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NEW ZEALAND

SCIENCE
SCHOOL OF CHEMICAL SCIENCES

11TH ANNUAL
Research Showcase
12 June 2019

Programme booklet

School of Chemical Sciences

11th Annual Research Showcase

Wednesday 12th June 2019

Organising Committee

Dr Fan Zhu (Chair)
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- The EETNZ also sponsors a chair in Energy Economics at the Business School. That funding has supported the establishment of the Energy Centre at the University of Auckland Business School. The Energy Centre undertakes research and issues publications on various energy related topics important to New Zealand's present and future energy needs.
- The EETNZ from time to time provides funding or co-funding to New Zealand universities and scientific research organisations for research, or relevant education projects, in all aspects of energy. Sectors/projects granted research awards have included, geothermal, solar and wind power, hydro and advanced forms of electricity generation, dairy industry processing, biofuel and hydrogen fuel production, sedimentary mapping and energy storage systems.
- The EETNZ sponsors a series in "Energy Matters" with distinguished international and local speakers. It also sponsors a Summer School on energy. Presentations are made by academics and executives from New Zealand energy companies.
- The EETNZ offers 15 undergraduate scholarships of $5000 each to 1st, 2nd, 3rd and honours year students at all participating New Zealand universities. The purpose of the scholarships is to encourage university study with an emphasis on energy in the followings fields:

1. Economics and related fields;
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Details on the scholarships and the application process are normally published in the annual Calendars of the participating New Zealand universities.

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Welcome

Welcome to the School of Chemical Sciences Research Showcase

I am very pleased to welcome you to our 11th Annual School of Chemical Sciences Research Showcase. Our Showcase provides an opportunity for us to share our excitement about research with the broad Chemical Sciences community. This event is a high point of our year, at which our PhD students share their interest in and excitement about research. It is a wonderful opportunity to learn about the diversity of science occurring within our School, and maybe start a new collaboration!

We welcome our research students and fellows, commercial suppliers and research partners, along with all other attendees who wish to learn about our research. This year, over 130 PhD students from our School will be presenting their research in interdisciplinary areas such as Food Science, Forensic Science, Green Chemical Science, Materials Chemistry, Medicinal Chemistry, and Wine Science, as well as in the traditional disciplines of Analytical, Inorganic, Organic, and Physical Chemistry.

Eight PhD students have been invited to give 15-minute presentations on their research, while 3-minute "Thesis Challenge" talks from 45 of our first-year PhD students provide an insight into the breadth of research activities in our School. We also have an invited keynote speaker, Dr Mark Krasnow, who is a viticultural researcher and entrepreneur.

Our more senior PhD students are displaying their research on posters. Please take the opportunity to read the posters and talk with the presenters. From past experience, all the presenters welcome the opportunity to let specialists and non-specialists learn about what they are doing and why it is important.

Finally, I thank the members of the Research Showcase Committee, and especially the Chair Dr. Fan Zhu for organising this celebration of our research.

Associate Professor Gordon Miskelly - Head, School of Chemical Sciences

Programme

Morning Session

07:45 – 08:15	*Registration*
08:15 – 08:20	*Welcome: Associate Professor Gordon Miskelly, Head of School*
08:20 – 08:25	*Address by Deputy Vice Chancellor (Research) – Professor James Metson*
08:25 – 09:25	*PhD Presentations (15 minutes)*
09:25 – 10:30	*PhD Presentations (3 minutes)*
10:30 – 10:50	*Morning Tea*
10:50 – 11:50	*PhD Presentations (15 minutes)*
11:50 – 13:15	*PhD Presentations (3 minutes)*
13:15 – 15:00	*Lunch and Poster Session*

Afternoon Session

15:00 – 16:00	***Keynote Speaker: Dr Mark Krasnow, Thoughtful Viticulture***
16:00 – 16:30	*Prize Giving and School Photo*
16:30 – 18:00	*Wine Tasting/Reception*

Keynote Speaker

Dr. Mark Krasnow, Viticultural and Culinary Scientist
Director, Thoughtful Viticulture Ltd.

Mark received his Ph.D. in Integrative Crop Plant Physiology in 2004 from UC Davis. He taught and worked as a postdoc in California until moving to Hawke's Bay in 2010 to lecture in Viticulture and carry out research at EIT.

In 2013 Mark returned to the US to establish and teach in the Culinary Science program at the Culinary Institute of America in New York state. He taught chefs about the chemistry, microbiology, and physics at work in the kitchen and oversaw the students' senior theses.

In 2015 Mark returned to New Zealand to establish his company, Thoughtful Viticulture Ltd., which conducts research projects for the New Zealand wine industry and individual clients. He is also a consultant, specialising in irrigation management. His research aims to reduce chemical inputs in the vineyard, increase vineyard efficiency, and improve wine quality. Mark works closely with the University of Auckland's Wine Science programme on many of his research projects.

