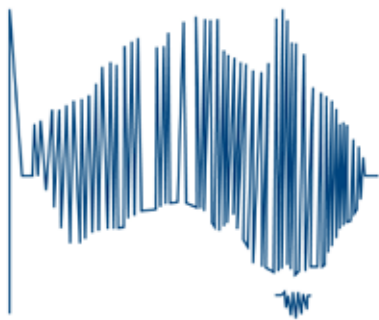


# ACROSS

Australian Centre  
for Research on  
Separation Science



# 2017

## Annual Report



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This report includes sections on the ARC Industrial Transformation Training Centre for Portable Analytical Separation Technologies (ASTech) and the ARC Centre of Excellence for Electromaterials Science (ACES).  
Report prepared by Aimee Scott.



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 [www.utas.edu.au/across](http://www.utas.edu.au/across)

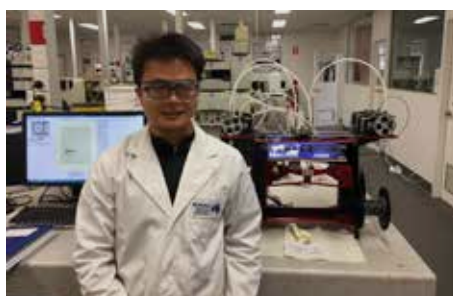
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AustralianCentre  
ForResearchOn  
SeparationScience](https://www.facebook.com/AustralianCentreForResearchOnSeparationScience)

 [twitter.com/SepScience](https://twitter.com/SepScience)



## 36 25TH ANNUAL RACI R&D TOPICS CONFERENCE REPORT

ACROSS PhD students and volunteers organised the 25th annual Royal Australian Chemical Institute (RACI) Research and Development Conference in Analytical and Environmental Chemistry, which was held at the University of Tasmania in Hobart over three days in December 2017 and was attended by close to 110 delegates.



## 12 POSTGRADUATE STUDENT RESEARCH PROJECTS

2017 saw continued growth in the number of higher degree research projects.



## 34 AWARDS

The hard work and innovation of ACROSS researchers in 2017 was recognised with awards for both staff and students.

## OVERVIEW

# Introduction to ACROSS

Separation science involves the study of fundamental materials and processes for the separation, isolation and quantitation of individual chemical species, or classes of chemical and biochemical compounds, from within complex mixtures and/or complex matrices. As such it finds application in almost all of the chemical and biological (life) sciences, and in many areas of chemical engineering and indeed industrial manufacturing. Fundamental advances in separation science have provided the impetus for ground-breaking new developments in the life sciences (e.g. genomics, proteomics and medicine), pharmaceutical sciences (e.g. drug discovery and characterisation), environmental sciences (e.g. ultra-trace residue analysis), forensic science (e.g. illicit drugs, DNA fingerprinting, and explosives residues), together with a myriad of other scientific disciplines of pronounced societal significance. The continued discovery of new modes of separation science involving analysis, characterisation and purification will be essential to help solve the future challenges in each of the above fields.

Separation science also spans the spectrum between nanoscale technology and exploration, and macroscale materials and their application, with common elements of theory and implementation. Further and greater advances in separation science will be an important driver behind a very broad spectrum of Australian science for the foreseeable future, ranging from new developments in nanotechnology, to novel biomaterials, to improved manufacturing processes. Therefore its importance as an enabling science cannot be overstated.

The Australian Centre for Research on Separation Science (ACROSS) was established in 2001 as a strategic agreement between key researchers at the University of Tasmania, Monash University and RMIT University (with Western Sydney University joining ACROSS in 2008) to form a consortium of prominent Australian researchers in separation science. This consortium was supported financially by the participating institutions to pursue the following aims:

- i. Maintain an outstanding level of international renown in research on separation science.
- ii. Coalesce and enhance Australian research on separation science into an organised structure, operating with a coordinated research plan, which addresses and exploits the most exciting and innovative themes in modern separation science.
- iii. Provide enabling research and research training of the highest quality, which supports and advances all major areas of Australian science.

Australian research in separation science has long enjoyed an excellent international reputation, earned by the individual activities of talented researchers. ACROSS offers an organisational and resource base, through which these individual researchers can work in a coordinated and synergistic manner, under a series of structured and interlocking research programs. ACROSS operates under an agreed Research Charter and organisational structure, established to avoid duplication of effort, allow resources and expertise to be shared, and provide value-added opportunities broadly to industry, academia and the nation.

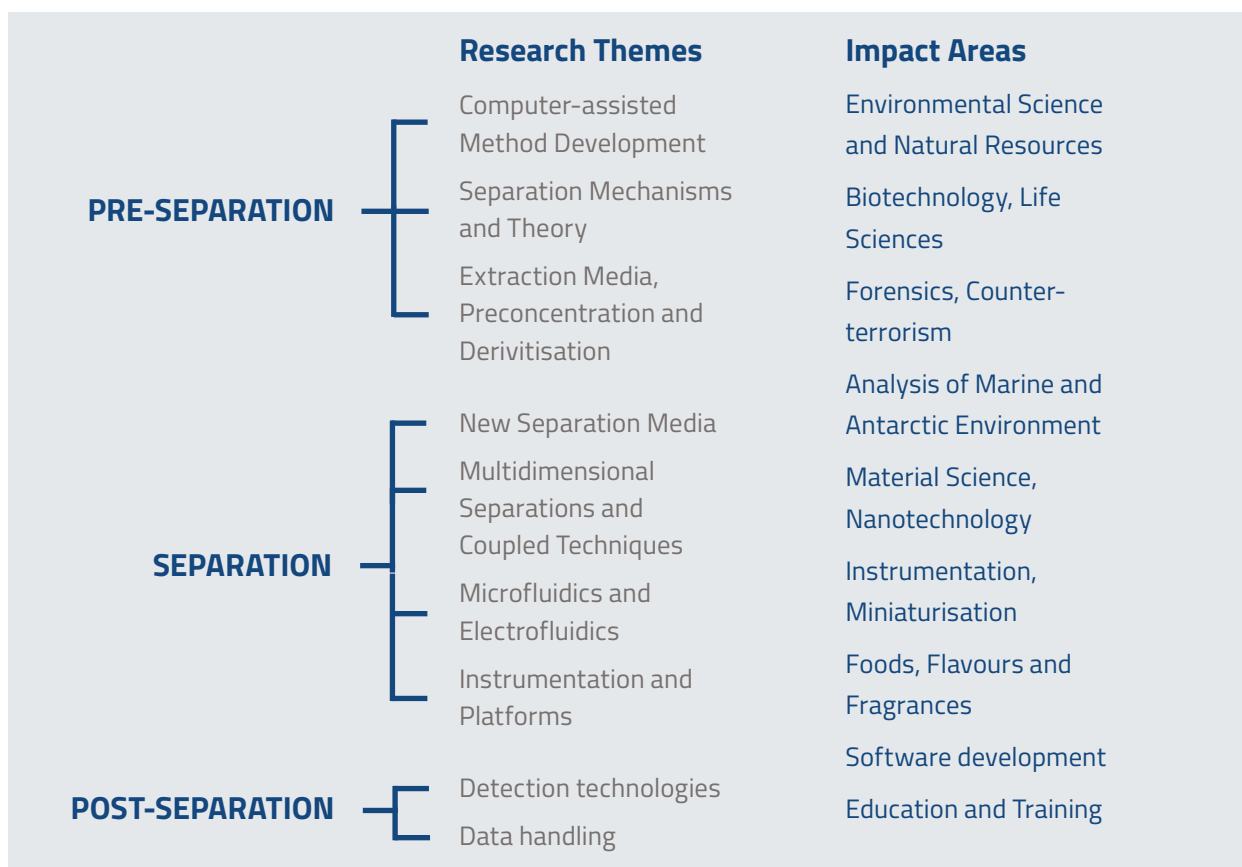


ACROSS UTAS PhD student Md Fokhrul Islam.

# ACROSS Research Structure

Research in ACROSS is based on focused research themes to provide both fundamental and applied research outcomes in separation science. ACROSS draws together multi-institutional, internationally prominent and genuinely collaborative research teams, having complementary skills and synergistic expertise, supported by a state-of-the-art resource base, and committed to focused research programs of national significance.

The research structure listed below groups research themes using the three major phases of a separation and also shows the major outcome areas in which these themes are being applied.



# Director's Report

It's with a sense of great pleasure and pride that I can once again present to you our annual report for the Australian Centre for Research on Separation Science (ACROSS). It has been another enormously successful and productive year for the centre, with our research program continuing to expand and attract new partners and collaborators, and our research outputs continuing to grow in both quantity and quality. Having also grown in membership over the past few years, currently to approximately 110 staff and students across our four university partners, we can now also confidently claim to be the world's largest academic research centre dedicated to the advancement of analytical separation technologies. This achievement in itself certainly gives me great pride in our collective efforts, and absolutely places ACROSS front and centre of international research in this exciting and continuously challenging field. Size of course matters, and critical mass allows us to collectively make a bigger splash within our discipline. However, research excellence and impact are what we now seek to achieve and demonstrate, and on these criteria too, we can feel justly satisfied. As both a core and underpinning science for numerous disciplines and related fields of science and engineering, ACROSS is clearly open for business and collaboration. With these goals in mind, it was particularly pleasing for the 'ACROSS Team' to be awarded the 2017 University of Tasmania (Science and Engineering) Dean's Award for 'Commercialisation and Partnerships with Industry', marking our increasing and rewarding efforts to translate our research in collaboration with our industry partners.

This annual report for 2017 details in full the range of activities and projects undertaken over the year, and the overall research performance of the entire centre. Below I can briefly highlight some of these activities for simple digestion, and truly congratulate everyone whose individual efforts are recorded within for their achievements and contributions to ACROSS in 2017.

## Higher Degree Students and Postgraduate Training

2017 has been another bumper year for awards to our postgraduate students. The full list of these competitive awards for research performance and presentations can be found within, but here I would like to highlight a few particularly notable accolades. Congratulations to Yan Li, who was awarded the Faculty of Science and Engineering Dean's Award for 'Exceptional Performance by Current



**"We can now confidently claim to be the world's largest academic research centre dedicated to the advancement of analytical separation technologies."**

Higher Degree by Research Students' (UTas), and to Jessica Pandohee, who received the RMIT Vice-Chancellor's Prize for 'Research Excellence in the Higher Degree by Research Category'. From ACROSS Monash, Yada Nolvachai was presented with the inaugural E. Kovats Award for best PhD thesis, an international award presided over by the Hungarian Chemical Society. Congratulations to all three for these significant awards from their host institutions and learned societies. These awards, taken together with the long list of national and international travel grants and best conference presentation awards received by ACROSS postgraduate researchers in 2017, are all clearly testament to the high esteem our postgraduates are held in amongst the national and international analytical science community. ACROSS places particular importance on providing for an excellent postgraduate education. With this in mind, it is also a great pleasure to highlight Professor Michael Breadmore's success in being presented with the University of Tasmania's Vice-Chancellor's 2017 Award for 'Exceptional Development and Higher Degree Research Training Supervision'.

## Research Outputs

All research is undervalued if not visible. In 2017 ACROSS researchers were once more highly visible at most of the top international symposia in analytical and separation science, helping to cement the reputation of ACROSS as the leading centre for research in the separation sciences globally. Indeed, it is very satisfying to note that for almost all of the top international separation science-based symposia, ACROSS researchers are generally present filling at least one of the plenary, keynote or invited lecture slots. With no fewer than 85 conference presentations for the year from ACROSS researchers, we can certainly confirm visibility of our research program. This number of presentations, and the work behind their preparation, is no small effort, and thanks to everyone who helped in getting the centre's research activities and achievements 'out there' in 2017.

In terms of ACROSS affiliated publications, 2017 broke new ground, publishing its 1,000th research paper (Oct. 2017), which collectively have amassed ~16,000 citations. In 2017 alone, ACROSS publications generated over 1,900 citations, up by 10% on the 2016 equivalent number. These figures demonstrate how our research is significantly impacting upon our discipline internationally. With regard to where the centre's work is published, its pleasing to see the majority of our work is mostly received into top quartile journals (~70%), with 2017 seeing 14 research papers published within ACS Analytical Chemistry, the leading international journal for our discipline.

The full list of the 110 peer reviewed research publications for 2017 can be found within, but here once again I'd like to acknowledge the massive collective effort in getting this work published and available for others to follow.

## ASTech

The ARC Training Centre for Portable Analytical Separation Technologies (ASTech) entered its third operational year in 2017. The centre, which is coordinated through ACROSS here at the University of Tasmania, but with project partners at the University of South Australia, La Trobe University and in Trajan Scientific and Medical, grew both in scale and productivity throughout 2017, with a number of new industrially funded PhD projects commencing at the University of Tasmania.

During 2017, ASTech researchers spent a total of 82 months of time based within the Trajan Scientific and Medical research and manufacturing facilities, in Melbourne. This number is exceptionally pleasing to be able to report and reflects the great support of the centre from our industrial partner. These placements ensured that postgraduate (PhD) and postdoctoral researchers not only delivered on their laboratory research but have also been directly exposed to the realities of research and product commercialisation, through product scoping and design interactions, IP management and protection, patenting and pre-commercial prototyping. Within 2017, five provisional patents have been filed emanating from technologies developed within ASTech projects, with the intimate involvement of the researchers themselves throughout the process.

For more information see [www.astech.org.au](http://www.astech.org.au)

## ACES

Led by the University of Wollongong, the ARC Centre of Excellence for Electromaterials Science (ACES) incorporates six Australian collaborating institutions and five international partner organisations, each known for their expertise in materials and device fabrication. A number of ACROSS

## ACROSS 2017 Performance at a Glance

Node	Research Staff	PhD & MSc students	Research Income (\$)	Publications	Conference Presentations
University of Tasmania	20	41	4,227,481	62	58
Monash University	6	10	553,674	18	10
RMIT University	1	13	426,885	14	12
Western Sydney University	4	15	223,498	16	5
<b>Total</b>	<b>31</b>	<b>79</b>	<b>5,431,538</b>	<b>110</b>	<b>85</b>

(CONT)

# Director's Report

researchers continued to engage and benefit from their association with ACES throughout 2017, particularly in areas of 3D printing and analytical device development, a capability which continues to grow in significance and utility within ACROSS. Although relatively small in number, ACES affiliated researchers working within the 'Electrofluidics and Diagnostics' theme were highly productive throughout 2017, with several key publications within high ranking journals, including *ACS Analytical Chemistry*, *Analytica Chimica Acta* and *Electrophoresis*.

For more information see [www.electromaterials.edu.au](http://www.electromaterials.edu.au)

## Research Funding

Research funding is of course essential in allowing us to undertake our diverse research program. Although not an easy accounting task, given the multimodal nature of our centre, the financial scale of ACROSS can be seen from our income statement for 2017 (page 61), which when summed to include competitive grant income, industrial (cash) support and institutional support, was just over \$5.4 M. The support from our institutional hosts, primarily through the award of scholarships is once again gratefully acknowledged, as indeed is the continued support of the Australian Research Council through its range of competitive funding schemes.

For 2017 it is particularly pleasing to note that direct industry funding was over \$700k, a number which can be multiplied several times over when in-kind considerations are considered, which demonstrates our commitment to working closely with our industry partners in the development and translation of our research.

Congratulations to all ACROSS members who were successful in securing research funding, however large or small, in 2017.

## Farewells and Welcomes

As with every ACROSS annual report to-date, the year brings with it a significant degree of change in terms of membership as we celebrate graduations, welcome new students and staff, and host our usual numbers of visiting international scholars. In the latter case, ACROSS labs hosted no fewer than 33 international visitors in 2017 (listed within), originating from 16 separate countries, and who collectively totaled over 13 FTE for the year, adding significantly to both our local research activity and capability, but also appreciably strengthening our international network. These welcome

visitors, the clear majority of which are self-funded, further increase our international visibility and profile and inevitably generate well cited co-authored publications. Here I thank all the international visitors to ACROSS laboratories for their important contributions within 2017.

The full list of PhD students both graduating and arriving within 2017 is included within this report. Across the full centre, 19 higher degree students were recruited in 2017, with 14 students completing over the year. To those arriving, welcome, and to those completing, good luck in your future careers. Your past (and future) contributions to our centre are highly valued.

In 2017 we also said farewell to Dr Rosanne Guijt, who departed to take up an exciting new position as Professor (Smart Sensing) within the Centre for Rural and Regional Futures, at Deakin University. Rosanne (Roos) has been a part of ACROSS from its very early years and had a significant impact in developing ACROSS research in the area of microfluidics over this period. We wish her luck in continuing to advance this field within her new position.

## 2018 and beyond

ACROSS is a unique collaborative centre, with a research program funded almost entirely through success in competitive research funding programs and industry support, and which works on a shared resource, cooperative-style model, striving to provide an excellent, cutting-edge research experience and education to our membership. The outputs of this collective are clear to see herein, however in my opinion it is the research society and family this model has brought, which truly sets us apart from our competitors. Our annual ACROSS gathering events are testament to the good feeling, collegiality and collective enthusiasm of our membership. As ACROSS continues to grow, we will see new challenges and opportunities arise in 2018, which we can collectively address. With the continued (and much appreciated) support of our host institutions, we can continue to occupy our hard-earned international position in the field of separation science, and I for one certainly look forward to reporting back on this and all our other achievements in early 2019.

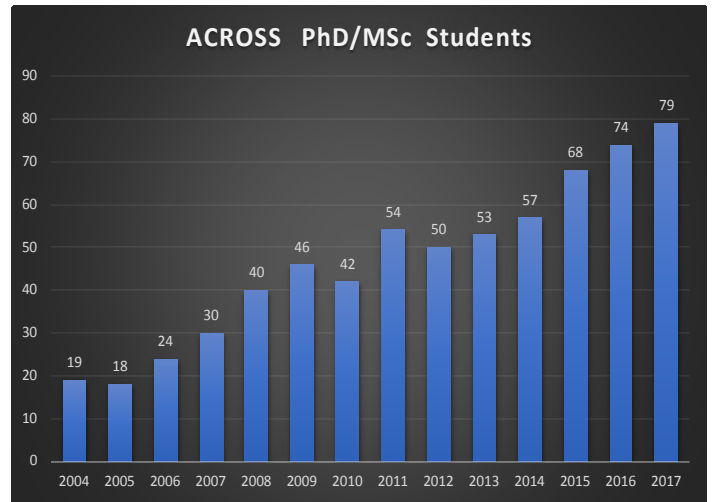
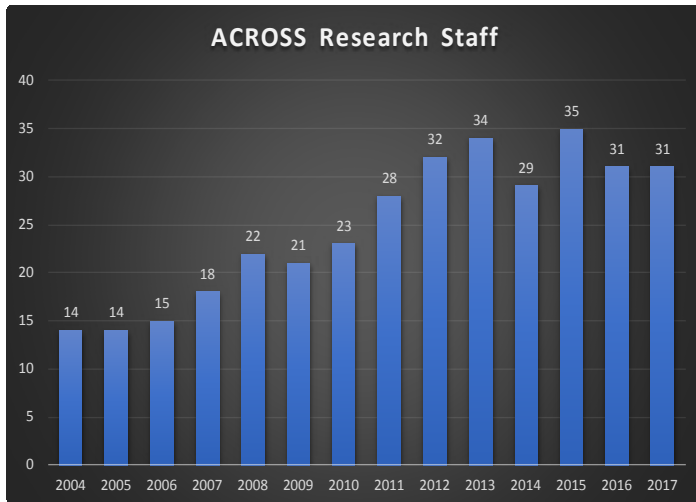
My personal regards and thanks to all our ACROSS family.



**Prof Brett Paull**  
**ACROSS Director**

# Research Metrics

The following graphs present the research trajectory of ACROSS as a national centre.

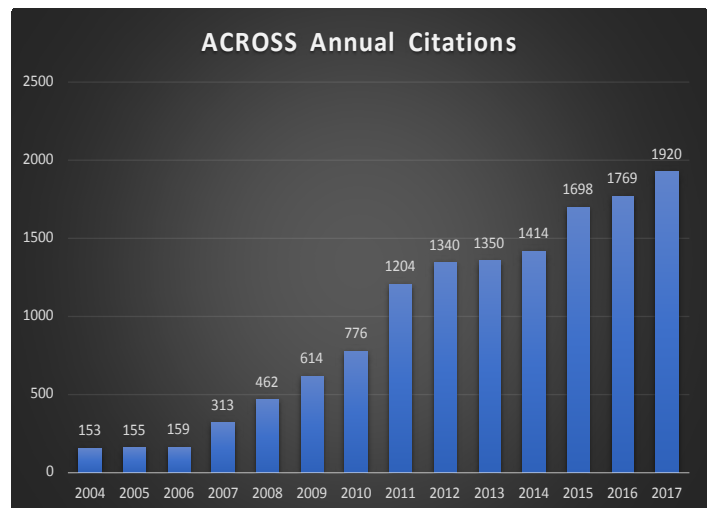
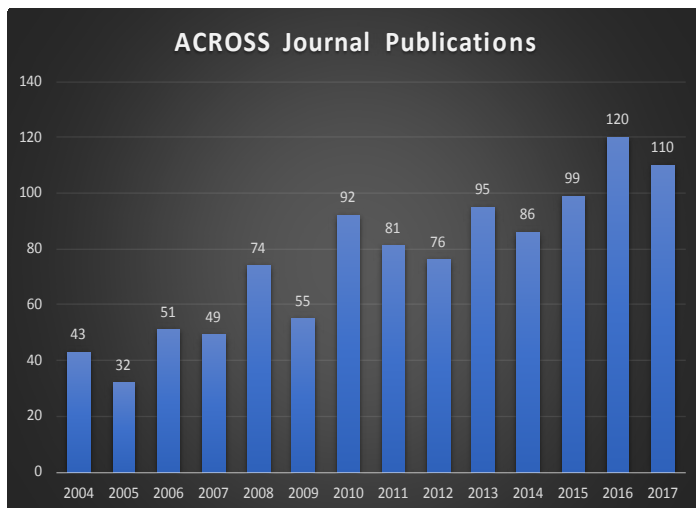


## Research Staff (2004-2017)

Numbers of research staff (includes academic members, postdoctoral fellows and research technicians) have grown relatively steadily over the past decade, with 31 staff employed for the full year, or part thereof, in 2017.

## HDR Students (2004-2017)

Numbers of research students working within ACROSS have grown annually since 2004, with significant increases in 2015, following the establishment of ASTech and ACES research centre nodes at the University of Tasmania.



## Affiliated Peer-Reviewed Journal Articles (2004-2017)

Research papers from ACROSS researchers have shown a steady increase in number from 2004 to 2017.

## Publications Annual Citations (2004-2017)

Based upon a citation analysis of 960 ACROSS affiliated publications, annual citations have increased steadily, reaching close to 1900 for the year in 2017.

ASTech explores science and technologies that can lead to portable analytical separation systems that will enable point-of-sample analysis for complex samples in food, environmental, and clinical applications – ultimately bringing 'the lab' to the sample. ASTech researchers have access to university facilities, as well as the opportunity to undertake industry placements with founding partner Trajan Scientific and Medical (Trajan), or Trajan's commercial partners.

## 2017 Highlights

### New university node

La Trobe University is the latest addition to ASTech's university nodes. La Trobe hosts the Centre for Materials and Surface Science (CMSS) at its campus in Melbourne, Australia. CMSS hosts Australia's most comprehensive surface science capability, featuring a range of custom built ultrahigh vacuum instrumentation, synchrotron end stations, and modern surface analytical instrumentation.

"I'm delighted that we have been able to expand ASTech into La Trobe University and bring on board the added expertise in areas of electrochemistry, photochemistry, chemical sensing and biosensing of Associate Professor Conor Hogan," said ASTech Director Professor Brett Paull. "The ASTech network is continually strengthening, and with this comes the added capacity and skill sets to collectively tackle the difficult challenges as we move forward."

### UTAS award

Trajan Chief Scientific Officer Dr Andrew Gooley received the University of Tasmania Vice-Chancellor's award for outstanding contributions by adjunct and clinical title holders, with A\$5000 grant to support his activities associated with the University. The award is in recognition of Andrew's sustained and outstanding contributions to ASTech, and more broadly to ACROSS over the past 5 years in the capacity of his adjunct position with the School of Natural Sciences.

"I'm honored to receive the award from the University, and on behalf of Trajan I'm delighted to acknowledge the commitment our organization has made in supporting industry-academia collaborations, none more evident than our joint program with the University of Tasmania through the foundation of ASTech and the training and mentoring of the next generation of young scientists and entrepreneurs," said Dr Gooley.



Dr Andrew Gooley with ASTech Director Prof Brett Paull after receiving the University of Tasmania 2017 Vice-Chancellor's Award.

According to Prof Paull: "Andrew's enthusiasm and passion for science and innovation, and his engaged and inspiring interactions with all the ASTech students, is an asset to our center, which we simply couldn't do without."

### Trajan's commercial release of hemaPEN®

2017 saw continued expansion of Trajan's investment of the hemaPEN® technology with the first prototypes assembled for key opinion leader investigations in Australia, Europe, and North America.\*

hemaPEN provides a minimally invasive and convenient sampling procedure for collecting four identical dried blood spot (DBS) based samples. Compared with conventional DBS sampling tools, hemaPEN delivers volumetric accuracy and precision during sample collection, thereby providing a superior sample for analyte measurement.

The proposed concept of the hemaPEN platform technology was developed in 2015 by ASTech, with the commercialisation pathway realised by Trajan.

Other ASTech technologies have also been presented to Trajan's commercial partners, customers and key opinion leaders (KOLs) for input into the development process; for example, application of micro liquid-liquid extraction (LLE) for automated environmental analysis in Canada.

\*The hemaPEN is under development and the prototype device is supplied for research or investigational purposes only. This device is not for therapeutic or diagnostic use. For more information, visit [www.hemapen.com](http://www.hemapen.com).



**Left**  
Dr Andrew Gooley  
presenting the hemaPen.

**Below**  
Research students working  
in the ASTech labs.



## Work program highlights

- Liquid-Liquid Extraction (LLE) syringe patent application filed, designed with the ability for digital control over the LLE process.
- Silica fibre technology (SiFT) patent application filed, as an in vivo microsampling method for Bio-SPME (solid phase microextraction) with a direct-to-instrument analysis of components from complex matrices such as blood.
- Demonstration of functional chemistry treatments of porous polymer monoliths (PPMo) for dried blood spotting of long chain polyunsaturated fatty acids and other applications.
- One new Postdoctoral Fellow Dr Estrella Sanz Rodriguez (right) joined ASTech in 2017 to undertake study on multi-lumen based capillary columns for separations.



