
CI: Akkari & Flynn
Investigation of microRNAs and other therapeutic targets for sporadic ALS

RAINE Travel Grant
Amount & Years: \$175,000 (2021-2022)
CI: Anderton, Meloni, Akkari, Chiba-Falek
Investigating a novel class of peptide as a therapeutic for neurodegenerative disorders

MT GROUP

NHMRC (led by University of Melbourne)
Amount & Years: \$670,788 (2019-2021)
CIs: Gregorevic, Wilton, Parker, Sandri & Sartori
Developing a novel class of therapeutics for muscle wasting and frailty

Sarepta Therapeutics
Amount & Years: Confidential (2020-2022)
CI: Wilton
Sponsored Research Agreement

Senisca Limited
Amount & Years: \$102,840.80 (2021-2022)
CI: Wilton
Development of novel oligonucleotide senotherapeutics

Malan Syndrome Foundation
Amount & Years: \$38,493.16 (2021-2022)
CI: McIntosh
Antisense Oligomer-Mediated Therapeutic Intervention for Malan Syndrome

Lynamid Limited
Amount & Years: \$82,949.26 (2021-2022)
CI: Wilton
Modification of Midkine expression

Impact Philanthropy Program (led by Hudson Institute of Medical Research)
Amount & Year: \$85,125 (2020-2021)
CI: Harley & Wilton
A drug to stop brain cell death in Parkinson's disease

NHMRC Ideas Grant APP1188694
Amount & Year: \$1,150,000 (2020-2025)
CI: Chen, CIB: Fletcher
Accelerating the identification and treatment of splice-altering mutations underlying inherited retinal diseases

PNAT GROUP

Dr George Bautovich
Amount & Years: Confidential (2020-2021)
CI: Veedu
In confidence

Dr George Bautovich
Amount & Years: Confidential (2020-2021)
CI: Veedu
AccuBlood: Development of a colorimetric precision DNA strip for rapid highly sensitive, user-friendly and cost-effective blood group typing

WA Department of Health and WA Health Translation Network
Amount & Years: \$70,000 (2020-2021)
CI: Veedu
Novel molecular plugs for accurate SARS-CoV-2 paper test from swabs in minutes and for treating COVID-19

Western Australian Department of Health Merit Award
Amount & Year: \$95,000 (2020-2021)
CI: Veedu
Next generation morpholino oligonucleotides for therapeutic alternate splicing

Queensland Institute of Medical Research
Amount & Years: (2020-2021)
CI: Veedu
Anti-fibrotic therapeutic development - role of microRNAs in collagen synthetic pathway chronic liver disease

Dr George Bautovich
Amount & Years: Confidential (2020-2023)
CI: Veedu
Aptamer Molecule development to an Isolated Purified Protein and to a synthesized peptide

Western Australian Department of Health (Future Health Research & Innovation Fund)
Amount & Years: \$260,542 (2020-2023)
CI: Veedu
A precision molecular paper strip test for neurodegenerative conditions: A robust point-of-care diagnostic platform for early clinical intervention

NHMRC (led by UWA/TKI)
Amount & Years: \$1,562,250.00 (2021-2023)
CI: Veedu
Cancer Immunotherapy Project

Ministry of Business Innovation and Employment
Amount & Years: \$79,000.00 (2020-2022)
CIs: Reid, Veedu, Diermeier
Building new capacities in functional nucleic acids to fight disease

SDR GROUP

QUT BridgeTech Industry Fellowship Agreement
Amount & Years: \$10,000 (2021)
CIA: Currie

NHMRC Ideas Grant #APP1187809
Amount & Years: \$728,455 (2020-2023)
CIA: Currie
Improving Sepsis Diagnosis Using a Precision Molecular Test

NHMRC Project Grant #APP1147630 (led by UWA)
Amount & Years: \$1,868,942 (2018-2021)
CI: Currie
Multi-centre, multi-disciplinary study using a systems biology approach to investigate immunomodulation in children with acute wheeze

ND GROUP

17514 IRMA19147
Michael J Fox Foundation
Amount & Years: \$ (2020-2021)
CI: Köks
Association of repetitive elements with Parkinson's disease risk and progression in the PPMI cohort

Michael J Fox Foundation - Fox Genetic Diversity in PD Program: Genome-wide
Amount & Years: US \$1,499,684 (2020-2022)
CI: Kin Mok, UCL
Association Study in Parkinson's Disease among East Asian

European Union Horizon 2020, Innovative Medicines Initiative 2 (IMI 2)
Amount & Years: EUR 10,500,000 (2019-2023)
CI: Köks
Biomarkers in Atopic Dermatitis and Psoriasis

Elaine Lake Estate Foundation
Amount & Years: \$500,000, four years
CI: Köks
Innovative therapeutics for psoriasis

MSWA
Amount & Years: \$375,000, three years
CI: Köks
Trajectories of Outcomes in Neurological Conditions study - TONiC in WA

DD GROUP

MSRA Incubator Grant #20-467
Amount & Years: \$24,950 (2021)
CI: Pedrini
The effect of auditory cues and music during walking on movement quality and exercise motivation in persons with multiple sclerosis

Western Australian Future Health Research & Innovation Fund
Amount & Years: \$260,542 (2020-2023)
CI: Veedu, Co-CIs: Kermode, Köks, Lundin, Balachandran
A precision molecular paper strip test for neurodegenerative conditions: A robust point-of-care diagnostic platform for early clinical intervention

MS Research Australia grant
Amount & Years: \$170,470 (2020-2022)
CI: Trend
Investigating the expression and function of peripheral blood Fc gamma receptors in MS

MSWA
Amount and Years: \$300,000 (2021)
CIs: Kermode, Fabis-Pedrini
Support for Demyelinating Diseases Group



SIR GROUP

INDUSTRY-SPONSORED CLINICAL TRIALS

Industry - unspecified
Amount & Years: \$180,000 (2021-2022)
CI: Sandy-Hodgetts
A non-randomised pragmatic trial for the early detection and prevention of surgical wound complications using an advanced hydropolymer wound dressing and smartphone technology; the EDISON study

Industry - unspecified
Amount & Years: \$526,560 (2020-2022)
CI: Sandy-Hodgetts
Safety and tolerability Of Lysyl Oxidase Inhibitor (LOX) In the amelioration of acute and established scAr: SOLARIA I, a single centre Phase I study in healthy male adults

Industry - Unspecified
Amount & Years: \$173,280 (2021-2022)
CI: Sandy-Hodgetts
A Phase II, Double-blind, Placebo-controlled Study Evaluating the Safety and Efficacy of Lysyl oxidase inhibitor (PXS6302) Administered in Patients for amelioration of acute and established scar following burn injury: SOLARIA II Trial

Industry - Unspecified
Amount & Years: \$636,880 (2021-2022)
CI: Sandy-Hodgetts
Single blinded randomised control trial evaluating DACC impregnated dressings for the prevention of Surgical site infection in at risk patients undergoing Abdominal surgery: the CRISTINA trial

Industry - Unspecified
Amount & Years: \$160,636 (2021-2023)
CI: Sandy-Hodgetts
Efficacy of BLUE light photobiomodulation for prevention of surgical wound complications following colorectal surgery, the BLUESurg Trial: a prospective pilot feasibility study

MYO GROUP

Care Cure Support
Amount & Years: \$120,000.00 (2019-2022)
CI: Needham
WA MND Research Consortium

Muscular Dystrophy WA
Amount & Years: \$4,922.93 (2021-2022)
CI: Needham
Limb Girdle Muscular Dystrophy Research

WA Department of Health, Biobank interim support program 2021, WA Future Health Research & Innovation Fund
Amount & Years: \$39,597 (2021-2022)
CI: Needham
Myositis Discovery Program Biobank

WA Department of Health, Biobank interim support program 2021, WA Future Health Research & Innovation Fund
Amount & Years: \$28,026 (2021-2022)
CI: Needham
MND Consortium Biobank

WA Department of Health
Amount & Years: \$880,000 (2021-2022)
CI: Needham
Building a digital WA-wide research platform, known as TRANSFORM, to provide access to quality, real-time prospective data on COVID-19 patients for a range of research purposes

NHMRC
Amount & Years: \$667,983.65 (2021-2024)
CI: Needham
Harnessing neural plasticity to improve functional outcomes following burn injury

Government of Western Australia Department of Jobs, Tourism, Science and Innovation Financial Assistance COVID-19 Special Initiative Scheme
Amount & Years: \$120,000 (2020-2022)
CI: Needham
Telemedicine during a pandemic: Impact on well-being of patients with chronic disease (an observational study)

MRFF NHMRC
(led by University of Notre Dame)
Amount & Years: \$1,883,014.00 (2020-2024)
CI: Needham
Optimism in IBM: A dbRCT Phase III trial of Sirolimus in patients with Inclusion Body Myositis, to slow or stabilise otherwise relentless disease progression, as measured by the IBM Functional Rating Scale (IBMFRS)

EEDD GROUP

RTP - Research Translation Projects - WA Health
Amount & Years: \$260,542 (2021-2022)
CI: Alam
A precision molecular paper strip test for neurodegenerative conditions: A robust point-of-care diagnostic platform for early clinical intervention

NHMRC Ideas Grant
Amount & Years: \$1,043,134 (2022-2024)
CI: Alam
NHMRC Ideas Grant APP 2013404: aSPOC – Commercialisable aptamer-based diagnostics for sepsis point of care

WA Department of Health
Years & Amounts: \$360,000 (2021-2024)
CI: Alam
Linking-up for better outcomes: Western Australian Aboriginal children and families

WA Department of Health
Years & Amounts: \$30,000 (2021-2021)
CI: Alam
Evaluation of Residential Care Line (RCL) outreach service model

WA Department of Health
Years & Amounts: \$200,000 (2020-2021)
CI: Alam
Mental health effects of COVID-19 pandemics on older adults in Australia



CEC GROUP

Multiple Sclerosis Australia
Amount & Years: \$225,000 (2021-2024)
CI: Learmonth
Changing Behaviours towards Aerobic & Strength Exercise in MS, delivering healthcare provider training for remote exercise delivery

Multiple Sclerosis Research Australia
Amount & Years: \$24,990 (2020-2021)
CI: Learmonth
Exploring carer experience to support health and wellbeing in MS

Multiple Sclerosis Research Australia
Amount & Years: \$230,000 (2020-2024)
CI: Learmonth
Crisis resilience in persons with MS, Project C-RIMS: Identifying a template for healthcare-based emergency management for persons with MS

Neurotrauma Research Program & Department of Health WA
Amount & Years: \$84,600 (2021-2022)
CI: Cruickshanks
The feasibility and therapeutic utility of an environmental enrichment program for young stroke patients experiencing cognitive impairment

Australian and New Zealand College of Anaesthetists
Amount & Years: \$65,323 (2021)
CI: Fujiyama

DAAD-German Academic Exchange Service, Research Stays for University Academics and Scientists
Amount & Years: \$12,000 (2021)
CI: Fujiyama
Fujiyama – Academic exchange

NHMRC
Amount & Years: \$667,983.65 (2021-2024)
CI: Vallence, Wood, Edgar, Needham
Harnessing neural plasticity to improve functional outcomes following burn injury

NHMRC MRFF Neurological Disorders
Amount & Years: \$1,563,952 (2020-2023)
CIs: Enticott, Fitzgerald, Barlow, Hickie, Licari, Rogasch, Middeldorp, Clark, Vallence & Boulton
Does repetitive transcranial magnetic stimulation (rTMS), compared to sham rTMS, improve social communication in adolescents and young adults with autism spectrum disorder?