Oral presentations

Session 1 (8:25 am - 9:25 am)
Chaired by Stephen Lo

1. **Lakshini Fernando**
   Self-cleaning coatings for pre-painted steel roofing

2. **Ryan England**
   The development and validation of massively parallel sequencing for use in forensic science in the New Zealand population

3. **Kristel Castillo**
   Construction of novel compounds with Si-Si and Si-element bonds via catalytic coupling reactions

4. **Taniela Lolohea**
   Atmospheric plasma jet printing for tailored surfaces

Session 2 (10:50 am - 11:50 am)
Chaired by Matthew Sullivan

5. **Annabelle Collins**
   The design and synthesis of itaconic acid analogue ICL1 & ICL2 inhibitors to provide a novel method of combating latent Tuberculosis

6. **Noor Febrianto**
   Composition of bioactive compounds in cocoa beans as affected by its intra-variety diversity

7. **Esperanza Pearl**
   Marine natural product synthesis: A crucible for methods development

8. **Dona Gunawardana**
   Structural and mechanistic studies of the ethylene-forming enzyme

Self-cleaning coatings for pre-painted steel roofing

T. Lakshini Dilesha Fernando[1,2]

M. Cather Simpson[1,2,3], Sudip Ray[1]

[1]School of Chemical Sciences, The University of Auckland
[2]The Photon Factory, The University of Auckland
[3]Department of Physics, The University of Auckland

Acknowledgement: Fletcher Building, Callaghan Innovation and Biocide Toolbox
Fletcher Building Technical Advisors: Lou Gommans and Scott Morrison

Pre-painted steel roofing is extensively used in both residential and commercial constructions. The contamination of such roofs over time due to biological organisms and other environmental pollutants is a major aesthetic and functional problem. On the other hand roof cleaning is costly, laborious, time consuming and have accessing limitations. Harsh and toxic chemicals are also required to remove most of these contaminants. Therefore development of a commercial self-cleaning coating system on pre-painted steel (PPS) roofing is important and demanding.

The critical organism types and other environmental pollutants on PPS roofing have already been investigated under Australian and few other different contexts. The activity of photocatalytic titanium dioxide (TiO2) against these roof contaminants, due to the formation of reactive oxygen species (ROS) has also been investigated in recent studies. However durability and efficiency are the key challenges in developing photocatalytic coatings on painted substrates. The degradation of underlying paint components due to the activity of ROS is a major problem of applying photocatalytic coatings directly on a painted substrate. The development of a durable self-cleaning coating is also challenging as conventional binders can easily be degraded due to the activity of ROS. Therefore this research is aiming to develop a **durable** and **efficient** photocatalytic self-cleaning coating system on PPS roofing.

In this study, an additional protective layer will be introduced in between photocatalytic top layer and underlying paint layer as shown in Fig.01. The protective and photocatalytic layers will be consisted of an ROS resistant resin system to obtain long lasting performance. The efficiency of the coating system will be optimized by adjusting the ratio of TiO2 and ROS resistant resin. The performance of this self-cleaning coating system will be evaluated by using the standard ISO test methods (ISO 10678-210 and ISO 27447-2009), microscopic techniques (AFM-Atomic Force Microscopy, SEM-Scanning Electron Microscopy) and spectroscopic techniques (FTIR -Fourier Transform Infra-Red Spectroscopy and EDX-Energy Dispersive Spectroscopy). The accelerated weathering conditions and outdoor exposure studies will also be used as a measure of success.

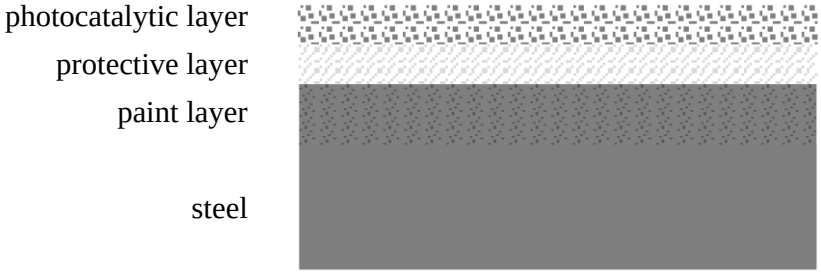


Figure 1. Layered structure of the self-cleaning coating system.

The development and validation of massively parallel sequencing for use in forensic science in the New Zealand population

Ryan England[1,2]

SallyAnn Harbison[1], Douglas Elliot[1,2], Andrew Sarman[1], Janet Stacey[1], Alex Liu[1,2], Rachel Boyle[1]

[1] Institute of Environmental Science and Research Limited, Auckland
[2] Forensic Science Program, School of Chemical Sciences, University of Auckland

Massively parallel sequencing is fast emerging as an increasingly useful tool for forensic science. This project aims to complete the forensic validation of the MiSeq FGx® Forensic Genomics System (Verogen). This system sequences up to 231 genomic DNA markers including short tandem repeats on autosomal, Y and X chromosomes, and SNPs which can be used to predict the ancestry, eye and hair colour of an individual. The forensic validation has involved completing a number of different studies into the system's performance, including methodology, sensitivity, repeatability and reproducibility, sequencing case type samples and DNA mixtures, and conducting a New Zealand population study.

