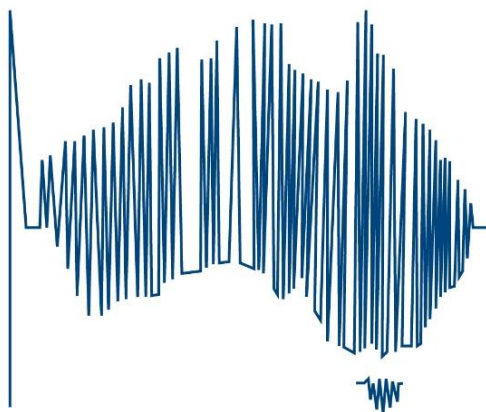


ACROSS

Australian Centre
for Research on
Separation Science



2015

ANNUAL REPORT



UNIVERSITY *of*
TASMANIA



ACROSS

Australian Centre
for Research on
Separation Science

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ACROSS at 'The Gathering 2015', Hobart Waterfront

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 therefore 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.

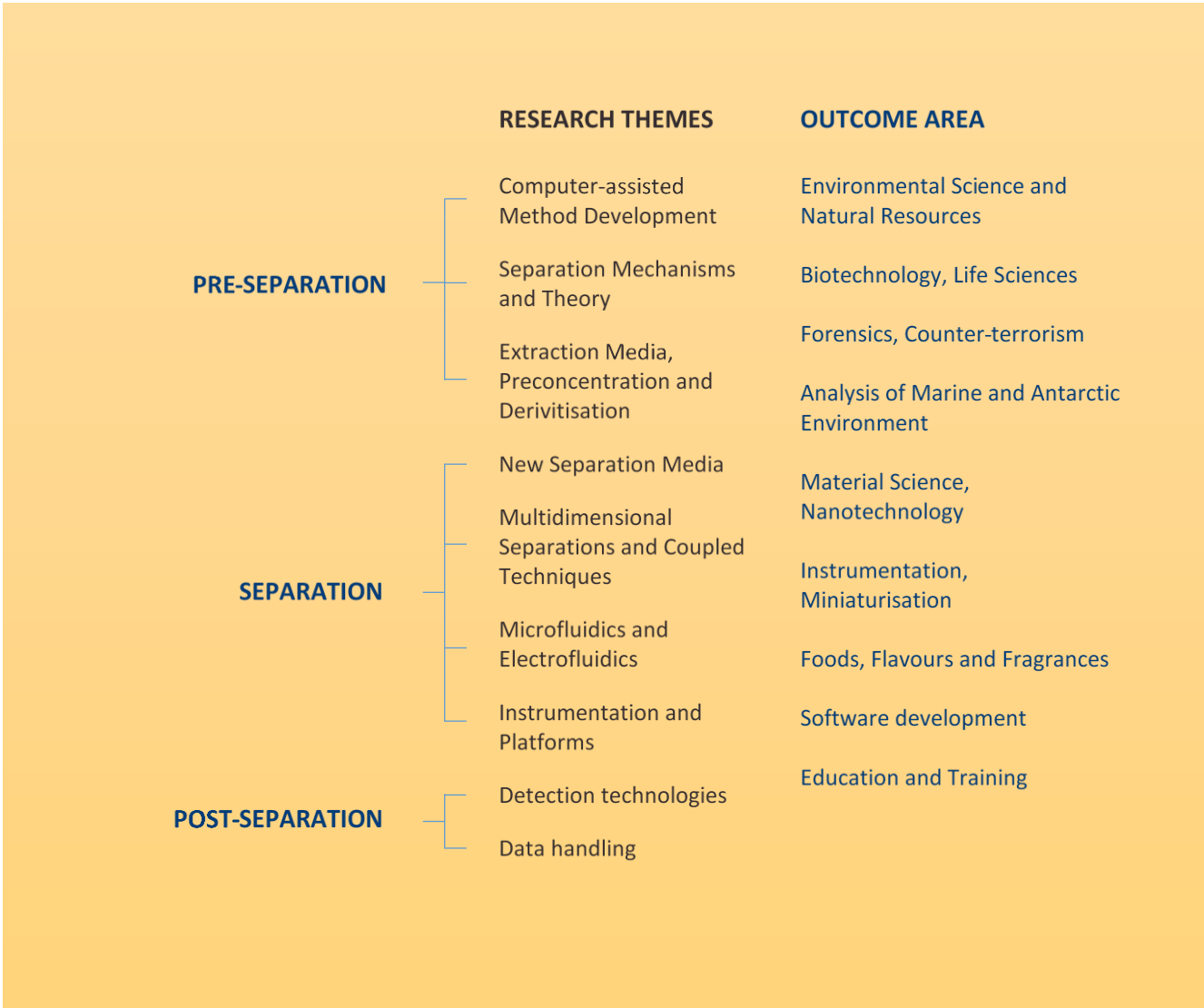
The Australian Centre for Research on Separation Science (ACROSS) was established in 2001 as a strategic agreement between key researchers at the University of Tasmania and RMIT University (with University of Western Sydney joining ACROSS in 2008, and Monash in 2011) to form a consortium of prominent 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 Research Structure

Research in ACROSS has been established based upon 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 my pleasure to present to you the ACROSS annual report for 2015. Once again it's been an exciting and memorable year, with numerous significant changes and achievements to report, which collectively cement ACROSS's position and reputation as one of the world's leading Centres dedicated to research into the separation sciences. In this, our 15th year since ACROSS was established, I'm pleased to report we have continued to expand our membership, research programs and collaboration network. I'm delighted to see how our research metrics and impact have also continued an upward trajectory, as witnessed by the 2015 Research Excellence in Australia (ERA) assessment results, and the significant joint academic-industry research initiatives launched this year.