### More information

[www.atech.org.au](http://www.atech.org.au)

# Research Students

The following is a list of postgraduate research students registered in 2017 in each of the ACROSS institutional nodes. 2017 continued to see growth in projects specialising in new materials and technologies for sampling, sample handling, extraction, and pre-concentration, together with a strong focus on portable and miniaturised instrumentation.

- New projects commenced in 2017 are highlighted in blue.
- Students who completed their project during 2017 are highlighted in white.

## University of Tasmania

Name	Degree	Programme	Start	Thesis Title	Supervisors
Mostafa Adel Atia Abuzeid	PhD	ASTech	2017	Portable Analytical systems for quality control and monitoring in pharmaceutical manufacturing facilities	MC Breadmore, JP Quirino, M Zhang
Zaidon Al-Aqbi	MSc	ACROSS	2017	Therapeutic Drug Monitoring of some Aminoglycosides using electrokinetic size and mobility traps device	MC Breadmore, YC Yap
Abdulkarim Albishri	MSc	ACROSS	2017	Electrokinetic pH measurement	MC Breadmore, M Zhang, JM Cabot
Mónica Alves	PhD	ACROSS	2015	Selective bioligands for portable analysis in micro-fluidic formats	M Macka, MC Breadmore, PN Nesterenko
Nicolaas Bester	PhD	ACROSS	2013	Construction and application of a low-cost, low power capillary electrophoresis apparatus for independent and remotely-controlled monitoring of low concentration analytes	MC Breadmore, RM Gujit, HH See
Farhan Cecil	PhD	ACROSS	2014	Detection in micro-separation formats designed, modelled and fabricated utilising modern engineering technologies	M Macka, B Paull, PN Nesterenko, A Henderson
Lewellwyn Coates	PhD	ASTech	2017	Development of a compact automated system to monitor bio-molecules in complex matrices	B Paull, PR Haddad, A Gooley, HJ Wirth
Christopher Desire	PhD	ACROSS	2013	Polymer nanoparticles and their assembled supra-colloidal monolithic structures for applications in separation science	EF Hilder, RD Arrua
Elisenda Fornells Vernet	PhD	ASTech	2015	New approaches for LC x LC	MC Breadmore, EF Hilder, RA Shellie
Atiyeah Ganjalinia	PhD	ACROSS	2017	A high speed, high fidelity 3D printer for fabricating microfluidic devices	MC Breadmore, S Thickett
Ronda Gras	PhD	ASTech	2015	Reactive gas detection	PR Haddad, RA Shellie
Vipul Gupta	PhD	ACES	2014	Miniaturised chromatographic technologies via additive fabrication	B Paull, PN Nesterenko,
Chowdhury Hasan	PhD	ASTech	2015	Functionalised porous materials for selective extraction and pre-concentration	PN Nesterenko, B Paull, RA Shellie
Mohamed Hemida	PhD	ASTech	2017	Portable analytical separation technologies for pharmaceutical manufacturing sites	B Paull, S Thickett, PR Haddad

Name	Degree	Programme	Start	Thesis Title	Supervisors
Md Fokhrul Islam	PhD	ACROSS	2016	Lab-on-a-chip technology for improving antibiotic treatment in intensive care unit patient	RM Guijt, MC Breadmore
Muhammed Ariful Islam	PhD	ACROSS	2015	Advanced pulsed electrochemical detection options for microfluidic and paper-fluidic platforms	M Macka, B Paull, PN Nesterenko
Laurel Jones	PhD	ACROSS	2017	Electrophoretic methods for the separation of inorganic cations	MC Breadmore, M Zhang
Sepideh Keshan Balavandy	PhD	ACROSS	2016	Low cost technology for environment monitoring and health diagnostic	MC Breadmore, RM Guijt
Aleksandra Koreshkova	PhD	ACROSS	2016	Advanced carbonaceous adsorbents for ultra high-performance liquid chromatography	PN Nesterenko, B Paull
Shing Chung Lam	PhD	ASTech	2016	Portable high performance liquid chromatography for use in pharmaceutical production monitoring and control	B Paull, PR Haddad, E Sanz Rodriguez
Leo Lebanov	PhD	ACROSS	2017	Development and application of multidimensional GC and GC-MS techniques to the investigation of the content and nature of plant extracts and essential oils	B Paull, L Tedone
Feng Li	PhD	ACROSS	2014	Micro-fluidic devices integrated with nano-channels for sample-in/answer-out analysis of pharmaceuticals and related compounds in body fluids	MC Breadmore, RM Guijt
Yan Li	PhD	ACROSS	2014	Portable liquid chromatographic separation platforms	M Macka, PN Nesterenko, B Paull, R Stanley
Ibraam Emad Mikhail	PhD	ASTech	2016	New approaches for lab-in-a-syringe systems	MC Breadmore, RM Guijt, MT Rokh
Brenda Mooney	PhD	ACROSS	2016	Recovery of ferric pigments from acid mine drainage	B Paull, T Lewis, A Parbhakar-Fox
Seyed Mojtaba Mostafavi	PhD	ACROSS	2017	Sample Preparation in HPLC	JP Quirino, M Macka
Pavisara Nanthasurasak	PhD	ACROSS	2015	Solid-state electrophoresis	MC Breadmore, RM Guijt, M Zhang
Ansara Noori	PhD	ACROSS	2013	Atmospheric monitoring by integrated miniaturised spectro-chemical sensors on small and micro-unmanned aerial vehicles	M Macka, A Lucieer
Maria Gabriela Paniagua	PhD	ACROSS	2017	Miniaturised Electrophoretic Systems for Distributed Environmental Sensing	MC Breadmore, M Zhang
Soo Hyun Park	PhD	ACROSS	2013	Rapid method development in pharmaceutical analysis using quality-by-design principles: Ion Chromatography	PR Haddad, RA Shellie, R Amos, M Talebi
Sui Phung	PhD	ACROSS	2012	Isotachophoresis of cells	MC Breadmore, RM Guijt, S Powell, M Macka
Mohammad Rahbar	PhD	ACROSS	2015	Microfluidic paper-based analytical devices for portable, low-cost, and rapid analysis targeted at environmental and agricultural areas.	M Macka, PN Nesterenko, B Paull
Leila Ranjbar Shourabi	PhD	ACROSS	2013	Two-dimensional separation approaches for complex sample analysis	RA Shellie, MC Breadmore
Alfonso Rojas Cardona	PhD	ACROSS	2013	Resolving dissolved organic matter: New multi-dimensional separations	B Paull, PN Nesterenko, PR Haddad, RA Shellie

# Research Students

## University of Tasmania (cont)

Name	Degree	Programme	Start	Thesis Title	Supervisors
Hung Ta	MSc	ACROSS	2017	Electrokinetic Separation of metal complexes	MC Breadmore, M Zhang
Maryam Taraji	PhD	ACROSS	2013	Rapid method development in pharmaceutical analysis using quality-by-design principles: Hydrophilic interaction liquid chromatography	PR Haddad, RA Shellie, R Amos
Faustino Tarongoy	PhD	ACROSS	2014	New coatings in electro-driven separations	JP Quirino, PR Haddad
Nirved Upadhyay	PhD	ACROSS	2015	Lectin modified open tubular capillary columns for selective glycoproteins extraction and isolation	B Paull, PN Nesterenko, M Macka
Sidra Waheed	PhD	ACES	2015	Integrated 3D printed electrophoresis chips for low cost analytical platforms	B Paull, T Lewis, MC Breadmore
Yabin Wen	PhD	ACROSS	2014	Rapid method development in pharmaceutical analysis using quality-by-design principles: Reversed-phase liquid chromatography	PR Haddad, RA Shellie, R Amos, M Talebi
Mitchell Zimmermann	Hons	ACROSS	2016	New avenues of stacking in CE-MS for proteomics	JP Quirino
					<b>Total = 41</b>

## Monash University

Name	Degree	Programme	Start	Thesis Title	Supervisors
Shezmin Izmail	PhD	ACROSS	2016	Development of methodologies for mineral oils and pesticides by using gas chromatography-mass spectrometry-Fourier Transform Infrared	PJ Marriott, B Wood
Mala Jayamanne	PhD	ACROSS	2012	Bio-markers of nanoparticle exposure from metabolomic profiling	PJ Marriott, T Turney
Mohammad Sharif Khan	PhD	ACROSS	2014	Pressure tuning in comprehensive two-dimensional gas chromatography	PJ Marriott
Giselle Pacot	PhD	ACROSS	2015	Chromatographic and sampling methods for PPCP in environmental catchments	PJ Marriott, M Grace
Shalveen Raj	PhD	ACROSS	2017	Metabolomics for chemical markers of fermented plant biomass	PJ Marriott, MTW Hearn
Aprilia Tasfiyati	PhD	ACROSS	2016	Development of technologies for construction and assessment of metal organic framework stationary phases in chromatography	PJ Marriott, D Turner
Renee Webster	PhD	ACROSS	2012	Improved quantitative and qualitative analysis of oxidative heteroaromatic species in middle distillate fuels using multidimensional gas chromatographic techniques	PJ Marriott, D Evans

Name	Degree	Programme	Start	Thesis Title	Supervisors
Habtewold Woktola	PhD	ACROSS	2016	Olive oil and essential oil profiling using two dimensional gas chromatography with Fourier Transform Infrared	PJ Marriott, B Wood
Yong Foo Wong	PhD	ACROSS	2013	Multidimensional gas chromatography with advanced mass spectrometry for phytoanalysis of plant extracts	PJ Marriott, P Perlmutter
Dandan Yan	PhD	ACROSS	2013	Multiplexed dual dimensions comprehensive two-dimensional gas chromatography (2GCx2GC) with contra-directional thermal modulation and flow control	R Shellie, A Koutoulis, PJ Marriott
					<b>Total = 10</b>

## RMIT University

Name	Degree	Programme	Start	Thesis Title	Supervisors
Lydon Alexandrou	PhD	ACROSS	2014	The sources, fate & behaviour of disinfection by-products in Victorian waters	OAH Jones, B Mehan
Nashi Alqahtani	PhD	ACROSS	2012	Inclusion of dietary fibre in model liquid and solid systems using chemistry and structure to probe potential functionality	S Kasapis, OAH Jones
Christine Close	PhD	ACROSS	2013	The validation and optimisation of a passive sampling device for the qualification and quantification of chlorinated organophosphorus flame retardants in Australian surface waters	OAH Jones, MJS Spencer, N Porter
Jake Collie	PhD	ACROSS	2015	Investigations into the role of thiamine and its phosphate derivatives in critically ill patients	R Greaves, OAH Jones
Asal Hajnajafi	PhD	ACROSS	2014	The use of metabolomics to predict cheese flavour development	OAH Jones, B Zizu, H Gill
Stuart Hombsch	PhD	ACROSS	2017	Metabolomics Investigations of the Effects of Microbeam Radiation on Tissue	OAH Jones, E Blanch, J Crosbie
William McCance	PhD	ACROSS	2017	Novel Use of Trace Organic Contaminants (TOCs) and Environmental Isotopes in Delineating Sources of Groundwater Contamination at Wastewater Treatment Plants	OAH Jones, M Currell
Hugh McKeown	MSc	ACROSS	2016	Investigations into the illicit synthesis of non-pharmaceutical fentanyl and its analogues	OAH Jones
Timothy Ong	PhD	ACROSS	2016	Developing novel surface enhanced Raman spectroscopy based methods for the detection of pharmaceuticals in the aquatic environment	E Blanch, OAH Jones
Jessica Pandohee	PhD	ACROSS	2012	New Techniques and Applications in Multidimensional Chromatography	OAH Jones, X Conlan, J Pearson
Elvina Parlindungan	PhD	ACROSS	2016	Metabolism and Biochemistry of Lactobacillus plantarum B21	OAH Jones,
Firoozeh Pourjavaheri	PhD	ACROSS	2013	Purification, design and characterisation of Keratin based materials and compositions	B Shanks, F Sherkat, OAH Jones
Lada Staskova	MSc	ACROSS	2017	Advancing the Collection and Storage of Blood Micro-Volumes For DNA applications (with Trajan Scientific and Medical)	OAH Jones, R Shellie
					<b>Total = 13</b>

PERFORMANCE

# Research Students

Western Sydney University

Name	Degree	Programme	Start	Thesis Title	Supervisors
Kash Bhullar	PhD	ACROSS	2017	Development and application of alternative polymeric materials for mining and materials handling	P Castignolles, M Gaborieau, R Wuhrer, J Thevarajah
Kevin Dizon	MSc	ACROSS	2016	Relation of morphology to functionality for the optimisation of ultrafiltration membranes	M Gaborieau, P Castignolles, J Oliver, G Johnstone-Hall
Mar-dean Du Plessis	MSc	ACROSS	2017	Determination of the structural heterogeneity of proteins by free-solution capillary electrophoresis	P Castignolles, M Gaborieau, C Jones
Aidan Grosas	PhD	ACROSS	2015	Structural and functional studies on the small heat-shock protein $\alpha$ -crystallin	J Carver, P Castignolles
Michael Horgan	MSc	ACROSS	2015	Characterisation of vinylphosphonic acid-based block copolymers	P Castignolles, M Gaborieau, F Li, M Destarac
Andrew Jones	PhD	ACROSS	2014	A Technique in Chemical and Molecular Analysis: Reaction Flow Chromatography	A Shalliker, G Dennis
James Lee	PhD	ACROSS	2017	Monitoring in vitro digestion of starchy foods	D Waters, C Blanchard, P Castignolles, M Gaborieau
Alison Maniego	PhD	ACROSS	2014	Characterization of branched poly(acrylic acid) via capillary spectroscopy for anticancer drug targeting and delivery	M Gaborieau, P Castignolles, Y Guillaneuf, J Aldrich-Wright
Neil Sharma	PhD	ACROSS	2015	Purification and Identification of Biologically Significant Compounds Derived from Complex Samples	A Shalliker, G Dennis
David Shock	PhD	ACROSS	2012	High Performance Liquid Chromatographic Selectivity	A Shalliker, G Dennis
Joel Thevarajah	PhD	ACROSS	2014	Characterisation of chitosan and its films for tissue engineering	M Gaborieau, P Castignolles, C Lefay, R Wuhrer, M O'Connor
Matthew Van Leeuwen	MSc	ACROSS	2015	Relating starch structure in breakfast cereals and rice to their digestibility	J Coorsen, M Gaborieau, P Castignolles
Matthew Van Leeuwen	PhD	ACROSS	2017	Relating starch structure in rice to its digestibility	M Gaborieau, P Castignolles, G Muench, R Ward, E Gilbert
Chester Vera	PhD	ACROSS	2015	At the crossroad towards faster chromatography	A Shalliker, G Dennis
Elizabeth Whitty	PhD	ACROSS	2015	Cytotoxicity of poly(acrylic acid)	R Callaghan, P Castignolles, M Gaborieau
					<b>Total = 15</b>

# Seminars at ACROSS

## University of Tasmania

### February 23

Chacriya Malasuk (Mahidol University, Thailand)  
'Breadboard-type modular microfluidic system as front-end for on-line micro solid phase extraction coupled with capillary ion chromatography with photometric detection for determination of phenylalanine and tyrosine in plasma.'

Lukas Hroch (Charles University, Czech Republic)  
'Medicinal chemistry and protein studies towards PhD.'

### March 2

Dr Barbora Cervinkova (Charles University, Czech Republic)  
'Modern techniques for separation and sample pre-treatment in bioanalysis.'

Eoin Murray (Dublin City University, Ireland)  
'Developing portable analytical detection systems for the monitoring of nutrients in water.'

### March 23

Xiaoyi Yi (Chinese Academy of Sciences, China)  
'Screening the toxicants in sediment with toxicity identification evaluation and effect-directed analysis.'

### March 30

Dr Nobutake Nakatani (Institute of Technology, Tokyo, Japan)  
'Ion-exclusion/cationexchange chromatography with various types of detector for determination of inorganic ions.'

### May 11

Shiladitya Chatterjee (Brigham Young University, USA)  
'Mathematical analysis of analytical data.'

### August 10

Elizabeth Olusetire (Kings College London, UK)  
'Electrokinetic paperfluidic detection of illicit drugs.'

Imogen Heaton (Kings College London, UK)  
'Screening amphetamine-type substances and cocaine by capillary electrophoresis with C4D detection.'

### September 21

Wojciech Grochocki (Medical University of Gdansk, Poland)  
'Sample concentration of small ions and peptides in capillary electrophoresis by micelle to cyclodextrin stacking.'

### November 2

Dr Bert Wouters (University of Amsterdam, Netherlands)  
'Towards 3D printing fused silica glass microfluidic devices.'

## Monash University

### September 4

Dr Francesco Cacciola, (University of Messina, Italy)  
'Design of various gradient elutions in reversed phase X reversed phase liquid chromatography as a powerful tool in complex real world samples.'

## Western Sydney University

### June 26

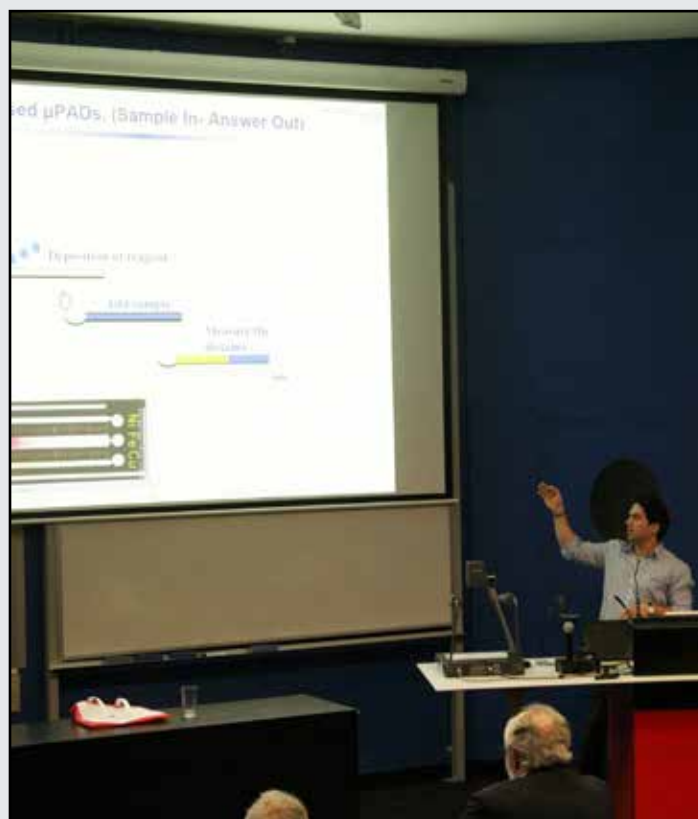
Prof. Jun Huang (University of Sydney, Australia)  
Solid-state NMR for catalyst characterisation and reaction.'

### October 23

Yaiza Benavent-Gil (Institute of Agrochemistry and Food Technology, Valencia, Spain)  
'How to obtain low glycemic index starches by modifying their structure.'

### November 3

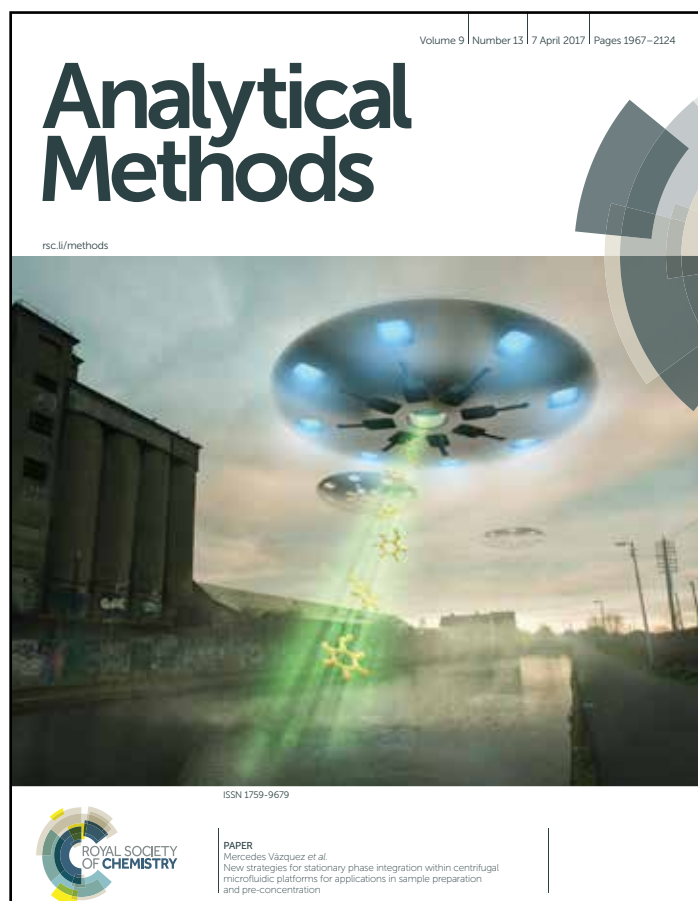
Dr Francois Ganachaud (National Institute of Applied Sciences INSA Lyon, France)  
'Ionic polymerization in aqueous dispersions: history, foundations and future constructions.'



# Publications

## University of Tasmania

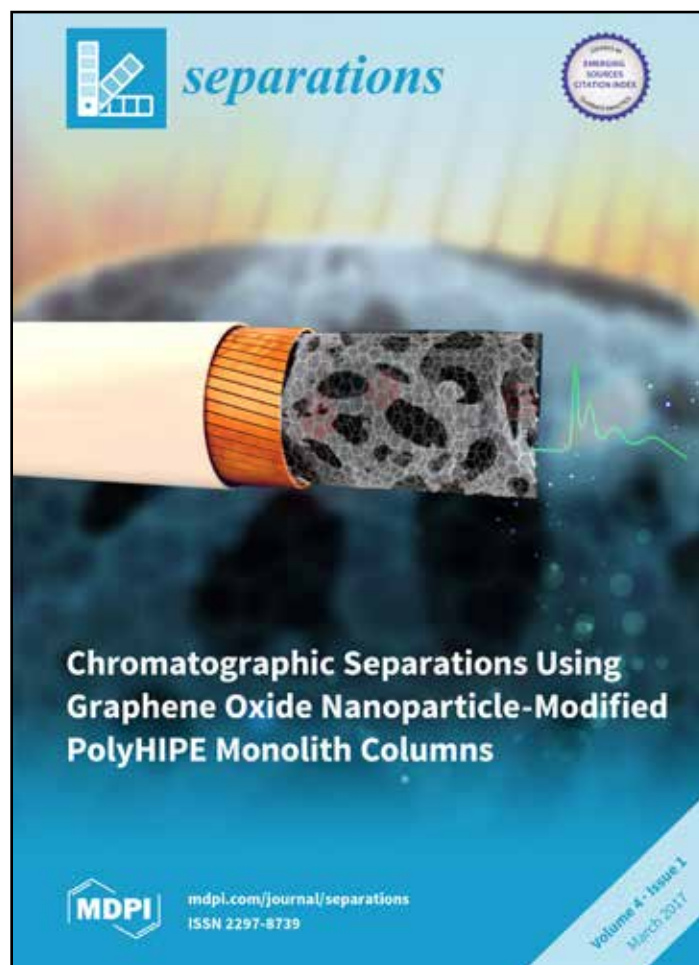
1. AA Alhusban, MC Breadmore, N Gueven, RM Guijt. Time-resolved pharmacological studies using automated, on-line monitoring of five parallel suspension cultures. *Scientific Reports* 7 (2017).
2. RIJ Amos, E Tyteca, M Talebi, PR Haddad, R Szucs, JW Dolan, CA Pohl. Benchmarking of Computational Methods for Creation of Retention Models in Quantitative Structure-Retention Relationships Studies. *Journal of Chemical Information and Modeling* 57 (2017) 2754-2762.
3. RD Arrua, A Peristyy, PN Nesterenko, A Das, DM D'Alessandro, EF Hilder. UiO-66@SiO<sub>2</sub> core-shell microparticles as stationary phases for the separation of small organic molecules. *Analyt* 142 (2017) 517-524.
4. DP Bishop, L Blanes, AB Wilson, T Wilbanks, K Killeen, R Grimm, R Wenzel, D Major, M Macka, D Clarke, R Schmid, N Cole, PA Doble. Microfluidic high performance liquid chromatography-chip hyphenation to inductively coupled plasma-mass spectrometry. *Journal of Chromatography A* 1497 (2017) 64-69.
5. MC Breadmore, A Wuethrich, F Li, SC Phung, U Kalsoom, JM Cabot, M Tehranirokh, A Shalan, AS Abdul Keyon, HH See, HH, M Dawod, JP Quirino. Recent advances in enhancing the sensitivity of electrophoresis and electrochromatography in capillaries and microchips (2014-2016). *Electrophoresis* 38 (2017) 33-59.
6. E Candish, A Khodabandeh, M Gaborieau, T Rodemann, RA Shellie, AA Gooley, EF Hilder. Poly(ethylene glycol) functionalization of monolithic poly(divinyl benzene) for improved miniaturized solid phase extraction of protein rich samples, *Analytical and BioAnalytical Chemistry* 409 (2017) 2189-2199.
7. F Cecil, M Zhang, RM Guijt, A Henderson, PN Nesterenko, B Paull, MC Breadmore, M Macka. 3D printed LED based on-capillary detector housing with integrated slit. *Analytica Chimica Acta* 965 (2017) 131-136.
8. KC Chong, LY Thang, JP Quirino, HH See. Monitoring of vancomycin in human plasma via portable microchip electrophoresis with contactless conductivity detector and multi-stacking strategy. *Journal of Chromatography A* 1485 (2017) 142-146.
9. S Choudhury, E Duffy, D Connolly, B Paull, B White, Graphene Oxide Nanoparticles and Their Influence on Chromatographic Separation Using Polymeric High Internal Phase Emulsions. *Separations* 4 (2017).



Paper contributed to by UTAS ACROSS researchers featured on the cover of *Analytical Methods*.