The New Zealand population is a diverse one comprised of an indigenous Maori population and more recent immigrants from over 200 different ethnic groups. Much of the publically available allele frequency information and tools for addressing biogeographical ancestry and externally visible phenotype determination are lacking data representing our population, in particular, data from the Pacific Islands and New Zealand Maori. DNA samples from 550 participants were collected, extracted and sequenced using the MiSeq FGx® Forensic Genomics System. These sequencing results will be used to represent the New Zealand population, to generate allele frequencies for the 231 markers, and test the accuracies of the different ancestry and phenotype prediction tools.

Construction of novel compounds with Si-Si and Si-element bonds *via* catalytic coupling reactions

Kristel Mae Castillo

Erin M. Leitao

Organosilanes have drawn considerable attention in medicinal[1] and materials[2] chemistry as useful synthetic building blocks.[3] The unique and interesting physicochemical properties, resulting from the inclusion of silicon atoms in the parent carbon-based compounds,[3] make these compounds suitable as semiconductors. To date, several catalysts and synthetic methods have been used to form Si-Si and Si-element (Si-E) bonds but they have several drawbacks including harsh conditions, formation of by-products, and limited functional group tolerance.[4]

Expanding the synthetic toolkit available for silicon chemists, will make the design and preparation of complex silicon materials possible. For example, increased robustness in the polysilane structure is known to exhibit greater potential for electronic applications and achieving this requires new catalytic routes to forming Si-E bonds. In this study, a strategic sequence of chemical reactions was employed to synthesise complex organosilanes to obtain the ultimate target – bridged disilanes. Aromatic and organometallic functionalities were incorporated in organosilanes as bridges, with a particular aim of reinforcing the Si-Si bond. Theoretical calculations were run in conjunction to the synthetic research and provide a closer look at the electronics of bridged disilanes.

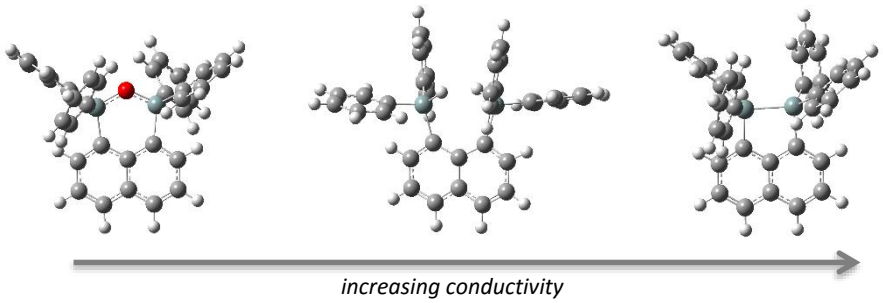


Figure 1. Comparative conductivities of compounds containing Si-O-Si, Si-H and Si-Si bonds.

1. Barnes, M. J.; Conroy, R.; Miller, D. J.; Mills, J. S.; Montana, J. G.; Pooni, P .K.; Showell, G. A.; Walsh, L. M.; Warneck, J. B. H. *Bioorg. Med. Chem. Lett.* **2007**, *17*, 354. (b) Wang, J.; Ma, C. L.; Wu, Y. B.; Lamb, R. A.; Pinto, L. H.; DeGrado, W. F. *J. Am. Chem. Soc.* **2011**, *133*, 13844. (c) Franz, A. K.; Wilson, S. O. J. *Med. Chem.* **2013**, *56*, 388.
2. Fukaya, N.; Haga, H.; Tsuchimoto, T.; Onozawa, S.; Sakakura, T.; Yasuda, H. *J. Organomet. Chem.* **2010**, *695*, 2540.
3. Guo, H.; Chen, X.; Zhao, C. He, W. *Chem. Commun*. **2015**, *51*, 17410-17412.
4. Itazaki, M.; Ueda, K.; Nakazawa, H. *Angew. Chem. Int. Ed*. **2009**, *48*, 3313-3316.