FG GROUP

Dementia Australia Research Foundation
Amount & Years: \$75,000 (2020-2022)
CI: Rea
Enhancing the TBK1-p62 axis as a therapeutic strategy for frontotemporal lobar degeneration



Publications

Publications in scientific journals and books are the currency upon which medical research is based. CMMIT's productivity continued on an upwards trajectory in 2021 with 147 scientific publications, an increase of 24.6% increase compared to 2020.

66% of CMMIT's publications were in scientific journals ranked in top quartile (SCImago Q1) with an average journal ranking (SCImago Journal Rank, SJR) of 3.2. SJR is a measure of both the number of citations and the prestige of the journals where the citations come from.

ALVES E, **MCLEISH E**, BLANCAFORT P, **COUDERT JD**, GAUDIERI S. Manipulating the NKG2D receptor-ligand axis using CRISPR: Novel technologies for improved host immunity. *Front Immunol*. 2021;12:712722.

AMATO AA, HANNA MG, MACHADO PM, BADRISING UA, CHINOY H, BENVENISTE O, KARANAM AK, WU M, TANKO LB, SCHUBERT-TENNIGKEIT AA, PAPANICOLAOU DA, LLOYD TE, **NEEDHAM M**, LIANG C, REARDON KA, DE VISSER M, ASCHERMAN DP, BAROHN RJ, DIMACHKIE MM, MILLER JAL, KISSEL JT, OSKARSSON B, JOYCE NC, VAN DEN BERGH P, BAETS J, DE BLEECKER JL, KARAM C, DAVID WS, MIRABELLA M, NATIONS SP, JUNG HH, PEGORARO E, MAGGI L, RODOLICO C, FILOSTO M, SHAIBANI AI, SIVAKUMAR K, GOYAL NA, MORI-YOSHIMURA M, YAMASHITA S, SUZUKI N, AOKI M, KATSUNO M, MORIHATA H, MURATA K, NODERA H, NISHINO I, ROMANO CD, WILLIAMS VSL, VISSING J, ZHANG AUBERSON L, GROUP RSE. Efficacy and safety of bimagrumab in sporadic inclusion body myositis: Long-term extension of RESILIENT. *Neurology*. 2021;96(12):e1595-e607.

ANNAMALAY AA, ABBOTT S, KHOO SK, **HIBBERT J**, BIZZINTINO J, ZHANG G, LAING I, **CURRIE A**, LE SOUEF PN, GREEN RJ. The impact of cytokine levels in young South African children with and without HIV-associated acute lower respiratory infections. *J Med Virol*. 2021;93(6):3647-55.

ASHTON C, **PARAMALINGAM S**, STEVENSON B, BRUSCH A, **NEEDHAM M**. Idiopathic inflammatory myopathies: a review. *Intern Med J*. 2021;51(6):845-52.

AVERY TJ, **MATHERSUL DC**, SCHULZ-HEIK RJ, MAHONEY L, BAYLEY PJ. Self-reported autonomic dysregulation in Gulf War Illness. *Mil Med*. 2021.

BAKEBERG MC, GORECKI AM, **PFAFF AL**, HOES ME, **KÖKS S**, **AKKARI PA**, **MASTAGLIA FL**, ANDERTON RS. TOMM40 '523' poly-T repeat length is a determinant of longitudinal cognitive decline in Parkinson's disease. *NPJ Parkinson's Dis*. 2021;7(1):56.

BAKEBERG MC, HOES ME, GORECKI AM, **THEUNISSEN F**, **PFAFF AL**, KENNA JE, PLUNKETT K, **KÖKS S**, **AKKARI PA**, **MASTAGLIA FL**, ANDERTON RS. The TOMM40 '523' polymorphism in disease risk and age of symptom onset in two independent cohorts of Parkinson's disease. *Sci Rep*. 2021;11(1):6363.

BAKER RI, O'DONNELL JS. How I treat bleeding disorder of unknown cause. *Blood*. 2021;138(19):1795-804.

BAYLEY PJ, SCHULZ-HEIK RJ, CHO R, **MATHERSUL D**, COLLERY L, SHANKAR K, ASHFORD JW, JENNINGS JS, TANG J, WONG MS, AVERY TJ, STANTON MV, MEYER H, FRIEDMAN M, KIM S, JO B, YOUNGER J, MATHEWS B, MAJUMDAR M, MAHONEY L. Yoga is effective in treating symptoms of Gulf War illness: A randomized clinical trial. *J Psychiatr Res*. 2021;143:563-71.



BERGAMASCHI L, MESCIA F, TURNER L, HANSON AL, KOTAGIRI P, DUNMORE BJ, RUFFIEUX H, DE SA A, HUHNS O, MORGAN MD, GERBER PP, WILLS MR, BAKER S, CALERO-NIETO FJ, DOFFINGER R, DOUGAN G, ELMER A, GOODFELLOW IG, GUPTA RK, HOSMILLO M, HUNTER K, KINGSTON N, LEHNER PJ, MATHESON NJ, NICHOLSON JK, PETRUNKINA AM, RICHARDSON S, SAUNDERS C, THAVENTHIRAN JED, TOONEN EJM, WEEKES MP, GÖTTGENS B, TOSHNER M, HESS C, BRADLEY JR, LYONS PA, SMITH KGC. Longitudinal analysis reveals that delayed bystander CD8+ T cell activation and early immune pathology distinguish severe COVID-19 from mild disease. *Immunity*. 2021;54(6):1257-75.e8.

BLAUWENDRAAT C, IWAKI H, MAKARIOUS MB, BANDRES-CIGA S, LEONARD HL, GRENN FP, LAKE J, KROHN L, TAN M, KIM JJ, GIBBS JR, HERNANDEZ DG, RUSKEY JA, PIHLSTRØM L, TOFT M, VAN HILTEN JJ, MARINUS J, SCHULTE C, BROCKMANN K, SHARMA M, SIITONEN A, MAJAMAA K, EEROLA-RAUTIO J, TIENARI PJ, GROSSET DG, LESAGE S, CORVOL JC, BRICE A, WOOD N, HARDY J, GAN-OR Z, HEUTINK P, GASSER T, MORRIS HR, NOYCE AJ, NALLS MA, SINGLETON AB. Investigation of autosomal genetic sex differences in Parkinson's Disease. *Ann Neurol*. 2021;90(1):35-42.

BUKHARI W, KHALILIDEHKORDI E, MASON DF, BARNETT MH, TAYLOR BV, **FABIS-PEDRINI M**, **KERMODE AG**, SUBRAMANIAN S, WATERS P, BROADLEY SA. NMOSD and MS prevalence in the Indigenous populations of Australia and New Zealand. *J Neurol*. 2022;269(2):836-45. 10.1007/s00415-021-10665-9

CALE JM, **GREER K**, **FLETCHER S**, **WILTON SD**. Proof-of-concept: Antisense oligonucleotide mediated skipping of Fibrillin-1 Exon 52. *Int J Mol Sci*. 2021;22(7). 10.3390/ijms22073479

CHEN Z, ZHANG D, REYNOLDS RH, GUSTAVSSON EK, GARCÍA-RUIZ S, D'SA K, FAIRBROTHER-BROWNE A, VANDROVCOVA J, HARDY J, HOULDEN H, GAGLIANO TALIUN SA, BOTÍA J, RYTEN M. Human-lineage-specific genomic elements are associated with neurodegenerative disease and APOE transcript usage. *Nat Commun*. 2021;12(1):2076.

CLARKE L, ARNETT S, BUKHARI W, KHALILIDEHKORDI E, JIMENEZ SANCHEZ S, O'GORMAN C, SUN J, PRAIN KM, WOODHALL M, SILVESTRINI R, BUNDELL CS, ABERNETHY DA, BHUTA S, BLUM S, BOGGILD M, BOUNDY K, BREW BJ, BROWNLEE W, BUTZKUEVEN H, CARROLL WM, CHEN C, COULTHARD A, DALE RC, DAS C, FABIS-PEDRINI MJ, GILLIS D, HAWKE S, HEARD R, HENDERSON APD, HESHMAT S, HODGKINSON S, KILPATRICK TJ, KING J, KNEEBONE C, KORNBERG AJ, LECHNER-SCOTT J, LIN MW, LYNCH C, MACDONELL RAL, MASON DF, MCCOMBE PA, PEREIRA J, POLLARD JD, RAMANATHAN S, REDDEL SW, SHAW CP, SPIES JM, STANKOVICH J, SUTTON I, VUCIC S, WALSH M, WONG RC, YIU EM, BARNETT MH, **KERMODE AGK**, MARRIOTT MP, PARRATT JDE, SLEE M, TAYLOR BV, WILLOUGHBY E, BRILLOT F, VINCENT A, WATERS P, BROADLEY SA. MRI patterns distinguish aqp4 antibody positive neuromyelitis optica spectrum disorder from multiple sclerosis. *Frontiers in Neurology*. 2021;12.

CLARKE L, BUKHARI W, O'GORMAN CM, KHALILIDEHKORDI E, ARNETT S, WOODHALL M, PRAIN KM, PARRATT JDE, BARNETT MH, MARRIOTT MP, MCCOMBE PA, SUTTON I, BOGGILD M, BROWNLEE W, CARROLL WM, HODGKINSON S, MACDONELL RAL, MASON DF, PEREIRA J, SLEE M, DAS C, HENDERSON APD, **KERMODE AG**, LECHNER-SCOTT J, COLLABORATION AN, WATERS P, SUN J, BROADLEY SA. Response to treatment in NMOSD: the Australasian experience. *Mult Scler Relat Disord*. 2021;58:103408.