10. ME Creese, MJ Creese, JP Foley, HJ Cortes, EF Hilder, RA Shellie, MC Breadmore. Longitudinal on-column thermal modulation for comprehensive two-dimensional liquid chromatography. *Analytical Chemistry* 89 (2017) 1123-1130.
11. E Duffy, R Padovani, X He, R Gorkin, E Vereshchagina, J Ducrée, E Nesterenko, PN Nesterenko, D Brabazon, B Paull, M Vázquez. New strategies for stationary phase integration within centrifugal microfluidic platforms for applications in sample preparation and pre-concentration. *Analytical Methods* 9 (2017) 1998-2006.
12. RR Farrell, J Fahrenttrapp, D García-Gómez, P Martinez-Lozano Sinues, R Zenobi. Rapid fingerprinting of grape volatile composition using secondary electrospray ionization orbitrap mass spectrometry: A preliminary study of grape ripening, *Food Control* 81 (2017) 107-112.
13. E Fornells, B Barnett, M Bailey, RA Shellie, EF Hilder, M. Breadmore, Membrane assisted and temperature controlled on-line evaporative concentration for microfluidics. *Journal of Chromatography A* 1486 (2017) 110-116.
14. R Gras, Y Hua, J Luong. High-throughput gas chromatography for volatile compounds analysis by fast temperature programming and adsorption chromatography. *Journal of Separation Science* 40 (2017) 1979-1984.

15. R Gras, J Luong, RA Shellie. Gas chromatography and diode array detection for the direct measurement of carbon disulfide in challenging matrices. *Analytical Methods* 9 (2017) 3908-3913.
16. R Gras, J Luong, RA Shellie. Gas chromatography with diode array detection in series with flame ionisation detection. *Journal of Chromatography A* 1500 (2017) 153-159.
17. W Grochocki, MJ Markuszewski, JP Quirino. Simultaneous determination of creatinine and acetate by capillary electrophoresis with contactless conductivity detector as a feasible approach for urinary tract infection diagnosis. *Journal of Pharmaceutical and Biomedical Analysis* 137 (2017) 178-181.
18. PR Haddad. Seeking the Holy Grail – Prediction of Chromatographic Retention Based Only on Chemical Structures. *LCGC North America* 35 (2017) 499-502.
19. A Khodabandeh, RD Arrua, BR Coad, T Rodemann, T Ohigashi, N Kosugi, SC Thickett, EF Hilder, Morphology control in polymerised high internal phase emulsion templated via macro-RAFT agent composition: visualizing surface chemistry. *Polymer Chemistry* 9 (2018) 213-220.
20. A Khodabandeh, RD Arrua, FR Mansour, SC Thickett and EF Hilder. PEO-based brush-type amphiphilic macro-RAFT agents and their assembled polyHIPE monolithic structures for applications in separation science. *Scientific Reports* 7 (2017) 7847.
21. SN Lanin, SA Rychkova, AE Vinogradov, KS Lanina, ON Obrezkov, PN Nesterenko. Modification of the surface chemistry of microdispersed sintered detonation nanodiamonds and its effect on the adsorption properties. *Adsorption* 23 (2017) 639-650.
22. SN Lanin, SA Rychkova, AE Vinogradov, MB Viryasov, EV Vlasenko, KS Lanina, PN Nesterenko, TD Khokhlova. Acid-base and adsorption properties of the porous microdispersed detonation nanodiamond. *Sorbtsionnye Khromatographicheskie Prozesy* 17 (2017) 63-77.
23. F Lapiere, A Gooley, M Breadmore, Principles around accurate blood volume collection using capillary action. *Langmuir* 33 (50) (2017) 14220-14225.
24. SJ Lee, ER Castro, RM Guijt, MD Tarn, A Manz. Van de Graaff generator for capillary electrophoresis. *Journal of Chromatography A* 1517 (2017) 195-202.
25. F Li, NP Macdonald, RM Guijt, MC Breadmore. Using Printing Orientation for Tuning Fluidic Behavior in Microfluidic Chips Made by Fused Deposition Modeling 3D Printing. *Analytical Chemistry* 89 (2017) 12805-12811.
26. F Li, P Smejkal, NP Macdonald, RM Guijt, MC Breadmore. One-step fabrication of a microfluidic device with an integrated membrane and embedded reagents by multimaterial 3D printing. *Analytical Chemistry* 89 (2017) 4701-4707.
27. J Luong, R Gras, RA Shellie. Differential ion mobility spectrometry with temperature programmable micromachined gas chromatography for the determination of bis(chloromethyl)ether. *Analytical Methods* 9 (2017) 5003-5008.
28. J Luong, R Gras, RA Shellie. A simplified approach in flow controlled multi-dimensional gas chromatography. *Analytical Methods* 9 (2017) 2835-2839.
29. NP Macdonald, GL Bunton, AY Park, MC Breadmore. 3D Printed Micrometer-Scale Polymer Mounts for Single Crystal Analysis. *Analytical Chemistry* 89 (2017) 4405-4408.
30. NP Macdonald, JM Cabot, P Smejkal, RM Guijt, B Paull, and MC Breadmore. Comparing Microfluidic Performance of Three-Dimensional (3D) Printing Platforms. *Analytical Chemistry* 89 (2017) 3858-3866.
31. NP Macdonald, SA Currivan, L Tedone, B Paull. Direct Production of Microstructured Surfaces for Planar Chromatography Using 3D Printing. *Analytical Chemistry* 89 (2017) 2457-2463.
32. P Nanthasurasak, JM Cabot, HH See, RM Guijt, MC Breadmore. Electrophoretic separations on paper: Past, present, and future – A review. *Analytica Chimica Acta* 985 (2017) 7-23.



ACROSS research on the cover of *Separations*.

# Publications

33. SH Park, PR Haddad, M Talebi, E Tyteca, RIJ Amos, R Szucs, JW Dolan, CA Pohl. Retention prediction of low molecular weight anions in ion chromatography based on quantitative structure-retention relationships applied to the linear solvent strength model. *Journal of Chromatography A* 1486 (2017) 68-75.
34. SH Park, M Talebi, RIJ Amos, E Tyteca, PR Haddad, R Szucs, CA Pohl, JW Dolan. Towards a chromatographic similarity index to establish localised Quantitative Structure-Retention Relationships for retention prediction. III Combination of Tanimoto similarity index,  $\log P$ , and retention factor ratio to identify optimal analyte training sets for ion chromatography. *Journal of Chromatography A* 1520 (2017) 107-116.
35. SH Park, M Talebi, RIJ Amos, E Tyteca, PR Haddad, R Szucs, CA Pohl, JW Dolan. Towards a chromatographic similarity index to establish localised Quantitative Structure-Retention Relationships for retention prediction. II Use of Tanimoto similarity index in ion chromatography. *Journal of Chromatography A* 1523 (2017) 173-182.
36. A Peristy, AN Koreshkova, B Paull, PN Nesterenko. Ion-exchange properties of High Pressure High Temperature synthetic diamond, *Diamond and Related Materials* 75 (2017) 131-139.
37. SC Phung, JM Cabot, M Macka, SM Powell, RM Guijt, MC Breadmore. Isotachophoretic Fluorescence in situ Hybridization of intact bacterial cells. *Analytical Chemistry* 89 (2017) 6513-6520.
38. BC Proemse, RS Eberhard, C Sharples, JP Bowman, K Richards, M Comfort, LA Barnuta. Stromatolites on the rise in peat-bound karstic wetlands. *Scientific Reports* 7 (2017).
39. JP Quirino. A cationic  $\beta$ -cyclodextrin as a dynamic coating for the separation of proteins in capillary electrophoresis. *Journal of Separation Science* 40 (2017) 4835-4838.
40. JP Quirino, W Grochocki, MJ Markuszewski. Sample Concentration of Charged Small Molecules and Peptides in Capillary Electrophoresis by Micelle to Cyclodextrin Stacking. *Analytical Chemistry* 89 (2017) 13422-13428.
41. M Rahbar, PN Nesterenko, B Paull, M Macka. Geometrical Alignment of Multiple Fabrication Steps for Rapid Prototyping of Microfluidic Paper-Based Analytical Devices. *Analytical Chemistry* 89 (2017) 11918-11923.
42. L Ranjbar, JP Foley, MC Breadmore. Multidimensional liquid-phase separations combining both chromatography and electrophoresis – A review. *Analytica Chimica Acta* 950 (2017) 7-31.
43. L Ranjbar, M Talebi, PH Haddad, SH Park, JM Cabot, M Zhang, P Smejkal, JP Foley, MC Breadmore. In silico screening of two-dimensional separation selectivity for ion chromatography  $\times$  capillary electrophoresis separation of low-molecular-mass organic acids. *Analytical Chemistry* 89 (2017) 8808-8815.
44. EF Romano, JP Quirino, JL Holdsworth, RC So, CI Holdsworth. Assessment of the binding performance of histamine-imprinted microspheres by frontal analysis capillary electrophoresis. *Electrophoresis* 38 (2017) 1251-1259.
45. S Sandron, NW Davies, R Wilson, AR Cardona, PR Haddad, PN Nesterenko, B Paull. Fractionation of Dissolved Organic Matter on Coupled Reversed-Phase Monolithic Columns and Characterisation Using Reversed-Phase Liquid Chromatography-High Resolution Mass Spectrometry. *Chromatographia* (2017) 1-11.
46. M Taraji, PR Haddad, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl. Error measures in quantitative structure-retention relationships studies. *Journal of Chromatography A* 1524 (2017) 298-302.
47. M Taraji, PR Haddad, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl. Use of dual-filtering to create training sets leading to improved accuracy in quantitative structure-retention relationships modelling for hydrophilic interaction liquid chromatographic systems. *Journal of Chromatography A* 1507 (2017) 53-62.
48. M Taraji, PR Haddad, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl. Rapid Method Development in Hydrophilic Interaction Liquid Chromatography for Pharmaceutical Analysis Using a Combination of Quantitative Structure-Retention Relationships and Design of Experiments. *Analytical Chemistry* 89 (2017) 1870-1878.
49. M Taraji, Paul R. Haddad, Ruth I.J. Amos, M Talebi, RA Shellie, R Szucs, JW Dolan, CA Pohl. Prediction of Retention in Hydrophilic Interaction Liquid Chromatography Using Solute Molecular Descriptors Based on Chemical Structures. *Journal of Chromatography A* 1486 (2017) 59-67.
50. RM Tubaon, PR Haddad, JP Quirino. Electrokinetic removal of dodecyl sulfate from digested protein samples prior to electrospray-ionization mass spectrometry. *Analytical Chemistry* 89 (2017) 13058-13063.
51. RM Tubaon, PR Haddad, JP Quirino. One-step selective electrokinetic removal of inorganic anions from small volumes and its application as sample clean-up for mass spectrometric techniques. *Journal of Chromatography A* 1488 (2017) 134-139.
52. RM Tubaon, PR Haddad, JP Quirino. Sample clean-up strategies for Electrospray Ionization Mass



Article by UTAS ACROSS researchers A Wuethrich, PR Haddad, JP Quirino featured on the cover of *LCGC Europe*.

Spectrometry applications in bottom-up proteomics: Trends from 2012–2016. *Proteomics* 17 (2017) 1700011.

53. E Tyteca, M Talebi, RIJ Amos, SH Park, M Taraji, Y Wen, R Szucs, CA Pohl, J Dolan, PR Haddad. Towards a chromatographic similarity index to establish localized Quantitative Structure-Retention Models for retention prediction: use of retention time ratio. *Journal of Chromatography A* 1486 (2017) 50-58.
54. M Vaculovicova, P Michalek, S Krizkova, M Macka, V Adam. Nanotechnology-based analytical approaches for detection of viruses. *Analytical Methods* 9 (2017) 2375-2391.
55. E van Tricht, L Geurink, H Backus, M Germano, GW Somsen, CE Sanger-van de Griend. One single, fast and robust capillary electrophoresis method for the direct quantification of intact adenovirus particles in upstream and downstream processing samples. *Talanta* 166 (2017) 8-14.
56. S Waheed, J M Cabot, NP Macdonald, U Kalsoom, S Farajikhah, PC Innis, PN Nesterenko, TW Lewis, MC Breadmore, B Paull. Enhanced physicochemical properties of polydimethylsiloxane based microfluidic devices and thin films by incorporating synthetic micro-diamond. *Scientific Reports* 7 (2017) 15109.

57. S Wouters, PR Haddad, S Eeltink. System design and emerging hardware technology for ion chromatography. *Chromatographia* 80 (2017) 689-704.
58. A Wuethrich, PR Haddad, JP Quirino. Electrophoretic concentration – A simple and green approach for sample preparation. *LCGC Europe* 30 (2017) 60-67; *LCGC North America* 35 (2017) 197-201.
59. A Wuethrich, JP Quirino. Sensitivity enhancing injection from a sample reservoir and channel interface in microchip electrophoresis. *Journal of Separation Science* 40 (2017) 927-932.
60. DD Yan, YF Wong, L Tedone, RA Shellie, PJ Marriott, SP Whittock, A Koutoulis. Chemotyping of new hop (*Humulus lupulus* L.) genotypes using comprehensive two-dimensional gas chromatography with quadrupole accurate mass time-of-flight mass spectrometry. *Journal of Chromatography A* 1536 (2017) 110-121.
61. DD Yan, L Tedone, A Koutoulis, SP Whittock, RA Shellie. Parallel comprehensive twodimensional gas chromatography. *Journal of Chromatography A* 1524 (2017) 202-209.
62. YC Yap, AE King, RM Guijt, T Jiang, CA Blizzard, MC Breadmore, TC Dickson. Mild and repetitive very mild axonal stretch injury triggers cytoskeletal mislocalization and growth cone collapse. *PLOS ONE* 12 (2017) 5.

## Monash University

63. JT Althakafy, C Kulsing, MR Grace, PJ Marriott. Liquid Chromatography - Quadrupole Orbitrap Mass Spectrometry Method for Selected Pharmaceuticals in Water Samples. *Journal of Chromatography A* 1515 (2017) 164-171.
64. M Bourke, PJ Marriott, R Glud, H Hasler-Sheetal, M Kamalanathan, J Beardall, P Cook. Metabolism in anoxic permeable sediments is dominated by eukaryotic dark fermentation. *Nature Geoscience* 10 (2017) 30-35.
65. RI Boysen, LJ Schwarz, DV Nicolau, MTW Hearn. Molecularly imprinted polymer membranes and thin films for the separation and sensing of biomacromolecules. *Journal of Separation Science* 40 (2017) 314-335.
66. F Cacciola, S Farnetti, P Dugo, PJ Marriott, L Mondello. Comprehensive two-dimensional liquid chromatography for polyphenol analysis in foodstuffs. *Journal of Separation Science* 40 (2017) 7-24.
67. C Kulsing, RL Webster, P Rawson, DJ Evans, and PJ Marriott. Group-type analysis of hydrocarbons and sulfur compounds in thermally stressed Merox jet fuel samples. *Energy & Fuels* 31 (2017) 8978-8984.
68. C Kulsing, Y Yang, JM Chowdhury, RI Boysen, MTW Hearn. Use of peak sharpening effects to improve

# Publications

- the separation of chiral compounds with molecularly imprinted porous polymer layer open-tubular capillaries. *Electrophoresis* 38 (2017) 1179-1187.
69. PJ Marriott and YF Wong. Haven't we been doing Multidimensional GC Analysis for ever? So what is new? *LCGC North America – Special Invited 35th Anniversary Issue* 35 (2017) 21-22.
70. Y Nolvachai, C Kulsing, CS Hawes, SR Batten, DR Turner, PJ Marriott. Selectivity differences of coordination compound stationary phases with polyaromatic hydrocarbons and polar analytes in gas and liquid phases. *Journal of Chromatography A* 1500 (2017) 167-171.
71. Y Nolvachai, C Kulsing and PJ Marriott. Multidimensional gas chromatography in food analysis. *Trends in Analytical Chemistry* 96 (2017) 124-137.
72. FJM Novaes, C Kulsing, HR Bizzo, FR de Aquino Neto, CM Rezende, PJ Marriott. Analysis of underivatized low volatility compounds by comprehensive two-dimensional gas chromatography with a short primary column. *Journal of Chromatography A* (2017).
73. PM Rawson, CA Stansfield, J Creek, RL Webster, DJ Evans. Suitability of a radical based method for assessment of jet fuel antioxidant capacity and projected storage stability. *Fuel* 199 (2017) 497-503.
74. R Sepehrifar, RI Boysen, B Danylec, Y Yang, K Saito, MTW Hearn. Design, synthesis and application of a new class of stimuli-responsive separation materials, *Analytica Chimica Acta* 963 (2017) 153-163.
75. KM Sharif, C Kulsing, AIDS Junior, PJ Marriott. Second dimension column ensemble pressure tuning in comprehensive two-dimensional gas chromatography. *Journal of Chromatography A* (2017) DOI: 10.1016/j.chroma.2017.10.060.
76. RL Webster, JB Mete, PM Rawson, DJ Evans, and PJ Marriott. Oxidised compounds in aviation fuels using Nafion fibre solid phase microextraction. *Fuel* 197 (2017) 226-231.
77. RL Webster, PM Rawson, C Kulsing, DJ Evans, PJ Marriott. Investigation of the thermal oxidation of conventional and alternate aviation fuels with comprehensive two-dimensional gas chromatography accurate mass quadrupole time-of-flight mass spectrometry. *Energy & Fuels* 31 (2017) 4886-4894.
78. YF Wong, C Kulsing and PJ Marriott. Switchable enantioselective three- and four-dimensional dynamic gas chromatography-mass spectrometry: Example study of on-column molecular interconversion. *Analytical Chemistry* 89 (2017) 5620-5628.
79. YF Wong and PJ Marriott. Approaches and Challenges for Analysis of Flavour and Fragrance Volatiles. *Journal of Agricultural and Food Chemistry* 65 (2017) 7305-7307.
80. YF Wong, P Perlmutter and PJ Marriott. Untargeted metabolic profiling of Eucalyptus spp. leaf oils using comprehensive two-dimensional gas chromatography with high resolution mass spectrometry: Expanding the metabolic coverage. *Metabolomics* 13 (2017) 46.

## RMIT University

81. LD Alexandrou, BJ Meehan, PD Morrison, OAH Jones. A new method for the fast analysis of trihalomethanes in tap and recycled waters using headspace gas chromatography with micro-electron capture detection. *International Journal of Environmental Research and Public Health* 14 (2017) DOI: 10.3390/ijerph14050527.
82. DJ Beale, J Crosswell, AV Karpe, W Ahmed, M Williams, PD Morrison, S Metcalfe, C Staley, MJ Sadowsky, EA Palombo, ADL Steven. A multi-omics based ecological analysis of coastal marine sediments from Gladstone, in Australia's Central Queensland, and Heron Island, a nearby fringing platform reef. *Science of the Total Environment* 609 (2017) 842-853.
83. DJ Beale, OAH Jones, AV Karpe, S Dayalan, DY Oh, KA Kouremenos, W Ahmed, EA Palombo. A review of analytical techniques and their application in disease diagnosis in breathomics and salivaomics research. *International Journal of Molecular Sciences* 18 (2017).
84. DJ Beale, AV Karpe, W Ahmed, S Cook, PD Morrison, C Staley, MJ Sadowsky, EA Palombo. A community multi-omics approach towards the assessment of surface water quality in an urban river system. *International Journal of Environmental Research and Public Health* 14 (2017).
85. DJ Beale, PD Morrison, AV Karpe, MS Dunn. Chemometric analysis of lavender essential oils using targeted and untargeted GC-MS acquired data for the rapid identification and characterization of oil quality. *Molecules* 22 (2017).
86. JTB Collie, RF Greaves, OAH Jones, Q Lam, GM Eastwood, R Bellomo. Vitamin B1 in critically ill patients: Needs and challenges. *Clinical Chemistry and Laboratory Medicine* 55 (2017) 1652-1668.
87. OAH Jones. Food contact materials: A cause for concern in the pulp and paper industry? *Journal of the Technical Association of the Australian and New Zealand Pulp and Paper Industry* 70 (2017) 30-31.
88. OAH Jones. Assessing pre-harvest sprouting in cereals using near-infrared spectroscopy-based metabolomics. *NIR news* 28 (2017) 15-19.
89. SP Oberegger, OAH Jones, MJS Spencer. Effect of nanostructuring of ZnO for gas sensing of nitrogen dioxide. *Computational Materials Science* 132 (2017) 104-115.

90. AV Karpe, VV Dhamale, PD Morrison, DJ Beale, IH Harding, EA Palombo. Winery biomass waste degradation by sequential sonication and mixed fungal enzyme treatments. *Fungal Genetics and Biology* 102 (2017) 22-30.
91. TJ McGrath, PD Morrison, AS Ball, BO Clarke. Detection of novel brominated flame retardants (NBFRs) in the urban soils of Melbourne, Australia. *Emerging Contaminants* 3 (2017) 23-31.
92. S Mehra, PD Morrison, F Coates, AC Lawrie. Differences in carbon source utilisation by orchid mycorrhizal fungi from common and endangered species of *Caladenia* (Orchidaceae). *Mycorrhiza* 27 (2017) 95-108.
93. AF Miranda, N Ramkumar, C Andriotis, T Höltkemeier, A Yasmin, S Rochfort, D Wlodkovic, P Morrison, F Roddick, G Spangenberg, B Lal, S Subudhi, A Mouradov. Applications of microalgal biofilms for wastewater treatment and bioenergy production. *Biotechnology for Biofuels* 10 (2017).
94. F Pourjavaheri, F Mohades, OAH Jones, F Sherkat, I Kong, A Gupta, RA Shanks. Avian keratin fibre-based bio-composites. *World Journal of Engineering* 14 (2017) 183-187.
- spectroscopy and capillary electrophoresis. *Polymer* (UK) 114 (2017) 209-220.
101. AR Maniego, AT Sutton, M Gaborieau, P Castignolles. Assessment of the Branching Quantification in Poly(acrylic acid): Is It as Easy as It Seems? *Macromolecules* 50 (2017) 9032-9041.
102. AM Michael, RA Shalliker. Pentafluorophenyl bonded phase separation: The assay of Australian antioxidant formulation of ascorbic acid, rutin and hesperidin. *Analytical Methods* 9 (2017) 4514-4519.
103. S Pravadali-Cekic, A Jones, A Kazarian, B Paull, A Soliven, H Ritchie, M Camenzuli, L Leung, GR Dennis, RA Shalliker. Postcolumn derivatization of amino acids using reaction flow chromatography columns with fluorescence detection: a fast new approach to selective derivatization techniques. *Journal of Liquid Chromatography and Related Technologies* 40 (2017) 83-92.
104. M Rudzińska, P Górnaś, M Raczyk, A Soliven. Sterols and squalene in apricot (*Prunus armeniaca* L) kernel oils: the variety as a key factor. *Natural Product Research* 31 (2017) 84-88.

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95. AM Michael and RA Shalliker. Pentafluorophenyl bonded phase separation: The assay of Australian antioxidant formulation of ascorbic acid, rutin and hesperidin. *Analytical Methods* 31 (2017) 4514-4519.
96. B De Cock, JD Oliver, N Delaunay, G Deblonde, D Mangelings, YV Heyden. Interinstrumental transfer of a fast short-end injection capillary electrophoretic method: Application to the separation of Niobium, Tantalum and their substituted ions. *Electrophoresis* 38 (2017) 2069-2074.
97. P Górnaś, M Rudzińska, A Soliven. Industrial by-products of plum *Prunus domestica* L and *Prunus cerasifera* Ehrh as potential biodiesel feedstock: Impact of variety. *Industrial Crops and Products* 100 (2017) 77-84.
98. KJ Howard-Smith, AR Craze, M Badbhade, CE Marjo, TD Murphy, P Castignolles, R Wuhrer, F Li. Syntheses and structure investigations of 3d transition metal complexes with a flexible N4O2-donor hexadentate Schiff-base ligand. *Australian Journal of Chemistry* 70 (2017) 581-587.
99. A Jones, S Pravadali-Cekic, GR Dennis, R Bashir, PJ Mahon, RA Shalliker. Ferric reducing antioxidant potential (FRAP) of antioxidants using reaction flow chromatography. *Analytica Chimica Acta* 967 (2017) 93-101.
100. JB Lena, AK Goroncy, JJ Thevarajah, AR Maniego, GT Russell, P Castignolles, M Gaborieau. Effect of transfer agent, temperature and initial monomer concentration on branching in poly(acrylic acid): A study by <sup>13</sup>C NMR spectroscopy and capillary electrophoresis. *Polymer* (UK) 114 (2017) 209-220.
105. EJR Rupesinghe, A Jones, RA Shalliker and S Pravadali-Cekic. High Efficiency Post Column Derivatisations of Natural Products using Reaction Flow High Performance Liquid Chromatography. *Chromatography Today* May/June (2017) 53-58.
106. J Samuelsson, RA Shalliker, T Fornstedt. Viscosity contrast effects in analytical scale chromatography – Evidence and impact. *Microchemical Journal* 130 (2017) 102-107.
107. RA Shalliker. High through-put liquid chromatography – mass spectrometry requires new strategies for the management of fluid at the interface. *Journal of Chromatography A* 1509 (2017) 176-178.
108. NND Sharma, GR Dennis, RA Shalliker. Radial sample load distribution under overload conditions: Analytical scale columns. *Journal of Liquid Chromatography and Related Technologies* 40 (2017) 978-983.
109. JJ Thevarajah, MP Van Leeuwen, H Cottet, P Castignolles, M Gaborieau. Determination of the distributions of degrees of acetylation of chitosan. *International Journal of Biological Macromolecules* 95 (2017) 40-48.
110. CM Vera, D Shock, GR Dennis, W Farrell, RA Shalliker. Comparing the selectivity and chiral separation of D- and L- fluorenylmethyloxycarbonyl chloride protected amino acids in analytical high performance liquid chromatography and supercritical fluid chromatography; evaluating throughput, economic and environmental impact. *Journal of Chromatography A* 1493 (2017) 10-18.