Atmospheric plasma jet printing for tailored surfaces

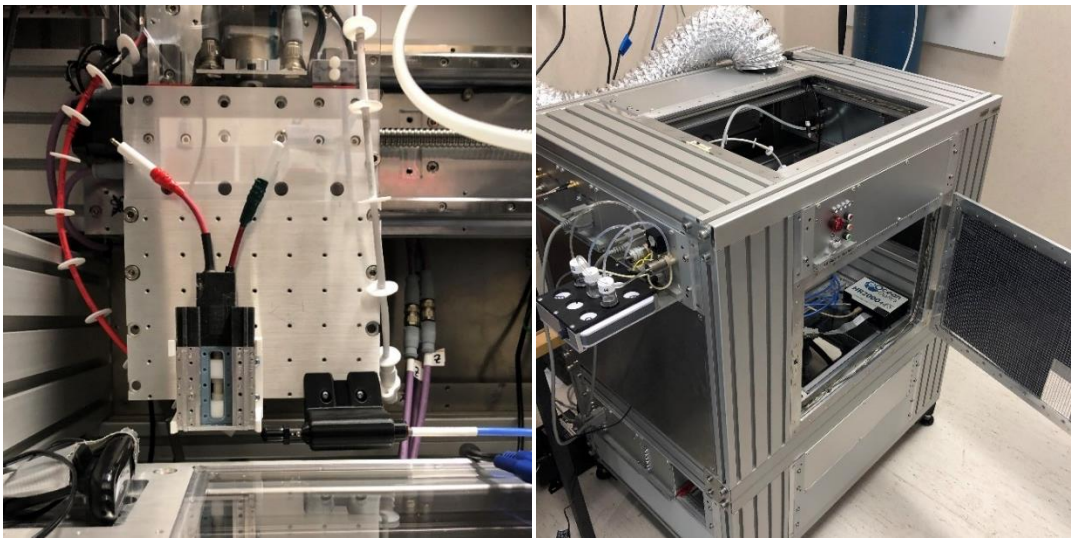
Taniela F. P. Lolohea

David E. Williams, Manatchanok Sitthiracha[1], Duncan J. McGillivray

[1]*Fisher and Paykel healthcare, 15 Maurice Paykel place*

Atmospheric plasma jet printing (APJP) offers a unique, versatile and fast technique to modify a surface, taking advantage of etching, activation and deposition of materials onto a range of surfaces. APJP can be used to modify the topography of a surface, introduce new chemical groups to the surface and depositing patterned coatings. APJP uses a combination of atmospheric plasma deposition alongside the ability to pattern the deposited material, to allow a unique control over the surface properties. Particular interest in nano to micron thick films; exploring combinations of surface treatments using plasma, such as surface activation and deposition.

The benefits of using plasma deposition include its unique interactions between the reactive species within the plasma and the precursor materials, the speed of deposition, its low temperature plasma, alongside its ability to pattern. These benefits make it a desirable route to surface modification which is more recently being integrated into industrial settings and device fabrication.



We present an overview of the atmospheric plasma jet printer and its functionality to control the behaviour of a surface. The overview will include the individual components of the instrument and their functionalities, leading into how these components can aid in tailoring a particular surface.

The design and synthesis of itaconic acid analogue ICL1 & ICL2 inhibitors to provide a novel method of combating latent Tuberculosis

Annabelle Collins

Brooke X C Kwai, Eva Anthony, Jonathan Sperry, Ivanhoe K H Leung

Mycobacterium Tuberculosis, the causative agent of the disease tuberculosis, is responsible for the highest human mortality rate among any infectious disease. Persistent *M. tuberculosis* infections depend on the glyoxylate shunt, a carbon-conserving bypass in the tricarboxylate cycle requiring isocitrate lyase (ICL). ICL is described as the gate enzyme of the glyoxylate shunt[1] and exists in two isoforms within *M. tuberculosis*; ICL1 & ICL2[2]. ICL's have a secondary function, acting as a methylisocitrate lyase in the Mtb methylcitrate cycle[3]. This role enables metabolism of propionyl-CoA and propionate generated from the ingestion of odd-chain fatty acids, avoiding the normal build-up of toxic intermediates. Previous studies have shown that inhibiting both ICLs removes the ability of *M. tuberculosis* to maintain the persistent stage, leading to bacterial death, making it an attractive target for drug discovery[4].

ICL1 & 2 catalyse the reversible retro-aldol cleavage of isocitrate into succinate and glyoxylate. Itaconic acid is an analogue of succinate, thought to play a role in macrophage-based immune response to *M. tuberculosis*[5]. As such, a number of itaconic acid analogues have been designed and synthesised for testing in *M. tuberculosis*, leading to the development of several series. Our results have identified a number of functional groups that affect the ability of the compounds to inhibit ICL1, and have led to further progress towards the design of a mechanism-based inactivator.

