AUSINE 2022 Australian Microbial Ecology Conference

Melbourne Connect

7 – 9 November 2022

PROGRAM



Program book sponsored by:

melbconnect.com.au







Monday 7th November 2022

CONFERENCE WELCOME

9:00AM - 9:10AM

Presenter: Chris Greening

OPENING ADDRESS

9:10AM - 9:20AM

Presenter: Steven Chown

Plenary 1

9:20AM - 10:00AM Chair: Linda Blackall

9:20 AM Maureen O'Malley

Healthy versus dysfunctional microbiomes abs# 1

Morning tea

10:00AM - 10:30AM

TERRESTRIAL MICROBIOLOGY SESSION

10:30AM - 12:40PM

Chairs: Zahra Islam & Christian Rinke

Session Sponsored by



International Agricultural Research

Australian Government
Australian Centre for

10:30 AM Hangwei Hu

Protist predation contributes to the development of bacterial antibiotic resistance in

soils abs#2

11:00 AM Christina Birnbaum

Soil microbiome in blue carbon ecosystems: opportunities and challenges for coastal

wetland restoration abs# 3

11:20 AM Simon J McIlroy

Discovery of a pleomorphic life cycle in the anaerobic methanotroph

'Candidatus Methanoperedens nitroreducens' abs# 4

12:35 PM Pok Man Leung

Atmospheric hydrogen oxidation extends to the domain archaea abs# 5

11:50 AM Samuel Aroney

A fork in the metabolic road: mapping methane and carbon dioxide emissions from a

microbial community in a thawing permafrost ecosystem abs# 6

11:53 AM Yijia Tang

Denitrification dynamics of N2O emissions after re-flooding on dry paddy soils abs# 7

11:56 AM Nathali Machado de Lima

Biocrust cyanobacteria improve the performance of native plants on Pilbara saline soils *abs#* 8

12:00 PM Georgina H Joyce

The distribution and metabolic diversity of anaerobic methanotrophic archaea of the family *Methanoperedenaceae abs# 9*

12:10 PM Yunyun Zhang

Three soil types differ in their mechanistic and temporal response of the priming effect to nitrogen addition *abs# 10*

12:20 PM **Sean K Bay**

Atmospheric energy supports microbial biodiversity and primary production in cave ecosystems *abs# 11*

12:30 PM Thi Bao Anh Nguyen

The great importance of biotic factors in structuring soil protist community across Australian natural soil ecosystems. *abs# 12*

POSTER SESSION I: TERRESTRIAL, SYMBIOSIS, TOOLBOX

1:20PM - 2:20PM

Including Poster Pitches Posters

- Samuel Aroney
- Yijia Tang
- Nathali de Lima
- Roshan Regmi
- Carl Kobel
- Ryan Hesse
- Yang Lu
- Yunke Jia
- Vanessa Rossetto Marcelino

Ella Bromhead

Survey of the insect symbiont *Wolbachia* sp. in native Australian mosquito populations of the Hunter Estuary *abs# 101*

Isini S. Buthgamuwa

The echidna microbiome is stable throughout the phases of gestation *abs# 103*

Sally Byers

A temperate bacteriophage gifts its *Klebsiella* hosts with a potent interbacterial weapon *abs# 105*

Mark Farrell

Cover crops, carbon, and microbial communities *abs# 107*

Imelda Forteza

Evidence for a limited and transient gut microbial diversity within the simple gut of a social forager velvet worm *Euperipatoides rowelli* abs# 109

Laura Geissler

Wanted alive: viability testing of the coral microbiome *abs# 111*

Brodie F Gillieatt

Uncovering the resistome and plasmidome of heavy metal impacted sediment communities *abs# 113*

Thanavit Jirapanjawat

Surveillance of antimicrobial resistant microorganisms across different reservoirs through culture-based techniques *abs# 115*

Abeeha Khalil

The role of plant growth promoting hormones in phytoplankton-bacteria interactions *abs# 117*

Cameron Lee

My Martian life microbial life in analogous Martian environments *abs# 119*

Cameron Lee

Perchlorate tolerant halophile isolated from analogous Martian environment *abs# 121*