ASTech

Whilst summarising the most significant developments for ACROSS at the University of Tasmania in 2015, one has to give first mention to the launch of the Australian Research Council (ARC) Industrial Training Centre for Portable Analytical Separation Technologies, or ASTech. Officially launched in late 2014, with all of the Chief Investigators being based within ACROSS, the first cohort of HDR researchers and Post-doctoral Fellows each began their research programs during 2015, with the Centre rapidly ramping up its activity throughout the year. The award of the Training Centre to the University recognises the considerable talent and expertise in separation science based within the University and specifically ACROSS. ASTech represents a new model of academic industry collaboration, with exciting opportunities to fast track new separation science and technology into the market place. The Centre, supported through in-kind and ARC funding equal to \$5.2 M, seeks to miniaturise,



Professor Brett Paull, Director of ACROSS

*I'd like to personally
thank everyone
involved with ACROSS
in 2015, from the
professional and
academic staff, to the
researchers, visitors
and volunteers, all of
whom contributed to
the achievements
outlined within this
report.*

Brett Paull

automate, and make portable, new rapid extraction and separation technologies, making novel devices to provide in-situ and point-of-care solutions. For more information on ASTech activities throughout 2015 see Page 21.

ACES

Whilst mentioning significant activities within ACROSS throughout 2015, one also has to mention the impact of our involvement within ACES, the ARC Centre of Excellence for Electromaterials Science. Officially launched in July 2014, the Electrofluidics and Diagnostics Research Theme is led by ACROSS based Chief Investigators at the University of Tasmania, and 2015 saw the arrival of both HDR students and Post-doctoral Fellows to begin their research programs in earnest. The establishment of an ACES node at the University of Tasmania has already had considerable impact upon the research programs within ACROSS, with the interface between materials science and separation science already proving to be a hotbed for the generation of new ideas, projects and technology. For more information on ACES activities throughout 2015 see Page 23.

The ACROSS Gathering

A significant and now annual Centre activity is the hosting of the ACROSS 'Gathering' Symposium. In 2015 this was once again held at the Hobart Conference and Convention Centre (HCCC) on Hobart's historic waterfront. The Symposium was again run over two full days, with 80 ACROSS members and invited guests attending, presenting no fewer than 52 research updates and presentations. The event once again lived up to expectations, enlivening the ACROSS research network and sparking new and exciting new projects and collaborations across the Centre. Acknowledgements are once again directed to the University of Tasmania for provision of a group career development scholarship to fund the 2015 Symposium.

Higher Degree Students and Post-graduate Training

The annual Gathering Symposium, together with regular specialist workshops, training courses and of course the weekly ACROSS full group meetings, are all part of the unique training and research environment ACROSS provides to its post-graduate students. In 2015 ACROSS recorded its highest ever number of higher degree students, with over 65 HDR students within the full Centre, and 44 of those registered at the University of Tasmania. I'd like to give a special welcome to the record number of new students (14) starting their PhD journeys with us in 2015. I'd also like to personally congratulate those students who obtained their PhD degrees in 2015, namely Esme Candish, Emer Duffy, Daniel Gstöttenmayr, Manish Khandagale, Anton Peristyy, Benjamin Savareear, Aliaa Shallan, and Yiing Chiing Yap. It's also great to be able to report that the 44 ACROSS students working with us in 2015 originated from no fewer than 22 different countries, a wonderful reflection of the multicultural nature of ACROSS.

This impressive research student population was boasted in 2015 with the scale-up of the ASTech Training Centre, which will continue to bring new post-graduate students on-board into 2016. I'd also like to acknowledge here the University of Tasmania, which plays a considerable role in supporting this post-graduate research student cohort, through the award of over \$550k in maintenance scholarships in 2015, and in excess of \$900k in tuition fee scholarships.

As an important part of the professional development of these early career researchers, ACROSS has always encouraged our research students to present at significant national and international symposia. In 2015, once again, ACROSS students and early career researchers

were very well represented at almost all of the major international separation science symposia (full details of which can be found on page 54).