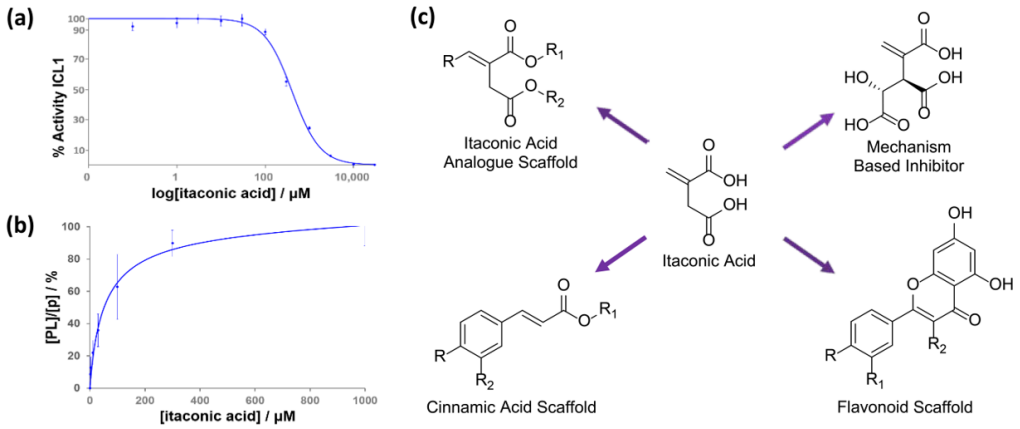


Figure 1. (**a**) The inhibition curve of the natural inhibitor itaconic acid shows an IC_{50} of 400 µM; (**b**) The binding curve of itaconic acid showing strong binding with a K_d of 50 µM; (**c**) Itaconic acid, and the series of inhibitors developed from SAR studies. Points of functional group exploration are marked.

1. McKinney, J. D. *et al.* Persistence of Mycobacterium tuberculosis in macrophages and mice requires the glyoxylate shunt enzyme isocitrate lyase. *Nature* **406,** 735–738 (2000).
2. Bhusal, R. P., Bashiri, G., Kwai, B. X. C., Sperry, J. & Leung, I. K. H. Targeting isocitrate lyase for the treatment of latent tuberculosis. *Drug Discov. Today* **22,** 1008–1016 (2017).
3. Gould, T. A., Van De Langemheen, H., Muñoz-Elías, E. J., McKinney, J. D. & Sacchettini, J. C. Dual role of isocitrate lyase 1 in the glyoxylate and methylcitrate cycles in Mycobacterium tuberculosis. *Mol. Microbiol.* **61,** 940–947 (2006).
4. Muñoz-Elías, E. J. & McKinney, J. D. Mycobacterium tuberculosis isocitrate lyases 1 and 2 are jointly required for in vivo growth and virulence. *Nat. Med.* **11,** 638–644 (2005)
5. Strelko, C. L. *et al.* Itaconic acid is a mammalian metabolite induced during macrophage activation. **133,** 16386– 16389 (2011).

Composition of bioactive compounds in cocoa beans as affected by its intra-variety diversity

Noor Ariefandie Febrianto

Fan Zhu

Bioactive compound in cocoa beans has been known to affect its sensory and nutritional properties. There is also an increasing interest in the bioactive composition of cocoa beans in relation with the development of nutritionally-enhanced products. Cocoa bioactive compounds such as polyphenol has been claimed to have antioxidant, anti-inflammatory, anti-allergenic, anti-microbial, immune-modulative and anti-carcinogenic activities[1]. In this study, cocoa beans samples were collected from Indonesia. Identification and quantification of bioactive compounds were carried out to better understand its composition as affected by its intra-variety diversity. The results showed a great genetic diversity in the composition of bioactive compounds among samples obtained from the same genotype. The concentration of methylxanthines, flavan-3-ols, anthocyanins and phenolic acids were found to be important factors differentiated the samples. From this study, several samples were found to be potential to be developed in order to achieve specific product's requirement. Further, this study also provide insights into farm management for improved breeding strategy based on cocoa beans bioactive composition.

Figure 1. Cocoa nibs extracted from single cocoa pod showing different pigmentation levels due to the content of anthocyanin.

1. Wollgast, J.; Anklam, E. *Food Res. Int.* **2000**, *33*, 423–447.

Marine natural product synthesis: A crucible for methods development

Esperanza Pearl

Dr Daniel Furkert, Dist. Prof. Margaret Brimble

Marine natural products possess a diverse range of unique molecular structures and exhibit potent biological activities. These features make them an ongoing source of inspiration for the development of novel pharmaceuticals and new chemical methods. Spirocyclic imine toxins are a particular sub-class of marine natural products characterised by a spiroimine motif embedded in a large ring framework. These are produced by marine dinoflagellates[1] and generally display high toxicity (mouse LD_{50} 40 μg/kg) leading to paralysis and death. Portimine represents the latest addition to this family of marine toxins, and unlike its predeccessors displays low toxicity and remarkable acitivty against leukeamia cell lines.[2] Synthesis of portimine would provide samples of the natural product and analogues, to systematically probe the exciting biological profile. Development of new chemical methods will be necessary to achieve a practical and modular synthesis suitable for analogue library generation.