Jiasui Li

Discovery of seaweed disease protective bacteria and analysis of the protective mechanisms *abs# 123*

Scott W Mitchell

Mobile genetic elements and antimicrobial resistance genes in the equine microbiome *abs#* 125

Carl Pille

Development of a *Brachypodium distachyon* root associated synthetic bacteria community *abs#* 127

B.L.D Uthpala Pushpakumara

Bacterial communities of the coral-associated alga *Ostreobium* are taxonomically diverse and reveal signatures of phylosymbiosis *abs# 129*

Dante Romeo

Investigating the effects of salinity on wheat plant-soil microbiomes *abs# 131*

Seka Seneviratne

Conservation treatments: microbial biodeterioration of paintings in southease asia *abs# 133*

Georgina Stagg

Genetic data critical to improving inoculant rhizobia strain selection programs and optimising nitrogen fixation in australian agriculture *abs#* 135

Kshitij Tandon

Genomic view of what's beneath the coral tissue *abs# 137*

Dana Z Tribbia

An investigation into the Antarctic uncultured bacterial

phylum Candidatus Eremiobacterota abs# 139

Vinícius Werneck Salazar

Facilitating genome-resolved metagenome analysis with Metaphor *abs# 141*

Peipei Xue

Continental-scale mapping of soil bacteria and fungi compositional heterogeneity *abs# 143*

Qi Yang

Characterising the specificity of the endosymbiotic microbiome within marine sponge stem cells *abs# 145*

There are no posters on the following numbers: #147, #149, #151, #153

SYMBIOSIS SESSION

2:20PM - 3:10PM

Chairs: Christina Birnbaum & Mark Farrell

2:20 PM Elizabeth Dinsdale

Using MAGs to investigate microbial relationships across shark host phylogenies abs#

13

2:50 PM Adam Frew

The arbuscular mycorrhizal symbiosis: fungal diversity and the impacts on plant-

herbivore interactions abs# 14

Afternoon tea

3:10PM - 3:40PM

SYMBIOSIS SESSION II

3:40PM - 5:00PM

Chairs: Christina Birnbaum & Mark Farrell

3:40 PM Katherine E. Dougan

Adaptation to a facultative lifestyle in an algal endosymbiont of corals via whole-

genome duplication abs# 15

3:55 PM Thea O. Andersen

The metabolic influence of the core ciliate *Entodinium caudatum* within the rumen

microbiome abs# 16

4:10 PM Roshan Regmi

Biological disease suppression: Rhizosphere microbe assembly and functions

influenced by soil amendments abs# 17

4:13 PM Carl M. Kobel

Holo-omics and host-microbiome interactions in the herbivore rumen abs# 18

4:16 PM **Ryan Hesse**

Exploring the epidermal virome of carcharhinid sharks abs# 19

4:20 PM Talisa Doering

Identification of reactive oxygen and nitrogen species-scavenging coral probiotic

bacteria to increase coral bleaching resilience abs# 20

4:30 PM Simon R Law

Metatranscriptomics captures dynamic shifts in mycorrhizal coordination in boreal

forests abs# 21

4:40 PM Elena Colombi

Diverse populations of nonsymbiotic *Mesorhizobium* spp. present in Australian soils

have a capacity to become legume symbionts following horizontal gene transfer abs#

22

4:50 PM Allison Mertin

Diversity, biogeography and plant growth promotion potential of native Australian seed

microbiomes abs# 23

PLENARY 2

5:00PM - 5:40PM

Chair: Xabier Vázquez-Campos

5:00 PM Phil B Pope

Grazed and confused: the complex feeding habits of our gut microbes abs# 24



ARC Research Hub for Smart Fertilisers

Developing New Fertiliser Products

The ARC Research Hub for Smart Fertilisers is funded by the Australian Government through the Australian Research Council Industrial Transformation Research Program.



















smartfertiliserhub.org.au



The University of Melbourne.