Publications, Citations and ERA

Of course one of the main goals of our Centre is to disseminate the results of our research to as wide an audience as we can. In 2015 we began to fully explore new avenues of communication to broadcast our achievements to around the globe. Our social media presence grew significantly in 2015, via Facebook and Twitter, with for example, just one posting on our Facebook page reaching close to 7,000 people. As has now become the norm, the year also saw ACROSS, its researchers' and its research activity highlighted in numerous published commentaries and interviews within the general science and laboratory media. Worthy of particular note was the prominent inclusion of the University of Tasmania and ACROSS as a so-called 'Power Institution' in the 'Analytical Scientist' magazine's article entitled "The Cream of Chromatography". The article, based upon recent publication and citation data saw the University of Tasmania included within an impressive directory of some of the world's leading centres of analytical science. See page 45-53 for a full list of media reports and articles highlighting the activities of ACROSS in 2015.

In 2015 ACROSS affiliated publications recorded their highest ever number of annual citations, in excess of 1,500 for the year, with publications originating from University of Tasmania accounting for well over 1,000 of these.

As for peer reviewed publications in 2015, the full details of which can be found on Page 49, 2015 once again saw ACROSS go from strength to strength. As a national Centre, ACROSS published its highest ever number of journal articles, just one short of a century, with University of Tasmania researchers contributing to ~60% of these. The year also saw the total number of ACROSS affiliated research papers rapidly pass the 800 mark, a milestone achievement the Centre can be justly proud of. However, what's more pleasing to report is the impact and quality metrics of our published research. In 2015 ACROSS affiliated publications recorded their highest ever number of annual citations, in excess of 1,500 for the year, with publications originating from the University of Tasmania accounting for well over 1,000 of these (citation number based upon 639 publications – Scopus).

In addition, 2015 saw a marked increase in the average journal impact factor for ACROSS publications, particularly those from Tasmania, which exceeded an average journal impact factor of 4 for the first time, with greater than 70% of those published within journals ranked within the top quartile for the discipline. University of Tasmania ACROSS researchers published four research papers in *Analytical Chemistry* in 2015, the top ranked original research based analytical science journal, plus no fewer than ten papers within the *Journal of Chromatography A*, commonly recognised as the leading specialist separation science journal. Worthy of specific mention is a paper on 'Electrokinetic size and mobility traps for on-site therapeutic drug monitoring', which was published within *Angewandte Chemie - International Edition* (Impact factor >11), and also recognised with the journal cover image. These recent outputs and citation metrics bode very well for future ARC Excellence in Research for Australia (ERA) assessment rounds, and of course I'm delighted to report that in 2015 *Analytical Chemistry (0301)* at the University of Tasmania was once again awarded a score of 5, rated as performing 'well above world standard', this being the third award of a 5 score from the ERA program in a row. A fantastic acknowledgement of the long term effort and dedication of the researchers based here within ACROSS.

Funding and Fellowships

From its early years ACROSS has established an outstanding track record in competitive research funding, most notably from within the ARC funding programs. With the significant impact of the ASTech and ACES funding, income from the ARC in 2015 remained at a record high. Remarkably, in 2015 ACROSS researchers were included as Chief Investigators in no fewer than fourteen active ARC funded research projects, including one Centre of Excellence, two Industrial Transformation Training Centres, seven Discovery and five linkage projects. The full details of each of these cutting edge projects, together with the complete grant record for 2015, can be found on Page 43.

Continually supporting all of the above activity is an outstanding record amongst ACROSS senior researchers in obtaining prestigious Fellowships. For 2015 ACROSS acknowledges the ARC for their continued support of A/Prof Robert Shellie (ARC Australian Research Fellowship), Prof. Mirek Macka (ARC Future Fellowship) and Prof. Michael Breadmore (ARC Future Fellowship). In addition to these on-going Fellowships, 2015 saw Dr. Rosanne Guijt travel to KIST-Europe, in Saarbrücken, Germany, to work with Prof. Andreas Manz, supported through the award of a von Humboldt Fellowship.

Added to the above successes, throughout 2015 ACROSS continued to strengthen and develop its industrial links and partnerships. Significant projects ongoing in 2015 included collaboration with Pfizer, Thermo Fisher Scientific, Trajan Scientific and Medical, and Grey Innovation, and the Australian Grape and Wine Authority.

Awards and International Recognition

It was another great year for ACROSS in terms of awards and recognition, with the post-graduate and post-doctoral researchers leading the way. ACROSS researchers swept the board at the annual RACI R&D Topics Conference, Melbourne, with Adam Sutton winning the best oral presentation prize, and Chris Desire for winning best poster award. Chris Desire was also successful with the award of an Endeavour Fellowship to spend six months at the University of Warwick. Vipul Gupta was awarded a highly competitive scholarship to attend the Lindau Nobel Laureates meeting in Germany, one of only 13 young Australian researchers to attend, and followed this up with a second travel scholarship to present at the 2015 'Junket' event in Canberra, an invite only event for 'Australia's leading young thinkers'. Congratulations too, to Chiing Yap and Sui Ching Phung, who were one of three finalist teams for the Lab on a Chip and Dolomite Video Award, with a video showcasing their PhD work on novel bacterial assays, and also Disha Choudhury, an ACROSS Visiting Scholar in 2015, who was awarded the Judges Award for her poster presentation at the 2015 Virtual Symposium on Applied Separation Sciences (VSASS).