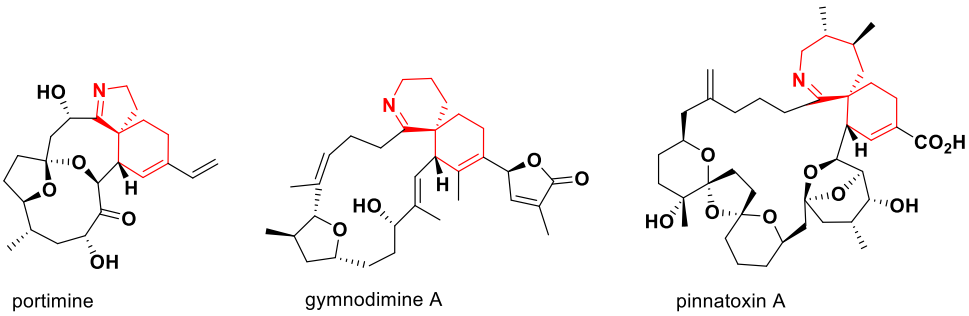


Figure 1. Spirocyclic imine marine toxins (*spiroimine highlighted in red*)

Current work is directed towards new strategies for key couplings of the sub-fragments of portimine. The Stetter reaction represents a mild and 'green' reaction (that mimics an enzymatic reaction catalysed by thiamine) to couple two fragments to form a 1,4-diketone.[3] The traditional intermolecular Stetter reaction remains under-used in natural product synthesis. In our work an *N*-heterocyclic carbene (NHC)-catalysed Stetter reaction is being investigated for use in the coupling of sub-fragments of portimine and also optimised as a general tool for wider application in organic synthesis.

1. Stivala, C. E.; Benoit, E.; Araoz, R.; Servent, D.; Novikov, A.; Molgo, J.; Zakarian, A. Nat. Prod. Rep. 2015, 32, 411-4352.
2. Selwood, A.I.; Wilkins, A.L.; Munday, R.; Shi, F.; Rhodes, L.L., Holland P.T. Tet. Lett. 2013, 54, 4705-4707.
3. Stetter, H. Angew. Chem. 1976, 15, 639-712.

Structural and mechanistic studies of the ethylene-forming enzyme

Dona Gunawardana[1,2]

Simranjeet Kaur[1], Yuliana Yosaatmadja[3], Christopher J. Squire[3,4], Ivanhoe K. H. Leung[1,2,4]

[1]*School of Chemical Sciences, The University of Auckland*
[2]*Centre for Green Chemical Science, The University of Auckland*
[3]*School of Biological Sciences, The University of Auckland*
[4]*Maurice Wilkins Centre for Molecular Biodiscovery, The University of Auckland*

Ethylene, which arguably is the most important of plant hormones, regulates all aspects of plant growth and development. The last enzyme in the plant ethylene biosynthesis pathway is 1-aminocyclopropane- 1-carboxylate oxidase (ACCO), which catalyses the conversion of 1-aminocyclopropane-1-carboxylate (ACC) into ethylene.[1,2] Surprisingly, there is little consistent knowledge about the mechanism of ACCO and its three dimensional structure. The atomic details of the active site are particularly relevant in order to understand the mechanism of ACCO and the relationship to its biological function.

We will report our progress in the structural characterisation of ACCO. In particular, we will present our breakthrough result in visualising substrate binding in ACCO, which enabled us a better understanding of how conformational change affects substrate binding and catalysis. We will also describe our work elucidating the mechanistic basis of ethylene production at the protein level. Our results help define how plants regulate ethylene production, and pave way for the development of new chemical agents that target ACCO for agricultural applications.

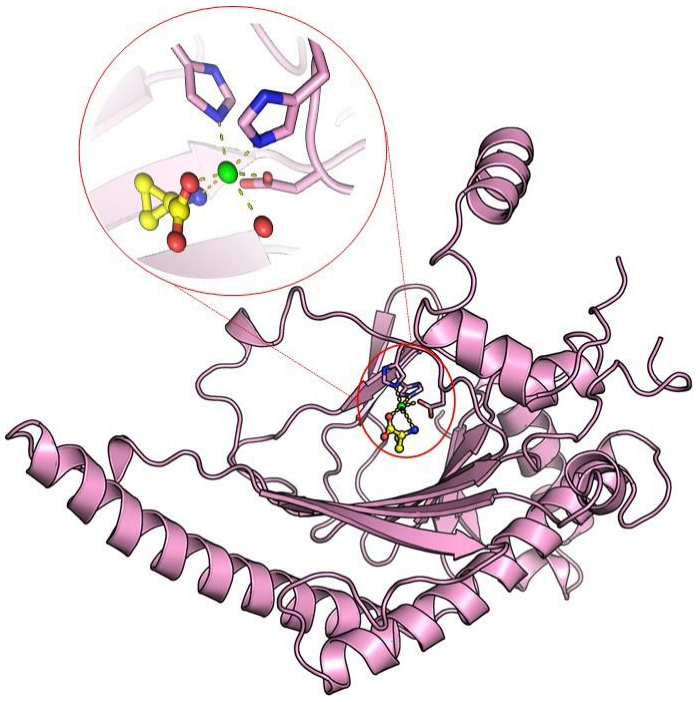


Figure 1. Crystal structure of the ACCO-Ni(II)-ACC complex that was solved in this study.

1. Yang, S. F.; Hoffman, N. E. *Ann. Rev. Plant Physiol.* **1984**, *35*, 155-189.
2. Zhang, Z.; Ren, J.-S.; Clifton, I. J.; Schofield, C. J. *Chem. Biol.* **2004**, *11*, 1383–1394.