# Publications

## Books,-chapters

1. S-T Chin, GR Eyres, PJ Marriott. 'Gas Chromatography -Mass Spectrometry in Odorant Analysis. Part C, Analytics, Sensor Technology and Human-Sensory Evaluation'. In *The Springer-Handbook of Odor*, A Buettner (Ed), Springer, Germany (2017) pp 343-353.
2. CT Desire, EF Hilder, RD Arrua. 'Monolithic High-performance Liquid Chromatography Columns'. In *Encyclopedia of Analytical Chemistry* (2017) pp 1-37.
3. S Fanali, PR Hwaddad, CF Poole, M-L Reikkola (Eds). *Liquid Chromatography: Vol 1 Fundamentals and Instrumentation*, 2nd edn., Elsevier, Amsterdam (2017) 784 pp.
4. S Fanali, PR Haddad, CF Poole & M-L Reikkola (Eds). *Liquid Chromatography: Vol 2 Applications*, 2nd edn. Elsevier, Amsterdam (2017) pp 840.
5. JP Hutchinson, GW Dicoski, PR Haddad. 'Aerosol-based Detectors in Liquid Chromatography - Approaches Towards Universal Detection and to Global Analysis'. In *Charged Aerosol Detection for Liquid Chromatography and Related Separation Techniques*, PH Gamache (Ed), John Wiley and Sons, New York (2017) pp 191-220.
6. PN Nesterenko, D Mitev, B Paull. 'Elemental analysis of nanodiamonds by inductively coupled plasma hyphenated methods'. In *Nanodiamonds: Advanced Material Analysis, Properties and Applications* (2017) pp 109-130.
7. PN Nesterenko, B Paull. 'Ion Chromatography'. In *Liquid Chromatography: Fundamentals and Instrumentation*, 2nd edn. (2017) pp 205-244.
8. J Novotný, F Foret, P Smejkal, M Macka. 'Miniaturization and Microfluidics'. In *Handbooks in Separation Science: Liquid Chromatography* (2 volumes), S Fanali, P Haddad, D Lloyd, CF Poole, PJ Schoenmakers (Eds.), Elsevier (2017) ISBN: 978-0-12-415807-8.
9. A Wuethrich, JP Quirino. 'Capillary Electrophoresis as a Green Alternative Separation Technique'. In *The Application of Green Solvents in Separation Processes*, Elsevier (2017) pp 517-532.
10. YC Yap, TC Dickson, AE King, MC Breadmore, RM Guijt. 'Microfluidic device for studying traumatic brain injury'. In *Neuromethods* (2017) pp 145-156.
11. YC Yap, TC Dickson, AE King, MC Breadmore, RM Guijt. 'Microfluidic Device for Studying Traumatic Brain Injury'. In *Stem Cell Technologies in Neuroscience*. AK Srivastava, EY Synder, YD Teng (Eds.), Springer Science and Business Media LLC (2017) pp 145-146.

## Plenary, keynote & invited conference presentations

- A Al Husban, N Gueven, MC Breadmore, RM Guijt. Sequential Injection Capillary Electrophoresis for Monitoring Bioprocesses. Invited talk at Analytical Technologies Europe, 14 -17 March 2017, Brussels, Belgium; Invited talk at the 16th annual PepTalk: The Protein Science Week, 14-18 January 2017, San Diego, USA.
- RD Arrua, AA Peristy , PM Nesterenko , A Das, MD D'Alessandro, EF Hilder. Composite MOFs@SiO<sub>2</sub> particles as stationary phases for the separation of small organic molecules. Invited talk at The Royal Australian Chemical Institute (RACI) Centenary Congress, 23-28 July 2017, Melbourne, Australia.
- MC Breadmore. The Lab-on-a-chip. Invited Lecture at Australian National Fabrication Facility – South Australia 4th Microengineering Winter School, 11-14 July 2017, Adelaide, Australia.
- MC Breadmore. 3D printing microfluidic devices. Keynote Lecture at the 46th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC), 5-9 Nov 2017, Jeju, Korea.
- MC Breadmore. From There to Here: 20 year old ideas, new directions. Doreen Clark Award Lecture at the 25th Annual RACI R&D Topics Conference in Analytical and Environmental Chemistry (R&D Topics), 3-6 Dec 2017, Hobart, Australia.
- RM Guijt. Once upon a time. Plenary talk at RACI R&D Topics 2017, Hobart, Australia.
- PR Haddad, M Taraji, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl. Method development in HILIC using quantitative structure-retention relationships based on analyte molecular structures. Invited keynote lecture at 45th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC), 18-22 June 2017, Prague, Czech Republic.
- PR Haddad, SH Park, M Taraji, Y Wen, M Talebi, RIJ Amos, R Szucs, CA Pohl, JW Dolan. Prediction of chromatographic retention times based only on chemical structures of analytes. Invited lecture at Conferentia Chemometrica, 3-6 Sep 2017, Gyongyos-Farkasmaly, Hungary.
- PR Haddad, SH Park, M Taraji, Y Wen, M Talebi, RIJ Amos, R Szucs, CA Pohl, JW Dolan. Seeking the Holy Grail: Prediction of chromatographic retention times based on chemical structures of analytes. Plenary lecture at 24th International Symposium on Electro- and Liquid Phase- Separation Techniques (ITP), 10-13 Sep 2017, Gdansk/Sopot, Poland; Plenary lecture at 17th Asia-Pacific International Symposium on Microscale Separations and Analysis (APCE), 10-13 Nov 2017, Shanghai, China.

PR Haddad, M Taraji, SH Park, Y Wen, M Talebi, RIJ Amos, R Szucs, CA Pohl, JW Dolan. Selection of the optimal chromatographic method based on chemical structures of analytes. Invited keynote lecture at HPLC 2017, Jeju, Korea.

OAH Jones. Food contamination from packaging materials: An industry problem with an Academic solution. Invited conference talk at RACI Centenary Congress 2017, Melbourne, Australia.

OAH Jones. Handmaiden no longer – Analytical Chemistry in everyday life. Invited public lecture at RMIT University, 11 September, Melbourne, Australia.

F Li, AI Shallan, MC Breadmore, RM Guijt. Electrokinetic Size Mobility Trap for Point of Care Analysis. Invited talk at Point of Care Diagnostics, 10-11 May 2017, Munich, Germany.

F Li, N McDonald, P Smejkal, MC Breadmore, RM Guijt. 3D printing in microfluidics. Invited talk at 3D Printing in Science Congress, 16-17 May, Hanover, Germany.

Y Li, PN Nesterenko, B Paull, R Stanley, M Macka. Deep UV-LEDs for photometric detection in capillary separation methods. Invited talk at ITP 2017, Gdansk/Sopot, Poland.

Y Li, PN Nesterenko, B Paull, R Stanley, M Macka. Portable Liquid Chromatography. Invited talk at the 23rd International Symposium on Separation Sciences (ISSS), 19-22 Sep 2017, Vienna, Austria.

Y Li, M Dvorak, PN Nesterenko, B Paull, R Stanley, M Macka. Portable Liquid Chromatography: Approaches in the past, recent developments, and what does the future hold? Invited keynote talk at HPLC 2017, Jeju, Korea.

NP Macdonald, SA Currivan, JM Cabot, F Li, P Smejkal, NL Kilah, RM Guijt, B Paull, and M Breadmore. 3D printing - Microfluidics and microfabrication. Invited talk at the 12th Annual International Electromaterials Science Symposium, Feb 8-10, 2017, Wollongong, Australia.

NP Macdonald, F Li, SC Phung, JM Cabot, S Waheed, P Smejkal, RM Guijt, B Paull, MC Breadmore. 3D printing microfluidic devices. Keynote lecture at the RACI Centenary Congress 2017, Melbourne, Australia.

M Macka. Light emitting diodes: How far are they ideal light sources for miniaturised and portable analysis? Invited keynote talk at APCE 2017, Shanghai, China.

C Malasuk, Y Li, PN Nesterenko, K Uraisin, M Macka. Breadboard-type modular microfluidic system as front-end for micro solid phase extraction on-line coupled with capillary ion chromatography with photometric detection for the determination of phenylalanine and tyrosine in plasma. Invited talk at HPLC 2017, Prague, Czech Republic.

PJ Marriott. Pressure Tuning in GCxGC - a Viable Strategy to Support Improved Separation through Adjustable Apparent Phase Polarity. Invited keynote lecture at the 41<sup>st</sup> International Symposium on Capillary Chromatography (ISCC); Invited

keynote lecture at the 14<sup>th</sup> GCxGC Symposium, 14-19 May 2017, Fort Worth, USA.

PJ Marriott. Selective Detection Methods for Higher Information Content Using Multidimensional Gas Chromatography. Invited keynote at the 46<sup>th</sup> World Chemistry Congress of the International Union of Pure and Applied Chemistry (IUPAC), 9-14 July 2017, São Paulo, Brazil.

PJ Marriott. Gas Chromatography – Multidimensionality and Hyphenation to Produce the Ultimate in Volatile Separation. Invited keynote at 50 years of Chemistry at La Trobe University, 21 July 2017, Melbourne, Australia.

PJ Marriott. Addressing the challenges to identification in gas chromatography by increased resolution and enhanced detection modalities. Invited plenary lecture FACS Foundation Lectureship Award at the 17<sup>th</sup> Asian Chemical Congress (17ACC), 23-28 July 2017, Melbourne, Australia.

PJ Marriott. Innovative method development by employing multiple sequential (3 or more) capillary GC columns. Invited plenary lecture at Balaton IX Symposium, 6-8 Sept 2017, Siofok, Hungary.

PJ Marriott. High Resolution Chemical Analysis of Essential Oil Constituents: Characterising and Authenticating Essential Oils and their Sources. Invited keynote lecture at the 1<sup>st</sup> International Conference of Essential Oil (ICEO), 11-12 Oct 2017, Malang, Indonesia.

PJ Marriott. Hyphenation in gas chromatography: Improving analyte characterisation. Invited keynote lecture at Separation Science, 1-2 November 2017, Biopolis, Singapore.

R Mohammad, PN Nesterenko, B Paull, R Stanley, M Macka. Paper Based Microfluidics: Why Is It So Popular and What Can It Offer to Food and Nutrition Analysis? Invited talk at the 17<sup>th</sup> International Nutrition & Diagnostics Conference (INDC), 9-12 Oct 2017, Prague, Czech Republic.

P Nanthasurasak, HH See, MC Breadmore, RM Guijt. Dry Polymer Membranes for Electrophoretic Separations. Invited talk at AMN/ISMM/APCBM/ANZNM Symposium, 26-29 June 2017, Hobart, Australia.

PN Nesterenko. Diamond based adsorbent in liquid chromatography. 46<sup>th</sup> International Symposium on high performance liquid phase separations and related techniques. Invited talk at HPLC 2017, Jeju, Korea.

A Peristyy, PN Nesterenko, B Paull, A Koreshkova. Diamond based adsorbents in liquid chromatography. Invited lecture at the 11<sup>th</sup> Conference on New Diamond and Nano Carbons (NDNC), 28 May-1 June 2017, Cairns, Australia.

SC Phung, M Zhang, M Macka, S Powell, P Smejkal, RM Guijt, MC Breadmore. Towards rapid autonomous detection of cells with isotachopheresis. Keynote lecture at APCE 2017, Shanghai, China.

# Presentations

MJSS Spencer, OAH Jones. Chirality-2 – A new app to teach organic chemistry. Invited conference talk at the Emerging Polymer Technologies Summit, 22-24 November 2017, Melbourne, Australia.

S Thomas, RD Arrua, PM Nesterenko, WB Hon, R Barber, A Gooley, HJ Wirth, EF Hilder. Development and application of mesoporous polymer monolith for sample preparation. Invited talk at RACI Centenary Congress 2017, Melbourne, Australia.

## Other conference papers & presentations

F Cecil, M Zhang, RM Guijt, A Henderson, M Macka, MC Breadmore. Fused deposition modelling 3D printing for the fabrication of detection devices. RACI Centenary Congress 2017, Melbourne, Australia.

JM Cabot, MC Breadmore, B. Paull. On-fibre electrophoresis and isotachopheresis of small molecules, biomolecules and whole cells. ISSS 2017, Vienna, Austria.

JM Cabot, MC Breadmore, B Paull. Fibre based platforms for direct analysis of metabolites in complex samples. Proceedings of the 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), 22-26 Oct 2017, Savannah, USA, page 360.

JM Cabot, NP Macdonald, SC Phung, MC Breadmore, B Paull. Fibre-based diagnostic devices on versatile 3D printed platforms. 12th Annual International Electromaterials Science Symposium, 8-10 Feb 2017, Wollongong, Australia.

C Close, OAH Jones, M Spencer, N Porter. Characterising the Molecular Interactions between Hydrophilic Contaminants and a Polymeric Sorbent with the Aid of Computational Chemistry. SETAC Australasia Conference 2017, Gold Coast, Australia.

E Fornells, B Barnet, M Bailey, RA Shellie, EF Hilder, MC Breadmore. Evaporative solvent removal interface for comprehensive multidimensional liquid chromatography. RACI R&D Topics 2017, Hobart, Australia.

E Fornells, B Barnet, M Bailey, RA Shellie, EF Hilder, MC Breadmore. Membrane evaporative interface for LCxLC. HPLC 2017, Prague, Czech Republic.

M Gaborieau, P Castignolles. Molecular characterisation of polysaccharides by solid-state NMR spectroscopy. GDR Symbiose, 14 December 2017, Paris, France.

V Gupta, NP Macdonald, S Currivan, PN Nesterenko, B Paull. Another 12 months closer to 3D printed HPLC columns! HPLC 2017, Prague, Czech Republic.

V Gupta, PN Nesterenko, B Paull. 3D printed miniaturised analytical devices (3D MADE). RACI R&D Topics 2017, Hobart, Australia.

M Horgan, M Meinel, K Tran, L Seiler, A Sutton, S Harrison, M Destarac, M Gaborieau, P Castignolles. Developing complementary characterisation methods for smart DHBCs Sydney Surfaces And Soft Stuff meeting (SASSY), 6 June 2017, Sydney, Australia.

OAH Jones. Two-dimensional liquid chromatography and its application in metabolomics. RACI Centenary Congress 2017, Melbourne, Australia.

OAH Jones. Revealing potential route specific impurities in the synthesis of illicit narcotics via mass spectrometry. 26th Australian and New Zealand Society for Mass Spectrometry (ANZSMS) Conference, 16-20 July, Adelaide, Australia.

A Khodabandeh. Organisation Committee member. 8th biennial Australian Colloid and Interface Symposium (ACIS), 29 Jan–2 Feb 2017, Coffs Harbour, Australia.

A Khodabandeh, RD Arrua, FR Mansour, SC Thickett, EF Hilder. PEO-based brush-type amphiphilic macro-RAFT agents and their assembled monolithic structures. The Royal Australian Chemical Institute Centenary Congress, 23-28 July 2017, Melbourne, Australia.

C Kulsing, Y Nolvachai, PJ Marriott. Frequency transformation and experimental approaches for improved data presentation and analysis capability in comprehensive two dimensional gas chromatography hyphenated with quadrupole time-of-flight mass spectrometry. ISCC 2017, Fort Worth, USA.

SC Lam, E Sanz Rodriguez, PR Haddad, B Paull. Development of portable liquid chromatography for small molecules analysis. RACI R&D Topics 2017, Hobart, Australia.

SN Lanin, SA Platonova, AE Vinogradov, EV Vlasenko, KS Lanina, ON Obrezkov, PN Nesterenko. Adsorption of polar organic compounds on the surface of porous microdispersed detonation nanodiamond from water-organic solvent solutions. 6th Symposium "Role of separation science in ecology" October 29–November 6 2017, Sochi, Russia.

F Lapierre. hemaPEN, a simple device for home-based blood microsampling. AMN/ISMM/APCBM/ANZNMFS Symposium, 26-29th June 2017, Hobart, Australia.

JJ Lee, L Liu, R Ward, V Butardo, D Waters, C Blanchard, J Tang, P Castignolles, M Gaborieau. Monitoring in vitro digestion of rice using capillary electrophoresis online. Australian Rice Quality Symposium, 19 July 2017, Wagga Wagga, Australia.

F Li, NP Macdonald, RM Guijt, MC Breadmore. Tunable fluid mixing in 3D printed microfluidic chips fabricated with various printing orientations. APCE 2017, Shanghai, China.

F Li, NP Macdonald, RM Guijt, MC Breadmore. Point-of-care analysis with integrated microfluidic devices. HPLC 2017, Jeju, Korea.



ACROSS Monash researchers at ISCC 2017, Fort Worth, USA.

F Li, NP Macdonald, RM Guijt, MC Breadmore. Printing orientation influences fluidic behaviour in channels made by fused deposition molding. MicroTAS 2017, Savannah, USA.

F Li, P Smejkal, NP Macdonald, RM Guijt, MC Breadmore. Fabrication of an integrated microfluidic device using multimaterial 3d printing for point-of-care detection of drugs in body fluids. MicroTAS 2017, Savannah, USA.

Y Li, PN Nesterenko, B Paull, R Stanley, M Macka. The potential of under 250 nm deep UV-LEDs in chemical analysis: 235 nm UV-LED photometric detection in capillary liquid chromatography. HPLC 2017, Prague, Czech Republic.

NP Macdonald, S Currivan, B Paull, MC Breadmore. 3D branching structures for fluidic proportioning and sample handling. MicroTAS 2017, Savannah, USA.

PJ Marriott, XP Liu, B Mitrevski, C Kulsing. Multi-residue analysis with advanced separations: pesticides, petrochemicals, and phosphate esters. RACI Centenary Congress 2017, Melbourne, Australia.

P Nanthasurasak, HH See, MC Breadmore, RM Guijt. Dry film electrophoresis. 33<sup>rd</sup> International Symposium on Microscale Separations and Bioanalysis (MSB), March 26-29 2017, Noordwijkerhout, The Netherlands.

PN Nesterenko, AA Peristy. Diamond based adsorbents in liquid chromatography. New Diamond and Nano Carbons Conference (NDNC), May 28-June 1 2017, Cairns, Australia.

TTX Ong, EW Blanch, OAH Jones. Raman Spectroscopy for the detection of pharmaceutical pollutants. SETAC Australasia Conference 2017, Gold Coast, Australia.

F Pourjavaheri, OAH Jones, I Martinez Pardo, F Sherkat, A Gupta, R Shanks. Keratin bio-composites with polysiloxane thermoplastic polyurethane. Proceedings of the 75th Annual

Technical Conference of the Society of Plastics Engineers, pp 672-678. Society of Plastics Engineers, 8-10 May, Bethel, USA,

F Pourjavaheri, OAH Jones, RA Shanks. Chicken Feather Keratin Hair Conditioner. Emerging Polymer Technologies Summit, 22-24 November 2017, Melbourne, Australia.

F Pourjavaheri, OAH Jones, F Sherkat, RA Shanks. Eco-friendly keratin extraction from waste chicken feathers. SETAC Australasia Conference 2017, Gold Coast, Australia.

F Pourjavaheri, OAH Jones, PM Smooker, R Brkljača, S Ostovarpour, F Sherkat, A Gupta, RA Shanks. Ecofriendly keratin extraction and characterisation from waste chicken feathers. RACI Centenary Congress 2017, Melbourne, Australia.

M Rahbar, PN Nesterenko, B Paull, M Macka, Integration of multiple fabrication steps for rapid prototyping of microfluidic paper-based analytical devices. RACI R&D Topics 2017, Hobart, Australia.

E Sanz Rodriguez, SC Lam, P Smejkal, PR Haddad, B Paull. Oral presentations at AsTech Biannual Conferences, 14 March & 30-31 Oct 2017, Melbourne, Australia.

E Sanz Rodriguez, SC Lam, P Smejkal PR Haddad, B Paull. Porous silica layer open tubular multichannel capillaries as micro analytical platforms for separation and extraction. HPLC 2017, Prague, Czech Republic.

K Sharif, PJ Marriott. Pressure tuning coupled column ensembles for comprehensive two-dimensional gas chromatography. RACI Centenary Congress 2017, Melbourne, Australia.

MJSS Spencer, OAH Jones. Chirality: Developing a new gaming app for teaching undergraduate chemistry. RACI Centenary Congress 2017, Melbourne, Australia.

N Upadhyay, S Currivan, M Macka, P Nesterenko, B Paull. Lectin modified open tubular capillary columns for selective glycoproteins extraction and isolation. RACI R&D Topics 2017, Hobart, Australia.

M Van Leeuwen, J Mata, E Gilbert, R Ward, P Castignolles, M Gaborieau. Relating the (supra)molecular structure of starch in rice to its digestibility. Australian Rice Quality Symposium, 19 July 2017, Wagga Wagga, Australia.

MP Van Leeuwen, MR Toutounji, J Mata, EP Gilbert, L Pallas, RM Ward, JR Coorsen, P Castignolles, M Gaborieau. Exploring the supra(molecular) characterisation of starch in rice as a tool to predict digestibility. 2017 Institute of Food Science & Technology (AIFST) Summer School, 1-2 February 2017, Richmond, Australia.

S Waheed, JM Cabot, NP Macdonald, T Lewis, MC Breadmore, B Paull. Doping of elastomeric polymer with micro-diamonds for efficient heat transferring within microfluidic platforms. Electromaterials Science Symposium 2017, Wollongong, Australia.

# Presentations

## Other conference papers & presentations (cont)

S Waheed, JM Cabot, NP Macdonald, TW Lewis, MC Breadmore, B Paull. Three dimensional printing with diamonds. RACI R&D Topics 2017, Hobart, Australia.

Y Wen, M Talebi, R Amos, PR Haddad, R Szucs, CA Pohl, JW Dolan. Retention prediction in reversed phase HPLC using Quantitative Structure-Retention Relationships applied to the Hydrophobic Subtraction Model. HPLC 2017, Prague, Czech Republic.

Y Wen, M Talebi, R Amos, PR Haddad, R Szucs, CA Pohl, JW Dolan. Retention prediction in reversed phase HPLC using Quantitative Structure-Retention Relationships. RACI R&D Topics 2017, Hobart, Australia.

DD Yan, YF Wong, C Kulsing, SP Whittock, A Koutoulis, RA Shellie, PJ Marriott. Evaluation of three-dimensional gas chromatography with accurate mass spectrometry for high resolution characterization of multicomponent samples. ISCC 2017, Fort Worth, USA.

YC Yap, TC Dickson, AE King, RM Guijt, MC Breadmore. Microfluidic Maze for Studying the Role of Neuron-Glia Signalling in Neuronal Networks. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.

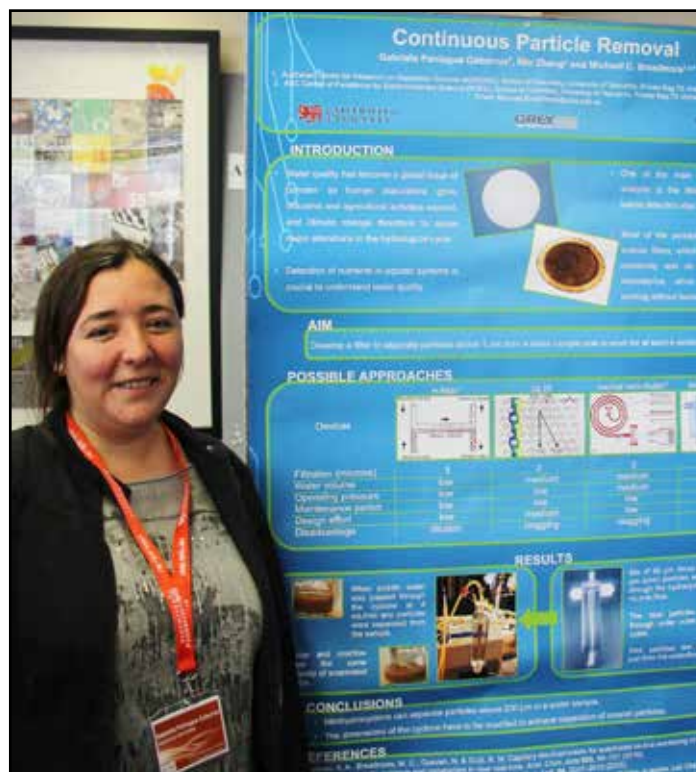
M Zhang, P Smejkal, RM Guijt, MC Breadmore. Inexpensive Capillary Electrophoresis Instrument for Distributed Monitoring Heavy Metals and Nutrients in Environmental Water. HPLC 2017, Jeju, Korea. APCE 2017, Shanghai, China.

## Poster Presentations

MN Alves, PN Nesterenko, P Brett, M Macka. Separations and surface characterisation of iron oxide nanoparticles by capillary electrophoresis. RACI R&D Topics 2017, Hobart, Australia. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.

JT Althakafy, C Kulsing, E Richmond, MR Grace, PJ Marriott. Quantitative analysis of PPCPs in freshwater invertebrates using quadrupole orbitrap and quadrupole time-of-flight mass spectrometry. RACI Centenary Congress 2017, Melbourne, Australia.

KA Bhullar, J Bonne, J Dunn, JJ Thevarajah, S Cheevers, R Wuhler, M Gaborieau, P Castignolles. Analysis of Chemical Stability of Polymeric Materials for the Mining Industry via Capillary Electrophoresis. Sydney Surfaces And Soft Stuff Meeting 2017 (SASSY 2017), 6 June 2017, Sydney, Australia.



ACROSS UTAS Phd student Gabriela Paniagua with her poster at RACI R&D Topics 2017, Hobart, Australia.

GP Cabarrus. Continuous particle removal. RACI R&D Topics 2017, Hobart, Australia.

JM Cabot, MC Breadmore, B Paull. Fiber based electrofluidic platforms for direct analysis of metabolites in complex samples. Proceedings of MicroTAS 2017, Savannah, USA.

F Cecil, MC Breadmore, RM Guijt, B Paull, PN Nesterenko, A Henderson, A Cole, M Macka. The role of spatial orientation in FDM 3D printing to spatial definition of printed slit and optical detection performance. Pittcon, 5-9 March 2017, Chicago, USA. HPLC 2017, Jeju, Korea.

F Cecil, M Zhang, RM Guijt, A Henderson, M Macka and MC Breadmore. Fused Deposition Modelling 3D printing for the Fabrication of Detection Devices for Microfluidics. RACI R&D Topics 2017, Hobart, Australia.

F Cecil, M Zhang, RM Guijt, A Henderson, M Macka, and MC Breadmore. 3D Printing with Focus on Fused Deposition Modelling for the Fabrication of Detection Devices for Microfluidics. HPLC 2017, Jeju, Korea.

C Close, OAH Jones, M Spencer, N Porter. Computational Modelling of Xanthine Compound Interactions with a Polymeric Sorbent. RACI Centenary Congress 2017, Melbourne, Australia.

JTB Collie, OAH Jones, PM Morrison, R Massie, RF Greaves. Sweat Travels: The Issue with sweat chloride transportation. Australasian Association of Clinical Biochemists (AACB) Annual Scientific Conference. 12-14th September 2017, Melbourne, Australia.