COLLIER DA, DE MARCO A, FERREIRA I, MENG B, DATIR RP, WALLS AC, KEMP SA, BASSI J, PINTO D, SILACCI-FREGNI C, BIANCHI S, TORTORICI MA, BOWEN J, CULAP K, JACONI S, CAMERONI E, SNELL G, PIZZUTO MS, PELLANDA AF, GARZONI C, RIVA A, COLLABORATION C-NBC-, ELMER A, KINGSTON N, GRAVES B, MCCOY LE, SMITH KGC, BRADLEY JR, TEMPERTON N, CERON-GUTIERREZ L, BARCENAS-MORALES G, CONSORTIUM C-GU, HARVEY W, VIRGIN HW, LANZAVECCHIA A, PICCOLI L, DOFFINGER R, WILLS M, VEESLER D, CORTI D, GUPTA RK. Sensitivity of SARS-CoV-2 B.1.1.7 to mRNA vaccine-elicited antibodies. *Nature*. 2021;593(7857):136-41.

COLLIER DA, FERREIRA I, KOTAGIRI P, DATIR RP, LIM EY, TOUIZER E, MENG B, ABDULLAHI A, COLLABORATION C-NBC-, ELMER A, KINGSTON N, GRAVES B, LE GRESLEY E, CAPUTO D, BERGAMASCHI L, SMITH KGC, BRADLEY JR, CERON-GUTIERREZ L, CORTES-ACEVEDO P, BARCENAS-MORALES G, LINTERMAN MA, MCCOY LE, DAVIS C, THOMSON E, LYONS PA, MCKINNEY E, DOFFINGER R, WILLS M, GUPTA RK. Age-related immune response heterogeneity to SARS-CoV-2 vaccine BNT162b2. *Nature*. 2021;596(7872):417-22.

CONNOR S, **NEEDHAM M**, YEAP B, **FAIRCHILD T**, **COUDERT J**, **LEARMONTH Y**, **BEER K**, HISCOCK K. A double-blinded randomised controlled trial to establish whether testosterone treatment combined with exercise improves muscle strength and function and quality of life in men affected by inclusion body myositis. *Tas Med J*. 2021;3(1):69-75.

Publications continued

COUDERT JD, MCLEISH E, SOODA A, SLATER N, BEER K, PARAMALINGAM S, LAMONT PJ, NEEDHAM M. Isolation of live leukocytes from human inflammatory muscles. *Methods Protoc.* 2021;4(4).

CUDKOWICZ M, GENGE A, MARAGAKIS N, PETRI S, VAN DEN BERG L, AHO VV, SARAPOHJA T, KUOPPAMAKI M, GARRATT C, AL-CHALABI A, INVESTIGATORS R. Safety and efficacy of oral levisimendan in people with amyotrophic lateral sclerosis (the REFALS study): a randomised, double-blind, placebo-controlled phase 3 trial. *Lancet Neurol.* 2021;20(10):821-31.

ENTICOTT PG, BARLOW K, GUASTELLA AJ, LICARI MK, ROGASCH NC, MIDDELDORP CM, CLARK SR, **VALLENCE AM,** BOULTON KA, HICKIE IB, WHITEHOUSE AJO, GALLETTY C, ALVARES GA, FUJIYAMA H, HEUSSLER H, CRAIG JM, KIRKOVSKI M, MILLS NT, RINEHART NJ, DONALDSON PH, FORD TC, CAEYENBERGHS K, ALBEIN-URIOS N, BEKKALI S, FITZGERALD PB. Repetitive transcranial magnetic stimulation (rTMS) in autism spectrum disorder: protocol for a multicentre randomised controlled clinical trial. *BMJ Open.* 2021;11(7):e046830.

FANG LT, ZHU B, ZHAO Y, CHEN W, YANG Z, KERRIGAN L, LANGENBACH K, DE MARS M, LU C, IDLER K, JACOB H, ZHENG Y, REN L, YU Y, JAEGER E, SCHROTH GP, ABAAN OD, TALSANIA K, LACK J, SHEN TW, CHEN Z, STANBOULY S, TRAIN B, SHETTY J, KRIGA Y, MEERZAMAN D, NGUYEN C, PETITJEAN V, SULTAN M, CAM M, MEHTA M, HUNG T, PETERS E, KALAMEGHAM R, SAHRAEIAN SME, MOHIYUDDIN M, GUO Y, YAO L, SONG L, LAM HYK, DRABEK J, VOJTA P, MAESTRO R, GASPAROTTO D, **KÖKS S,** REIMANN E, SCHERER A, NORDLUND J, LILJEDAHL U, JENSEN RV, PIROOZANIA M, LI Z, XIAO C, SHERRY ST, KUSKO R, MOOS M, DONALDSON E, TEZAK Z, NING B, TONG W, LI J, DUERKEN-HUGHES P, CATALANOTTI C, MAHESHWARI S, SHUGA J, LIANG WS, KEATS J, ADKINS J, TASSONE E, ZISMANN V, MCDANIEL T, TRENT J, FOOX J, BUTLER D, MASON CE, HONG H, SHI L, WANG C, XIAO W. Establishing community reference samples, data and call sets for benchmarking cancer mutation detection using whole-genome sequencing. *Nat. Biotechnology.* 2021; 39(9): 1151-1160.

FARRELL JW, 3RD, MOTL RW, **LEARMONTH YC,** PILUTTI LA. Persons with multiple sclerosis exhibit strength asymmetries in both upper and lower extremities. *Physiotherapy.* 2021;111:83-91.

FLYNN LL, MITRPANT C, **ADAMS A, PITOUT IL,** STIRNWEISS A, **FLETCHER S, WILTON SD.** (2021) Targeted SMN exon skipping: A useful control to assess in vitro and in vivo splice-switching. *Studies. Biomedicine.* 9(5).

FOGARTY H, TOWNSEND L, MORRIN H, AHMAD A, COMERFORD C, KARAMPINI E, ENGLERT H, BYRNE M, BERGIN C, O'SULLIVAN JM, MARTIN-LOECHES I, NADARAJAN P, BANNAN C, MALLON PW, CURLEY GF, PRESTON RJS, REHILL AM, MCGONAGLE D, NI CHEALLAIGH C, **BAKER RI,** RENNÉ T, WARD SE, O'DONNELL JS, O'CONNELL N, RYAN K, KENNY D, FAZAVANA J. Persistent endotheliopathy in the pathogenesis of long COVID syndrome. *Journal of Thrombosis and Haemostasis.* 2021;19(10):2546-53.

FOSTER AD, FLYNN LL, CLUNING C, CHENG F, DAVIDSON JM, LEE A, **POLAIN N, MEJZINI R,** FARRAWELL N, YERBURY JJ, LAYFIELD R, **AKKARI PA, REA SL.** p62 overexpression induces TDP-43 cytoplasmic mislocalisation, aggregation and cleavage and neuronal death. *Int J Mol Sci.* 2021;11(1):11474



FRANKLIN AR, **MATHERSUL DC,** RAINE A, RUSCIO AM. Restlessness in generalized anxiety disorder: Using actigraphy to measure physiological reactions to threat. *Behav Ther.* 2021;52(3):734-44.

GIALLUISI A, RECCIA MG, MODUGNO N, NUTILE T, LOMBARDI A, DI GIOVANNANTONIO LG, PIETRACUPA S, RUGGIERO D, SCALA S, GAMBARDELLA S, IACOVIELLO L, GIANFRANCESCO F, ACAMPORA D, D'ESPOSITO M, SIMEONE A, CIULLO M, ESPOSITO T. Identification of sixteen novel candidate genes for late onset Parkinson's disease. *Mol Neurodegener.* 2021;16(1):35.

GUPTA N, PARTRIDGE GJ, BULLER NB, PILMER L, **CURRIE A,** LYMBERY AJ. Genetic diversity of Australian isolates of *Photobacterium damsela* subsp. *damsela* is associated with virulence to yellowtail kingfish (*Seriola lalandi*). *Aquaculture.* 2021;538.

HADE AC, PHILIPS MA, REIMANN E, JAGOMÄE T, ESKLA KL, TRAKS T, PRANS E, **KÖKS S,** VASAR E, VÄLI M. Chronic alcohol use induces molecular genetic changes in the dorsomedial thalamus of people with alcohol-related disorders. *Brain Sci.* 2021;11(4).



HAM KA, KEEGAN NP, MCINTOSH CS, AUNG-HTUT MT, ZAW K, GREER K, FLETCHER S, WILTON SD. Induction of cryptic pre-mRNA splice-switching by antisense oligonucleotides. *Scientific Reports.* 2021;11(1).

HARRIS SA, **DEMPSEY AR,** MACKIE K, KING D, HECIMOVICH M, MURPHY MC. Do sideline tests of vestibular and oculomotor function accurately diagnose sports-related concussion in adults? A systematic review and meta-analysis. *Am J Sports Med.* 2021;3635465211027946.

HIBBERT J, ARMSTRONG NJ, GRANLAND C, NG S, SIMMER K, RICHMOND P, BURGNER D, STRUNK T, **CURRIE A.** Plasma secretory phospholipase A2 as an early marker for late-onset sepsis in preterm infants—a pilot study. *Acta Paediatr.* 2021;110(11):3011-3.

HINDER L, **PAFF AL,** EMMERICH RE, MICHELS S, SCHLITZER M, CULMSEE C. Characterization of novel diphenylamine compounds as ferroptosis inhibitors. *J Pharmacol Exp Ther.* 2021;378(2):184-96

HIRAOKA H, SHU Z, TRI LE B, MASUDA K, NAKAMOTO K, FANGJIE L, ABE N, HASHIYA F, KIMURA Y, SHIMIZU Y, **VEEDU RN,** ABE H. Antisense oligonucleotide modified with disulfide units induces efficient exon skipping in mdx myotubes through enhanced membrane permeability and nucleus internalization. *Chembiochem.* 2021;22(24):3437-42.

HOP PJ, ZWAMBORN RAJ, HANNON E, SHIREBY GL, NABAIS MF, WALKER EM, VAN RHEENEN W, VAN VUGT JJFA, DEKKER AM, WESTENENG H-J, TAZELAAR GHP, VAN EIJK KR, MOISSE M, BAIRD D, KHLEIFAT AA, IACOANGELI A, TICOZZI N, RATTI A, COOPER-KNOCK J, MORRISON KE, SHAW PJ, BASAK AN, CHIÒ A, CALVO A, MOGLIA C, CANOSA A.