From right: Vipul Gupta with Prof. William E. Moerner, 2014 Chemistry Noble Laureate

Amongst the ACROSS post-doctoral fellows, congratulations go to Dr. Sara Sandron for also receiving an Endeavour Fellowship, in this case to spend 6 months at the University of South Carolina, and Dr. Sinead Currivan, who was awarded a travel scholarship and invite to present her research at the 2015 Theo Murphy Australian Frontiers of Science Conference – 'Materials for the 21st century' event. Finally, congratulations to Dr. Mohammad Telebi, who's 2015

Analytical Chemistry paper made it into the 'Top Ten Chromatography, Mass Spectrometry and Lab Automation Papers' published in the journal, as awarded by *Chemical and Engineering News* (C&EN).

As mentioned above, the work of ACROSS at the University of Tasmania was collectively recognised by the *Analytical Scientist* magazine in the 'The Cream of Chromatography' review, however they further recognised individual contributions to the field of analytical science in their annual review of the 'Top 100' most influential people in the world of analytical science, where Prof. Paul Haddad was listed in 13th position, a very lofty and well deserved accolade. Internally, there was also successes to celebrate, with Prof. Emily Hilder receiving the Faculty of Science, Engineering and Technology, Dean's Award for Outstanding Research Training and Supervision.

Welcomes and Farewells

2015 really was a year of significant staffing changes to ACROSS at the University of Tasmania. Here we take the opportunity to personally thank those who have left our Centre to advance their careers further afield, for all their substantial contributions during their time with us. Over the year we bid farewell to Dr. Wei Boon Hon, who joined Trajan Scientific and Medical (Melbourne), Dr. Tom Kazarian, who joined Amgen (California), Dr. Dimitar Mitev, who joined the Institute of Solid State Physics (Sofia), Dr. Yi-Heng Nai, who joined the Centre for Regional and Rural Futures (Deakin), Dr. Georg Schuster, who departed to pursue new challenges back in Europe, Dr. Parvez Mahub (remaining with ACROSS as an Honorary Associate), and finally, Dr. Philip Zakaria, who is now establishing his own business within the brewing industry. Good luck, thanks and best wishes to them all.



From Left: Postdoc fellows, Dr. Mohammad Telebi, Dr. Tom Kazarian, Dr. Parvez Mahub, and Dr. Dario Arrua on a recent ACROSS fishing trip

However, as with all departures come new arrivals, and in 2015 we welcomed into the various ACROSS research projects the following Post-doctoral Fellows; Dr Niall Macdonald (ACES); Dr. Joan-Marc Cabot Canyelles (ACES); Dr. Greg Barbante (ASTech); Dr. Florian Lapierre (ASTech); Dr. Masoomeh Rokh (ASTech); Dr. Sinead Currivan (ARC Discovery); Dr. Anton Peristyy (ARC Discovery); Dr. Laura Tedone (ARC Linkage); and Dr. Ming Zhang (ARC Linkage).

The enriching and capacity building benefits to ACROSS of visiting and honorary Scholars and Fellows is something we are always keen to support and enable. Together with hosting nine visiting post-graduate students from overseas institutions in 2015, ACROSS was also a willing host to a significant number of internationally recognised experts in the field of separation science. Working with ACROSS for periods of between 2 week to 12 months in 2015 were Prof. Stefan Bon (University of Warwick, UK), Dr. Fotouh Mansour (University of Tanta, Egypt), Professors Wei-Qing Chen and Mei-Lan Chen (Zhejiang Shuren University), Prof. Matthew Linford (Brigham Young University, USA), Dr. Damian Connolly (Waterford Institute of Technology, Ireland), Dr. Kevin Thomas (Norwegian Institute of Water Research, Oslo, Norway), Prof. Charles Lucy (University of Alberta, Canada), Professors Sergy Krylov and Svetlana Krylov (York University, Canada), Prof. Buchberger (Johannes Kepler

University, Linz, Austria), Dr. Florencia Torres (National University of Cordoba, Spain), Prof. Joe Foley (Drexel, University, USA), Dr. Nantana Nuchtavorn (Siam University Bangkok, Thailand), and Dr. Eva Tyteca (Free University of Brussels, Belgium).

This impressive roll-call of international experts and high achieving young researchers, who originated from no fewer than 17 different countries to spend time with us here at the University of Tasmania, is a true reflection of the international reputation of ACROSS, and an aspect of our Centre for which we are also very proud.

Sadly, in 2015 we also bid farewell to two of our long standing academic members and lead investigators, namely A/Prof. Robert Shellie and Prof. Emily Hilder. Both have taken on new positions and challenges elsewhere, with Robert moving to a position within Industry (Trajan Medical and Scientific), and Emily moving to the University of South Australia to take on the role of Director of the recently established Future Industries Institute. We are of course confident both will do exceptionally well in their new roles and thank them sincerely for their substantial contributions to the growth and success of ACROSS down the years.

2016 and Beyond

It's with great pleasure that I bring you this report for 2015, but it's with even greater pleasure and excitement that we look forward to the year ahead.