S Currivan, N Upadhyay, B Paull. Fabrication of biomolecule containing multi-channel photonic crystal fibres, and their

- application to bio-affinity and bio-catalytic reactions. HPLC 2017, Prague, Czech Republic.
- N Delaunay, JD Oliver, P Castignolles, M Gaborieau. On-line pre-concentration and separation of polyelectrolytes by branching utilizing transient isotachopheresis capillary zone electrophoresis in the critical conditions (tITP-CC-CZE). SCM-8 2017, Amsterdam, Netherlands.
- K Dizon, T Henin, JD Oliver, P Castignolles, M Gaborieau. Molecular characterisation of amphiphilic polymer blends used as water filtration devices through solid-state 2-Dimensional Wavelength Separation (2D-WISE) NMR Spectroscopy. SASSY 2017, Sydney, Australia.
- MD Du Plessis, A Grosas, J Thevarajah, J Carver, P Castignolles, M Gaborieau. Structural characterisation of proteins using free-solution capillary electrophoresis. SASSY 2017, Sydney, Australia.
- S Farajikhah, JM Cabot, S Sayyar, B Paull, P Innis, GG Wallace. Fabrication of 3D textile based fibre microfluidic structures utilising thermally conductive graphene-filled fibre composites. Electromaterials Science Symposium 2017, Wollongong, Australia.
- RR Farrell, D Stadler, J Krismer, R Zenobi. Rapid Screening of Non-Volatile Oak Wood Components of Oenological Importance. 26th Australian and New Zealand Society for Mass Spectrometry Biannual Conference, 16-20 July 2017, Adelaide, Australia.
- E Fornells, B Barnet, M Bailey, RA Shellie, EF Hilder, MC Breadmore. Membrane evaporative interface for LCxLC. HPLC 2017, Prague, Czech Republic.
- A HajNajafi, B Zisu, H Gil, OAH Jones. The use of metabolomics to predict cheese flavour development. RACI R&D Topics 2017, Hobart, Australia.
- CK Hasan, H Juergen, R Shellie, A Gooley, B Paull, P Nesterenko. Functional porous materials for selective extraction and pre-concentration. ASTech Biannual Conferences, 14 March & 30-31 Oct 2017, Melbourne, Australia.
- M Horgan, M Meinel, JJ Thevarajah, K Tran, L Seiler, AT Sutton, S Harrisson, M Destarac, M Gaborieau, P Castignolles. Separation and characterization of vinylphosphonic acid-based block copolymers with capillary electrophoresis. SCM-8, 1-3 February 2017, Amsterdam, Netherlands.
- MA Islam, P Mahbub, PN Nesterenko, B Paull, M Macka. Analysis of electrochemical cell efficiency and effective cell volume of a gap flow cell as a tool for end-capillary electrochemical detection. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.
- MA Islam, SC Lam, P Mahbub, PN Nesterenko, B Paull, M Macka. End-capillary gap flow cell as electrochemical detector in capillary LC-hyphenated detection system. RACI R&D Topics 2017, Hobart, Australia.
- MF Islam, F Li, NP Macdonald, RM Guijt and MC Breadmore. A Sample-in/answer-out Device for the Analysis of Pharmaceuticals in Biological fluids. RACI R&D Topics 2017, Hobart, Australia.
- S Keshan Balavandy, NP Macdonald, RM Guijt and MC Breadmore. Investigating the effect of print direction on physical properties of thin layer part in polyjet 3D printer. AMN/ISMM/APCBM/ANZNMFSymposium 2017. RACI R&D Topics 2017. 11th Annual UTas Graduate Research Conference, 7-8 September 2017, Hobart, Tasmania.
- SN Lanin, SN Platonova, AE Vinogradov, EV Vlasenko, KS Lanina, ON Obrezkov, PN Nesterenko. The role of separation science in ecology. 6th Symposium on Kinetics and Dynamics of Exchange Processes, 2017, Moscow, Russia.
- F Lapierre. A novel device for blood collection and storage in dried blood spot format. 65th ASMS Conference on Mass Spectrometry and Allied Topics, 4-8 June 2017, Indianapolis, USA.
- JJ Lee, L Liu, R Ward, V Butardo, D Waters, C Blanchard, M Gaborieau, P Castignolles. Monitoring in vitro digestion of rice using capillary electrophoresis online. 2017 Australian Institute of Food Science & Technology (AIFST) Summer School, 1-2 February 2017, Richmond, Australia; 67th Australasian Grain Science Conference (AGSA 2017), 20-22 September 2017, Christchurch, New Zealand; Food Structures, Digestion & Health International Conference, 25-27 October 2017, Sydney, Australia; AIFST 50th Anniversary Convention, 17-18 July 2017, Sydney, Australia; and SASSY 2017, Sydney, Australia.
- F Li, P Smejkal, NP Macdonald, RM Guijt, MC Breadmore. One-Step Fabrication of a Microfluidic Device with an Integrated Membrane and Embedded Reagents by Multimaterial 3D Printing. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.
- F Li, NP Macdonald, RM Guijt, MC Breadmore. Fabrication of an integrated microfluidic device using multimaterial 3D printing for point-of-care detection of drugs in body fluids. MicroTAS 2017, Savannah, USA.
- F Li, NP Macdonald, RM Guijt, MC Breadmore. Printing orientation influences fluidic behavior in channels made by fused deposition modelling. MicroTAS 2017, Savannah, USA.
- Y Li, PN Nesterenko, B Paull, R Stanley, M Macka. Miniaturised HPLC Injection Valve with Potential for Portable Capillary LC. Pittcon 2017, 6-10 March 2017, Chicago, USA.
- Y Li, PN Nesterenko, B Paull, R Stanley, M Macka. The potential of under 250 nm deep UV-LEDs in chemical analysis: 235 nm UV-LED photometric detection in capillary liquid chromatography. Pittcon 2017, Chicago, USA.
- Y Li, PN Nesterenko, R Stanley, B Paull, M Macka. High power deep UV-LEDs for analytical optical instrumentation. HPLC 2017, Jeju, Korea.

# Presentations

## Poster Presentations (cont)

Y Li, PN Nesterenko, R Stanley, B Paull, M Macka. Microfluidic breadboard approach to miniaturised capillary liquid chromatography. APCE 2017, Shanghai, China.

NP Macdonald, GL Bunton, AY Park, MC Breadmore, NL Kilah. 3D printed micrometre-scale polymer mounts for single crystal analysis. RACI Centenary Congress 2017, Melbourne, Australia.

NP Macdonald, S Currivan, B Paull, MC Breadmore. 3D branching structures for fluidic proportioning and sample handling. MicroTAS 2017, Savannah, USA.

NP Macdonald, SA Currivan, L Tedone, B Paull. Direct Production of Microstructured Surfaces for Planar Chromatography Using 3D Printing. Electromaterials Science Symposium 2017, Wollongong, Australia. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.

AR Maniego, AT Sutton, Y Guillaneuf, C Lefay, M Destarac, C Fellows, P Castignolles, M Gaborieau. Branchement dans le poly(acide acrylique) obtenu par polymérisation conventionnelle ou contrôlée. 46ème édition du colloque du Groupe Français des Polymères (GFP), 21-24 November 2017, Paris, France.

ME Mason, JJ Thevarajah, D Bairamian, T Murphy, R Wuhler, R Graf, MD O'Connor, P Castignolles, M Gaborieau. Fabrication and characterization of modified chitosan films, surface homogeneity and biocompatibility. SASSY 2017, Sydney, Australia.

W McCance. Novel co-tracers in delineating sources of groundwater contamination at wastewater treatment plants. Water: Effective Technologies and Tools (WETT) Research Centre Higher Degree by Research Conference, 22 November 2017, Melbourne, Australia.

B Mooney, B Paull, T Lewis, A Parbhakar-Fox. Physicochemical properties of iron oxides opportunities for useful AMD products. 9th Australian Workshop on Acidic and Metalliferous Drainage, 20-23 Nov 2017, Burnie, Australia.

B Mooney, T Lewis, A Parbhakar-Fox, B Paull. Properties of Acidic and Metalliferous Drainage Iron Oxides – Resources to Recover. RACI R&D Topics 2017, Hobart, Australia.

R Neto. An integrated Dried Blood Spot (DBS) collection, storage and extraction device – towards an automated work flow for capillary blood samples. ASMS Conference 2017, Indianapolis, USA.

A Noori, P Mahbub, JS Parry, J Davis, A Lucieer, M Macka. Highly Sensitive and Quantitative Measurements of Atmospheric Methane with On-the-fly Rapid Data Handling

for UAV based monitoring. UAS4RS Conference 2017, 24-25 May 2017, Hobart, Australia.

G Pacot, PJ Marriott. Determination of selected PPCPs in water by direct-injection LC-MS/MS. ISCC 2017, Fort Worth, USA.

SC Phung, F Li, M Macka M, SM Powell, RM Guijt, MC Breadmore. Multimaterial 3D printing: Integrated electrodes for ITP of bacterial cells. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.

F Pourjavaheri, OAH Jones, RA Shanks. Biomaterial Applications of Avian-Keratin Refinement. Emerging Polymer Technologies Summit, 22-24 November 2017, Melbourne, Australia.

F Pourjavaheri, OAH Jones, F Sherkat, RA Shanks. Avian-Keratin Refinement. SETAC Australasia Conference 2017, Gold Coast, Australia.

F Pourjavaheri, OAH Jones, RA Shanks. Applications of chicken feather keratin", ACS on Campus, 21 July 2017, Melbourne, Australia.

F Pourjavaheri, OAH Jones, I Martinez Pardo, F Sherkat, A Gupta, RA Shanks. Design and characterisation of keratin composites. Society of Plastic Engineers Annual Technical Conference (SPE-ANTEC), 8-10th May 2017, Anaheim, California, USA.

F Pourjavaheri, OAH Jones, RA Shanks. Chicken feather keratin. Beyond Research: Pathways to Impact, 21-23 February 2017, Melbourne, Australia.

M Rahbar, PN Nesterenko, B Paull, M Macka. Geometrical alignment of multiple fabrication steps for rapid prototyping of microfluidic paper-based analytical devices. AMN/ISMM/APCBM/ANZNMFSymposium 2017, Hobart, Australia.

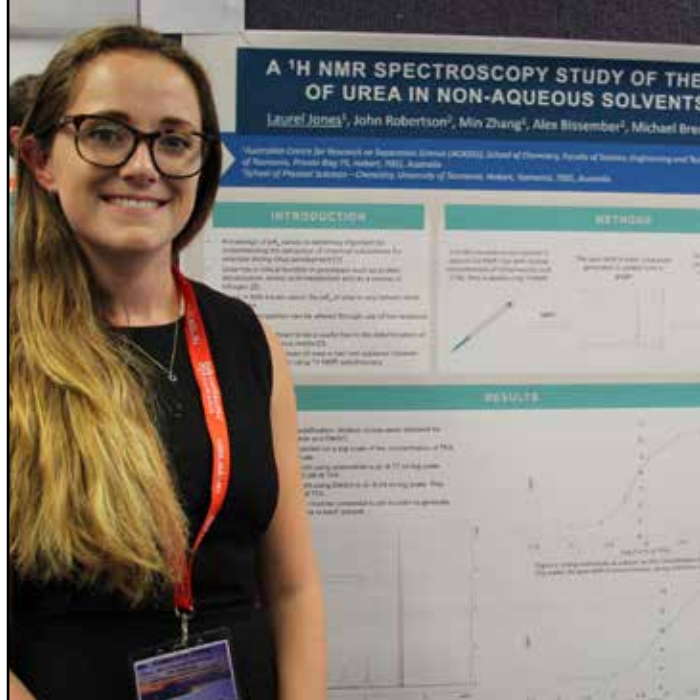
M Tehrani Rokh, M Van den Bronk, A Uhe, A Gooley, J Hon, B Paul, MC Breadmore, R Shellie. Lab-in-syringe: automated liquid-liquid extraction. 19th International Symposium on Advances in Extraction Technologies (ExTech), 27-30 June 2017, Santiago de Compostela, Spain.

FM Tarongoy Jr, PR Haddad, JP Quirino. Surfactant admicelles for open tubular capillary electrochromatography. RACI R&D Topics 2017, Hobart, Australia.

AN Tasfiyati, S Weber, C Kulsing, CS Hawes, DR Turner, PJ Marriott. A cadmium-based metal organic framework stationary phase for gas chromatography. RACI Centenary Congress 2017, Melbourne, Australia.

JJ Thevarajah, M Mason, D Bairamian, T Murphy, R Wuhler, R Graf, MD O'Connor, P Castignolles, M Gaborieau. Chitosane : de la caractérisation fine à des films fonctionnels pour la culture de cellules. GFP 2017, Paris, France.

S Thomas, D Arrua, HJ Wirth, WB Hon, R Barber, PN Nesterenko, EF Hilder. Mesoporous polymer monolith for the selective sorption of perfluorinated compounds. RACI R&D Topics 2017, Hobart, Australia.



ACROSS UTAS Phd student Laurel Jones with her poster at RACI R&D Topics 2017, Hobart, Australia.

NAB Tinoco, TM Uekane, A Tsukui, RG Costa, RMV da Silva, FKF Santos, FJM Novaes, FRA Neto, HR Bizzo, PJ Marriott, CM Rezende. Assessment of different postharvest coffee processes by simultaneous analysis of chemical constituents. IUPAC 2017, São Paulo, Brazil.

M Van Leeuwen, J Mata, E Gilbert, R Ward, P Castignolles, M Gaborieau. Supramolecular characterization of starch in rice by NMR, SAXS and XRD. Gordon Research Seminar on Neutron Scattering as a Cutting Edge Probe of Structure and Dynamics of Advanced Materials, 5-6 August 2017, Hong Kong, China; Gordon Research Conference on Structure and Dynamics of Materials on Many Length and Time Scales, 6-11 August 2017, Hong Kong, China.

S Waheed, JM Cabot, NP Macdonald, TW Lewis, MC Breadmore, B Paull. Novel elastomeric diamond composite for microfluidic platforms. 11th Conference on New Diamond and Nano Carbons, 28 May-1 June 2017, Cairns, Australia.

HD Waktola, C Kulsing, Y Nolvachai, PJ Marriott. High-temperature multidimensional gas chromatographic separation of triglycerides in olive oil. RACI Centenary Congress 2017, Melbourne, Australia.

EG Whitty, ER Andrew, A Fahrer, P Castignolles, M Gaborieau, R Callaghan. Exploiting tumour acidity for polymer based drug delivery. 2nd Australian Cancer and Metabolism Meeting, 15-17 May 2017, Melbourne, Australia; & at Australian Society for Medical Research New Investigator Forum (ASMR NIF), 7 June 2017, Canberra, Australia; & at Canberra Health Research Meeting (CHARM2017), 1-4 August 2017, Canberra, Australia.

YF Wong, F Cacciola, S Fermas, V Manzin, B Bonnet, PJ Marriott, P Dugo, L Mondello. Untargeted profiling of *Glycyrrhiza glabra* with comprehensive two-dimensional liquid chromatography-mass spectrometry using multi-

segmented shift gradients in second dimension: expanding the metabolic coverage. ISCC 2017, Fort Worth, USA.

YF Wong, F Cacciola, K Arena, D Mangraviti, F Rigano, PJ Marriott, P Dugo, L Mondello. Comprehensive two-dimensional liquid chromatography-mass spectrometry with 'multi-segmented shift gradients'. Designing an eluent strategy for the second dimension based upon chemical knowledge. ISCC 2017, Fort Worth, USA.

JS Zavahir, J Smith, PJ Marriott. Hype of hyphenation: uncovering and discovering volatile compounds. RACI Centenary Congress 2017, Melbourne, Australia.

M Zhang, P Smejkal, RM Guijt, MC Breadmore. Hand Portable Capillary Electrophoresis Instrument for Distributed Monitoring Heavy Metals in Environmental Waters. 3rd Xiamen Symposium on Marine Environmental Sciences (XMAS-III), 9-11 Jan 2017, Xiamen, China.

## Seminars to Universities & Companies

P Castignolles. Size-exclusion chromatography. Water Evoqua Technologies, 7 September 2017, South Windsor, Australia.

P Castignolles, M Gaborieau. Characterisation of synthetic and natural polymers by capillary electrophoresis: Capillary electrophoresis in the critical conditions, branching, composition. Universite de Pau et des Pays de l'Adour, 18 December 2017, Pau, France.

M Gaborieau. Polymer characterisation by solution- and solid-state NMR spectroscopy. Universite de Pau et des Pays de l'Adour, 4 December 2017, Pau, France.

M Gaborieau. Solid-state NMR of synthetic and natural polymers for applications ranging from industrial adhesives to anti-cancer treatments, Universite de Pau et des Pays de l'Adour, 19 December 2017, Pau, France.

Rosanne Guijt, [μTAS@UTAS](mailto:μTAS@UTAS), Belder Research Group, 31 January 2017, Leipzig, Germany.

OAH Jones. The Use of Metabolomics in Environmental Science. Griffith University, 10th March 2017, Gold Coast, Queensland, Australia.

OAH Jones. Two-dimensional Liquid Chromatography at RMIT, Beyond Research: Pathways to Impact, 21-23 February, Melbourne, Australia.

M Macka. Paperfluidics: The old and the new, the hype and the sense, Mendel University, 13 June 2017, Brno, Czech Republic.

PJ Marriott. Invited Lecture: Designing advanced multidimensional GC methods for food, flavours and fragrances. University of Messina, 3 March 2017, Messina, Italy.

PJ Marriott. Invited Lecture: Designing advanced multidimensional GC methods for food flavours fragrances, fun... Industrial University of Santander, 8 May 2017, Bucaramanga, Colombia.



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## Seminars (cont)

PJ Marriott. Invited Lecture: Wine, Drugs, and Interconversion; some GC, GC-MS and LC-MS stories. Federal University of Fluminense, 4 July 2017, Niteroi, Brazil.

PJ Marriott. Invited Lecture: Gas Chromatography – Multidimensionality and Hyphenation Produces the Ultimate in Volatile Separation. La Trobe University, 21 July 2017, Melbourne, Australia.

PJ Marriott. Ultra-high resolution multidimensional and comprehensive 2D GC with MS for metabolite, essential oil & aroma analysis. University of Melbourne, 25 Sept 2017, Melbourne, Australia.

PJ Marriott. Increased Resolution and Enhanced Detection in Gas Chromatography Improves Molecular Identification. University of Brawijaya, 10 Oct 2017, Malang, Indonesia.

IE Mikhail, M Tehranirokh, AA Gooley, R Guijt, MC Breadmore. Lab-in-a-syringe. ASTech Biannual Conference, 14 March 2017, Melbourne, Australia.

IE Mikhail, M Tehranirokh, AA Gooley, R Guijt, MC Breadmore. New approaches for lab-in-a-syringe systems. PhD confirmation seminar, 6 July 2017, University of Tasmania, Hobart, Australia.

IE Mikhail, M Tehranirokh, AA Gooley, R Guijt, MC Breadmore. Lab-in-a-syringe coupled with mass spectrometry for biological samples analysis. ASTech Biannual Conference, 31 Oct 2017, Melbourne, Australia.

TTX Ong, EW Blanch, OAH Jones. Developing Surface Offset Raman Spectroscopy-based methods for detecting pharmaceutical pollutants in treated wastewater. Water:

Effective Technologies and Tools (WETT) Research Centre Higher Degree by Research Conference, 22 November 2017, Melbourne, Australia.

## Invited Workshops

MC Breadmore, R Guijt, NP Macdonald, G Nordin. 3D printed microfluidic chips. 21st International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), 22-26 Oct 2017, Savannah, USA.

JM Cabot. Microfluidic devices for monitoring drugs and metabolites. Electrofluidics and Diagnostics Workshop, University of Tasmania 1 May 2017, Hobart, Australia.

JM Cabot. Fibre-based platforms for microfluidics, diagnostics, and DNA purification. Electrofluidics and Diagnostics Workshop, University of Tasmania 1 May 2017, Hobart, Australia.

NP Macdonald. Electrofluidics and Diagnostics Workshop, University of Tasmania 1 May 2017, Hobart, Australia.

PJ Marriott. Portable GC-MS: Taking advanced chemical analysis to the field. Torion Workshop, PerkinElmer, Green Chemical Futures, Monash University, 22 Sept 2017, Melbourne, Australia.

PJ Marriott. Riva GCxGC Workshop. Comprehensive Two-Dimensional Gas Chromatography Course: Fundamentals and Applications. 41<sup>st</sup> International Symposium on Capillary Chromatography (ISCC) and 14<sup>th</sup> GCxGC Symposium, 14-19 May 2017, Fort Worth, USA.

M Macka. Light Emitting Diodes: Analytical Use beyond Optical Detection. Pittcon, 5-9 March 2017, Chicago, USA.

# Media Reports

S Waheed, JM Cabot, NP Macdonald, T Lewis, RM Guijt, B Paull, MC Breadmore. 3D printed microfluidic devices: enablers and barriers. *Lab Chip* 16 (2016) 1993-2013 featured in *Lab on a Chip* 2016 Most Downloaded Articles at [pubs.rsc.org/en/journals/articlecollectionlanding?sercode=lc&themeid=f548b41e-537a-4377-aab4-e2fd5a7df17b](http://pubs.rsc.org/en/journals/articlecollectionlanding?sercode=lc&themeid=f548b41e-537a-4377-aab4-e2fd5a7df17b)

**January 5** ACROSS (UTas) raised \$3500 in its inaugural fundraising relay, reported at [www.media.utas.edu.au/general-news/all-news/runners-raise-funds-for-sick-kids](http://www.media.utas.edu.au/general-news/all-news/runners-raise-funds-for-sick-kids)

**February 7** ACROSS postdoctoral research fellow Dr Naama Karu interviewed on saving the Tasmanian Devil from extinction at [www.chromatographyonline.com/old-devil-called-tasmanian-0](http://www.chromatographyonline.com/old-devil-called-tasmanian-0)

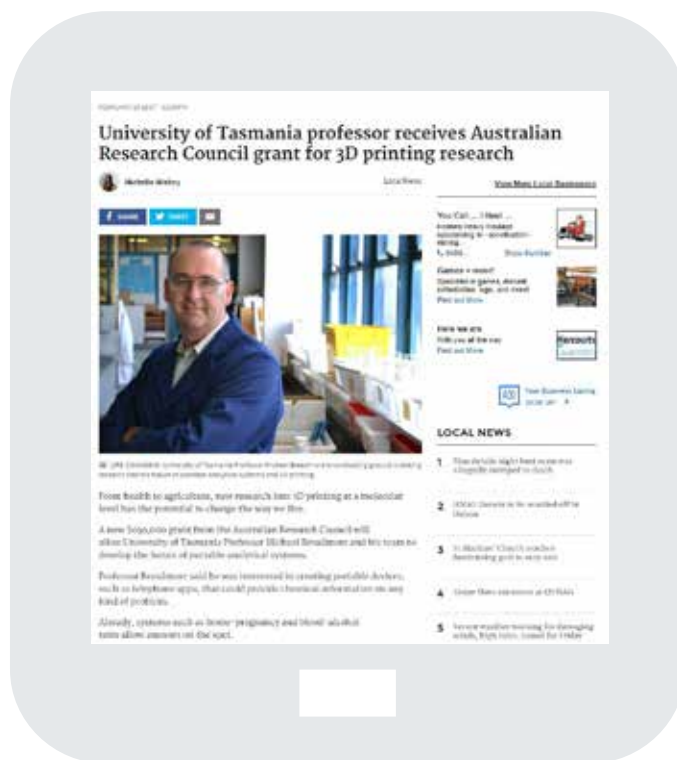
**February 20** Article authored by ACROSS researchers Prof Paul Haddad and Ass Prof Joselito Quirino at [www.chromatographyonline.com/electrophoretic-concentration-simple-and-green-approach-sample-preparation?pageID=5](http://www.chromatographyonline.com/electrophoretic-concentration-simple-and-green-approach-sample-preparation?pageID=5)

**February 24** Prof Michael Breadmore interviewed for '3D printer project puts UTas at the cutting edge of micro engineering' at [www.media.utas.edu.au/general-news/all-news/3d-printer-project-puts-university-at-the-cutting-edge-of-micro-engineering](http://www.media.utas.edu.au/general-news/all-news/3d-printer-project-puts-university-at-the-cutting-edge-of-micro-engineering)

**February 25** Prof Michael Breadmore interviewed by The Mercury for 'Tasmania on track to be a world leader at building laboratories on a chip' at [www.themercury.com.au/news/tasmania/tasmania-on-track-to-be-a-world-leader-at-building-laboratories-on-a-chip/news-story/34a61a387c4a568ba3a33c8cf1774836](http://www.themercury.com.au/news/tasmania/tasmania-on-track-to-be-a-world-leader-at-building-laboratories-on-a-chip/news-story/34a61a387c4a568ba3a33c8cf1774836)

**February 26** Prof Michael Breadmore interviewed by The Examiner for 'University of Tasmania professor received Australian Research Council grant for 3D printing research' at [www.examiner.com.au/story/4491374/unprecedented-research/](http://www.examiner.com.au/story/4491374/unprecedented-research/)

**March 2** Prof Michael Breadmore interviewed by ABC Radio Hobart, 'Tasmanian researcher given grants to develop lab-on-a-chip technology through 3D printing', at [www.abc.net.au/news/2017-03-02/lab-on-a-chip-tech-developed-in-hobart/8318006](http://www.abc.net.au/news/2017-03-02/lab-on-a-chip-tech-developed-in-hobart/8318006)



**April 7** 'Trajan Scientific and Medical sprang from a search for 'purpose'' reported by Financial Review at [www.afr.com/news/special-reports/businesses-of-tomorrow/wanting-more-purpose-led-to-trajan-scientific-and-medical-20170405-gveh3g](http://www.afr.com/news/special-reports/businesses-of-tomorrow/wanting-more-purpose-led-to-trajan-scientific-and-medical-20170405-gveh3g)

**April 7** ACROSS Members Research Niall P. Macdonald and Feng Li interviewed on 3D printing microfluidics for MicroTAS for WIN TV.