BRUNETTI M, GRASSANO M, GOTKINE M, LERNER Y, ZABARI M, VOURCH P, CORCIA P, COURATIER P, MORA PARDINA JS, SALAS T, DION P, ROSS JP, HENDERSON RD, MATHERS S, MCCOMBE PA, **NEEDHAM M,** NICHOLSON G, ROWE DB, PAMPHLETT R, MATHER KA, SACHDEV PS, FURLONG S, GARTON FC, HENDERS AK, LIN T, NGO ST, STEYN FJ, WALLACE L, WILLIAMS KL, CONSORTIUM B, CONSORTIUM BM, NETO MM, CAUCHI RJ, BLAIR IP, KIERNAN MC, DRORY V, PAVEDANO M, DE CARVALHO M, PINTO S, WEBER M, ROULEAU G, SILANI V, LANDERS JE, SHAW CE, ANDERSEN PM, MCRAE AF, VAN ES MA, PASTERKAMP RJ, WRAY NR, MCLAUGHLIN RL, HARDIMAN O, KENNA KP, TSAI E, RUNZ H, AL-CHALABI A, VAN DEN BERG LH, DAMME PV, MILL J, VELDINK JH. Genome-wide study of DNA methylation in Amyotrophic Lateral Sclerosis identifies differentially methylated loci and implicates metabolic, inflammatory and cholesterol pathways. *medRxiv.* 2021:2021.03.12.21253115.

HORDACRE B, AUSTIN D, BROWN KE, GRAETZ L, PAREES I, DE TRANE S, **VALLENCE AM**, KOBLAR S, KLEINIG T, MCDONNELL MN, GREENWOOD R, RIDDING MC, ROTHWELL JC. Evidence for a window of enhanced plasticity in the human motor cortex following ischemic stroke. *neurorehabil neural repair*. 2021;35(4):307-20.

HUANG D, HEATH JEFFERY RC, **AUNG-HTUT MT**, MCLENACHAN S, **FLETCHER S**, **WILTON SD**, CHEN FK. (2021) Stargardt disease and progress in therapeutic strategies. *Ophthalmic Genetics*.1-26.

HUANG D, ZHANG D, CHEN S-C, **AUNG-HTUT M**, LAMEY TM, THOMPSON JA, MCLAREN TL, DE ROACH JN, **FLETCHER S**, **WILTON SD**, MCLENACHAN S, CHEN FK. (2021) Generation of an induced pluripotent stem cell line from a patient with Stargardt disease caused by biallelic c.[5461-10T>C;5603A>T]:[6077T>C] mutations in the ABCA4 gene. *Stem Cell Res*. 54:102439

HUANG D, ZHANG D, CHEN SC, **AUNG-HTUT MT**, LAMEY TM, THOMPSON JA, MCLAREN TL, DE ROACH JN, **FLETCHER S**, **WILTON SD**, CHEN FK, MCLENACHAN S. (2021) Generation of two induced pluripotent stem cell lines from a patient with Stargardt disease caused by compound heterozygous mutations in the ABCA4 gene. *Stem Cell Res*. 54:102448.

HUANG D, ZHANG D, CHEN SC, JENNINGS L, CARVALHO LS, **FLETCHER S**, CHEN FK, MCLENACHAN S. Gene replacement therapy restores RCBTB1 expression and cilium length in patient-derived retinal pigment epithelium. *Journal of Cellular and Molecular Medicine*. 2021;25(21):10020-7.

INGALE D, KULKARNI P, ELECTRICWALA A, MOGHE A, KAMYAB S, JAGTAP S, MARTSON A, **KÖKS S**, HARSULKAR, A. Synovium-synovial fluid axis in osteoarthritis pathology: A key regulator of the cartilage degradation process. *Genes (Basel)*. 2021 Jun 29;12(7): 989.

IVASK M, VOLKE V, RAASMAJA A, **KÖKS S**. High-fat diet associated sensitization to metabolic stress in Wfs1 heterozygous mice. *Mol Genet Metab*. 2021;134(1-2):203-11.

KALINCIK T, DIOUF I, SHARMIN S, MALPAS C, SPELMAN T, HORAKOVA D, HAVRDOVA EK, TROJANO M, IZQUIERDO G, LUGARESI A, PRAT A, GIRARD M, DUQUETTE P, GRAMMOND P, JOKUBAITIS V, VAN DER WALT A, GRAND'MAISON F, SOLA P, FERRARO D, SHAYGANNEJAD V, ALROUGHANI R, HUPPERTS R, TERZI M, BOZ C, LECHNER-SCOTT J, PUCCI E, VAN PESCH V, GRANELLA F, BERGAMASCHI R, SPITALERI D, SLEE M, VUCIC S, AMPAPA R, MCCOMBE P, RAMO-TELLO C, PREVOST J, OLASCOAGA J, CRISTIANO E, BARNETT M, SALADINO ML, SANCHEZ-MENOYO JL, HODGKINSON S, ROZSA C, HUGHES S, MOORE F, SHAW C, BUTLER E, SKIBINA O, GRAY O, **KERMODE A**, CSEPANY T, SINGHAL B, SHUEY N, PIROSKA I, TAYLOR B, SIMO M, SIRBU CA, SAS A, BUTZKUEVEN H. Effect of disease-modifying therapy on disability in relapsing-remitting multiple sclerosis over 15 years. *Neurology*. 2021;96(5):e783-e97.

KEMP SA, COLLIER DA, DATIR RP, FERREIRA I, GAYED S, JAHUN A, HOSMILLO M, REES-SPEAR C, MLCOCHOVA P, LUMB IU, ROBERTS DJ, CHANDRA A, TEMPERTON N, COLLABORATION C-NBC-, CONSORTIUM C-GU. SHARROCKS K, BLANE E, MODIS Y, LEIGH KE, BRIGGS JAG, VAN GILS MJ, SMITH KGC, BRADLEY JR, SMITH C, DOFFINGER R, CERON-GUTIERREZ L, BARCENAS-MORALES G, POLLOCK DD, GOLDSTEIN RA, SMIELEWSKA A, SKITRALL JP, GOULIOURIS T, GOODFELLOW IG, GKRAKIA-KLOTSAS E, ILLINGWORTH CJR, MCCOY LE, GUPTA RK. SARS-CoV-2 evolution during treatment of chronic infection. *Nature*. 2021;592(7853):277-82.

KERMODE WPH, KAVANAGH S, **KERMODE AG**. Myeloid maturation arrest and severe late-onset neutropenia following ocrelizumab therapy in a patient with multiple sclerosis: A case report and review of the literature. *Neuroimmunology Reports*. 2021;1:100012.

KIA DA, ZHANG D, GUELF I S, MANZONI C, HUBBARD L, REYNOLDS RH, BOTÍA J, RYTEN M, FERRARI R, LEWIS PA, WILLIAMS N, TRABZUNI D, HARDY J, WOOD NW. Identification of candidate Parkinson disease genes by integrating genome-wide association study, expression, and epigenetic data sets. *JAMA Neurol*. 2021;78(4):464-72.

KÖKS G, **PFAFF AL**, BUBB VJ, QUINN JP, **KÖKS S**. At the dawn of the transcriptomic medicine. *Exp Biol Med (Maywood)*. 2021;246(3):286-92

KÖKS S, **PFAFF AL**, BUBB VJ, QUINN JP. Expression quantitative trait loci (eQTLs) associated with retrotransposons demonstrate their modulatory effect on the transcriptome. *Int J Mol Sci*. 2021;22(12).

KÖKS S, **PFAFF AL**, BUBB VJ, QUINN JP. Transcript variants of genes involved in neurodegeneration are differentially regulated by the APOE and MAPT haplotypes. *Genes (Basel)*. 2021;12(3).

KURVITS L, LÄTTEKIVI F, REIMANN E, KADASTIK-EERME L, KASTERPALU KM, **KÖKS S**, TABA P, PLANKEN A. Transcriptomic profiles in Parkinson's disease. *Exp Biol Med (Maywood)*. 2021;246(5):584-95.



LAWLER NG, GRAY N, KIMHOFER T, BOUGHTON B, GAY M, YANG R, MORILLON AC, CHIN ST, RYAN M, BEGUM S, BONG SH, **COUDERT JD**, EDGAR D, RABY E, PETERSSON S, RICHARDS T, HOLMES E, WHILEY L, NICHOLSON JK. NMR Spectroscopic windows on the systemic perturbations in amine and kynurenine metabolism associated with acute SARS-CoV-2 infection and inflammatory cytokine responses. *J Proteome Res*. 2021;20(5):2796-811. 10.1021/acs.jpoteome.1c00052

LE ATH, KRYLOVA SM, BELOBORODOV SS, WANG TY, HILI R, JOHNSON PE, LI F, **VEEDU RN**, BELYANSKAYA S, KRYLOV SN. How to develop and prove high-efficiency selection of ligands from oligonucleotide libraries: a universal framework for aptamers and DNA-encoded small-molecule ligands. *Anal Chem*. 2021;93(13):5343-54.

LE TB, AGARWAL S, **VEEDU RN**. Evaluation of DNA segments in 2'-modified RNA sequences in designing efficient splice switching antisense oligonucleotides†. *RSC Advances*. 2021;23:14029 - 35.

LEARMONTH YC, CHAN Z, CORREIA H, HATHORN D, KERMODE A, SMITH C, WALKER D. Exercise participation and promotion in the multiple sclerosis community; perspectives across varying socio-ecological levels. *Disability and Rehabilitation*. 2021;43(25):3623-38

LEARMONTH YC, KAUR I, BAYNTON SL, **FAIRCHILD T**, PAUL L, VAN RENS F. Changing Behaviour towards Aerobic and Strength Exercise (BASE): Design of a randomised, phase I study determining the safety, feasibility and consumer-evaluation of a remotely-delivered exercise programme in persons with multiple sclerosis. *Contemp Clin Trials*. 2021;102:106281.

LEARMONTH YC, MOTL RW. exercise training for multiple sclerosis: a narrative review of history, benefits, safety, guidelines, and promotion. *Int J Environ Res Public Health*. 2021;18(24).

LEARMONTH YC, PILUTTI LA, HERRING MP, MOTL RW, CHAN B, METSE AP. Safety of exercise training in multiple sclerosis: a protocol for an updated systematic review and meta-analysis. *Syst Rev*. 2021;10(1):208. 10.1186/s13643-021-01751-0

LEE CJ, **GARDINER BS**, EVANS RG, SMITH DW. Predicting oxygen tension along the ureter. *Am J Physiol Renal Physiol*. 2021;321(4):F527-F47.

LI C, WANG J, SUN X, LI R, CHANG Y, WANG Y, ZHONG X, **KERMODE AG**, MAO Z, QIU W. The current situation of diagnosis and treatment of neuromyelitis optica spectrum disorder: Experience with 461 cases from a single centre in South China. *Journal of Neuroimmunology*. 2021;353.

LI D, **MCINTOSH CS**, **MASTAGLIA FL**, **WILTON SD**, **AUNG-HTUT MT**. Correction to: Neurodegenerative diseases: a hotbed for splicing defects and the potential therapies. *Translational Neurodegeneration*. 2021;10(1):41.

LI D, **MCINTOSH CS**, **MASTAGLIA FL**, **WILTON SD**, **AUNG-HTUT MT**. Neurodegenerative diseases: a hotbed for splicing defects and the potential therapies. *Translational Neurodegeneration*. 2021;10(1):16.