Three Minute Talks

First Session (9:25 am - 10:30 am)

1. **Heiana Agnieray**
   Protein-based biomaterials for 3D/4D printing
2. **Aljo Anand**
   Integrated self-assembling bio-mimetic light harvesting platform for energy applications
3. **Jesna Ashraf**
   Fabrication of chemically grafted substrates to reduce fouling (non specific attachment of proteins) during capture and release of cancer cells
4. **Sara Beikzadeh**
   Development of lemon myrtle essential oil-loaded electrospun cellulose acetate nanofibers for active food packaging
5. **Joseph Bell-Tyrer**
   New methods in vinyl azide chemistry
6. **Raina Chand**
   Optimising virtual screening library based on solubility
7. **Xiao Chen**
   Characterization of aroma precursors and potential odorants in Tamarillo through metabolomic pathway study
8. **Daniel Clyde**
   Synthesis of conjugated molecules and metal clusters for nanomaterials applications
9. **Rongbin Cui**
   Sweetpotato processing: Physicochemical studies
10. **Rory Devlin**
    Synthetic studies towards the nudicaulins
11. **Yusong Dong**
    Metal inverse opals and their potential applications
12. **Andrew Earl**
    Synthetic studies towards 13-desmethyl spirolide C
13. **Bethany Forsythe**
    Mitochondrial DNA analysis in forensics
14. **Sunandita Ghosh**
    Protein-polysaccharide complexes as carriers of bioactive molecules
15. **Kapish Gobindlal**
    Mechanochemical reactions at solid-solid interfaces: The degradation of persistent organic pollutants
16. **David Goodman**
    Development of novel redox activated, hypoxia selective, metallodrugs
17. **Georgina Howard**
    Synthetic studies towards antimicrobial therapeutic agents for treatment of drug-resistant pathogens
18. **Emeka Itumoh**
    Unravelling the by-products during the formation of phosphoramidates via copper-catalysed dehydrogenative cross-coupling
19. **Junghun Ji**
    Synthesis of antiviral agents targeting norovirus
20. **Vicky Juan**
    Biochemical studies of mycobacterial Fe(II) and 2-oxoglutarate-dependent dioxygenases

Second Session (11:50 am - 1:15 pm)

21. **Saawan Kumar**
    Synthesis of ruthenium complexes featuring biologically active co-ligands and their conjugation to peptides and antibodies for improved cancer cell targeting
22. **Jiecheng Li**
    Effect of hydrolysed whey protein isolate on physicochemical properties of bovine infant formula
23. **Sheung Yin Li**
    Fouling control through polymer brush grafting on conductive microfibres for the fabrication of high performance wine juice filter
24. **Lingdai Liu**
    Potential applications of green synthesized nanocomposites for development of environmentally-benign antimicrobial packaging
25. **Alexandra Lowrey**
    Soils, sprays and sustainability: Everything is connected
26. **Courtney Lynch**
    Advancing forensic body fluid identification
27. **Zainab Makinde**
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28. **Alex Mayer**
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29. **Nur Maizura Mohd Darbi**
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30. **Shabnam Mosaferi**
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31. **Sneh Patel**
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32. **Emily Paulin**
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33. **Stefy Peediakal**
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34. **Shaun Rees**
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35. **Mejo Remanan**
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36. **Anu Sharma**
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37. **Martin Spasovski**
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38. **Tasha Steel**
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39. **Kenneth Sue**
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40. **Fearghal Walsh**
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41. **Jin Wang**
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42. **Yuxin Wang**
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43. **Yimei Wu**
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44. **Boyang Xu**
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45. **Billy Yi Yang**
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Posters

1. **Valentina Lucarelli**
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2. **Shinji Kihara**
   Shining light on the chemical and biological identity of nanoplastics
3. **Urawadee Rajchakit**
   Antimicrobial peptide-conjugated nanoparticles against bacterial pathogens
4. **Natalie Haverkate**
   Investigation of thieno [2,3-b] pyridine derivatives for enhanced solubility and anti-proliferative activity
5. **Eva Antony**
   Targeting seryl-tRNA synthetase from methanogenic archaea to control ruminant methane emission
6. **Geoff Ang**
   Lipase-catalysed production of structured phospholipid containing nervonic acid from Malania oleifera fruit and the functional characterisation
7. **Renjie Huang**
   Restoring the efficacy of polymyxins in polymyxin-resistance bacteria
8. **Saman Sabet Ghadam Haghighi**
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9. **Mohinder Naiya**
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10. **Timothy Christopher**
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11. **Nadiia Kovalenko**
    Synthetic studies towards lasso peptides
12. **Rebecca Richards**
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13. **Ruoyu Hou**
    Evaluation of variability in yeast early hydrogen sulfide production and its relationship to thiol potential
14. **Jamal Cheema**
    Electrochemical odorant sensing using insect odorant receptors
15. **Shi-Wei Kim**
    Synthetic studies towards hyrtioseragamine A
16. **Vipin Kumar**
    Reinforcing polysilanes: Creating bridged disilane building blocks
17. **Maurycy Prystupa**
    Synthetic studies towards natural products derived from Indigo
18. **Honglei Ling**
    Enchancing gas separation performance of PIMs materials