**August 31** Professor Michael Breadmore, ARC Future Fellow, led an ACROSS team to develop Scantex, and innovative methods of detecting homemade explosive residue with amazing accuracy, at [www.youtube.com/watch?v=5mNHGXXzjLo](http://www.youtube.com/watch?v=5mNHGXXzjLo)

**October 9** ACROSS Chief Investigator A. Prof Oliver Jones was in the news at RMIT for his new teaching app Chirality-2, at [www.rmit.edu.au/news/all-news/2017/oct/chemistry-education-app-a-worldwide-hit](http://www.rmit.edu.au/news/all-news/2017/oct/chemistry-education-app-a-worldwide-hit)

**October 26** Dr Patrice Castignolles was interviewed by Blab Coats about his research, at [blabcoats.com/blab-coats-abridged/2017/10/26](http://blabcoats.com/blab-coats-abridged/2017/10/26)

**November 20** ACROSS researchers successfully conduct electrophoresis on individual textile threads, reported at [www.separationsnow.com/details/ezone/15fca39fbe8/Caught-by-a-thread-Conducting-electrophoresis-on-individual-textile-threads.html](http://www.separationsnow.com/details/ezone/15fca39fbe8/Caught-by-a-thread-Conducting-electrophoresis-on-individual-textile-threads.html)

## PERFORMANCE

# Awards



### **ACROSS Team** University of Tasmania

- Dean's Award 2017 in recognition of Commercialisation or Development of Partnerships with Industry

### **Prof Michael Breadmore** University of Tasmania

- 2017 RACI Doreen Clark Medal for Excellence in Analytical Chemistry.
- 2017 Royal Society of Tasmania M.R. Banks Medal.
- University of Tasmania 2017 Vice-Chancellor's Award for Exceptional Researcher Development and Higher Degree Research Training Supervision.



Prof Michael Breadmore

### **Dr Patrice Castignolles** Western Sydney University

- Awarded membership of the International Advisory Board of Analytical and Bioanalytical Chemistry.

### **Dr Marion Gaborieau** Western Sydney University

- Awarded an "Invited Professorship" for December 2017 by Universite de Pau et des Pays de L'Adour, France.

### **Dr Andrew Gooley** Trajan Scientific and Medical

- University of Tasmania 2017 Vice-Chancellor's Award for Outstanding Contributions by Adjunct and Clinical Title Holders.

### **Prof Philip Marriott** Monash University

- Federation of Asian Chemical Societies Foundation Lectureship Award 2017 in Analytical Chemistry. Presented at 17th Asian Chemical Congress, 24-28 July 2017, Melbourne, Australia.



Prof Philip Marriott



Acting Vice-Chancellor Prof Mike Calford presenting Dr Andrew Gooley his award.



Dr Jessica Pandohee

## Student Awards

Farhan Cecil. The 2nd Poster Presentation Award for 'F Cecil, M Zhang, RM Guijt, A Henderson, M Macka and MC Breadmore, Fused Deposition Modelling 3D printing for the Fabrication of Detection Devices for Microfluidics' at RACI R&D Topics 2017, Hobart, Australia; CASSS Travel Grant to attend the APCE 2017, Shanghai, China; Young Scientist Travel Grant to attend HPLC 2017, Jeju, South Korea & University of Tasmania Conference & Research Travel Funding Scheme to attend HPLC 2017, Jeju, South Korea.

Jake Collie. Awarded the Australasian Association of Clinical Biochemists (AACB) Travelling Scholarship in the category of Early Career Scholarship to attend the AACB Annual Scientific Conference, 12-14 September 2017, Melbourne, Australia.

Christopher Desire. Awarded an RACI Congress Student Bursary to attend the RACI Centenary Congress 2017, July 23-28, Melbourne, Australia.

M Horgan. Awarded an invited poster presentation for "M Horgan, M Meinel, JJ Thevarajah, K Tran, L Seiler, AT Sutton, S Harisson, M Destarac, M Gaborieau, P Castignolles. Separation and characterization of vinylphosphonic acid-based block copolymers with capillary electrophoresis". SCM-8 2017, Amsterdam, Netherlands.

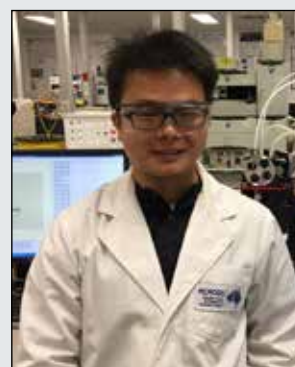
JJ Lee. Awarded a Student Travel Award for "JJ Lee, L Liu, R Ward, V Butardo, D Waters, C Blanchard, M Gaborieau, P Castignolles. Monitoring in vitro digestion of rice using capillary electrophoresis online" at 67th Australasian Grain Science Conference (AGSA), 20-22 September 2017, Christchurch, New Zealand.

Brenda Mooney. The Young Achiever Award – Poster for 'B Mooney, B Paull, T Lewis, A Parbhakar-Fox, Physicochemical properties of iron oxides opportunities for useful AMD products' at 9th Australian Workshop on Acidic and Metalliferous Drainage, 20-23 Nov 2017, Burnie, Australia.

Feng Li. Awarded the Jim Luong Travelling Scholarship 2017 to present his work at HPLC 2017, Jeju, South Korea and APCE 2017, Shanghai, China.

Feng Li. Won the CASSS Student Travel Award to present his work at HPLC 2017 Jeju, South Korea and APCE 2017 Shanghai, China.

Yan Li. Awarded the "Dean's Award for Exceptional Performance by Current Higher Degree by Research Candidates" at Faculty of Science, Engineering & Technology, 9 Sep 2017, Hobart, Australia.

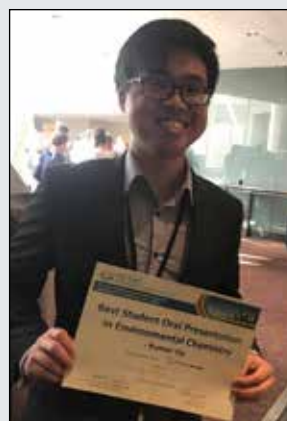


Feng Li

Yan Li. Awarded the "Best Poster Prize" for "Yan Li, Pavel N. Nesterenko, Brett Paull, Roger Stanley, Mirek Macka, Microfluidic breadboard approach to miniaturised capillary liquid chromatography" at 17th Asia-Pacific International Symposium on Microscale Separations and Analysis (APCE), 10-13 Nov 2017, Shanghai, China.

W McCance. People's Choice Award for Best Poster for 'Novel co-tracers in delineating sources of groundwater contamination at wastewater treatment plants' at the Water: Effective Technologies and Tools (WETT) Research Centre Higher Degree by Research Conference, 22 November 2017, Melbourne, Australia.

Yada Nolvachai. Won the inaugural E Kováts Award 2017, an international award for the best PhD thesis adjudged by the Hungarian Chemical Society. Presented at Balaton IX Symposium, 6-8 Sept 2017, Siofok, Hungary.



Timothy Ong

Timothy Ong. Awarded the Best Student Oral Presentation in Environmental Chemistry - Runner Up at the Society of Environmental Toxicology and Chemistry Australasian Conference, 4-6 September, 2017, Gold Coast, Australia.

Dr Jessica Pandohee. RMIT Vice Chancellor's Prize for Research Excellence 2017 – Higher Degree by Research, Melbourne, Australia.

Elvina Parlindungan. Awarded first prize in the RMIT Microscopy and Microanalysis Facility Image competition.

Mohammad Rahbar. Awarded the 2017 Mona Heavy Metal Scholarship (AUD \$5000), Hobart, Australia.

Renee Webster. Selected as one of 6 early career researchers in Australia to attend the JSPS 9th HOPE Meeting with Nobel Laureates, 26 Feb–2 Mar 2017, Tokyo, Japan.

EG Whitty. Awarded a Student poster award for "EG Whitty, ER Andrew, A Fahrer, P Castignolles, M Gaborieau, R Callaghan. Exploiting tumour acidity for polymer based drug delivery" at 2nd Australian Cancer and Metabolism Meeting, 15-17 May 2017, Melbourne, Australia.

# 25th annual RACI R&D Topics Conference

University of Tasmania, Hobart, 3-6 December, 2017



## The Organising Committee

Mohammad Rahbar (Chair), Prof Michael Breadmore, Chris Desire (Treasurer), Pavisara Nanthasurasak (Social media), Gabriela Paniagua Cabarrus (Logistics), Chowdhury Kamrul Hasan (Sponsorship), Farhan Cecil (Co-chair).

The 25th annual Royal Australian Chemical Institute (RACI) Research and Development Conference in Analytical and Environmental Chemistry was held at the University of Tasmania in Hobart in December 2017, and organised by ACROSS PhD students and volunteers. The centre was also well represented in terms of awards, with Prof Michael Breadmore being presented the Doreen Clark medal and Farhan Cecil (PhD Candidate and co-chair of the conference) winning the 2nd best poster prize.

With close to 110 delegates, including young and early career researchers, MSc and PhD students, renowned experts and academics, the conference was an exciting mix of youth and experience, making for a hugely educational, productive and entertaining experience for all.

The three-day scientific program packed in 30 student-based oral presentations and a similar number of posters. Also featured were some excellent plenary, keynote and invited

presentations. Each session began with a keynote presentation from either a medallist or an invited scientist. The medallist presentations were:

- Doreen Clark medallist Prof Michael Breadmore from the University of Tasmania – ‘From There to Here –20 Year Old Ideas, New Directions’.
- Peter W. Alexander medallist Dr Debbie S. Silvester from Curtin University – ‘Detection of Toxic Gases and Explosives Using Miniaturised, Portable Electrochemical Methods’.
- Environmental Chemistry medallist Prof Spas D. Kolev from the University of Melbourne – ‘Flow Analysis of Environmental Contaminants Based on the Use Polymer Inclusion Membranes’.
- Original Research Publication Prize winner Muhammad Zenaidee from the University of New South Wales – ‘Highly Charged Protein Ions: The Strongest Organic Acids to Date’.

Invited speakers included Prof Peter Teasdale from University of South Australia (‘New Measurement Techniques Improve Understanding of Biogeochemical and Contaminant Processes’); and Prof Rosanne M. Guijt from Deakin University, (‘Once upon a Time....Chemistry that Tells a Story’).

Trade talks were also given by Prof Brett Paull from ACROSS (‘Australian Centre for Research on Separation Science, Capabilities and Opportunities’) and Dr Ben Davies from Agilent Technologies (‘High Resolution Accurate Mass (HRAM) with the 7250 GCQTOF and Innovative Technology of the Intuvo 9000 GC’).

Best oral presentation and poster prizes were awarded by an independent judging panel of academic, industry and government representatives. Thanks to the judges for their efforts: Prof Peter Teasdale, Prof Robert Shellie, Dr Debbie Silvester, Dr Ashley Townsend, Dr Maria Ines Almeida, Mr Ajith Subramanian, and Mr Graeme Currie.

The conference also featured a range of exciting social events, beginning with the pre-mixer on December 3. The following day, attendees enjoyed a barbecue in the bush setting of Hobart’s Waterworks Reserve. The conference dinner took place at the Wrest Point Revolving Restaurant on

**"The conference was an exciting mix of youth and experience, making for a hugely educational, productive and entertaining experience for all."**



**Left**  
UTAS PhD student Aleksandra Koreshkova gives a presentation.

**Below**  
Conference guests enjoy the barbecue at Hobart's Waterworks Reserve.



December 5, allowing guests to take in stunning panoramas of the whole city. A closing function on December 6 exhibited local Tasmanian products for attendees to try, with Iron House Brewery, Willie Smiths Organic Apple Cider, Heritage Honey and the Wicked Cheese company on display.

The success of the symposium was of course dependent upon the generous sponsorship of supporting organisations – ACROSS, Elsevier, Agilent Technologies, LasteK, Thermo Fisher Scientific, Shimadzu Corporation, Sciex, MEP Instruments, Central Science Laboratory (CSL), eDAQ, Tasmania University Union, Tasmanian Alkaloids, Grey Innovations, Envirolab, Accurate Mass Scientific, Heritage Honey, Iron House Brewery, Wicked Cheese Company, RACI, and the University of Tasmania.

## Prize winners

	Oral	Poster
1st	Diana Zhang, University of NSW	Panthipa Suwannakot, University of NSW
2nd	Adam Troy Sutton, University of South Australia	Farhan Cecil, University of Tasmania
3rd	Laena Nadine D'Alton, La Trobe University	Deanna Langone, Flinders University

# Chief Investigators

## University of Tasmania



**PROF BRETT PAULL**

DSc, PhD, BSc(Hons), FRSC, CChem  
New Stars Professor, School of Natural Sciences  
Director, ACROSS/ASTech

Brett is a University of Plymouth (England) BSc(Hons), PhD and DSc graduate, and a Fellow of the Royal Society of Chemistry. He took up his first lectureship at the University of Tasmania from 1995 to 1997, before moving to Dublin City University (1998–2011). In 2011, he rejoined the University of Tasmania as Professor in the School of Chemistry. His research interests within ACROSS specifically focus upon the production and characterisation of new materials and platforms for application within the analytical and bio-analytical sciences, and in particular advanced inorganic and organic phase materials for selective extraction and separation purposes. He currently holds a seat on the editorial advisory board of *Analytical Methods* and as a scientific editor of *Chromatographia*.

- J Bones, KV Thomas, B Paull. Using environmental analytical data to estimate levels of community consumption of illicit drugs and abused pharmaceuticals. *J. Environ. Monitor.* 9 (2007) 701-707.
- E Duffy, X He, PN Nesterenko, B Paull. Hierarchical porous graphitic carbon monoliths with detonation nanodiamonds: synthesis, characterisation and adsorptive properties. *J. Mat. Sci.* 50 (2015) 6245-6259.
- V Gupta, M Talebi, J Deverell, S Sandron, PN. Nesterenko, B Heery, F Thompson, S Beirne, GG. Wallace, B Paull. 3D printed titanium micro-bore columns containing polymer monoliths for reversed-phase liquid chromatography. *Anal. Chim. Acta.* 910 (2016) 84-94.



**PROF MICHAEL BREADMORE**

DSc, PhD, BSc(Hons), FRACI  
Professor and ARC Future Fellow, School of Natural Sciences

Michael was awarded his PhD (2001) from the University of Tasmania, after which he held postdoctoral positions at the Microchip Electrophoresis Laboratory at the University of Virginia (USA) and the Institute of Clinical Pharmacology, University of Bern (Switzerland). He has also been Project Leader in Microfluidics for DeltaDOT, an Imperial College London Biotechnology spin-out company. He has extensive research interests in the design and development of miniaturised analytical technology with integrated sample preparation, with applications in drug monitoring, forensics, medical diagnostics and environmental monitoring. He is an editor of the *Journal of Chromatography A*, and a member of the editorial boards of *Electrophoresis*, *Analytical Chimica Acta*, *Journal of Visualised Experiments* and *Aviation Security International*. In 2017 Michael was awarded his DSc.

- MC Breadmore, KA Wolfe, IG Arcibal, WK Leung, D Dickson, BC Giordano, ME Powers, JP Ferrance, S Feldman, PM Norris, JP Landers. Microchip-based DNA purification from biological samples. *Anal. Chem.* 75 (2003) 1880-1886.
- Al Shallan, P Smejkal, M Corban, RM Guijt, MC Breadmore. Cost effective 3D-printing of visibly transparent microchips within minutes, *Anal. Chem.* 86 (2014) 3124-3130
- Al Shallan, RM Guijt, MC Breadmore. Electrokinetic size and mobility traps for on-site therapeutic drug monitoring. *Angew. Chem. Int. Ed.* 54 (2015) 7359-7362.



**DR ROSANNE GUIJT**

PhD, Drs (BioPharmSci), MRACI, CChem

Senior Lecturer, School of Medicine, and Alexander von Humboldt Fellow

Professor, Smart Sensing, Centre for Rural and Regional Futures, Deakin University, Geelong

Rosanne obtained her undergraduate degree in biopharmaceutical sciences from Leiden University (The Netherlands), and her PhD from Delft University of Technology (The Netherlands), with a significant part of her PhD studies being conducted at the Institute de Microtechnique (Switzerland). Her research interests lie in the design and fabrication of microfluidic devices and their application across life sciences. In microfabrication, her research focuses on simple and cost-effective microfabrication methods including 3D printing. As a member of the School of Medicine, she focuses on biomedical applications including therapeutic drug monitoring and personalized medicine, as well as bioprocess control and neuroscience.

- AI Shallan, RM Guijt, MC Breadmore. Electrokinetic size and mobility traps for on-site therapeutic drug monitoring. *Angew. Chem. Int. Ed.* 54 (2015) 7359-7362.
- AI Shallan, P Smejkal, M Corban, RM Guijt, MC Breadmore. Cost-effective three-dimensional printing of visibly transparent microchips within minutes. *Anal. Chem.* 86 (2014) 3124-3130.
- JK Park, CDM Campos, P Neužil, L Abelman, RM Guijt, A Manz. Direct coupling of a free-flow isotachopheresis (FFITP) device with electrospray ionization mass spectrometry (ESI-MS). *Lab. Chip.* 15 (2015) 3495-3502.



**PROF PAUL HADDAD**

DSc, PhD, BSc(Hons), DipMilStud, FAA, FTSE, FRACI, FRSC, FFACS

Emeritus Distinguished Professor of Chemistry, School of Natural Sciences

Foundation Director, ACROSS

Paul obtained the degrees of BSc, PhD and DSc in analytical chemistry from the University of New South Wales. He is currently an Emeritus Distinguished Professor of Chemistry and a former ARC Federation Fellow at the University of Tasmania, and is the former Director of ACROSS (2001–2013). His research interests lie predominantly in theoretical aspects and applications of separations of inorganic ions using the techniques of ion chromatography, capillary electrophoresis, and capillary electrochromatography. He is a former editor of *Journal of Chromatography A*, a former contributing editor of both *Trends in Analytical Chemistry* and *Encyclopedia of Separation Science*, and is a member of the editorial boards of eight other separation science and analytical chemistry journals.

- PR Haddad, PE Jackson. *Ion chromatography: Principles and applications. Journal of Chromatography Library*, Vol. 46, Elsevier Science Publishers, Amsterdam, The Netherlands, 1990, 798 pp.
- RA Shellie, BK Ng, GW Dicoski, SDH Poynter, JW O'Reilly, CA Pohl, and PR Haddad. Prediction of analyte retention for ion chromatography separations performed using elution profiles comprising multiple isocratic and gradient steps. *Anal. Chem.* 80 (2008) 2474-2482.
- M Taraji, PR Haddad, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl. Rapid method development in hydrophilic interaction liquid chromatography for pharmaceutical analysis using a combination of quantitative structure-retention relationships and design of experiments. *Anal. Chem.* 89 (2017) 1870-1878.

# Chief Investigators

## University of Tasmania



**PROF MIREK MACKA**

PhD, RNDr, FRACI, CChem, MRSC

Professor and ARC Future Fellow, School of Natural Sciences

Mirek holds the degrees of RNDr and BSc in analytical chemistry from the Masaryk University (Brno, Czech Republic), and a PhD from the University of Tasmania. He started his career as a research scientist in the pharmaceutical industry in the Czech Republic and Switzerland, and with his move to Australia in 1994, switched to an academic career. He held an Australian Research Council Research Fellowship and a Marie Curie Excellence Grant and Fellowship, and currently ARC Future Fellowship Level 3. His research interests are in the areas of analytical chemistry, separation science, liquid chromatography, capillary electrophoresis, electrochromatography, miniaturised and microfluidic chip-based analysis, instrumental design, solid-state light sources, and numerical modelling and simulations. He is a member of four editorial boards: *Analytica Chimica Acta*, *Electrophoresis*, *Journal of Applied Biomedicine*, and *Czech and Slovak Pharmacy*.

- M Macka, P Andersson, PR Haddad. Changes in electrolyte pH due to electrolysis during capillary zone electrophoresis. *Anal. Chem.* 70 (1998) 743-749.
- Z Walsh, S Abele, B Lawless, D Heger, P Klán, MC Breadmore, B Paull, M Macka. Photo-initiated polymerisation of monolithic stationary phases using visible region LEDs. *Chem. Commun.* 48 (2008) 6504-6506.
- M Macka, T Piasecki, PK Dasgupta. Light-emitting diodes for analytical chemistry. *Annual Review of Analytical Chemistry* 7 (2014) 183-207.



**PROF PAVEL NESTERENKO**

DSc, PhD, MSc, MRACI CChem

Professor, School of Natural Sciences

Pavel obtained his MSc, PhD and DSc from Lomonosov Moscow State University. In 2006 he joined ACROSS as a Quantum Leap Professor and continued as New Star Professor and Senior Research Associate in Separation Science. Author of more than 340 scientific publications including 3 monographs, 10 books chapter, 26 review articles, 290 regular papers and 12 patents. Member of advisory and editorial boards for 6 international journals in the field of analytical chemistry and separation sciences. Editor-in-Chief of journal *Current Chromatography*. His research focuses on the development, investigation and application of non-traditional adsorbents and stationary phases for the various separation techniques and specific applications including high-performance chelation ion chromatography, chiral phase chromatography of enantiomers, ligand-exchange chromatography, simultaneous determination of anions and cations, and determination of traces of metals in complex samples.

- GV Lisichkin, AY Fadeev, PN Nesterenko, AA Serdan, PG Mingalev, DB Furman. *Chemistry of surface grafted compounds*. GV Lisichkin (Ed), Fizmatlit, Moscow, Russia, 2003, 592p.
- PN Nesterenko, B Paull, P Jones. *High performance chelation ion chromatography*. RSC Chromatography Monographs Series. RM Smith (Ed), Royal Society of Chemistry, Cambridge, UK, 2010, 303p.
- PN Nesterenko, PR Haddad. Diamond-related materials as potential new separation media in separation science. *Anal. Bioanal. Chem.* 396 (2010) 205-211.



**A/PROF JOSELITO QUIRINO**

PhD, MSc, BSc

Assoc/Professor, School of Natural Sciences

Lito holds a BSc in industrial pharmacy (1992) from the University of the Philippines and an MSc (1998) and PhD (1999) in material science/analytical chemistry from the Himeji Institute of Technology (HIT), Japan. He was a postdoctoral fellow at HIT (1999-2000) and Stanford University (2000-2001), and has more than 5 years' experience working as an analytical development scientist for the biotechnology and pharmaceutical industry in the USA. Lito's research is supported by the Australian Research Council. His research includes the development of surfactants as soft stationary phases for chromatography and electrophoresis, sample preparation for chromatography and mass spectrometry/proteomics, stacking in capillary electrophoresis, and the applications of separation science to food science, natural products and drug discovery and development.

- KC Chong, LY Thang, JP Quirino, HH See. Monitoring of vancomycin in human plasma via portable microchip electrophoresis with contactless conductivity detector and multi-stacking strategy, *J. Chromatogr. A* 1485 (2017) 142-146.
- EF Romano, JP Quirino, JL Holdsworth, RC So, CI Holdsworth. Assessment of the binding performance of histamine-imprinted microspheres by frontal analysis capillary electrophoresis, *Electrophoresis* 38 (2017) 1251-1259.
- RM Tubaon, PR Haddad, JP Quirino. Electrokinetic removal of dodecyl sulfate from digested protein samples prior to electrospray-ionization mass spectrometry. *Anal. Chem.* 89 (2017) 13058-13063.

## Monash University



**EM. PROF MILTON HEARN AM**

RSV FTSE FAICD FRACI(CChem) FRSC FICChemE(A) BSc(Hons) PhD DSc

Professor, School of Chemistry

Expert in Separation Science, Process Analytical Technologies (PATs); Green and Sustainable Chemical Synthesis, (Bio) Process Valorisation and White (Industrial) Biotechnology. ROPE achievements include 659 original peer-reviewed scientific papers and book chapters, and is named co-inventor on 32 issued and pending patent applications and invention disclosures. Recent International awards include the American Chemical Society 2015 Award for Chromatography; American Chemical Society 2015 Alan S. Michaels Award; American Chemical Society 2013 Green Chemistry Institute Green Chemistry Distinguished Lecturer Award; Japan Society for Advancement of Science 1998 and 2017 Awards; Organon Award, Alexander von Humboldt Forschungspreis and numerous other international research awards. National Awards include the Royal Australian Chemical Institute's Leighton Memorial Medal, the Institute's Green Chemistry Challenge Award, H.G. Smith Medal, Applied Research Medal, Analytical Chemistry Medal, R.K Murphy Medal, and numerous other national Awards. He is a recipient of the Centennial Medal of the Commonwealth of Australia and is a Member of the Order of Australia (AM).

- R Daly, MTW Hearn. Expression of heterologous proteins in *Pichia pastoris*: a useful experimental tool in protein engineering and production *J. Mol. Recognit.* 18 (2005) 119-138.
- KK Unger, G Gilge, JN Kinkel, MTW Hearn. Evaluation of advanced silica packings for the separation of biopolymers by high-performance liquid-chromatography. *J. Chromatogr. A* 359 (1986) 61-72.
- WS Hancock, CA Bishop, RL Prestidge, DRK Harding, MTW Hearn. Reversed-phase, high pressure liquid chromatography of peptides and proteins with ion-pairing reagents. *Science* 200 (1978) 1168-1170.

# Chief Investigators

## Monash University



**PROF PHILIP MARRIOTT**

PhD, BSc(Hons), FRACI, FFACS

Professor of Chemistry, Distinguished Visiting Researcher CNPq (Brazil) Federal University of Rio de Janeiro, Deputy Director of ACROSS

Philip has the degrees of BSc(Hons) and PhD from La Trobe University. He is Professor of chemistry at Monash University and a Deputy Director of ACROSS. His research is primarily in the area of high resolution separation, in the fields of multi-dimensional and comprehensive two-dimensional gas chromatography, the use of selective detection including low and high resolution mass spectrometry in gas chromatography, micro-fluidics and cryogenic methods. Philip was recipient of an ARC Discovery Outstanding Researcher Award. He was also recently awarded the FACS Foundation Lectureship Award for Analytical Chemistry. He is a member of the editorial advisory boards of the following international journals: *Journal of Chromatography A*, *Journal of Separation Science*, *LCGC Europe*, *LCGC Asia Pacific*, and *Chromatographia*.

- LW Sumner, A Amberg, D Barrett, R Beger, CA Daykin, TW-M Fan, O Fiehn, R Goodacre, JL Griffin, T Hankemeier, N Hardy, J Harnly, R Higashi, J Kopka, AN Lane, JC Lindon, P Marriott, AW Nicholls, MD Reily, JJ Thaden, MR Viant. Proposed minimum reporting standards for chemical analysis. *Metabolomics* 3 (2007) 211-221.
- AC Lewis, N Carslaw, PJ Marriott, RM Kinghorn, P Morrison, AL Lee, KD Bartle, MJ Pilling. A larger pool of ozone-forming carbon compounds in urban atmospheres. *Nature* 405 (2000) 778-781.
- M Bourke, PJ Marriott, R Glud, HH-Sheetal, M Kamalanathan, J Beardall, P Cook. Eukaryotic dark fermentation dominates metabolism during anoxia in permeable sediments. *Nature Geosci.* 10 (2017) 30-35.



**DR REINHARD BOYSEN**

Dr rer. nat.