LI G, **LI D**, **WANG T**, HE S. Pyrimidine biosynthetic enzyme CAD: Its function, regulation, and diagnostic potential. *Int J Mol Sci*. 2021;22(19).

LIAO J, SMITH DW, MIRAMINI S, **GARDINER BS**, ZHANG L. A probabilistic failure risk approach to the problem of articular cartilage lubrication. *Comput Methods Programs Biomed*. 2021;203:106053.

LITTON E, ANSTEY M, BROADHURST D, CHAPMAN A, **CURRIE A**, FERRIER J, GUMMER J, HIGGINS A, LIM J, MANNING L, MYERS E, ORR K, PALERMO AM, PAPANINI A, PELLICANO S, RABY E, RAMMOHAN A, REGLI A, RICHTER B, SALMAN S, STRUNK T, WATERSON S, WEIGHT D, WIBROW B, WOOD F. Early and sustained Lactobacillus plantarum probiotic therapy in critical illness: the randomised, placebo-controlled, restoration of gut microflora in critical illness trial (ROCIT). *Intensive Care Med*. 2021;47(3):307-15.

LITTON E, **CURRIE A**, RABY E, Investigators R. Probiotics and sepsis: separating the signal from the noise. *Intensive Care Med*. 2021;47(8):924-5.

LIU C, LU Y, WANG J, CHANG Y, WANG Y, CHEN C, LIU Z, **KERMODE AG**, ZHANG Y, QIU W. Serum neurofilament light chain and glial fibrillary acidic protein in AQP4-IgG-seropositive neuromyelitis optica spectrum disorders and multiple sclerosis: A cohort study. *Journal of Neurochemistry*. 2021;159(5):913-22.



Publications continued

LIU C, ZHAO L, FAN P, KO H, AU C, NG A, AU L, WONG A, **KERMODE AG**, MOK V, YAN Y, QIU W, LAU AY. High serum neurofilament levels among Chinese patients with aquaporin-4-IgG-seropositive neuromyelitis optica spectrum disorders. *Journal of Clinical Neuroscience*. 2021;83:108-11.

LIU G, PENG J, LIAO Z, LOCASCIO JJ, CORVOL JC, ZHU F, DONG X, MAPLE-GRØDEM J, CAMPBELL MC, ELBAZ A, LESAGE S, BRICE A, MANGONE G, GROWDON JH, HUNG AY, SCHWARZSCHILD MA, HAYES MT, WILLS AM, HERRINGTON TM, RAVINA B, SHOULSON I, TABA P, **KÖKS S**, BEACH TG, CORMIER-DEQUAIRE F, ALVES G, TYSNES OB, PERLMUTTER JS, HEUTINK P, AMR SS, VAN HILTEN JJ, KASTEN M, MOLLENHAUER B, TRENKWALDER C, KLEIN C, BARKER RA, WILLIAMS-GRAY CH, MARINUS J, SCHERZER CR. Genome-wide survival study identifies a novel synaptic locus and polygenic score for cognitive progression in Parkinson's disease. *Nat Genet*. 2021;53(6):787-93.

LODGE S, NITSCHKE P, KIMHOFER T, **COUDERT JD**, BEGUM S, BONG SH, RICHARDS T, EDGAR D, RABY E, SPRAUL M, SCHAEFER H, LINDON JC, LOO RL, HOLMES E, NICHOLSON JK. NMR spectroscopic windows on the systemic effects of SARS-CoV-2 infection on plasma lipoproteins and metabolites in relation to circulating cytokines. *J Proteome Res*. 2021;20(2):1382-96. 10.1021/acs.jproteome.0c00876

LOITE U, RAAM L, REIMANN E, REEMANN P, PRANS E, TRAKS T, VASAR E, SILM H, KINGO K, **KÖKS S**. The expression pattern of genes related to melanogenesis and endogenous opioids in psoriasis. *Int J Mol Sci*. 2021;22(23).

LU J, WOOD D, INGLE E, **KÖKS S**, WONG D. Update on genomic and molecular landscapes of well-differentiated liposarcoma and dedifferentiated liposarcoma. *Mol Biol Rep*. 2021;48(4):3637-47.

LUO W, CHEN Y, MAO S, JIN J, LIU C, ZHONG X, SUN X, **KERMODE AG**, QIU W. Serum neurofilament light chain in adult and pediatric patients with myelin oligodendrocyte glycoprotein antibody-associated disease: Correlation with relapses and seizures. *J Neurochem*. 2021;160(5):568-77.

LUO W, FANG L, WANG Z, LIU Z, LIAO J, MENG Z, SHEN S, LIU B, LI R, **KERMODE AG**, QIU W. Hypothalamic lesions in neuromyelitis optica spectrum disorders: exploring a scoring system based on magnetic resonance imaging. *Japanese Journal of Radiology*. 2021;39(7):659-68.

LUO W, LI R, CHANG Y, SHE H, **KERMODE AG**, QIU W. Myelin oligodendrocyte glycoprotein antibody-associated disorders coexisting with ankylosing spondylitis: Potential association between demyelination and tumor necrosis factor inhibitors. *Multiple Sclerosis and Related Disorders*. 2021;51.

MALTBY VE, LEA RA, MONIF M, **FABIS-PEDRINI MJ**, BUZZARD K, KALINCIK T, **KERMODE AG**, TAYLOR B, HODGKINSON S, MCCOMBE P, BUTZKUEVEN H, BARNETT M, LECHNER-SCOTT J. Efficacy of cladribine tablets as a treatment for people with multiple sclerosis: Protocol for the CLOBAS Study (Cladribine, a multicenter, long-term efficacy and biomarker Australian Study). *JMIR Research Protocols*. 2021;10(10).

MANAF FA, PEIFFER JJ, MAKER GL, **FAIRCHILD TJ**. Branched-chain amino acid supplementation improves cycling performance in untrained cyclists. *J Sci Med Sport*. 2021;24(4):412-7.



MARCK CH, HUNTER A, HERITAGE B, GIBBS L, **KERMODE AG**, WALKER DI, **LEARMONTH YC**. The effect of the Australian bushfires and the COVID-19 pandemic on health behaviours in people with multiple sclerosis. *Multiple Sclerosis and Related Disorders*. 2021;53.

MARSHALL JN, LOPEZ AI, **PAFF AL**, **KÖKS S**, QUINN JP, BUBB VJ. Variable number tandem repeats - Their emerging role in sickness and health. *Exp Biol Med (Maywood)*. 2021;246(12):1368-76.

MATASAR MJ, CAPRA M, OZCAN M, LV F, LI W, YANEZ E, SAPUNAROVA K, LIN T, JIN J, JURCZAK W, HAMED A, WANG MC, **BAKER R**, BONDARENKO I, ZHANG Q, FENG J, GEISSLER K, LAZAROIU M, SAYDAM G, SZOMOR A, BOUABDALLAH K, GALIULIN R, UCHIDA T, SOLER LM, CAO A, HIEMEYER F, MEHRA A, CHILDS BH, SHI Y, ZINZANI PL. Copanlisib plus rituximab versus placebo plus rituximab in patients with relapsed indolent non-Hodgkin lymphoma (CHRONOS-3): a double-blind, randomised, placebo-controlled, phase 3 trial. *Lancet Oncol*. 2021;22(5):678-89.

MATHERSUL DC, DIXIT K, AVERY TJ, SCHULZ-HEIK RJ, ZEITZER JM, MAHONEY LA, CHO RH, BAYLEY PJ. Heart rate and heart rate variability as outcomes and longitudinal moderators of treatment for pain across follow-up in Veterans with Gulf War illness. *Life Sci*. 2021;277:119604.



MCINNES AN, LIPP OV, TRESILIAN JR, **VALLENCE AM**, MARINOVIC W. Premovement inhibition can protect motor actions from interference by response-irrelevant sensory stimulation. *J Physiol*. 2021;599(18):4389-406.

MCINTOSH CS, LI D, **WILTON SD**, **AUNG-HTUT MT**. Polyglutamine Ataxias: Our current molecular understanding and what the future holds for antisense therapies. *Biomedicine*. 2021;9(11):1499.

MCINTOSH CS, WATTS GF, **WILTON SD**, **AUNG-HTUT MT**. Splice correction therapies for familial hypercholesterolemia patients with low-density lipoprotein receptor mutations. *Curr Opin in Lipidol*. 2021 Oct.

MCLLENACHAN S, ZHANG D, **GRAINOK J**, ZHANG X, HUANG Z, CHEN SC, **ZAW K**, **LIMA A**, JENNINGS L, ROSHANDEL D, MOON SY, HEATH JEFFERY RC, ATTIA MS, THOMPSON JA, LAMEY TM, MCLAREN TL, DE ROACH J, **FLETCHER S**, CHEN FK. Determinants of disease penetrance in prpf31-associated retinopathy. *Genes*. 2021;12(10).10.3390/genes12101542

GLOBAL BURDEN OF DISEASE 2020 HEALTH FINANCING COLLABORATOR NETWORK (**ALAM K**). Tracking development assistance for health and for COVID-19: a review of development assistance, government, out-of-pocket, and other private spending on health for 204 countries and territories, 1990–2050. *The Lancet*. 2021;398(10308):1317-43.

MISHRA B, SAINI M, DOHERTY CM, PITCEATHLY RDS, RAJAN R, SIDDIQI OK, RAMDHARRY G, ASRANNA A, TOMASELLI PJ, **KERMODE AG**, BAJWA JA, GARG D, VISHNU VY. Use of Twitter in neurology: Boon or bane? *J Med Internet Res*. 2021;23(5).



MOK KY (ON BEHALF OF THE EAST ASIAN PARKINSON DISEASE GENOMICS CONSORTIUM, (**KÖKS S**)). The East Asian Parkinson Disease Genomics Consortium. *Lancet Neurol*. 2021;20(12):982.

MOREAU P, DIMOPOULOS MA, MIKHAEL J, YONG K, CAPRA M, FACON T, HAJEK R, ŠPI KA I, **BAKER R**, KIM K, MARTINEZ G, MIN CK, POUR L, LELEU X, ORIOL A, KOH Y, SUZUKI K, RISSE ML, ASSET G, MACÉ S, MARTIN T, KIHUN K, CHANG-KI M, YOUNGIL K, MARTIN T, QUACH H, LIM A, CROWTHER H, SIA H, HULIN C, MOHTY M, MIKALA G, NAGY Z, REINOSO SEGURA M, ROSINOL L, YAGCI M, TURGUT M, GARG M, PARMAR G, AUGUSTSON B, CASTRO NI, CRUSOE E, PIKA T, DELIMPASI S, ISHIZAWA K, GEORGE A, KONSTANTINOVA T, DE LA RUBIA J, SUNG-HYUN K, MAIOLINO A, REIMAN A, LEBLANC R, ITO S, TANAKA J, LUCHININ A, KRYUCHKOVA I, MARTINEZ J, SHUSTIK J, KARLIN L, SYMEONIDIS A, EGYED M, PETRINI M, CAVO M, UCHIYAMA M, BLACKLOCK H, ARAT M, GRIFFIN J, HUNTER H, BUCK T, ANAGNOSTOPOULOS A, KONSTANTOPOULOS K, MASSZI T, BRINGHEN S, GAMBERI B, KAWANO Y, JIN SEOK K, OZDOGU H, OZKALEMKAS F. Isatuximab, carfilzomib, and dexamethasone in relapsed multiple myeloma (IKEMA): a multicentre, open-label, randomised phase 3 trial. *The Lancet*. 2021;397(10292):2361-71.

