

Centre for Molecular Therapeutics

May News Updates



“Harnessing the power of the tropics to develop innovative solutions to global public health”

The Centre for Molecular Therapeutics is based at James Cook University, adjacent to the World Heritage- listed Daintree Rainforest and the iconic Great Barrier Reef. North Queensland also harbours many parasites and other microorganisms that are restricted to tropical environments. This enormous biodiversity provides a unique opportunity to explore and test new medicines derived from these natural resources as novel therapeutics for a range of infectious diseases and non-infectious human illnesses, including chronic disorders, allergies and autoimmune diseases as well as envenomation's.

The world's tropical regions also have special significance as home to a number of major global health pathogens as well as important emerging or re-emerging infectious disease threats. Immunotherapeutic's, vaccines and diagnostics to manage these diseases are urgently needed. The Centre for Molecular Therapeutics provide a unique framework for researchers with diverse expertise to collaborate on innovative cross-disciplinary research to develop novel therapeutics, vaccines and diagnostics from the tropics and for the tropics. Research is carried out under four key programs of Biodiscovery, Molecular Characterisation and Design, Molecular Immunology and Clinical Translation.

CMT WEBSITE: <https://www.jcu.edu.au/cmt>

FACEBOOK:

<https://www.facebook.com/Centre-For-Molecular-Therapeutics-1511726859066532/>

TWITTER: <https://twitter.com/CMTJCU>



Under the Microscope – Thimo Ruethers



1. Tell me about your area of research?

I am tackling fish allergy, facing the challenge of thousands of different fish. As every fish is different, allergy to fish heavily depends on the species. Some suffering Australians could die from barramundi while safely enjoying salmon or gummy shark. The problem: All fish is often considered the same due to limited diagnostic capability. My research aims to provide much-needed reliable and species-specific diagnostics for the Asia-Pacific region.

2. What interests you about working in this area?

All animals can be relevant for allergy research. Most of them can still kill humans even when sizzling on the barbie. People suffering from fish allergy often also have to watch out for other vertebrates including crocodiles and snakes as we recently discovered.

3. How do you see your research developing in the future?

We are currently experiencing a wave of food allergy epidemics and there are many challenges for clinicians, researchers and patients. Australia is the World's Food Allergy Capital and therefore we have to take a leading role in ensuring a safe and nutritious diet for the hundreds of millions people suffering worldwide. My research shall contribute to reliable diagnostics of fish allergy and liberate patients from strict diets.

4. What are the 5 most important techniques you use in your research?

Catching and cutting fish, protein extraction, SDS-PAGE, immunoblotting, and advanced mass spectrometric analyses.

5. What advice do you have for science students who are considering medical research as a career?

Find a field you have a passion for and people you'd enjoy working with.

6. What do you see as the benefits of being part of the Centre for Molecular Therapeutics (CMT)?

Nowadays, you can't conduct research just by yourself. Therefore, Centre's like CMT are crucial to promote much-needed inter-disciplinary collaborations.

7. Tell me about the highlights of your professional career so far?

Doing exciting research with fantastic collaborators and publishing it in high-profile journals as well as talking with experts and non-experts about it. One of the most spectacular findings so far is the 'fish-crocodile syndrome': Two out of three fish allergy sufferers could die from eating crocodile. Recently, I had a chance talking about it in the international science communication competition FameLab.

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Under the Microscope continued

8. What would you like to do in the future?

Expanding my knowledge about life (sciences) and living a happy life

9. Tell me 5 things you dislike?

Distances, dishonesty, money-stress, diseases, and injuries

10. Tell me 5 things that make you happy?

Crocs, crabbing, sunshine, time and travel with loved ones, actions of love

Professor Zoltan Sarnyai GUT REACTION TO SCHIZOPHRENIA

A James Cook University research team led by neuroscientist, Professor Zoltan Sarnyai, has identified that changes to gut bacteria, triggered by a high fat, very low carbohydrate diet, may have the potential to reverse symptoms of schizophrenia

<https://www.aithm.jcu.edu.au/gut-reaction-to-schizophrenia/>



Dr Cadhla Firth

THROWING LIGHT ON HOW DISEASES SPREAD FROM ANIMALS TO HUMANS.

Dr Cadhla Firth, who has joined the AITHM at James Cook University, hopes to use the institutes genome sequencing research to understand more about the spread of disease from animals to humans.

<https://www.aithm.jcu.edu.au/throwing-light-on-how-diseases-spread-from-animals-to-humans/>





PhD Student Daniel Browne Growing Science Students in the Laboratory

Centre for Molecular Therapeutics immunology research assistant and soon to be PhD student, Daniel Browne, is already keen to mentor others. His first workplace intern, aged 16, recently passed with flying colours.

Cairns Hinterland Steiner School Year 10 student, Bethany Sarles, spent two days per week working alongside him in a laboratory, in November last year.

<https://www.aithm.jcu.edu.au/growing-science-students-in-the-laboratory/>



FameLab Annual Competition

**Thimo Ruethers was a national Finalist
in the Science Communication**

<https://australiascience.tv/vod/thimo-ruethers-the-deadly-danger-of-crocs-on-a-plate/>

Previous Winners and Finalists.