19. **Ziyao Wan**

    Selective capture--release: Pulling intact cells from complex mixtures

20. **Qing Wang**

    Single-Zn-atom materials derived from Zeolitic imidazolate frameworks

21. **Indra Yudhipratama**

    The synthetic studies towards opaliferin, a tetracyclic polyketide metabolite

22. **Nabangshu Sharma**

    A MALDI-based assay for the anti-cancer target phosphatidylcholine-specific phospholipase C

23. **Thomas Grant**

    Eco-friendly antifouling biocides

24. **Delsa Pulickal Joseph**

    An investigation into the functionalisation of Phormium tenax (NZ Flax) fibre

25. **Luis Camacho**

    Perfluorinated carbons

26. **Yann Hermant**

    Synthesis of S-lipidated analogues of daptomycin using CLipPa technology

27. **Jessica Liyu**

    Synthetic studies towards pegaharmaline A

28. **Steven Li**

    Synthesis of claramine A1 derivatives as potential antibacterial agents

29. **Kelvin Tong**

    Investigating the antitumour properties of metal-NHC complexes: Modifying the structure of the NHC ligand and its coordination mode to metal centres

30. **Pipat Tangjaidee**

    Speciation and anticancer properties of organic Se compounds in Se-enriched Cyclocarya paliurus

31. **Mbenza Mbambi Naasson**

    Oxygen binding to human oxygen sensing enzymes

32. **Yongchao Zhu**

    Co-encapsulation of omega-3 long chain fatty acids and carotenoids by monodisperse droplet spray dryer: The effect of drying parameters and feed emulsion composition on physicochemical properties of microcapsules

33. **Phillip Grant**

    Studies towards the divergent synthesis of diterpenoid natural products leonuketal, 17-dihydroxy-atisan-3-one and pseurata C

34. **Nicola Brant**

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35. **Min Wang**

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36. **Ardalan Nabi**

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37. **Yao-Yuan Liu**

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38. **Miriana Horacek-Glading**

    Lighting-up sugars: O-BODIPYs as tools for studying saccharides

39. **Jinal Patel**

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40. **Antony Melton**

    Electrocatalytic films for the oxidative destruction of pollutants in water

41. **Se Hun Kim**

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42. **Martijn Wildervanck**

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43. **Kirsty Anderson**

    Biomimetic synthetic studies towards violatinctamine

44. **Jakob Gaar**

    Antibodies from selectively Advanced Glycation Endproduct (AGE) modified Collagen Model Peptides (CMPs)

45. **Hugh Glossop**

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46. **Aakanksha Rani**

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47. **Dianna Truong**

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48. **Dana Goodacre**

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49. **Betty Lee**

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50. **Thuy Trang Pham**

    Access to valuable bio-derived chemicals from the chitin-derived building block 3-acetamido-5-acetylfuran (3A5AF)

51. **Wendy Qi**

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52. **Yangyi Lai**

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53. **Grace Chen**

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54. **Oi Wei Mak**

    Hsp90 middle domain inhibitors by using virtual screening and biophysical techniques

55. **Ryan Dixon**

    Photo-crosslinked Meridianin F derivatives for the identification of a PSA-NCAM modulator

56. **Xiaotong Lyu**

    Effect of antioxidant additions at harvest on aroma profiles of Pinot gris, Chardonnay and Sauvignon blanc wines

57. **Sutharsana Yathursan**

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58. **Stephen Lo**

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59. **Huihua Zhou**

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60. **Ziqi Lu**

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61. **Victor Yim**

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62. **Piao Ye**

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63. **Buzhe Xu**

    Total synthesis and biological evaluation of a new lanthipeptide, Tikitericin

64. **Terence Christy**

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65. **Kamal Patel**

    Design, synthesis and biological evaluation of novel peptide based inhibitors of histone deacetylases and sirtuins implicated in causing cancer

66. **Anand Mohan**

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67. **Qiang Zhang**

    Construction of a novel multi-functional antimicrobial polymer

68. **Peikai Zhang**

    Direct writing of 3D conducting polymer micro arrays for biological sensing and stimulation

69. **Deepika Kanyan**

    Exploring applications of O-BODIPY complex: Sugar recognition

70. **Rosanna Rov**

    The effect of doping on the formation of stable skyrmion lattices in single crystals of Cu_2OSeO_3

71. **Rakesh Arul**

    Vibro-polaritons for control of chemical reaction kinetics

72. **Hamesh Patel**

    Harnessing the potential of low cost particle sensors for use in hierarchical air quality networks

73. **Danielle Paterson**

    PI3King apart a protein-protein interaction: A peptide approach

74. **Brooke Kwai**

    Structural and mechanistic studies of Mycobacterium tuberculosis isocitrate lyase