MORGAN WH, KHOO YJ, **KERMODE AG**, LIND CR, HAZELTON ML, PARSONS KE, YU DY. Utilisation of retinal vein photoplethysmography to measure intracranial pressure. *J Neurol Neurosurg Psychiatry*. 2021;92(1):104-6.

MORGAN-JONES R, CAO L, DAOZHANG C, SUNG HYUN L, BOON KENG T, KOBAYASHI J, NARIANI B, **SANDY-HODGETTS K**. Incision care and dressing selection in surgical wounds: Findings from an international meeting in the APAC region. *Int Wound J*. 2021

MULDMAA M, MENCACCI NE, PITTMAN A, KADASTIK-EERME L, SIKK K, TABA P, HARDY J, **KÖKS S**. Community-based genetic study of Parkinson's disease in Estonia. *Acta Neurol Scand*. 2021;143(1):89-95.

MÜLLER-NEDEBOCK AC, VAN DER WESTHUIZEN FH, **KÖKS S**, BARDIEN S. Nuclear genes associated with mitochondrial DNA processes as contributors to Parkinson's Disease risk. *Mov Disord*. 2021;36(4):815-31.



NABAIS MF, LAWS SM, LIN T, VALLERGA CL, ARMSTRONG NJ, BLAIR IP, KWOK JB, MATHER KA, MELLICK GD, SACHDEV PS, WALLACE L, HENDERS AK, ZWAMBORN RAJ, HOP PJ, LUNNON K, PISHVA E, ROUBROEKS JAY, SOININEN H, TSOLAKI M, MECOCCI P, LOVESTONE S, KLOSZEWSKA I, VELLAS B, AUSTRALIAN IMAGING B, LIFESTYLE S, ALZHEIMER'S DISEASE NEUROIMAGING I, FURLONG S, GARTON FC, HENDERSON RD, MATHERS S, MCCOMBE PA, **NEEDHAM M**, NGO ST, NICHOLSON G, PAMPHLETT R, ROWE DB, STEYN FJ, WILLIAMS KL, ANDERSON TJ, BENTLEY SR, DALRYMPLE-ALFORD J, FOWDER J, GRATTON J, HALLIDAY G, HICKIE IB, KENNEDY M, LEWIS SJG, MONTGOMERY GW, PEARSON J, PITCHER TL, SILBURN P, ZHANG F, VISSCHER PM, YANG J, STEVENSON AJ, HILLARY RF, MARIONI RE, HARRIS SE, DEARY IJ, JONES AR, SHATUNOV A, IACOANGELI A, VAN RHEENEN W, VAN DEN BERG LH, SHAW PJ, SHAW CE, MORRISON KE, AL-CHALABI A, VELDINK JH, HANNON E, MILL J, WRAY NR, MCRAE AF. Meta-analysis of genome-wide DNA methylation identifies shared associations across neurodegenerative disorders. *Genome Biol.* 2021;22(1):90.

NAVEED A, COOPER JA, LI R, HUBBARD A, CHEN J, LIU T, **WILTON SD**, **FLETCHER S**, FOX AH. NEAT1 polyA-modulating antisense oligonucleotides reveal opposing functions for both long non-coding RNA isoforms in neuroblastoma. *Cellular and Molecular Life Sciences.* 2021;78(5):2213-30.

OREN YS, IRONY-TUR SINAI M, GOLEC A, BARCHAD-AVITZUR O, MUTYAM V, LI Y, HONG J, OZERI-GALAI E, HATTON A, LEIBSON C, CARMEL L, REITER J, SORSCHER EJ, **WILTON SD**, KEREM E, ROWE SM, SERMET-GAUDELUS I, KEREM B. Antisense oligonucleotide-based drug development for cystic fibrosis patients carrying the 3849+10 kb C-to-T splicing mutation. *J Cyst Fibros.* 2021 Sep; 20(5): 865–875.

PARAMALINGAM S, NEEDHAM M, RAYMOND W, **MASTAGLIA F**, LIGHTOWLER D, MORIN N, COUNSEL P, KEEN HI. Muscle shear wave elastography, conventional B mode and power Doppler ultrasonography in healthy adults and patients with autoimmune inflammatory myopathies: a pilot cross-sectional study. *BMC Musculoskelet Disord.* 2021;22(1):537.

GBD 2019 UNDER-5 MORTALITY COLLABORATORS (**ALAM K**). Global, regional, and national progress towards Sustainable Development Goal 3.2 for neonatal and child health: all-cause and cause-specific mortality findings from the Global Burden of Disease Study 2019. *The Lancet.* 2021;398(10303):870-905.

PFAFF AL, BUBB VJ, QUINN JP, **KÖKS S**. Reference SVA insertion polymorphisms are associated with Parkinson's Disease progression and differential gene expression. *NPJ Parkinson's Dis.* 2021;7(1):44

PUGH JD, MCCOY K, **NEEDHAM M**, JIANG L, GILES M, MCKINNON E, HEINE K. Evaluation of an Australian neurological nurse-led model of post-discharge care. *Health Soc Care Community.* 2021.

RAGURAMAN P, BALACHANDRAN AA, CHEN S, DIERMEIER SD, **VEEDU RN**. Antisense oligonucleotide-mediated splice switching: potential therapeutic approach for cancer mitigation. *Cancers (Basel).* 2021;13(21).

RESTUADI R, GARTON FC, BENYAMIN B, LIN T, WILLIAMS KL, VINKHUYZEN A, VAN RHEENEN W, ZHU Z, LAING NG, MATHER KA, SACHDEV PS, NGO ST, STEYN FJ, WALLACE L, HENDERS AK, VISSCHER PM, **NEEDHAM M**, MATHERS S, NICHOLSON G, ROWE DB, HENDERSON RD, MCCOMBE PA, PAMPHLETT R, BLAIR IP, WRAY NR, MCRAE AF. Polygenic risk score analysis for amyotrophic lateral sclerosis leveraging cognitive performance, educational attainment and schizophrenia. *Eur J Hum Genet.* 2021.

ROSHANDEL D, THOMPSON JA, CHARNG J, ZHANG D, CHELVA E, ARUNACHALAM S, ATTIA MS, LAMEY TM, MCLAREN TL, DE ROACH JN, MACKAY DA, **WILTON SD**, **FLETCHER S**, MCLENACHAN S, CHEN FK. (2021) Exploring microperimetry and autofluorescence endpoints for monitoring disease progression in PRPF31-associated retinopathy. *Ophthalmic Genet.* 42(1):1-14.

ROTHZERG E, HO XD, XU J, WOOD D, MÄRTSON A, **KÖKS S**. Upregulation of 15 antisense long non-coding RNAs in osteosarcoma. *Genes (Basel).* 2021;12(8).

ROTHZERG E, XU J, WOOD D, **KÖKS S**. 12 Survival-related differentially expressed genes based on the TARGET-osteosarcoma database. *Exp Biol Med (Maywood).* 2021;246(19):2072-81.

RURAK BK, RODRIGUES JP, POWER BD, DRUMMOND PD, **VALLENCE AM**. Reduced SMA-M1 connectivity in older than younger adults measured using dual-site TMS. *Eur J Neurosci.* 2021;54(7):6533-52.

RURAK BK, RODRIGUES JP, POWER BD, DRUMMOND PD, **VALLENCE AM**. Test re-test reliability of dual-site TMS measures of SMA-M1 connectivity differs across inter-stimulus intervals in younger and older adults. *Neuroscience.* 2021;472:11-24.

SANDY-HODGETTS K, ANDERSEN CA, AL-JALODI O, SERENA L, TEIMOURI C, SERENA TE. Uncovering the high prevalence of bacterial burden in surgical site wounds with point-of-care fluorescence imaging. *Int Wound J.* 2021.

SANDY-HODGETTS K, BUI U, COYER F, WELLER C, WOOD F, FINLAYSON K. Research priorities for acute wounds in adults in Australia: a scoping review protocol. *Wounds Prac Res Wounds Aus J.* 2021;29(3):171-6.

SANDY-HODGETTS K, CAO L, DOOZHANG C, SUNG HYUN L, BOON KENG T, KOBAYASHI J, NARIANI B, MORGAN-JONES R. Post-surgical incision care across the Asia-Pacific region: current practice and perceptions. *Int Wound J.* 2021;12(3):63-9.

SANDY-HODGETTS K. A national registry for wound research—a new frontier for Australia? *J Wounds Aus.* 2021;29(1).

SANGILD PT, STRUNK T, **CURRIE AJ**, NGUYEN DN. Editorial: Immunity in compromised newborns. *Front Immunol.* 2021;12:732332.

SENECHAL M, HEBERT JJ, **FAIRCHILD TJ**, MOLLER NC, KLAKK H, WEDDERKOPP N. Vigorous physical activity is important in maintaining a favourable health trajectory in active children: the CHAMPS Study-DK. *Sci Rep.* 2021;11(1):19211.

SHE H, ZHENG X, XIAO Y, **MASTAGLIA F**, **AKKARI A**, WU J. Novel SPG4 mutation in a patient with sporadic hereditary spastic paraplegia and elevated cerebrospinal fluid protein. *J Clin Neurol.* 2021;17(1):152-3.

SHEFNER JM, ANDREWS JA, GENGE A, JACKSON C, LECHTZIN N, MILLER TM, COCKROFT BM, MENG L, WEI J, WOLFF AA, MALIK FI, BODKIN C, BROOKS BR, CARESS J, DIONNE A, FEE D, GOUTMAN SA, GOYAL NA, HARDIMAN O, HAYAT G, HEIMAN-PATTERSON T, HEITZMAN D, HENDERSON RD, JOHNSTON W, KARAM C, KIERNAN MC, KOLB SJ, KORNGUT L, LADHA S, MATTE G, MORA JS, **NEEDHAM M**, OSKARSSON B, PATTEE GL, PIORO EP, PULLEY M, QUAN D, REZANIA K, SCHELLENBERG KL,

SCHULTZ D, SHOESMITH C, SIMMONS Z, STATLAND J, SULTAN S, SWENSON A, BERG L, VU T, VUCIC S, WEISS M, WHYTE-RAYSON A, WYMER J, ZINMAN L, RUDNICKI SA. A Phase 2, Double-Blind, randomized, dose-ranging trial of Reldesemtiv In patients with ALS. *Amyotroph Lateral Scler Frontotemporal Degener.* 2021;22(3-4):287-99.