Looking ahead, 2016 sees the ASTech Centre enter its second year running at full steam, and we look forward to seeing the substantial benefits of this new industry collaboration model to our research and researchers come to the fore. Early in 2016 will also see new infrastructural investment in ACROSS come into operation, with a substantial \$250k laboratory refurbishment and significant equipment upgrades. I'm also very pleased to announce ACROSS will also be hosting a significant International Symposium in late 2016, the ACROSS International Symposium on Advances in Separation Science (ASASS2), for which we have already secured exemplary plenary and keynote speakers from around the globe. These developments and many more, all point towards another great year ahead for ACROSS.



Prof Brett Paull

Director of the Australian Centre for Research on Separation Science

2015 ACROSS (University of Tasmania) Performance at a Glance

Node	Research staff	PhD, MSc students	BSc, Hons students	Grants (\$)	Publications	Conference presentations
University of Tasmania	30	44	4	7,620,091	57	88

ACROSS Metrics

The following graphs present the research trajectory of ACROSS as both a National Centre and presented as research metrics for each individual institutional node of ACROSS.

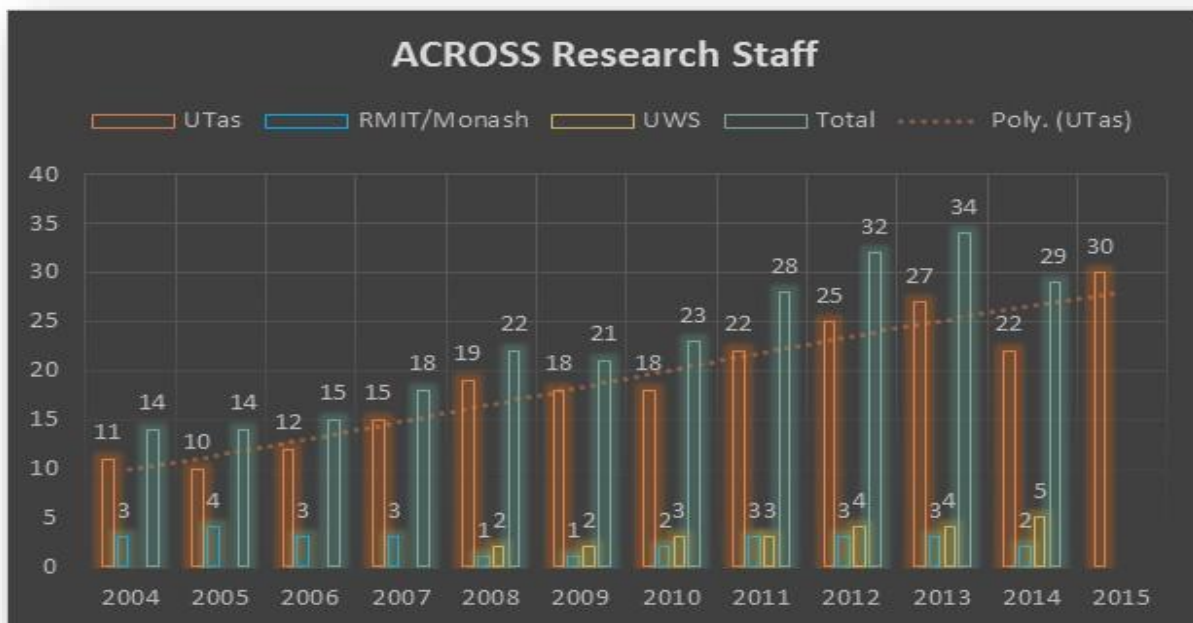


Figure 1. ACROSS Research Staff (2004-2015). Numbers of research staff (includes academic members, post-doctoral fellows and research technicians) within ACROSS at the University of Tasmania have grown steadily over the past decade, reaching a maximum of 30 staff, employed for the full year, or part thereof, in 2015.