2014: Michael Smout (AITHM), Winner

2015: Sandip Kamath (AITHM and CSTFA),
Winner

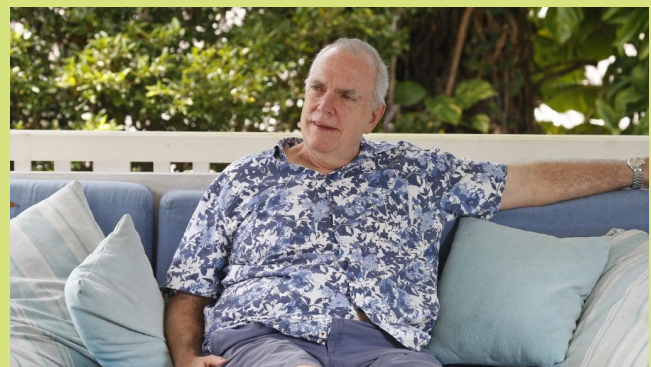
2017: Maria Nayfa (CSTFA), Finalist

2019: Thimo Ruethers (AITHM and
CSTFA), Finalist

'GODFATHER' OF FNQ MOSQUITO RESEARCH TO TAKE ON GLOBAL SCIENCE ROLE IN PANAMA

The Godfather of mosquito research in the far north has urged his colleagues to step-up their fight against a dangerous mozzie species, after he leaves to take on a new role in central America.

James Cook University's Professor Scott Ritchie is departing Cairns for Panama, starting work in August as the director of field entomology for the World Mosquito Program, formerly known as the Eliminate Dengue project. Prof Ritchie was the principal investigator for the program, which is funded by the Bill and Melinda Gates Foundation, when it started in 2005.



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May Publications

Vaccination of hamsters with *Opisthorchis viverrini* extracellular vesicles and vesicle-derived recombinant tetraspanins induces antibodies that block vesicle uptake by cholangiocytes and reduce parasite burden after challenge infection.

Chaiyadet S, Sotillo J, Krueajampa W, Thongsen S, Brindley PJ, Sripa B, Loukas A, Laha T.
doi: 10.1371/journal.pntd.0007450 PLOS Neglected Tropical Diseases

In-depth proteomic characterization of *Schistosoma haematobium*: Towards the development of new tools for elimination.

Sotillo J, Pearson MS, Becker L, Mekonnen GG, Amoah AS, van Dam G, Corstjens PLAM, Murray J, Mduluza T, Mutapi F, Loukas A.
doi: 10.1371/journal.pntd.0007362. PLOS Neglected Tropical Diseases

New insights into the kinetics and variability of egg excretion in controlled human hookworm infections.

Hoogerwerf MA, Coffeng LE, Brienen EAT, Janse JJ, Langenberg MCC, Kruize YCM, Gootjes C, Manurung MD, Dekker M, Becker L, Erkens MAA, van der Beek MT, Ganesh MS, Feijt C, Winkel BMF, Westra IM, Meij P, Loukas A, Visser LG, de Vlas SJ, Yazdanbakhsh M, van Lieshout L, Roestenberg M.
doi: 10.1093/infdis/jiz218. The Journal of Infectious diseases

Fish-derived low molecular weight components modify bronchial epithelial barrier properties and release of pro-inflammatory cytokines.

Kalic T, Ellinger I, Kamath SD, Palladino C, Mayr V, Tscheppe A, Ruethers T, Waltl EE, Niederberger V, Lengger N, Radauer C, Hafner C, Lopata AL, Bublin M, Breiteneder H.
doi: 10.1016/j.molimm.2019.04.029. Molecular Immunology

A cross-sectional, population-based study on the prevalence of food allergies among children in two different socio-economic regions of Vietnam.

Le TTK, Nguyen DH, Vu ATL, Ruethers T, Taki AC, Lopata AL.
doi: 10.1111/pai.13022 Pediatric Allergy and Immunology

TCR-induced alteration of primary MHC peptide anchor residue.

Madura F, Rizkallah PJ, Legut M, Holland CJ, Fuller A, Bulek A, Schauenburg AJ, Trimby A, Hopkins JR, Wells S, Godkin A, Miles JJ, Sami M, Li Y, Liddy N, Jakobsen BK, Loveridge EJ, Cole DK, Sewell AK.
doi: 10.1002/eji.201948085. European Journal of Immunology

Molecular dissection of box jellyfish venom cytotoxicity highlights an effective venom antidote.

Lau MT, Manion J, Littleboy JB, Oyston L, Khuong TM, Wang QP, Nguyen DT, Hesselton D, Seymour JE, Neely GG.
doi: 10.1038/s41467-019-09681-1. Nature Communications



SKILLING UP FOR A CAREER IN SCIENCE

WORKSHOPS

CMT is proud to be co-hosting a workshop titled '*Skilling up for a Career in Science*' targeted for PhD students and ECRs. The workshop will be co-hosted by *TropWater*, the *Centre for Tropical Bioinformatics and Molecular Biology*, and the *Centre for Molecular Therapeutics*.

We will cover topics including grant writing, alternative pathways to success, networking, working with industry and government and combatting imposter syndrome.

The TOWNSVILLE workshop will be held on July 4 at 9am-1pm in the ATSIP seminar room.

The CAIRNS workshop will be held on July 15 at 11am-3pm in D003-059.

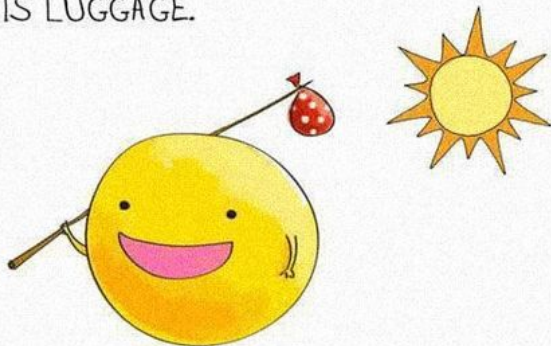
In both locations, lunch will be provided to allow an opportunity to network with panel members.

If you would like to attend please email Lynne Saunders: Lynne.Saunders@jcu.edu.au



JOKES

A PHOTON CHECKS INTO A HOTEL AND IS ASKED IF HE NEEDS ANY HELP WITH HIS LUGGAGE.



"NO, I'M TRAVELLING LIGHT."