SMITH SJ, LOPRESTI AL, TEO SYM, **FAIRCHILD TJ**. Examining the effects of herbs on testosterone concentrations in men: A systematic review. *Adv Nutr.* 2021;12(3):744-65.

SMITH SJ, TEO SYM, LOPRESTI AL, HERITAGE B, **FAIRCHILD TJ**. Examining the effects of calorie restriction on testosterone concentrations in men: a systematic review and meta-analysis. *Nutr Rev.* 2021.

SOO J, RACINAIS S, **FAIRCHILD TJ**, IHSAN M, BUCHHEIT M, GIRARD O. Effects of graded hypoxia during exhaustive intermittent cycling on subsequent exercise performance and neuromuscular responses. *Eur J Appl Physiol.* 2021;121(12):3539-49.

STORM CS, KIA DA, ALMRAMHI MM, BANDRES-CIGA S, FINAN C, HINGORANI AD, WOOD NW. Finding genetically-supported drug targets for Parkinson's disease using Mendelian randomization of the druggable genome. *Nat Commun.* 2021;12(1):7342.

STRUNK T, **HIBBERT J**, DOHERTY D, NATHAN E, SIMMER K, RICHMOND P, **CURRIE A**, BURGNER D. Impaired cytokine responses to live *Staphylococcus epidermidis* in preterm infants precede gram-positive, late-onset sepsis. *Clin Infect Dis.* 2021;72(2):271-8.

SULTANA MA, CLUNING C, KWONG WS, **POLAIN N**, PAVLOS NJ, RATAJCZAK T, WALSH JP, XU J, **REA SL**. The SQSTM1/p62 UBA domain regulates Ajuba localisation, degradation and NF-kappaB signalling function. *PLoS One.* 2021;16(11):e0259556.

TEO SYM, KANALEY JA, GUELFY KJ, DIMMOCK JA, JACKSON B, **FAIRCHILD TJ**. Effects of diurnal exercise timing on appetite, energy intake and body composition: A parallel randomized trial. *Appetite.* 2021;167:105600.

THEUNISSEN F, ANDERTON RS, **MASTAGLIA FL**, **FLYNN LL**, WINTER SJ, JAMES I, BEDLACK R, HODGETTS S, **FLETCHER S**, **WILTON SD**, LAING NG, MACSHANE M, **NEEDHAM M**, SAUNDERS A, MACKAY-SIM A, MELAMED Z, RAVITS J, CLEVELAND DW, **AKKARI PA**. Novel STMN2 variant linked to amyotrophic lateral sclerosis risk and clinical phenotype. *Frontiers in Aging Neuroscience.* 2021;13(127).

THEUNISSEN F, WEST PK, BRENNAN S, PETROVIC B, HOOSHMAND K, **AKKARI PA**, KEON M, GUENNEWIG B. New perspectives on cytoskeletal dysregulation and mitochondrial mislocalization in amyotrophic lateral sclerosis. *Transl Neurodegener.* 2021;10(1):46.

THOMAS PB, JEFFERY P, GAHETE MD, WHITESIDE E, WALPOLE C, MAUGHAM M, JOVANOVIC L, GUNTER J, WILLIAMS E, NELSON C, HERINGTON A, LUQUE RM, **VEEDU R**, CHOPIN LK, SEIM I. The long non-coding RNA GHSROS reprograms prostate cancer cell lines toward a more aggressive phenotype. *PeerJ.* 2021;9:e10280.

TIAN J, ADAMS MJ, TAY JWT, JAMES I, POWELL S, HUGHES QW, GILMORE G, **BAKER RI**, **TIAO JY**. Estradiol-Responsive miR-365a-3p Interacts with tissue factor 3'UTR to modulate tissue factor-initiated thrombin generation. *Thromb Haemost.* 2021.

TREND S, LEFFLER J, JONES AP, CHA L, GORMAN S, BROWN DA, BREIT SN, **KERMODE AG**, FRENCH MA, WARD NC, HART PH. Associations of serum short-chain fatty acids with circulating immune cells and serum biomarkers in patients with multiple sclerosis. *Scientific Reports*. 2021;11(1).

TREND S, LEFFLER J, TEIGE I, FRENDEUS B, **KERMODE AG**, FRENCH MA, HART PH. FcγRIIb expression is decreased on naive and marginal zone-like B cells from females with multiple sclerosis. *Front Immunol*. 2020;11:614492.

VALENTIN R, WONG C, ALHARBI AS, PRADELOUX S, MORROS MP, LENNOX KA, ELLYARD JJ, GARCIN AJ, ULLAH TR, KUSUMA GD, PEPIN G, LI HM, PEARSON JS, FERRAND J, LIM R, **VEEDU RN**, MORAND EF, VINUESA CG, BEHLKE MA, GANTIER MP. Sequence-dependent inhibition of cGAS and TLR9 DNA sensing by 2'-O-methyl gapmer oligonucleotides. *Nucleic Acids Res*. 2021;49(11):6082-99.

VALLENCE AM, DANSIE K, GOLDSWORTHY MR, MCALLISTER SM, YANG R, ROTHWELL JC, RIDDING MC. Examining motor evoked potential amplitude and short-interval intracortical inhibition on the up-going and down-going phases of a transcranial alternating current stimulation (tacs) imposed alpha oscillation. *Eur J Neurosci*. 2021;53(8):2755-62.

VAN RHEENEN W, VAN DER SPEK RAA, BAKKER MK, VAN VUGT J, HOP PJ, ZWAMBORN RAJ, DE KLEIN N, WESTRA HJ, BAKKER OB, DEELEN P, SHIREBY G, HANNON E, MOISSE M, BAIRD D, RESTUADI R, DOLZHENKO E, DEKKER AM, GAWOR K, WESTENENG HJ, TAZELAAR GHP, VAN EIJK KR, KOOYMAN M, BYRNE RP, DOHERTY M, HEVERIN M, AL KHLEIFAT A, IACOANGELI A, SHATUNOV A, TICOZZI N, COOPER-KNOCK J, SMITH BN, GROMICHO M, CHANDRAN S, PAL S, MORRISON KE, SHAW PJ, HARDY J, ORRELL RW, SENDTNER M, MEYER T, BASAK N, VAN DER KOOI AJ, RATTI A, FOGH I, GELLERA C, LAURIA G, CORTI S, CEREDA C, SPROVIERO D, D'ALFONSO S, SORARU G, SICILIANO G, FILOSTO M, PADOVANI A, CHIO A, CALVO A, MOGLIA C, BRUNETTI M, CANOSA A, GRASSANO M, BEGHI E, PUPILLO E, LOGROSCINO G, NEFUSSY B, OSMANOVIC A, NORDIN A, LERNER Y, ZABARI M, GOTKINE M, BALOH RH, BELL S, VOURCH P,

CORCIA P, COURATIER P, MILLECAMPS S, MEININGER V, SALACHAS F, MORA PARDINA JS, ASSIALIOU A, ROJAS-GARCIA R, DION PA, ROSS JP, LUDOLPH AC, WEISHAUPT JH, BRENNER D, FREISCHMIDT A, BENSIMON G, BRICE A, DURR A, PAYAN CAM, SAKER-DELYE S, WOOD NW, TOPP S, RADEMAKERS R, TITTMANN L, LIEB W, FRANKE A, RIPKE S, BRAUN A, KRAFT J, WHITEMAN DC, OLSEN CM, UITTERLINDEN AG, HOFMAN A, RIETSCHEL M, CICHON S, NOTHEN MM, AMOUYEL P, CONSORTIUM S, CONSORTIUM P, CONSORTIUM S, CONSORTIUM S, TRAYNOR BJ, SINGLETON AB, MITNE NETO M, CAUCHI RJ, OPHOFF RA, WIEDAU-PAZOS M, LOMEN-HOERTH C, VAN DEERLIN VM, GROSSKREUTZ J, ROEDIGER A, GAUR N, JORK A, BARTHEL T, THEELE E, ILSE B, STUBENDORFF B, WITTE OW, STEINBACH R, HUBNER CA, GRAFF C, BRYLEV L, FOMINYKH V, DEMESHONOK V, ATAULINA A, ROGELJ B, KORITNIK B, ZIDAR J, RAVNIK-GLAVAC M, GLAVAC D, STEVIC Z, DRORY V, POVEDANO M, BLAIR IP, KIERNAN MC, BENYAMIN B, HENDERSON RD, FURLONG S, MATHERS S, MCCOMBE PA, **NEEDHAM M**, NGO ST, NICHOLSON GA, PAMPHLETT R, ROWE DB, STEYN FJ, WILLIAMS KL, MATHER KA, SACHDEV PS, HENDERS AK, WALLACE L, DE CARVALHO M, PINTO S, PETRI S, WEBER M, ROULEAU GA, SILANI V, CURTIS CJ, BREEN G, GLASS JD, BROWN RH, JR., LANDERS JE, SHAW CE, ANDERSEN PM, GROEN EJM, VAN ES MA, PASTERKAMP RJ, FAN D, GARTON FC, MCRAE AF, DAVEY SMITH G, GAUNT TR, EBERLE MA, MILL J, MCLAUGHLIN RL, HARDIMAN O, KENNA KP, WRAY NR, TSAI E, RUNZ H, FRANKE L, AL-CHALABI A, VAN DAMME P, VAN DEN BERG LH, VELDINK JH. Common and rare variant association analyses in amyotrophic lateral sclerosis identify 15 risk loci with distinct genetic architectures and neuron-specific biology. *Nat Genet*. 2021;53(12):1636-48.

VO L, ILICH N, **FUJIYAMA H**, DRUMMOND PD. Anodal transcranial direct current stimulation reduces secondary hyperalgesia induced by low frequency electrical stimulation in healthy volunteers. *J Pain*. 2021;23(2):305-17.

VUCIC S, HENDERSON RD, MATHERS S, **NEEDHAM M**, SCHULTZ D, KIERNAN MC, the TEALS study group. Safety and efficacy of dimethyl fumarate in ALS: randomised controlled study. *Ann Clin Transl Neurol*. 2021;8(10):1991-9.