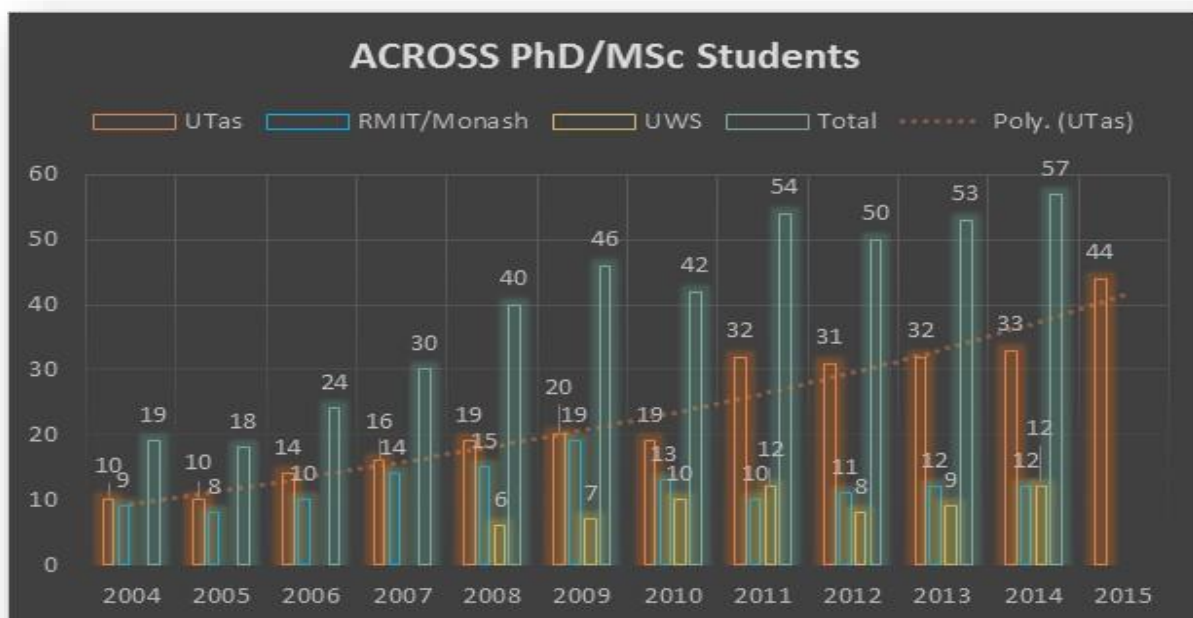


Figure 2. ACROSS HDR Students (2004-2015). Numbers of research students working within ACROSS has grown annually since 2004, with significant increases in 2011 following new strategic staff appointments, and most recently in 2015, following the establishment of ASTech and ACES research Centres.

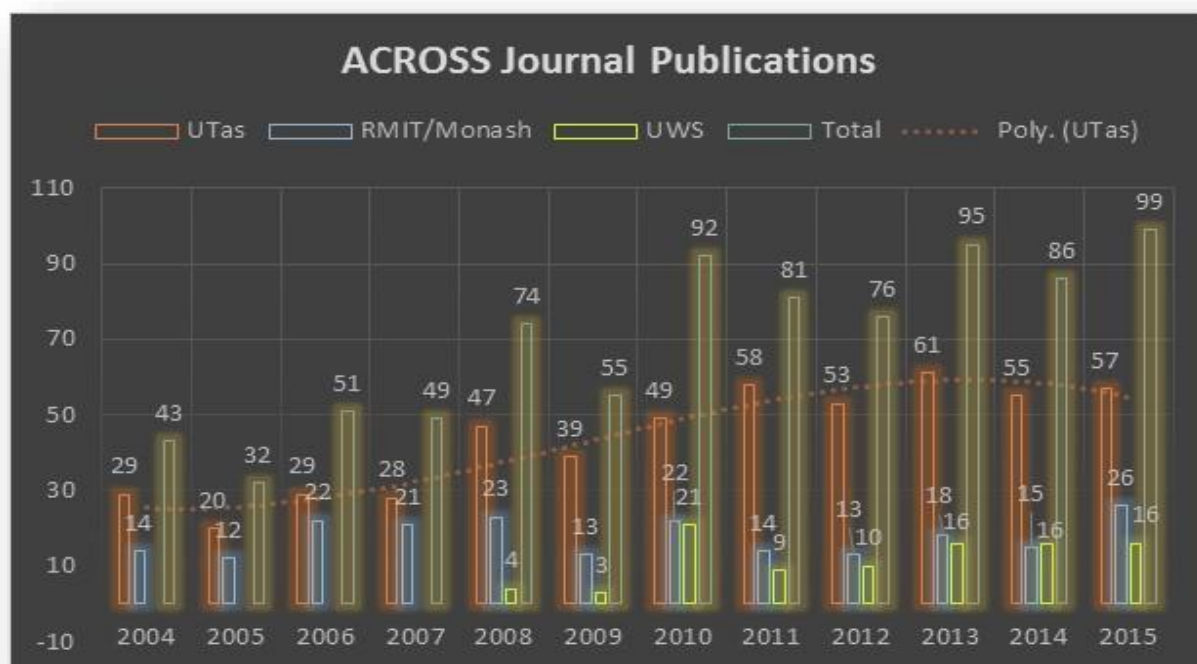


Figure 3. ACROSS Affiliated Peer Reviewed Journal Articles (2004-2015). Research papers from University of Tasmania based ACROSS researchers (as main or lead author) have shown a steady increase in number from 2004 to 2011, and remained relatively constant from 2011 to 2015.