Senior Research Fellow, School of Chemistry

Reinhard was awarded a Dr rer. nat. from the Freie Universität Berlin, Germany, where he specialized in analytical biochemistry. He held research positions in the Department of Biochemistry and Molecular Biology and the Centre for Green Chemistry/School of Chemistry at Monash University, working in various fields of analytical chemistry that impact on the separation, green chemical and material sciences. He has authored 117 scientific publications in the fundamental and applied sciences.

- RI Boysen, LJ Schwarz, DV Nicolau, MTW Hearn, Molecularly imprinted polymer membranes and thin films for the separation and sensing of biomacromolecules. *J Sep. Sci.* 40 (2017) 314-335.
- RI Boysen, MTW Hearn, 'Modern methods in natural product chemistry: high performance chromatography separation methods', In: *Comprehensive Natural Products Chemistry II*, L Mander, HW Lui (Eds), Elsevier: Oxford, Vol. 9 (2010) 5-49.
- RI Boysen, AJO Jong, JA Wilce, GF King, MTW Hearn, The role of interfacial hydrophobic residues in the stabilisation of the leucine zipper structures of the transcription factors c-fos and c-jun. *J Biol. Chem.* 277 (2002) 23-31.

## RMIT University



### **A/PROF OLIVER A. H. JONES**

PhD, MSc, BSc(Hons) FRACI, CCHEM

Associate Professor, School of Science

Oliver was awarded his PhD from Imperial College London in 2005. He then held a postdoctoral position at the University of Cambridge and later a lecturer post at the University of Durham. He moved to Australia in 2012. He has extensive interests in metabolomics and trace environmental monitoring and a major focus in his group at present is developing and utilising new analytical methods and technologies, particularly multidimensional chromatographic techniques and solution state NMR, for applications in these areas. Oliver is a chartered chemist and fellow of the Royal Australian Chemical Institute. He is President of the Australian and New Zealand Metabolomics Network, board member for the International Metabolomics Society, secretary of the Australian and New Zealand Society for Magnetic Resonance, an associate editor of RSC Advances and serves on the Australian Academy of Science National Committee for Chemistry.

- OAH Jones, N Voulvoulis, JN Lester. Aquatic environmental assessment of the top 25 English prescription pharmaceuticals. *Wat. Res.* 36 (2001) 5013-5022.
- J Pandohee, PG Stevenson, XA Conlan, XR Zhou, OAH Jones. Off-line two-dimensional liquid chromatography for metabolomics: an example using *Agaricus bisporus* mushrooms exposed to UV irradiation. *Metabolomics* 11 (2015) 939-951.
- LD Alexandrou, BJ Meehan, PD Morrison, OAH Jones. A new method for the fast analysis of trihalomethanes in tap and recycled waters using headspace gas chromatography with micro-electron capture detection. *Int. J. Environ. Res. Public Health* 14 (2017) 1-9.

## Western Sydney University



### **PROF ANDREW SHALLIKER**

DSc, PhD, BSc(Hons)

Professor, Western Sydney University

Deputy Director of ACROSS

Andrew has the degrees of BSc(Hons), PhD and DSc from Deakin University. He is currently a Professor in analytical chemistry within the School of Science and Health at the Western Sydney University, and the head of the Western Sydney University node of ACROSS. His research interests are in the field of high resolution separations in liquid chromatography, which entails aspects of column and stationary phase design, multidimensional high-performance liquid chromatography, and fluid dynamics.

- D Kocic, W Farrell, GR Dennis, RA Shalliker. Ultra-fast HPLC MS analyses using active flow technology columns, *Microchem. J.* 127 (2016) 160-164.
- R.A. Shalliker, M. Camenzuli, L. Pereira, H.J. Ritchie. Parallel segmented flow chromatography columns: Conventional analytical scale column formats presenting as a 'virtual' narrow bore column. *J. Chromatogr. A* 1262 (2012) 64-69.
- D Kocic, RA Shalliker. A new approach to live reaction monitoring using active flow technology in ultra-high-speed HPLC with mass spectral detection. *J. Mass Spectrometry* 50 (2015) 1396-1399.

# Chief Investigators

## Western Sydney University



**DR PATRICE CASTIGNOLLES**

PhD, MSc

Senior Lecturer, School of Science and Health

Patrice graduated at the National Graduate School of Chemistry of Paris and the University Pierre et Marie Curie. After a postdoctoral stay at the Max Planck Institute for Polymer Research, he was an ARC international research fellow at the Key Centre for Polymer and Colloids (University of Sydney), and a research fellow at the Centre for Nutrition and Food Science (University of Queensland) and the Institute of Physical Chemistry (Johannes Gutenberg University, Germany). He investigated the separation mechanism of branched polymers, such as polyacrylates and starch, by size-exclusion chromatography (SEC/GPC). His current research at Western Sydney University focuses on capillary electrophoresis in the critical conditions to characterise polysaccharides (chitosan, starch, hemicellulose), smart polymers (polyacrylates) and industrial polymers to design healthier rice, anticancer drug carriers, water purification membranes, bioplastics or hot-melt adhesives.

- JJ Thevarajah, MP Van Leeuwen, H Cottet, P Castignolles, M Gaborieau. Determination of the distributions of degrees of acetylation of chitosan. *Int. J. Biol. Macromolec.* 95 (2017) 40-48.
- JJ Thevarajah, AT Sutton, AR Maniego, EG Whitty, S Harisson, H Cottet, P Castignolles, M Gaborieau. Quantifying the heterogeneity of chemical structures in complex charged polymers through the dispersity of their distributions of electrophoretic mobilities or of compositions. *Anal. Chem.* 88 (2016) 1674-1681.
- AT Sutton, E Read, AR Maniego, JJ Thevarajah, J-D Marty, M Destarac, M Gaborieau, P Castignolles. Purity of double hydrophilic block copolymers revealed by capillary electrophoresis in the critical conditions. *J. Chromatogr A.* 1372 (2014) 187-195.



**DR MARION GABORIEAU**

PhD, MSc

Senior Research Lecturer, School of Science and Health

Marianne 'Marion' completed her PhD at the Max Planck Institute for Polymer Research in Mainz, Germany. Her research potential was recognized through the award of an Australian Postdoctoral Fellowship Industry (APDI) by the Australian Research Council. She holds a research lectureship in the School of Science and Health, and the Medical Sciences Research Group at Western Sydney University. She is an expert in the use of Nuclear Magnetic Resonance (NMR) spectroscopy for the advanced characterisation of macromolecules, especially in the solid state. She is using solid-state NMR and complementary methods (FT-IR, XRD etc.) to relate the structure of polymers to adhesion (hot-melt adhesives), mechanical properties (water purification membranes) or digestibility (rice).

- AR Maniego, AT Sutton, M Gaborieau, P Castignolles. Assessment of the branching quantification in poly(acrylic acid): is it as easy as it seems? *Macromolecules* 50 (2017) 9032-9041.
- C Gartner, BL Lopez, L Sierra, R Graf, HW Spiess, M Gaborieau. Interplay between structure and dynamics in chitosan films investigated with solid-state NMR, dynamic mechanical analysis and X-ray diffraction. *Biomacromolecules* 12 (2011) 1380-1386.
- M Gaborieau, L Nebhani, R Graf, L Barner, C Barner-Kowollik. Accessing quantitative degrees of functionalization on solid substrates via solid-state NMR spectroscopy. *Macromolecules* 43 (2010) 3868-3875.

# Postdoctoral Research Fellows

## University of Tasmania



### DR RUTH AMOS

PhD, BSc(Hons), MRACI

Lecturer and ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Ruth graduated from the University of Tasmania where she received the University Medal in 2010. She went on to complete a PhD at the University of Tasmania in the area of physical organic chemistry using both computational and experimental chemistry. Following her graduation she worked in the areas of computational chemistry and materials science at the University of Sydney before returning to the University of Tasmania to work as a postdoctoral fellow in the area of separation science. Ruth is presently applying her skills to the problem of separation of drug-like compounds to streamline the pharmaceutical drug development process. The calculation of quantitative structure and retention relationships (QSRR) will allow the prediction of retention times from molecular descriptors allowing in-silico separations, massively decreasing the time and effort required for process development.

- RIJ Amos, E Tyteca, M Talebi, PR Haddad, R Szucs, JW Dolan, CA Pohl, Benchmarking of Computational Methods for Creation of Retention Models in Quantitative Structure–Retention Relationships Studies. *J. Chem. Inf. Model* 57 (2017) 2754–2762.
- M Taraji, PR Haddad, RIJ Amos, M Talebi, R Szucs, JW Dolan, CA Pohl, Rapid Method Development in Hydrophilic Interaction Liquid Chromatography for Pharmaceutical Analysis Using a Combination of Quantitative Structure–Retention Relationships and Design of Experiments. *Anal. Chem.* 89 (2017) 1870–1878.
- RIJ Amos, BS Gourlay, BF Yates, CH Schiesser, TW Lewis, JA Smith. Mechanistic investigation of the oxidation of hydrazides: Implications for the activation of the TB drug isoniazid. *Org. Biomol. Chem.* 11 (2013) 170–176.



### DR SINÉAD CURRIVAN

PhD, BSc(Hons), MRSC

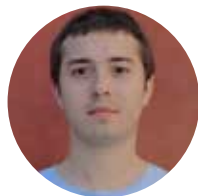
ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Sinéad is a graduate of Dublin City University, received her BSc (Hons) in 2008, and PhD in 2012, under the auspices of the Irish Separation Science Cluster. Following her PhD, she worked at Ipsen Manufacturing Ireland Limited (2012), after which she took up a postdoctoral position at the University of Pardubice, Czech Republic (2013–2015). During this time, she worked on the development of novel monolithic stationary phases for use in HILIC separations. In 2014, she undertook a three month internship, as a visiting postdoctoral fellow at the Lawrence Berkeley National Laboratory, California. Sinéad joined ACROSS in 2015, as an honorary associate with an Endeavour scholarship, shortly after which she began her current postdoctoral fellowship within ACROSS. Her research themes have included the development of polymeric monolithic columns, stationary phase technologies (in a variety of column housing materials), and their application in separation sciences, as well as monolithic retaining frits, and 3D printed media for separations.

- NP Macdonald, SA Curriivan, L Tedone, B Paull. Direct production of microstructured surfaces for planar chromatography using 3D printing. *Anal. Chem.* 89 (2017) 2457–2463.
- S Curriivan, JM Macak, P Jandera. Polymethacrylate monolithic columns for hydrophilic interaction liquid chromatography prepared using a secondary surface polymerization. *J. Chromatogr. A.* 1402 (2015) 82–93.
- S Curriivan, D Connolly, B Paull. Production of novel polymer monolithic columns, with stationary phase gradients, using cyclic olefin co-polymer (COC) optical filters. *Analyst* 137 (2012) 2559–2566.

# Postdoctoral Research Fellows

## University of Tasmania



**DR ANTON PERISTYY**

PhD, MSc

ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Anton graduated from Lomonosov Moscow State University in Russia, obtaining his Specialist Degree in Chemistry in 2011. In 2015 he completed his PhD degree at University of Tasmania. Since September 2015 he has been working as a Postdoctoral Research Fellow within ACROSS. His current research interests are related to the preparation and characterisation of nanocarbon composite adsorbents for application in ultra-high pressure and high temperature liquid chromatography.

- A Peristyy, PN Nesterenko, A Das, DM D'Alessandro, EF Hilder, RD Arrua. Flow-dependent separation selectivity for organic molecules on metal-organic frameworks containing adsorbents. *Chem. Commun.* 52 (2016) 5301-5304.
- A Peristyy, B Paull, PN Nesterenko. Chromatographic performance of synthetic polycrystalline diamond as a stationary phase in normal phase high performance liquid chromatography. *J. Chromatogr. A.* 1391 (2015) 49-59.
- A Peristyy, ON Fedyanina, B Paull, PN Nesterenko. Diamond based adsorbents and their application in chromatography. *J. Chromatogr. A* 1357 (2014) 68-86.



**DR ESTRELLA SANZ RODRÍGUEZ**

PhD, BSc

ACROSS Research Assistant, School of Natural Sciences

Estrella obtained the degrees of BSc and PhD in analytical chemistry from the University Complutense of Madrid, Spain. She has over 21 years' experience as an analytical chemist, with her research interests focused on the development of new analytical methods based on chromatographic techniques coupled to mass spectrometry. She joined ACROSS in August 2014 and has since been involved in the development of new methods for the analysis of anionic species, inorganic and organic by ion chromatography (standard and capillary) in different samples such as ice cores, seawater, etc. In September 2015, she was awarded an Ian Potter Foundation Science Grant. Since August 2016, she has coordinated the Mass Spectrometry Facility at ACROSS. During 2017, she worked within ASTech as a Postdoctoral Research Fellow and in August 2017 she was awarded an Australian Antarctic Science (AAS) Grant for a two-year project titled 'Development and application of new highly sensitive low volume capillary ion chromatography techniques to deliver higher resolution ice core derived paleoclimatic records'.

- E Sanz Rodriguez, S Poynter, MAJ Curran, PR Haddad, RA Shellie, PN Nesterenko, B Paull. Capillary ion chromatography with on-column focusing for ultra-trace analysis of methanesulfonate and inorganic anions in limited volume Antarctic ice core samples. *J. Chrom. A* 1409 (2015) 182-188.
- E Sanz Rodriguez, AN Setiawan, S Pope, PR Haddad, RA Shellie, PN Nesterenko, B Paull. A simple and sensitive method for the determination of iodide and iodate in raw, ultraviolet- and ozone-treated aquacultural seawater samples using ion chromatography coupled to an ultraviolet detector. *Anal. Methods* 8 (2016) 5587-5595.
- E Sanz Rodriguez, M Nation, AD Moy, MAJ Curran, PR Haddad, PN Nesterenko, B Paull. Application of capillary ion chromatography and capillary ion chromatography coupled with mass spectrometry to determine methanesulfonate and inorganic anions in microliter sample volumes of Antarctic snow and ice. *Anal. Methods* 8 (2016) 7650-7660.



**DR MOHAMMAD TALEBI**

PhD, MSc, BSc

ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Mohammad obtained his PhD in 2013 from the University of Tasmania where he worked with Prof. Emily Hilder and Prof. Paul Haddad on developing new stationary phases for high-performance liquid chromatography of biomolecules. His research interest is in the area of liquid chromatography and related technologies with the focus on bioseparation, pharmaceutical analysis, and analytical method development and optimisation. Mohammad was an ACROSS Postdoctoral Research Fellow until mid 2017, when he joined Envirolab Group as an R&D Scientist. Envirolab is also a UTAS partner in a CRC project, an Australian Government funded programme aimed at developing a field deployable detection system for perfluoroalkylated Substances (PFAS). Mohammad's current research includes retention time prediction and modelling, and developing new technologies for sample preparation and analysis of emerging environmental contaminants such as PFAS.

- Y Wen, M Talebi, R Amos, R Szucs, J Dolan, C Pohl, P Haddad. Retention prediction in reversed phase high performance liquid chromatography using quantitative structure-retention relationships applied to the Hydrophobic Subtraction Model. *J. Chromatogr. A*. 1541 (2018) 1-11.
- L Ranjbar, M Talebi, P Haddad, Soo Park, J Cabot, M Zhang, P Smejkal, Petr, J Foley, M Breadmore. In Silico Screening of Two-Dimensional Separation Selectivity for Ion Chromatography × Capillary Electrophoresis Separation of Low-Molecular-Mass Organic Acids. *Anal. Chem.* 89 (2017) 8808-8815.
- M Talebi, SH Park, M Taraji, Y Wen, RIJ Amos, PR Haddad, RA Shellie, R Szucs, CA Pohl, JW Dolan. Retention time prediction based on molecular structure in pharmaceutical method development: A Perspective. *LCGC North America* 34 (2016) 550-558.



**DR LAURA TEDONE**

PhD, MSc, BSc

ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Laura obtained her BSc and MSc degrees in Marine Biology and Ecology at the University of Messina (Italy). She then successfully applied for a PhD position at the same University, in the Food Chemistry and Safety group, where her research was focused on volatile compounds analysis using gas chromatographic techniques. She spent the last year as a visiting student in Chemistry/ACROSS at the University of Tasmania, working on hop and beer aroma analysis as well as investigating FAMES from marine organisms by GC×GC techniques. In 2015 she was offered an ARC funded position as Postdoctoral Research Fellow in Separation Science from the same group at the University of Tasmania, where she is currently working on a research project that aims to utilize flavoromics techniques on hop chemical composition to provide clear inferences about the influence of hop chemistry on beer flavor chemistry.

- R Costa, L Tedone, S De Grazia, P Dugo, L Mondello. Multiple Headspace-Solid-Phase Microextraction (MHS-SPME): an application to quantification of mushroom volatiles. *Anal. Chim. Acta* 770 (2013) 1-6.
- L Tedone, I Bonaccorsi, P Dugo, A Cotroneo, G Dugo, L Mondello. Reliable Identification and quantification of volatile components of sage essential oil using ultra HRGC. *Nat. Prod. Commun.* 6(0) (2011) 1-6.
- G Genovese, L Tedone, MT Hamann, M Morabito. The mediterranean red alga *Asparagopsis*: A source of compounds against *Leishmania*. *Mar. Drugs* 7(3) (2009) 361-366.

# Postdoctoral Research Fellows

## University of Tasmania



**DR YIING CHIING YAP**

PhD, MSc, BSc (Hons)

ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Yiing holds a BSc in honours in Biotechnology (2006) from the University Tunku Abdul Rahman, Malaysia and MSc (2010) and PhD (2015) in chemistry and neuroscience area from the University of Tasmania, Australia. Her doctorate work focused on developing a new microfluidic platform for studying stretch injury in Traumatic Brain Injury. Part of her thesis also involved the developing of a novel, low cost microfabrication method by using laser engraver system. Upon completion of her PhD in 2015, she was appointed as a Postdoctoral Research Fellow in ACROSS. Current studies involve developing a new neuron-glia co-culture platform for elucidating the pathogenesis of neurological disorders.

- YC Yap, RM Guijt, TC Dickson, AE King, MC Breadmore. Stainless steel pinholes for fast fabrication of high-performance microchip electrophoresis devices by CO<sub>2</sub> laser ablation. *Anal. Chem.* 85 (2013) 10051-10056.
- YC Yap, TC Dickson, AE King, MC Breadmore, RM Guijt. Microfluidic culture platform for studying neuronal response to mild to very mild axonal stretch injury. *Biomicrofluidics* 8 (2014) 044110.
- YC Yap, AE King, RM Guijt, T Jiang, CA Blizzard, MC Breadmore, TC Dickson. Mild and repetitive very mild axonal stretch injury triggers cytoskeletal mislocalization and growth cone collapse. *PLOS One* 12 (2017) 5.



**DR MIN ZHANG**

PhD, BSc

ACROSS Postdoctoral Research Fellow, School of Natural Sciences

Min studied environmental science at Xiamen University, China, receiving his PhD there in 2011. This was followed by a post-doc at the University of Texas at Arlington in the USA from 2012 to mid-2014. During this period, he participated in a project developing capillary scale ion chromatograph and detector for the same. After that, he held another postdoctoral position at University of Oklahoma for one year. In April 2015, he joined the University of Tasmania mainly working on miniaturized analytical separation instruments.

- M Zhang, SC Phung, P Smejkal, RM Guijt, MC Breadmore. Recent trends in capillary and micro-chip electrophoretic instrumentation for field-analysis. *Trends Environ. Anal. Chem.* (2018) Accepted.
- F Kong, M Zhang, J Chen, L Fan, H Xiao, S Liu, C Cao. Continuous protein concentration via free-flow moving reaction boundary electrophoresis. *J. Chromatogr. A* 1508 (2017) 169-175.
- M Zhang, A Chen, JJ Lu, C Cao, S Liu. Monitoring gradient profile on-line in micro- and nano-high performance liquid chromatography using conductivity detection. *J. Chromatogr. A* 1460 (2016) 68-73.

## University of Tasmania

### ARC Centre of Excellence for Electromaterials Science (ACES)



#### DR JOAN-MARC CABOT

PhD, MSc, BSc(Hons)

ACES Postdoctoral Research Fellow, School of Natural Sciences

Joan-Marc graduated from the University of Barcelona, receiving BSc(Hons) in Chemistry, MSc in Advanced Chemistry and PhD in Analytical Chemistry. Before finishing his Bachelors degree, he was awarded a 6-month scholarship from the 'Ministerio de Educación y Ciencias de España' to collaborate with the PhysChem Analytical Chemistry research group. After completion of his degree, he got a 2-year fellowship to work part-time in the GC/MS department of the CCIIT while doing a Masters in Advanced Chemistry. In 2012, he got a FI-DGR PhD fellowship from the Catalan Government focused on 'Determination of acidity constants of biological compounds by capillary electrophoresis' in the field of method development in capillary electrophoresis. In 2015, he completed his PhD with the maximum qualification, Cum Laude. Additionally, his PhD thesis received the extraordinary distinction award from the University of Barcelona. Since completing his PhD, Dr. Cabot has been with ACES and ACROSS as a Research Fellow at the University of Tasmania. He participates in research within the Electrofluidics and Diagnostics Theme of ACES, developing new electrofluidic scaffolds for the next generation of chemical, bio-sensing and diagnostic devices.

- JM Cabot, MC Breadmore, B Paull. Thread based electrofluidic platform for direct metabolite analysis in complex samples. *Anal. Chim. Acta* 1000 (2018) 283-292.
- S Waheed, JM Cabot, NP Macdonald, T Lewis, R Guijt, B Paull, MC Breadmore. 3D printed microfluidic devices: Enablers and barriers. *Lab. Chip* 16 (2016) 1993-2013.
- JM Cabot, E Fuguet, M Rosés, P Smejkal, M Breadmore. Novel instrument for automated pKa determination by internal standard capillary electrophoresis. *Anal. Chem.* 87 (2015) 6165-6172.



#### DR NIALL PATRICK MACDONALD

PhD, MEng

ACES Postdoctoral Research Fellow, School of Natural Sciences

Niall obtained his MEng in electronic engineering in 2009 and completed his PhD in the field of biomedical engineering in 2014 both at the University of Glasgow (UK). His PhD research focused on 'microsystems manufacturing technologies for pharmaceutical toxicity testing' and was an Industrial CASE Award partnered with Unilever. His research interests lie in developing microfluidic systems for miniaturised diagnostic platforms with applications in environmental and biomedical research. In particular, the integration of micro fabrication, multi-material 3D printing and electrofluidic manipulation to control fluids within macroporous, nanofunctional and biomimetic structures.

- NP Macdonald, JM Cabot, P Smejkal, RM Guijt, B Paull, MC Breadmore. Comparing microfluidic performance of three-dimensional (3D) printing platforms. *Anal. Chem.* 89 (2017) 3858-3866.
- NP Macdonald, SA Currivan, L Tedone, B Paull. Direct production of microstructured surfaces for planar chromatography using 3D printing. *Anal. Chem.* 89 (2017) 2457-2463.
- NP Macdonald, F Zhu, CJ Hall, J Reboud, PS Crosier, EE Patton, D Wlodkovic, JM Cooper. Assessment of biocompatibility of 3D printed photopolymers using zebrafish embryo toxicity assays. *Lab. Chip* 16 (2016) 291-297.

# Postdoctoral Research Fellows

University of Tasmania

ARC Industrial Transformation Training Centre for Portable Analytical Separation Technologies (ASTech)



**DR GREGORY JOSEPH BARBANTE**

PhD, BSc (Hons)

ASTech Postdoctoral Research Fellow, School of Natural Sciences

Gregory completed his science degree at La Trobe University (LTU). He continued his studies at LTU and completed his postgraduate training in the areas of electro-analytical chemistry and organometallic synthesis. After completing his PhD, Greg accepted a postdoctoral position at Deakin University, Geelong, to work with Prof. Paul Francis on the development of novel electrochemically active luminescent materials for sensing and solid state catalytic applications. From there, he accepted a postdoctoral role in ASTech with industry partner, Trajan Scientific & Medical focusing on the development of portable analytical applications.

- GJ Barbante, TD Ashton, EH Doeven, FM Pfeffer, DJD Wilson, PS Francis. Photoredox catalysis of intramolecular cyclizations with a reusable silica-bound ruthenium complex. *ChemCatChem*. 7 (2015) 1655-1658.
- E Kerr, EH Doeven, GJ Barbante, CF Hogan, D Bower, PS Donnelly, TU Connell, PS Francis. Mixed annihilated electrogenerated chemiluminescence of metal chelates in solution: Modulating emission colour by controlling the energetics. *Chem. Sci.* 6 (2015) 472-479.
- EH Doeven, E Zammit, GJ Barbante, CF Hogan, NW Barnett, PS Francis. Selective excitation of concomitant electrochemiluminophores: Tuning emission color by electrode potential. *Angew. Chem. Int. Ed. Engl.* 51 (2012) 4354-4357.



**DR FLORIAN LAPIERRE**

PhD, MEng

ASTech Postdoctoral Research Fellow, School of Natural Sciences

Florian graduated from the University of Lille in France obtaining his MEng in Science and Technology in 2007 and his PhD in Micro and Nanotechnology, acoustic and telecommunication in 2011. Before joining ASTech, he held an OCE postdoctoral position at the Commonwealth Scientific and Industrial Research Organisation (CSIRO, Australia), working on the development of microfluidic platforms for biomaterial synthesis, manipulation and analysis (i.e. enzyme, bacteria, cells, hydrogel, metal organic framework). His expertise brought him to work for the Boeing Company on antimicrobial protection for spacecraft systems. His current research interests are related to the conception of microfluidic and medical devices. In 2015, he invented the hemaPEN technology for accurate blood collection in home-based setting in collaboration with the company Trajan SciMed.

- R Neto, A Gooley, M Breadmore, E Hilder, F Lapiere. Precise, accurate and user independent blood collection system for Dried Blood Spot sample preparation. *Anal. Bioanal. Chem.* (Accepted)
- F Lapiere, A Gooley, M Breadmore. Principles around accurate blood volume collection using capillary action. *Langmuir* 33 (50) 14220-14225.
- F Lapiere, G Piret, H Drobecq, O Melnyk, Y Coffinier, V Thomy, R Boukherroub. High sensitive matrix-free mass spectrometry analysis of peptides using silicon nanowires based digital microfluidic device. *Lab. Chip* 11 (2011) 1620-1628.