VUCIC S, WRAY N, HENDERS A, HENDERSON RD, TALMAN P, MATHERS S, BELLGARD M, AOUN S, BIRKS C, THOMAS G, HANSEN C, THOMAS G, HOGDEN A, **NEEDHAM M**, SCHULTZ D, SOULIS T, SHEEAN B, MILNE J, ROWE D, ZOING M, KIERNAN MC. MiNDAUS partnership: a roadmap for the cure and management of motor neurone disease. *Amyotroph Lateral Scler Frontotemporal Degener*. 2021;1-8.

WANG T, CHEN L, **CHIKKANNA A**, CHEN S, BRUSIUS I, SBUH N, **VEEDU RN**. Development of nucleic acid aptamer-based lateral flow assays: A robust platform for cost-effective point-of-care diagnosis. *Theranostics*. 2021;11(11):5174-96.

GBD 2019 ADOLESCENT MORTALITY COLLABORATORS (**ALAM K**). Global, regional, and national mortality among young people aged 10–24 years, 1950–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*. 2021;398(10311):1593-618.

WARD SE, FOGARTY H, KARAMPINI E, LAVIN M, SCHNEPPENHEIM S, DITTMER R, MORRIN H, GLAVEY S, NI CHEALLAIGH C, BERGIN C, MARTIN-LOECHES I, MALLON PW, CURLEY GF, **BAKER RI**, BUDE U, O'SULLIVAN JM, O'DONNELL JS, O'CONNELL N, BYRNE M, TOWNSEND L, MCEVOY NL, CLARKE J, BOYLAN M, ALALOAM R, WORRALL AP, KELLY C, DE BARRA E, PRESTON R, KENNY D. ADAMTS13 regulation of VWF multimer distribution in severe COVID-19. *Journal of Thrombosis and Haemostasis*. 2021;19(8):1914-21.

WASZCZYKOWSKA A, ZMYŚŁOWSKA A, BARTOSIEWICZ K, STUDZIAN M, PUŁASKI Ł, BRAUN M, IVASK, M, **KÖKS S**, JUROWSKI P, MŁYNARSKI W. Reduced corneal sensitivity with neuronal degeneration is a novel clinical feature in Wolfram Syndrome. *Am J Ophthalmol*. 2021;236:63-8.

WHIFE CJ, **VALLENCE AM**, EDGAR DW, WOOD FM. Decreased neuroplasticity in minor burn injury survivors compared to non-injured adults: A pilot study in burn injury survivors aged 45 years and older. *Burns*. 2021;47(2):327-37.

WINES BD, TRIST HM, ESPARON S, IMPEY RE, MACKAY GA, ANDREWS RK, SOARES DA COSTA TP, PIETERSZ GA, **BAKER RI**, Hogarth PM. Fc Binding by FcγRIIa Is Essential for cellular activation by the Anti-FcγRIIa mAbs 8.26 and 8.2. *Frontiers in Immunology*. 2021;12.

WOOD A, **GURFINKEL Y**, **POLAIN N**, LAMONT W, **LYN REA S**. Molecular mechanisms underlying TDP-43 Pathology in cellular and animal models of ALS and FTLD. *Int J Mol Sci*. 2021;22(9).

XIAO W, REN L, CHEN Z, FANG LT, ZHAO Y, LACK J, GUAN M, ZHU B, JAEGER E, KERRIGAN L, BLOMQUIST TM, HUNG T, SULTAN M, IDLER K, LU C, SCHERER A, KUSKO R, MOOS M, XIAO C, SHERRY ST, ABAAN OD, CHEN W, CHEN X, NORDLUND J, LILJEDAHL U, MAESTRO R, POLANO M, DRABEK J, VOJTA P, **KÖKS S**, REIMANN E, MADALA BS, MERCER T, MILLER C, JACOB H, TRUONG T, MOSHREFI A, NATARAJAN A, GRANAT A, SCHROTH GP, KALAMEGHAM R, PETERS E, PETITJEAN V, WALTON A, SHEN TW, TALSANIA K, VERA CJ, LANGENBACH K, DE MARS M, HIPPIA, WILLEY JC, WANG J, SHETTY J, KRIGA Y, RAZIUDIN A, TRAN B, ZHENG Y, YU Y, CAM M, JAILWALA P, NGUYEN C, MEERZAMAN D, CHEN Q, YAN C, ERNEST B, MEHRA U, JENSEN RV, JONES W, LI JL, PAPAS BN, PIROOZNIYA M, CHEN YC, SEIFUDDIN F, LI Z, LIU X, RESCH W, WANG J, WU L, YAVAS G, MILES C, NING B, TONG W, MASON CE, DONALDSON E, LABABIDI S, STAUDT LM, TEZAK Z, HONG H, WANG C, SHI L. Toward best practice in cancer mutation detection with whole-genome and whole-exome sequencing. *Nat Biotechnol*. 2021;39(9):1141-50.

XIONG H, **VEEDU RN**, DIERMEIER SD. Recent advances in oligonucleotide therapeutics in oncology. *Int J Mol Sci*. 2021;22(7).

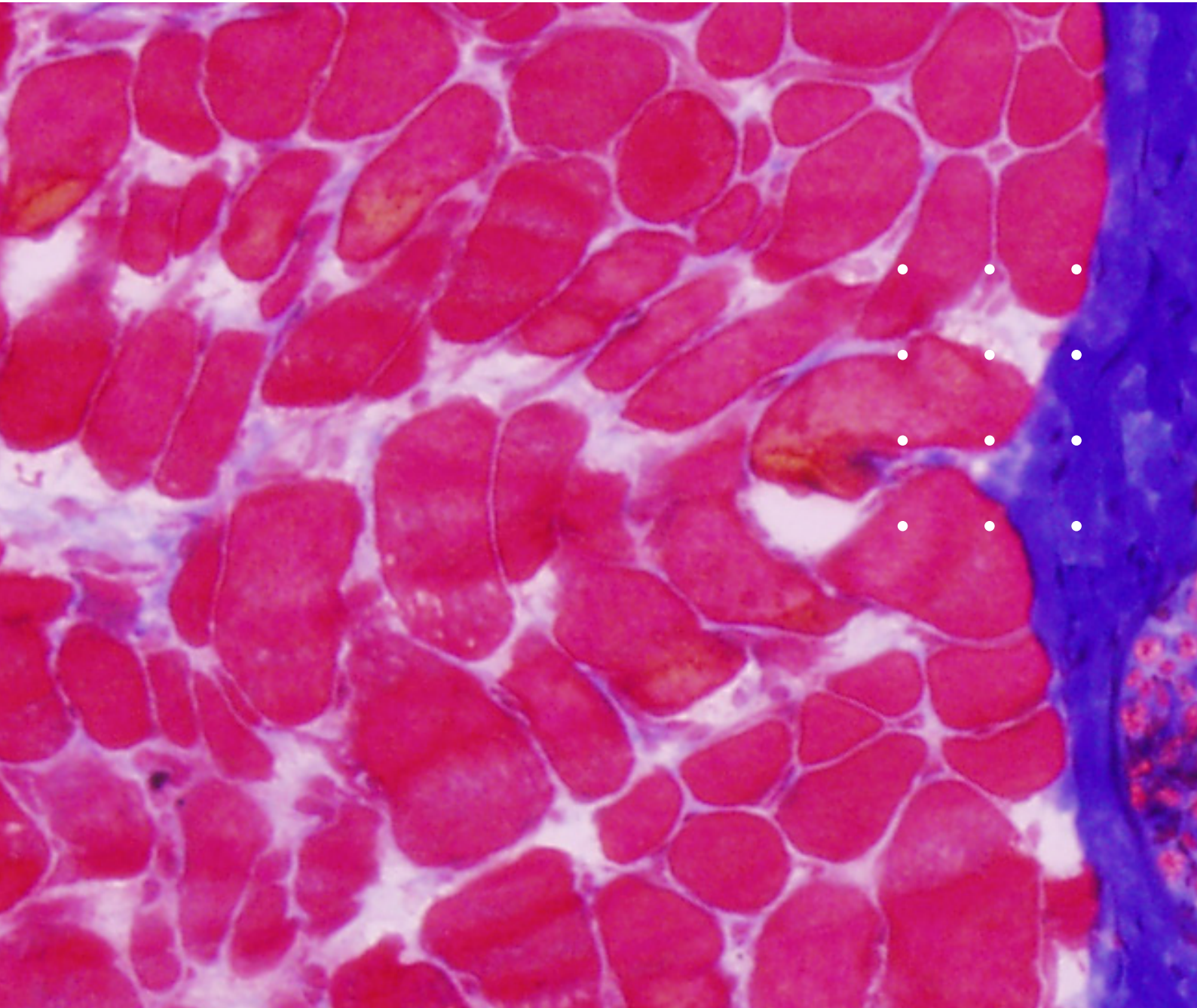
ZAW K, WONG EYM, ZHANG X, ZHANG D, CHEN SC, THOMPSON JA, LAMEY T, MCLAREN T, DE ROACH JN, **WILTON SD**, **FLETCHER S**, MITRPANT C, ATLAS MD, CHEN FK, MCLENACHAN S. Generation of three induced pluripotent stem cell lines from a patient with Usher syndrome caused by biallelic c.949C > A and c.1256G > T mutations in the USH2A gene. *Stem Cell Res*. 2021;50.

ZHAO Y, FANG LT, SHEN TW, CHOUDHARI S, TALSANIA K, CHEN X, SHETTY J, KRIGA Y, TRAN B, ZHU B, CHEN Z, CHEN W, WANG C, JAEGER E, MEERZAMAN D, LU C, IDLER K, REN L, ZHENG Y, SHI L, PETITJEAN V, SULTAN M, HUNG T, PETERS E, DRABEK J, VOJTA P, MAESTRO R, GASPAROTTO D, **KÖKS S**, REIMANN E, SCHERER A, NORDLUND J, LILJEDAHL U, FOOX J, MASON CE, XIAO C, HONG H, XIAO W. Whole genome and exome sequencing reference datasets from a multi-center and cross-platform benchmark study. *Sci Data*. 2021;8(1):296.

ZHONG M, VAN DER WALT A, STANKOVICH J, KALINCIK T, BUZZARD K, SKIBINA O, BOZ C, HODGKINSON S, SLEE M, LECHNER-SCOTT J, MACDONELL R, PREVOST J, KUHLER J, LAUREYS G, VAN HIJFTE L, ALROUGHANI R, **KERMODE AG**, BUTLER E, BARNETT M, EICHAU S, VAN PESCH V, GRAMMOND P, MCCOMBE P, KARABUDAK R, DUQUETTE P, GIRARD M, TAYLOR B, YEH W, MONIF M, GRESLE M, BUTZKUEVEN H, JOKUBAITIS VG. Prediction of multiple sclerosis outcomes when switching to ocrelizumab. *Mult Scler*. 2021.



Cover image: Glycogen accumulation in muscle due to acid alpha-glucosidase deficiency



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