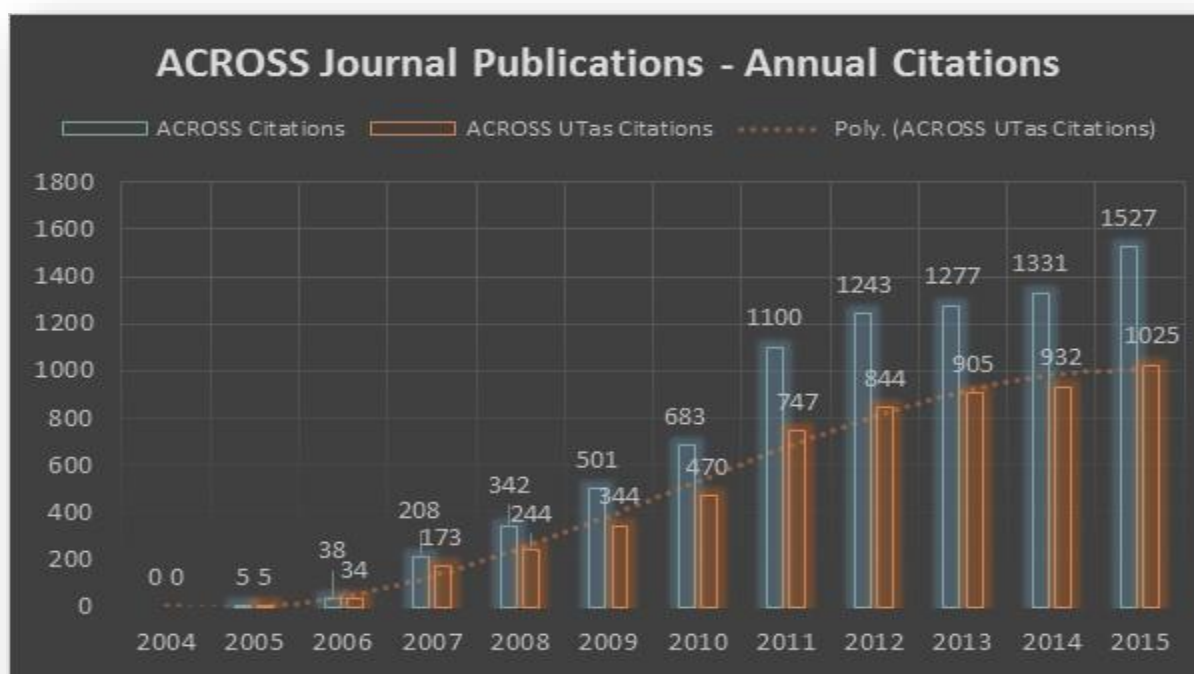


Figure 4. ACROSS Publications Annual Citations (2004-2015). Based upon a citation analysis of 639 ACROSS affiliated publications, annual citations have increased steadily to over 1,000 per year for those originating from the University of Tasmania based ACROSS researchers.

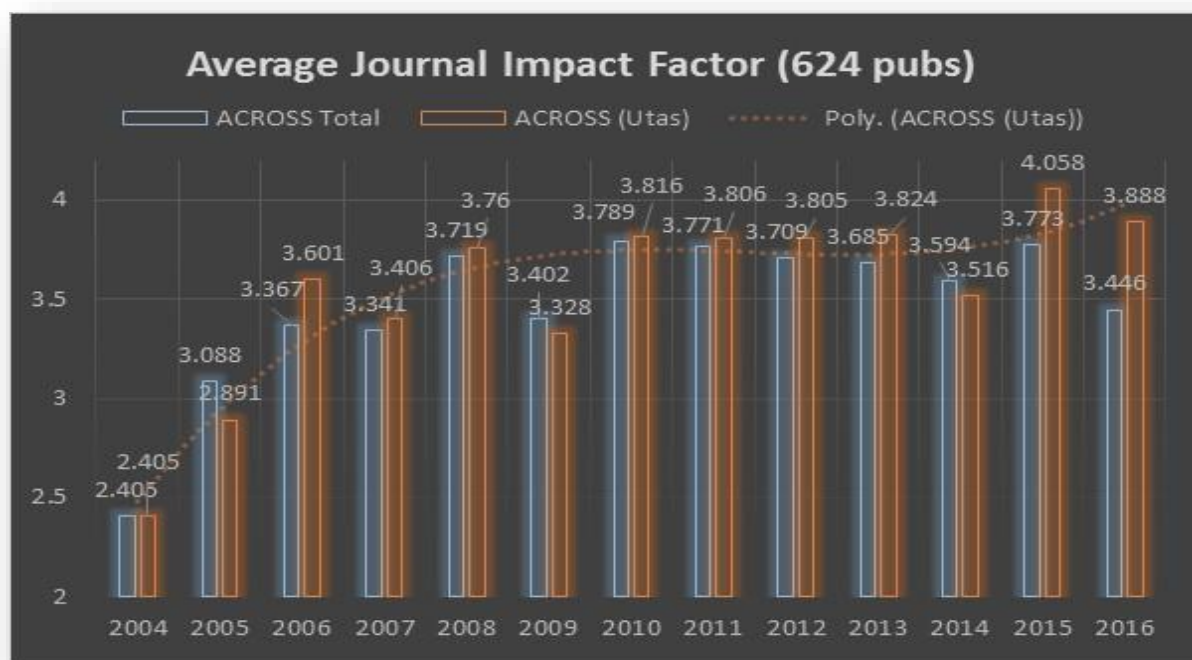


Figure 5. Average Journal Impact Factor (2004-2016). Based upon a survey of 624 ACROSS affiliated publications, the average journal impact factor for published ACROSS research showed a rapid increase from 2004 to 2008, remaining close to 4 over the period 2009 to 2016, with 2015 seeing an average journal impact factor of 4.058 for publications originating from the University of Tasmania.