Tuesday 8th November 2022

PLENARY 3

9:00AM - 10:00AM Chair: Helen Hayden

9:00 AM Ulrike Mathesius

Signaling and eavesdropping in the rhizosphere of legumes abs# 25

9:40 AM **Damien T Maher**

The weird and wonderful world of bark-dwelling microbial communities abs# 26

Morning tea

10:00AM - 10:30AM

AQUATIC MICROBIOLOGY SESSION

10:30AM - 12:40PM

Chairs: Ashley Dungan & Gaofeng Ni

10:30 AM Suhelen Egan

Impact of the Roseobacter group on marine health and microbiome assembly abs# 27

11:00 AM Torsten Thomas

To be announced abs# 28

11:30 AM Apoorva Prabhu

Exploring microbial community dynamics and their ecological functions in a subtropical

estuary - bay ecosystem abs#29

11:45 AM **Diane McDougald**

Protozoan predation drives the adaptive evolution of Vibrio cholerae abs# 30

12:00 PM Viduthalai Rasheedkhan Regina

Adaptation to overflow metabolism in Vibrio vulnificus enhances predation defence

against Tetrahymena pyriformis abs# 31

12:03 PM Ruby Comte

Antibiotics disrupt ecosystem processes in aquatic biofilms abs# 32

12:06 PM Ning Hall

Methanogenesis in coastal sandy sediments linked to seaweed-derived methylated

substrates abs# 33

12:10 PM Caitlin Romanis

Metagenomic insights of benthic seeding in recurrent toxigenic Microcystis bloom

development abs# 34

12:20 PM Barbara Drigo

The resistome, mobilome, and virulome of waterbodies in Australia and the Pacific

Islands abs# 35

12:30 PM Perran Cook

Isotopologues of ¹³C labelled glucose reveal organic carbon is oxidised through distinct

pathways in permeable and cohesive sediments abs# 36

Lunch

12:40PM - 1:20PM

POSTER SESSION 2: MARINE, HUMAN, INDUSTRIAL

1:20PM - 2:20PM

Including Poster Pitches Posters

- Meghann Thai
- Abolghasem Hedayatk hah
- Xinwei Ruan

- Azhar Sindi
- Jadzia Livingston
- Ruby Comte
- Ning Hall

- Christian Rinke
- Viduthalai

Rasheedkhan Regina

Maha MA Alharbi

Which bacteria mediate Fe²⁺ driven DNRA in iron rich marine sediments? *abs# 102*

Madison S. Bone

Biofilm microbial necrobiomes as novel markers for estimating pmsi for submerged, freshwater remains *abs# 104*

Wenan W. Cai

Influence of cocoa powder in encapsulating probiotic *Escherichia coli Nissle* 1917 for food use *abs# 106*

Yibi Chen

Genome wide transcriptome analysis reveals the diversity and role of non coding RNAs in dinoflagellates *abs# 108*

Phil Aidan C. Cruz

In vitro simulated gastrointestinal digestion and colonic fermentation of a fixed combination of *Euphorbia hirta* L. extract and probiotic bacteria *abs# 110*

Chloe L. Estoque

Metal ionophores break macrolide resistance in streptococcus pneumoniae abs# 112

Sebastian Euler

Methanogens limited to lower rhizosphere and atypical salt marsh niche along a pristine mangrove community continuum *abs# 114*

David Gillett

Beggars can't be choosers: the mixotrophic *Mycobacterium smegmatis* uses both hydrogen fermentation and nitrate respiration to support persistence during hypoxia *abs# 116*

Cecilie R Gotze

Spatial Resolution and Function of Bacterial Aggregates Within Tissues of the Coral *Acropora loripes abs# 118*

Shiqi Guo

Identifying mannitol biosynthesis in anemoneassociated bacteria abs# 120

Tess Hutchinson

The fate of organic fermentation products in facultative anaerobes of dynamic sandy sediments *abs# 122*

Rania Ismail

Temporal changes of microbial community composition in Yan Yean drinking water reservoir *abs# 124*

Harpreet Kaur

Insights into Cr (VI) bioremediation mechanisms

of an efficient novel metal resistant bacterium isolated from effluent water *abs# 126*