**DR MASOOMEH TEHRANI ROKH**

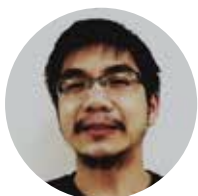
PhD, MSc, BSc

ASTech Postdoctoral Research Fellow, School of Natural Sciences

Masoomeh obtained the degrees of BSc in Medical engineering from Shahid Beheshti University (Iran) and MSc in Microengineering and Nanoelectronics from National University of Malaysia. She holds PhD in Engineering from Deakin University (Australia) where she conducted her thesis on a 3D cell culture microfluidic device. Her research interests include modelling, design and fabrication of BioMEMS/Microfluidic devices.

- M Nasabi, M Tehranirokh, F J Tovar-Lopez, A Kouzani, K Khoshmanesh, A Mitchell. Design, characterization and application of a novel mono-layer pin-microvalve for microfluidic devices. *RSC Adv.* 4 (2014) 24394-24398.
- M Tehranirokh, A Kouzani, PS Francis and JR Kanwar. Microfluidic devices for cell cultivation and proliferation. *Biomicrofluidics* 7 (2013) 051502.
- M Tehranirokh, A Kouzani, PS Francis and JR Kanwar. Generating different profiles of gradient concentrations inside a gel-filled chamber: Design and simulation. *Microsys. Tech.* 19 (2013) 623-628.

## Monash University



**DR CHADIN KULSING**

PhD; BSc

ACROSS Postdoctoral Research Fellow, School of Chemistry

Chadin obtained his BSc with Honours in Chemistry at Mahidol University, Thailand. He then completed his PhD in Chemistry at Monash University (Prof. Hearn's group) with his research focusing on novel concepts in capillary electro chromatography and liquid chromatography. He commenced his post-doctoral position in late 2014 with Prof. Marriott as the supervisor at Monash University. He has conducted a diverse research project with the focus on new concepts and application of the latest technologies in MDGC. This has included experimental design and development of theoretical equations and models to understand separation performance in MDGC based on temperature dependent LSER and time summation model principles, integrating several disciplines in science for improved limitation and application in GC and LC.

- C Kulsing, Y Nolvachai, P Rawson, DJ Evans, PJ Marriott. Continuum in MDGC technology: from classical multidimensional to comprehensive two-dimensional gas chromatography. *Anal. Chem.* 88 (2016) 3529-3538.
- Y Nolvachai, C Kulsing, PJ Marriott. In silico modeling of hundred thousand experiments for effective selection of ionic liquid phase combinations in comprehensive two-dimensional gas chromatography. *Anal. Chem.* 88 (2016) 2125-2131.
- C Kulsing, RI Boysen, MTW Hearn. Contribution of eigenmobility shifts to the separation of peptides in capillary electrophoresis with aqueous-acetonitrile background electrolytes. *Anal. Chem.* 88 (2016) 12255-12263.

# Postdoctoral Research Fellows

## Monash University



**DR YADA NOLVACHAI**

PhD; BFoodTech (Hons)

ACROSS Postdoctoral Research Fellow, School of Chemistry

Yada obtained her Bachelor of Food Technology with Honours at the University of Queensland, Australia. She completed her PhD in Chemistry at Monash University in Prof. Marriott's group. Her research focuses on application of novel materials and computational approaches in gas chromatography. She then started her post-doctoral position in late 2016 in the same group conducting a wide range of research with the main focus on development of hyphenation techniques, application of MDGC-MSn technologies in food and biological analysis and molecular modelling for improved data analysis.

- Y Nolvachai, C Kulsing, PJ Marriott. Multidimensional gas chromatography in food analysis. *Trends Anal. Chem.* (2017) 124-137.
- Y Nolvachai, C Kulsing, PJ Marriott. Thermally sensitive behaviour explains unusual orthogonality observed in comprehensive two-dimensional gas chromatography comprising a single ionic liquid stationary phase. *Anal. Chem.* 87 (2015) 538-544.
- Y Nolvachai, CS Hawes, C Kulsing, GP Knowles, AL Chaffee, PJ Marriott, SR Batten, DR Turner. Metal-organic frameworks as stationary phases for mixed-mode separation applications. *Chem. Commun.* 50 (2014) 3735-3737.

## Western Sydney University



**DR JAMES OLIVER**

PhD

ACROSS Postdoctoral Research Fellow

James completed his PhD at Western Sydney University in 2014. His research focused on the development of Capillary Electrophoresis as a tool for the monitoring of carbohydrate release and fermentation to bio-ethanol from complex but sustainable sources. Following his PhD, James joined the group of Prof. Kim Williams at the Colorado School of Mines, USA, where he worked on developing polymer microstructure-based separations for industrial rubbers. He was then awarded an Endeavour award to pursue a post-doctorate fellowship at ESPCI ParisTech working on the characterization of drug carriers. James now holds a teaching-based position with the WSU pathways programme. Currently he is working with an industrial company on the characterization of water filtration membranes and their feed waters with both capillary electrophoresis and field-flow fractionation.

- SKR Williams, MA Benincasa, WC Smith, JD Oliver. Field-Flow Fractionation in Analysis of Polymers and Rubbers. *Encyclopedia of Analytical Chemistry*, John Wiley & Sons (2016) 1-33.
- JD Oliver, AT Sutton, N Karu, M Phillips, J Markham, P Peiris, EF Hilder, P Castignolles. Simple and robust monitoring of ethanol fermentations by capillary electrophoresis. *Biotechnol. Appl. Biochem.* 62 (2015) 329-342.
- JD Oliver, M Gaborieau, EF Hilder, P Castignolles. Simple and robust determination of monosaccharides in plant fibers in complex mixtures by capillary electrophoresis and high performance liquid chromatography. *J. Chromatogr. A* 1291 (2013) 179-186.

# Technical and Administrative Staff

## University of Tasmania



**MS CAROL JACOBS**

MBA

ACROSS/ASTech /ACES Centre Manager

Carol obtained her Masters degree in Business Management from the University of Tasmania in 2007. She has an extensive track record in large project management and senior administrative roles, for both private and public organisations. Before commencing her role as Centre Manager in September 2016, she worked as Project Manager in the Division of Pharmacy (UTas) where she worked on the accreditation process for the delivery of the Bachelor of Pharmacy, event management, 'Students in General Practice' initiative and student engagement activities. Carol brings a broad senior management background to this position which includes experience in financial management, human resources, project management and technical expertise in managing projects.

### **DR UMME KALSOOM**

ACROSS Administrative Assistant

### **DR PETR SMEJKAL**

Research Technician, University of Tasmania

## Monash University

### **DR KIM SHEPHERD**

Administrative Officer (Research Support) for Prof Philip Marriott

## RMIT University



**MR PAUL MORRISON**

Technical Research Scientist

CI Paul Morrison is a professional officer of separation science at RMIT. With 32 years of chromatography experience, he has been involved with purchasing, installation, use, maintenance and modification of a wide range of analytical instruments. He currently manages a chromatography facility which has GC systems with FID,  $\mu$ ECD, NPD, FPD, Q, QQQ, TOF detectors. He has been involved with the development of GCxGC cryogenic and flow modulation systems. CI Morrison has a track-record of collaboration with CI Jones and CI Ball. He also collaborates with CSIRO, Land and Water, Swinburne University, Trajan Scientific, Supelco, Agilent and LECO. He has more than 1700 citations and was awarded the Francis Ormond Medal in 2016 as well as the ACROSS Outstanding Contribution Award and the RACI Outstanding Laboratory Technician of the Year Award in 2015.

## OUR PEOPLE

# Honorary Associate Members

## University of Tasmania

<b>Dr Hare Aryal</b>	University of Tasmania, Australia
<b>Dr Dario Arrua</b>	Future Industries Institute, University of South Australia
<b>A/Prof Alireza Ariaferd</b>	University of Tasmania, Australia
<b>Mr Mike Bailey</b>	Trajan Scientific and Medical, Australia
<b>Dr Richard Barber</b>	Trajan Scientific and Medical, Australia
<b>Ms Barbora Cervinkova</b>	Charles University in Prague
<b>Dr Pascal Craw</b>	CSIRO Marine And Atmospheric Research, Australia
<b>A/Prof Greg Dicinowski</b>	Reserve Bank of Australia, Australia
<b>Dr Adam Gaudry</b>	KD Analytical, Australia
<b>Prof Alireza Ghiasvand</b>	Lorestan University, Iran
<b>Dr Andrew Gooley</b>	Trajan Scientific and Medical, Australia
<b>Mr Wojciech Grochowski</b>	Medical University of Gdansk, Poland
<b>Dr Wei Boon Hon</b>	Trajan Scientific and Medical, Australia
<b>Mr Lukas Hroch</b>	Charles University in Prague
<b>Dr Shaoqiang Hu</b>	Luoyang Normal University, China
<b>Mr Aminreza Khodabandeh</b>	Future Industries Institute, University of South Australia
<b>Prof Massoud Kaykhaii</b>	University of Sistan & Baluchestan, Iran
<b>Ms Chacriya Malasuk</b>	Mahidol University, Thailand
<b>Mr Yanawut Manmana</b>	Mahidol University, Thailand
<b>Dr Simon Mills</b>	Envirolab, Australia
<b>A/Prof Nobutake Nakatani</b>	Rakuno Gakuen University, Japan
<b>Mr Luca Panacea</b>	University of Bologna, Italy
<b>Dr Rob Shellie</b>	Trajan Scientific and Medical, Australia
<b>Dr Eva Tyteca</b>	Vrije Universiteit Brussel, Belgium
<b>Mr Andrew Uhe</b>	Trajan Scientific and Medical, Australia
<b>Dr Hans-Jürgen Wirth</b>	Trajan Scientific and Medical, Australia
<b>Prof Paul Worsfold</b>	University of Plymouth, UK



# Visitors to ACROSS

Name	Institution	Country	Period of visit
<b>University of Tasmania</b>			
Eoin Murray	Dublin City University	Ireland	10 weeks
Chacriya Malasuk	Mahidol University	Thailand	6 months
Dr Barbora Cervinkova	Charles University	Czech Republic	6 months
Lukas Hroch	Charles University	Czech Republic	6 months
Wojciech Grochocki	Medical University of Gdansk	Poland	1 year
Xiaoyi Yi	Guangzhou Institute of Geochemistry, Chinese Academy of Sciences	China	3 months
Alexander Mosqueda	Tokyo Institute of Technology	Japan	6 weeks
A/Prof Nobutake Nakatani	Rakuno Gakuen University	Japan	1 year
Matthew Lindford	Brigham Young University	US	1 week
Shiladitya Chatterjee	Brigham Young University	US	1 week
Imogen Heaton	Kings College London	UK	3 Months
Elizabeth Olusetire	Kings College London	UK	3 Months
Shaoqiang Hu	Luoyang Normal University	China	1 year
Luca Panacea	University of Bologna	Italy	6 months
Dr Bert Wouters	University of Amsterdam	Netherlands	4 weeks
Prof Paul Worsfold	University of Plymouth	UK	4 weeks
Yanawut Manmana	Mahidol University	Thailand	6 months
Prof Alireza Ghiasvand	Lorestan University	Iran	1 year
<b>Monash University</b>			
Mr Fabio Moreira Novaes Jr	Federal University of Rio de Janeiro	Brazil	2 months
Prof Ademario de Silva	Federal University of Rio de Janeiro	Brazil	1 year
Prof Song Shen	Nanjing University of Chinese Medicine	China	12 months
Mr Tosopol Anukunwithaya	Chulalongkorn University	Thailand	1 month
Mr Federico Floris	Warwick University	UK	4 months
Ms Siriluck Pojjanaponpun	KMUTT	Thailand	7 months
Prof Francesco Cacciola	University of Messina	Italy	2 weeks
Ms Dandan Yan	University of Tasmania	Australia	1 year
Dr Elvina Iftitah	University of Brawijaya	Indonesia	1 week
Prof Chandrawati Cahyani	University of Brawijaya	Indonesia	1 week
<b>Western Sydney University</b>			
Dr Agustin Acquaviva	University of La Plata	Argentina	6 months
Prof AM Awad Michael	Ahram Canadian University	Egypt	3 months
Charline Henaff	Toulouse Institut National Polytechnique	France	4 months
Thomas Henin	Toulouse Institut National Polytechnique	France	4 months
Lola Pinsard	Toulouse Institut National Polytechnique	France	4 months

## RESEARCHER PROFILE

# Vipul Gupta

MSc, BPharm

ACES Research Fellow

I started my PhD with ACROSS in 2014, working with Prof Brett Paull and Prof Pavel N. Nesterenko, after completing my Masters Degree in Science at Brigham Young University, Utah, USA. During my pre-doctoral studies, I gained experience in fields such as pharmaceutical science, material science, computational fluid dynamic modelling, molecular modelling, and separation science. My interest in inter-disciplinary work motivated me to pursue my doctoral research in the field of analytical science, to develop analytical methods and platforms for health and environmental monitoring.

The focus of my PhD research work is the development of 3D printed miniaturised analytical devices (3D MADE). We have developed multiple new miniaturised analytical devices, such as liquid chromatographic columns and chemiluminescence flow-cells, and have studied various 3D printing techniques such as selective laser sintering, polyJet printing, and fused deposition modelling for the rapid and customisable production of these miniaturised devices.

**"Availability of exemplary guidance and facilities here at ACROSS has enabled me to undertake cutting-edge research."**

This multi-disciplinary project would not have been possible without close collaboration between multiple research groups and access to wide variety of scientific and technical expertise and facilities. An opportunity to work in a centre such as ACROSS, which spans through multiple universities and houses nodes for various other centres such as ACES and ASTech provided me with the required expertise and facilities. Access to the Australian National Fabrication Facility allowed me to use one of the limited numbers of high-resolution metal 3D



printing facilities. Moreover, frequent discussions with a large team of at the centre have always resulted in the cross-fertilisation of new ideas and a better understanding of new concepts.

Availability of exemplary guidance and facilities at ACROSS has enabled me to undertake cutting-edge research in the field of analytical science. The findings and technologies developed from our work have been a subject of multiple peer-reviewed articles and commentary pieces in leading analytical science journals (such as Analytical Chemistry and Analytica Chimica Acta) and media outlets (such as LC-GC and SeparationsNOW). The novelty and impact of these works have also been recognised at international conferences such as the International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC) and the International Symposium on Advances in Separation Science (ASASS) where I was awarded the Best Poster prize.

My training and the skills developed during my PhD have earned me awards and honours. My academic performance resulted in me being awarded the University of Tasmania Dean's Award for Exceptional Performance by a current Higher Degree by Research Candidate in 2016. In 2015 Junket invited me to join a Canberra conference as one of Australia's top 200 young leaders and thinkers, and in 2016 I was invited as as one of Australia's top 13 young researchers to the 65th Lindau Nobel Laureates meeting in Germany. In addition to academic research, I have always been encouraged to make positive changes in society and promote scientific communication.

I cherished every moment of completing my PhD in the company of researchers here at ACROSS, and am now proud to be one of the team.



Yada with Prof Philip Marriott receiving the inaugural Ervin sz. Kováts award for young scientists in Siófok, Hungary.

## RESEARCHER PROFILE

# Dr Yada Nolvachai

MSc, BPharm

ACES Research Fellow

After I graduated from the University of Queensland, I went to Melbourne for a short visit, where I was introduced to Professor Philip Marriott by a friend of mine who was a PhD student. From there Prof Marriott and I wrote a review together, which led me to a successful application for a scholarship at Monash University. I then became part of ACROSS Monash as a PhD student in the next semester.

I completed my PhD in 2016, then in 2017 I was awarded the inaugural Ervin sz. Kováts award for young scientists, an international award given to a recently completed PhD student for the best PhD thesis. Titled "Novel molecular materials and computational strategies with gas chromatography", my thesis was about developing new computational approaches based on the concepts of linear solvation energy relationship and time summation model for column selection and simulation of experimental results in GC×GC, supported by the comparison with experimental results. The selected application areas include column selection for separation of hundreds

compounds in a wide range of samples, such as petroleum, food, contaminants and environmental.

I am now a postdoctoral researcher in Prof Marriott's group. I have conducted a diverse field of research projects with a special focus on computational approach to support application of new materials in GC and GC×GC. Apart from routine application of the advanced MDGC techniques and supporting the students in Phil's lab, I am developing computer software to improve understanding of separation mechanisms and to simulate the results in GC and GC×GC applying new materials. The modelling concepts are based on a time summation model, linear solvation energy relationships, molecular modelling and thermodynamic principles. I have pursued this study towards more advanced separation techniques with straightforward computational approaches, focusing on the comparison between simulation and experiment.

At the time of writing, I have 21 papers either published or accepted.

ACROSS has given me the opportunity to conduct this research in a world-class facility with great guidance from a specialist in the field of separation science. I also get to meet people with the same interests, and am able to share and gain the knowledge that is very beneficial to my research. I enjoy every moment that I spend at ACROSS thanks to the warm and supportive atmosphere created among the members.

# Research Funding

## ARC Discovery Grants

B Paull, M Macka, W Buchberger, P Innis. New on-fibre separation science with ambient ionisation mass spectrometry. Australian Research Council: Grant-Discovery Projects; Johannes Kepler University of Linz, University of Wollongong. \$181,160.

MC Breadmore, RM Guijt, TC Dickson, AE King. Microfluidic technology to help understand physical damage to brain cells. Australian Research Council: Grant-Discovery Projects. \$115,581.

PN Nesterenko, Australian Research Council: Grant-Discovery Projects, Carbonaceous adsorbents for ultra-high performance liquid chromatography, \$58,537.

## ARC Future Fellowships

MC Breadmore. Highly integrated miniaturised total analysis systems for pharmaceuticals in biological and environmental samples. Australian Research Council: Fellowship-Future. \$117,808.

## ARC Linkage Grants

MC Breadmore, RM Guijt, SCV Thickett, B Paull, C Lin. A high speed, high fidelity 3D printer for fabricating microfluidic devices. Australian Research Council: Grant-Linkage Projects; Young Optics Inc. \$295,696.

MC Breadmore, RM Guijt, R Barber. Miniaturised electrophoretic systems for distributed environmental sensing. Australian Research Council: Grant-Linkage Projects Round 1; Grey Innovation Pty Ltd. \$108,249.

MR Grace, PJ Marriott, RA Coleman, V Pettigrove, EJ Rosi-Marshall. Impacts of pharmaceuticals and personal care products on Australian aquatic ecosystems. ARC Linkage LP130100040. \$51,454.

PJ Marriott, AB Wood, ST Chin. New hyphenated chromatographic and spectroscopic methods for oil analysis. ARC Linkage LP150100465. \$71,000

## ARC Centres of Excellence

PGG Wallace, M Forsyth, DR MacFarlane, DL Officer, M Cook, SM Dodds, GM Spinks, A Gursel, S Moulton, M in het Panhuis, R Kapsa, M Higgins, A Mozer, J Crook, P Innis, M Coote, Xungai Wang, P Howlett, B Paull. ARC Centre of Excellence for Electromaterials Science (ACES). Australian Research Council: Grant-ARC Centres of Excellence. \$250,218

## ARC Industrial Transformation Training Centres

B Paull, EF Hilder, Assoc RA Shellie, PR Haddad, MC Breadmore, PN Nesterenko, RM Guijt, A Gooley. ARC Training Centre for Portable Analytical Separation Technologies. Australian Research Council: Grant-Industrial Transformation Training Centres; Trajan Scientific Australia Pty Ltd; University of South Australia. \$752,570.

## Industry and Foundations

B Paull, M Curran, AD Moy, E Sanz Rodriguez. Development and application of new highly sensitive low volume capillary ion chromatography techniques to deliver higher resolution ice core derived paleoclimatic records. Department of Environment and Energy (Cwth): Grant-Australian Antarctic Science, Australian Antarctic Division. \$63,778.

MC Breadmore, RM Guijt. Field deployable unit for the detection of Perfluorinated contaminants CRC-P. Department of Industry, Innovation and Science: Grant-Cooperative Research Centres Projects CRC-P; Envirolab Services Pty Ltd; J3Seven Pty Ltd; KD Analytical Australia Pty Ltd. \$262,333

MC Breadmore. Grey Innovation HSponsorship Program - Research on cation electrophoresis. Grey Innovation Pty Ltd: Contract Research. \$40,330.

MC Breadmore, P Smejkal. GreyScan Prototype Development Support. Grey Innovation Pty Ltd: Contract Research. \$12,130.

PJ Marriott, B Wood, ST Chin. New hyphenated chromatographic and spectroscopic methods for oil

analysis. Matching funds Perkin Elmer & ATTIA Contributions. \$42,000.

PJ Marriott, MR Grace. Environmental monitoring of PPCPs. Chemicals and Plastics Manufacturing Innovation Network and Training Centre, CAPMIN, Monash, with Agilent support. \$15,000.

PJ Marriott, V Haritos. Petrochemicals analysis using GC with mass spectrometry and FTIR. Chemicals and Plastics Manufacturing Innovation Network and Training Centre; CAPMIN; Monash; with PerkinElmer support. \$15,000.

PJ Marriott (Special named PVE researcher). Real time investigation of coffee roasting using Comprehensive Multidimensional Chromatography (GCxGC). CNPq Program, Brazil. \$32,100.

M Currell, OAH Jones. Novel tracers to delineate groundwater contamination from wastewater treatment plants. Project No. 2.3.02-16/17, CRC for Contamination Assessment and Remediation of the Environment with Water Industry Support. \$110,001.

M Gaborieau, P Castignolles, R Wuhrer, S Cheevers. Warwick J. Rule PhD scholarship, Development and application of alternative polymeric materials for mining and materials handling. International Materials and Technology Pty Ltd (Imatech). \$111,000.

MP Van Leeuwen, M Gaborieau, P Castignolles, R Ward. Understand and more accurately predict GI with techniques such as capillary electrophoresis and solid-state NMR spectroscopy (Postgraduate Scholarship PRJ-010712). Australian Government Rural Industries Research And Development Corporation. \$60,000.

P Castignolles, M Gaborieau. Characterisation of starchy food structure and digestibility to predict GI and texture. Campbell Arnott's. \$32,988

## Miscellaneous

MC Breadmore. To Bring 3 Plenary speakers to AMN/ ISMM/APCBM/ANZNM Symposium, 26-29 June 2017, Hobart, Australia. Ian Potter Foundation: Grant-Conference. \$8,000.

M Macka, Heavy Metals Monitoring by Microfluidic. MONA, Funding of Scholarship. \$5,000.

P Worsfold. Visiting Fellowship. Plymouth University. \$9,898.

PJ Marriott, M Hearn, V Haritos. Polyphenols in food waste materials Food & Dairy, Graduate Research Interdisciplinary Process. CSIRO, \$15,000.

PJ Marriott, Barrow, F Floris. Biofuels: Interpreting the energy of the future. Monash-Warwick Alliance Travel Grant Australian Bicentennial Fellowship. \$13,700.

Monash University host support contributions to ARC LP grants. \$11,420.

Monash miscellaneous. \$32,000.

MJS Spencer, M Spichkova, OAH Jones. Who Needs Paper? Teaching Chemical Bonding with Tablet Based Gaming Technology, RMIT Scheme for Teaching and Learning Research (STeLR) grant, \$7,000.

OAH Jones. School of Science Research Incentive Scheme Funding. \$4344.

OAH Jones. School of Science Teaching Incentive Scheme Funding. \$4540.

MP Van Leeuwen, M Gaborieau, P Castignolles, EP Gilbert. Investigating the architecture of rice starch at the nanoscale using complementary scattering methods to predict digestibility (AINSE Post Graduate Research Award). Australian Institute of Nuclear Science and Engineering Ltd. \$7,500.

M Gaborieau, JD Oliver. From Hollow Fibre Flow-Field Flow Fractionation (HF5) to pure water and proteins structure. Western Sydney University Medical Sciences Research Group. \$7,000.

M Gaborieau. Invited ship. Université de Pau et des Pays de l'Adour (France). \$5,500.

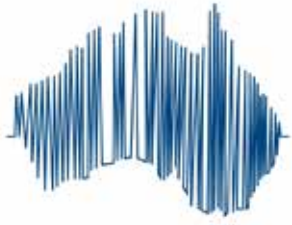
P Castignolles. Academic Development Plan. Western Sydney University. \$3,500.

P Castignolles, M Gaborieau. Characterisation of rice starch: determination of true amylose content and characterisation of branching in amylose and amylopectin. New South Wales Department of Primary Industries. \$3,000.

# Income Statement 2017

	University of Tasmania	Monash University	RMIT University	Western Sydney University
<b>Australian Research Council income</b>				
Discovery Grants	349,278			
Centre of Excellence	250,218			
Linkage Grants	304,377	122,454		
Industrial Transformation Training Centre	752,570			
Future Fellowships	117,808			
<b>Sub-total</b>	<b>1,774,251</b>	<b>122,454</b>	<b>0</b>	<b>0</b>
<b>Industry/private</b>				
Trajan Scientific and Medical	113,000		15,000	
Grey Innovation	52,460			
Young Optics	99,578			
Other industry partners	54,854	119,100	110,001	143,998
<b>Sub-total</b>	<b>319,892</b>	<b>119,100</b>	<b>125,001</b>	<b>143,998</b>
<b>Host institution support</b>				
Tuition Fee Scholarships	667,663	125,000	286,000	
Maintenance Scholarships	668,448	130,000		
DVCR contribution ASTech	120,000			
School contribution ASTech	30,000			
School contribution ACROSS maintenance	50,000			
School contribution ARC grants	6,000	11,420		
Faculty contribution ACES	46,500			
DVCR contribution ACES	46,500			
School contribution ACES	9,300			
<b>Sub-total</b>	<b>1,644,411</b>	<b>266,420</b>	<b>286,000</b>	<b>0</b>
<b>Miscellaneous institutional support</b>				
Grants	147,918	13,700	7,000	
Faculty cross campus grant				3,500
Visiting Professors	9,898			5,500
<b>Sub-total</b>	<b>157,816</b>	<b>13,700</b>	<b>7,000</b>	<b>8,500</b>
<b>Other government funding</b>				
Dept Industry, Innovation & Science – CRC-P grant	262,333			
Dept of Environment & Energy – AAD grant	63,778			
Australian Government research funding				70,500
<b>Sub-total</b>	<b>326,111</b>	<b>0</b>	<b>0</b>	<b>70,500</b>
<b>Other income sources/interest</b>				
Miscellaneous	5,000	32,000	8,884	
<b>Sub-total</b>	<b>5,000</b>	<b>32,000</b>	<b>8,884</b>	<b>0</b>
<b>Total annual income (\$)</b>	<b>4,227,481</b>	<b>553,674</b>	<b>426,885</b>	<b>223,498</b>





# ACROSS

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for Research on  
Separation Science

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