Emma Kerr

Body-site specific microbiome of *Myliobatis* tenuicaudatus abs# 128

Andrew D Letten

Why resource dynamics matter in the optimization of microbial communities *abs# 130*

Geetika Nambiar

Exploring the utility of museum specimens for characterising fish microbiome dynamics *abs#* 132

Daniel D Nebauer

Identifying molecular trends in a seasonal toxic cyanobacterial bloom through metaproteomics *abs# 134*

Thanh NGUYEN

Isolation of marine bacteria regulating N_2O emissions from permeable sediments *abs# 136*

Gaofeng Ni

Quantification and VOC delineation of SARS-CoV-2 virus from municipal wastewater *abs# 138*

Life, death or dormancy? Ciprofloxacin induces persistence in aquatic microbiota abs# 140

Laura Rood

Shelf-life extension of vacuum-packed lamb through manipulation of the microbial community by elevated glucose *abs# 142*

Amber Skye

Whale shark epidermal microbiome are stable across size and sex but vary over days *abs# 144*

I Nyoman Sumerta

Defining microbial community dynamics in spontaneous fermentation of palm wine and association with metabolomic profile. *abs# 146*

Callaway Thatcher

Developing probiotics for aquaculture production of corals abs# 148

Ben Vezina

Metabolic diversity of the *Klebsiella* pnuemoniae Species Complex abs# 150

Elizabeth Watkin

The microbial ecology of acidic saline lakes of the Yilgarn Craton *abs# 152*

Anna Wittwer

Carbohydrate assimilation profiles and enzyme secretion of *Kazachstania* yeasts *abs# 154*

HUMAN MICROBIOLOGY SESSION

2:20PM - 3:10PM

Chairs: Vanessa Rossetto Marcelino & Christopher Stubenrauch

2:20 PM Samuel Forster

Understanding microbial communities in inflammatory bowel disease abs# 37

2:40 PM Hajara Aslam

The Human Gut Microbiome, Mental Health, and Diet abs# 38

Afternoon tea

3:10PM - 3:40PM

HUMAN MICROBIOLOGY SESSION II

3:40PM - 5:00PM

Chairs: Vanessa Rossetto Marcelino & Christopher Stubenrauch

3:40 PM Erin R Shanahan

Identification of diet-linked gut microbial ecosystem features associated with cancer

immunotherapy outcomes abs# 39

3:55 PM Caitlin Welsh

A previously uncharacterised hydrogenase dominates fermentation in the human

gastrointestinal tract abs# 40

4:10 PM Xinwei Ruan

The salivary microbiome shows a high prevalence of core bacterial members yet variability

across human population abs# 41

4:13 PM **Azhar S Sindi**

Effect of a maternal dietary intervention during lactation on the infant gut microbiome abs#

42

4:16 PM **Jadzia Livingston**

Visualization of mRNA expression in Pseudomonas aeruginosa aggregates reveals spatial

patterns of fermentative and denitrifying metabolism abs# 43

4:20 PM Laura K Inglis

Prevalence of prophages in the microbiome of healthy vs unhealthy humans abs# 44

4:30 PM Cameron Reid

Chicken or the plasmid? ColV plasmids in E. coli and their relationships with hosts and

lineages abs# 45

4:40 PM **Don Ketagoda**

In vitro oral microbiome transplantation abs# 46

4:50 PM **Heema Vyas**

Assessing the Role of Pharyngeal Cell Surface Glycans in Group A Streptococcus Biofilm

Formation abs# 47

PLENARY 4

5:00PM - 5:40PM Chair: Simon Law

5:00 PM Scott Rice

Talking to the neighbours, communication and interactions in microbial communities' abs#

48

EVENING FUNCTION

7:00PM - 9:00PM

Inner North Brewery (ticketed event)



Australian Government

Australian Centre for International Agricultural Research

THE AUSTRALIAN
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RESEARCH-FOR-DEVELOPMENT

AGENCY



Investing in research partnerships



Increasing the productivity of agricultural systems



Improving the resilience of food systems





Wednesday 9th November 2022

PLENARY 5

9:20AM - 10:00AM Chair: Sacha Pidot

9:20 AM Georgina Hold

The Use Of Targeted Microbial Therapeutics To Improve Health – Are We There Yet? *abs# 49*

Morning tea

10:00AM - 10:30AM

INDUSTRIAL & FOOD MICROBIOLOGY

10:30AM - 12:30PM

Chairs: Steve Petrovski & Elizabeth Watkin

10:30 AM **Jianhua Guo**

Opportunities and challenges for novel nitrogen cycling microorganisms to achieve

sustainable nitrogen removal and recovery abs# 50

11:00 AM Nicholas Coleman

The hydrocarbon-oxidising Mycobacterium strain NBB4: bioremediation, biocatalysis,

biosensors and beyond abs# 51

11:20 AM Matthew Lee

Metabolism of dichloromethane and quaternary amines by the strictly anaerobic bacterium

'Ca. Formimonas warabiya' abs# 52

11:35 AM **Jayson JA Rose**

Candidatus Mycosynbacter amalyticus and the CPR insight into the world of the "microbial

dark matter" and their role in the wastewater microbial community abs# 53

11:50 AM Christian Rinke

Insights into plastic biodegradation: community composition and functional capabilities of

the superworm (Zophobas morio) microbiome abs# 54

11:53 AM **Meghann Thai**

Feeding mushrooms: a microbial conversation between bacteria and fungi abs# 55

11:56 AM **Abolghasem Hedayatkhah**

eDNA production, surface colonization, biofilm formation and changes on the surface and

subsurface of phosphate minerals by Klebsiella aerogenes abs# 56

12:00 PM **Yi Peng**

Probing the plastic degradation potential of marine microbes abs# 57

12:10 PM Sui Nin Nicholas Yang

Characterisation of a novel soluble di-iron monooxygenase gene cluster in the soil

bacterium Solimonas soli abs# 58

12:20 PM Farhad Shafiei

Engineering thiocyanate-degrading microbial consortia: considerations for mine waste

bioremediation abs# 59

Lunch

12:30PM - 1:10PM

MICROBIAL TOOLBOX

1:10PM - 2:50PM

Chairs: Thomas Watts & Ben Vezina

1:10 PM **Ben Woodcroft**

New informatic tools for genome-centric metagenomics abs# 60

1:40 PM Rochelle Soo

Probing for Vampirovibrionia with a microbial toolbox abs# 61

2:00 PM Vanessa Rossetto Marcelino

A new approach to quantify functional redundancy in microbiomes and guide

therapies abs# 62

2:03 PM Yang LU

Investigating the low methane economy of the marsupial microbiome using metagenomic

and cultivation techniques abs# 63

2:06 PM Yunke Jia

Correlative light and electron microscopy to detect protein-protein interactions in microbial

symbiosis abs# 64

2:10 PM Rachael Lappan

There's a bear in there, and a chair as well: reducing, removing and understanding

contamination in low-biomass metagenomics applications abs# 65

2:20 PM Saritha Kodikara

Longitudinal microbiome data analysis abs# 66

2:30 PM Ruby Dixon

Identification of unique microbial signatures pre- and post-coitus by next generation

sequencing and it's potential to detect sexual contact abs# 67

2:40 PM Cheong Xin Chan

Understanding resilience of the "red tide" dinoflagellate Prorocentrum cordatum in warming

oceans using an integrated multi-omics approach abs# 68

PLENARY 6

2:50PM - 3:30PM

Chair: Madeleine van Oppen

2:50 PM Robert Edwards

To be announced abs# 69

CLOSING, PRIZES, AUSME 2024 PREVIEW

3:30PM - 3:45PM





biomedical sciences. We strive to be the pre-eminent veterinary and agricultural science Faculty in the Asia-Pacific region and the regional school of choice for

veterinary and agricultural science students.

MELBOURNE

DELEGATE INFORMATION

VIEWING ALL ABSTRACTS

We have made all conference information, abstracts and programs available in a user-friendly smart phone compatible website.

To access the compatible website on your smart phone, computer, or tablet – please use this link: http://ausme-2022.p.asnevents.com.au/

For easy access, we recommend that you save a shortcut to the site to your home screen. Should you require any additional help using the mobile based app, please do not hesitate to visit the friendly staff at the registration desk.

TRAVEL & CAR PARKING

Melbourne Connect does not have onsite parking, however, the closest parking location to the building is Cardigan House Parking (96 Grattan St, Carlton VIC 3053)

For more information and prices:

https://en.parkopedia.com.au/parking/station/cardigan_house/3053/carlton/

Melbourne Connect is also accessible via train (Melbourne Central is the closest station).

Trams run along Swanston Street and stop at Melbourne Central Station and Flinders Street Station. Swanston Street tram numbers are 1, 3, 3a, 5, 6, 16, 64, 67 & 72

COVID-19 INFORMATION

The following COVID-19 measures have been put in place to ensure the health and safety of our friends and colleagues. The Organising Committee requests that anyone who is unwell or showing symptoms prior to conference does not attend. If you are unwell and unable to attend prior to the conference, please contact Kara Barker (kara.b@asnevents.net.au). Alternative attendance options may be available.

The Organising Committee recommends a negative result on a Rapid Antigen Test, 12-24 hours prior to arriving at the venue.

It is requested that everyone maintains social distancing where possible, observes cough etiquette, and maintains personal hygiene measures. We recommend wearing a facemask. There will be several hand sanitiser dispensers available around the venue.

If at any point during the conference, you start to feel unwell, the Organising Committee requests that you immediately remove yourself from the conference and contact Kara Barker (kara.b@asnevents.net.au).

If you need medical care or advice on resources to support you, please use the following:

- Nurse on Call: 1300 60 60 24
- Emergency Services: 000
- Please follow the COVID requirements as per your state.

SOCIAL PROGRAM

Evening Function - Inner North Brewery

- Date: Tuesday 8th November
- Time: 7PM 9PM
- Location: 10A Russell Street Brunswick, VIC 3056 (accessible via the number 19 tram)
- Includes: limited drinks and pizza

ADVANCED BOOKING REQUIRED – CHECK YOUR REGISTRATION TO ENSURE YOU HAVE BOOKED YOUR SEAT.

NOTICE BOARD

A notice board will be available at the venue should you wish to advertise jobs or events. Please ensure you bring your flyers pre-printed as no printing facilities will be available. Velcro to attach to the notice board will be provided.

SPEAKER INSTRUCTIONS

Due to the tight program, we would be grateful for speaker to supply their presentations ahead of time. If you are comfortable to do so, please use this google drive link to upload your slides.

If you have not supplied your presentations ahead of time, please bring it on a USB device to upload in the session room. Audio-visual equipment will be supplied and there will be a committee member available to assist with any enquiries. Your presentation should be 16:9 format to get the best image. ALL presentations should be pre-loaded **at least 1 full session before your session** (or by 8:30 AM for the Monday morning session). Unfortunately, due to the setup at the venue, we cannot allow personal computers to be used to present.

POSTER PRESENTER INSTRUCTIONS

Posters should be size A0 portrait orientation and can be attached to the poster boards with Velcro (supplied). Additional Velcro supplies can be obtained from the registration desk. The poster boards are located in the Exhibition Hall and are numbered according to the poster numbers in the program.

There will be 2 dedicated poster sessions:

- Poster Session One (Terrestrial, Symbiosis, Toolbox): Monday 7th November Odd numbered presenters
- **Poster Session Two (Marine, Human, Industrial)**: Tuesday 8th November Even numbered presenters

Posters can be put up on the first day of the conference and removed by the end of the conference. Presenters are asked to stand in proximity of their poster during their poster session to answer any questions from other delegates.

PRESENTATION JUDGING

AusME will be conducting presentation judging as "People's Choice". To participate in the judging, please use the following links. Please remember to be professional and fair when submitting your form.

- People's choice poster: https://forms.gle/Ws94NkmgvdQ5fJd89
- People's choice oral: https://forms.gle/QyGoLFQyx43RHH3aA

PLEASE SUBMIT YOUR ONLINE FORM BY THE END OF THE MICROBIAL TOOLBOX SESSION.