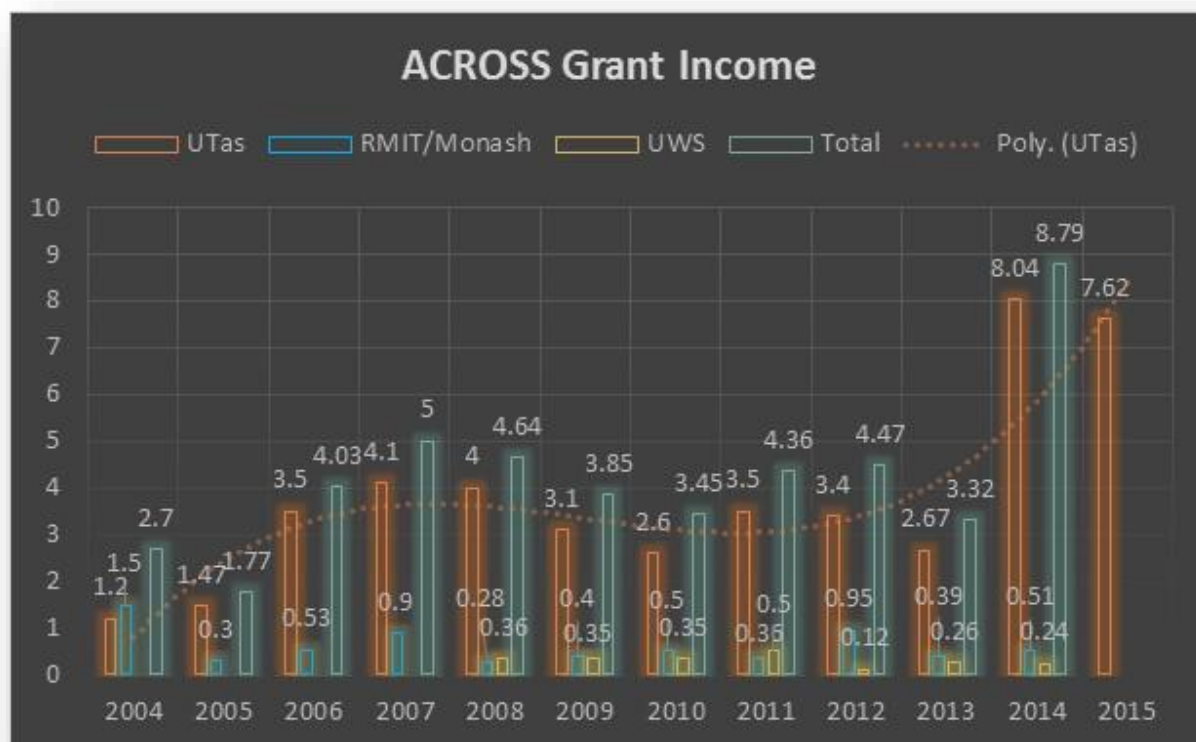


Figure 6. ACROSS Grant Income (2004-2015). Research grant income for each year is shown, proportioned appropriately for multi-year grants. For 2014 and 2015, the income for the multi-institutional grants for the ARC ACES CoE and ASTech ITTC is included.

Post-graduate Student Research Projects

The following is a list of post-graduate research students registered in 2015, working within ACROSS at the University of Tasmania. The students and their research projects are classified according to the Centre's research Themes, as outlined on page 3. 2015 saw a growth in the number of projects based on new materials and technologies for sampling, sample handling, extraction, and preconcentration, a research focus area of the ASTech Industrial Training Centre.

Students who completed their project during 2015 are marked with an asterisk.
New projects commencing in 2015 are highlighted in blue.

Name	Degree	programme	Start	Thesis Title	Supervisors
PRE-SEPARATION - Computed-assisted Method Development					
Soo Hyun Park	PhD	ACROSS	2013	<i>Rapid method development in pharmaceutical analysis using quality-by-design principles: Ion Chromatography</i>	PR Haddad, RA Shellie, R Amos, M Talebi
Maryam Taraji	PhD	ACROSS	2013	<i>Rapid method development in pharmaceutical analysis using quality-by-design principles: Hydrophilic interaction liquid chromatography</i>	PR Haddad, RA Shellie, R Amos
Yabin Wen	PhD	ACROSS	2014	<i>Rapid method development in pharmaceutical analysis using quality-by-design principles: Reversed-phase liquid chromatography</i>	PR Haddad, RA Shellie, R Amos, M Talebi
PRE-SEPARATION – Separation Mechanisms and Theory					
Adam Sutton	PhD	ACROSS	2015	<i>Understanding nanoparticle interactions with capillary electrophoresis</i>	EH Hilder, D Arrua, S Thickett
PRE-SEPARATION – Extraction Media, Preconcentration and Derivatisation					
Mónica Alves	PhD	ACROSS	2015	<i>Selective bioligands for portable analysis in micro-fluidic formats</i>	M. Macka, PN Nesterenko, B Paull
Esme Candish*	PhD	ACROSS	2011	<i>Novel polymeric monolithic devices to aid sample preparation in bio-analysis</i>	EF Hilder, RA Shellie, A Gooley
Chowdhury Kamrul Hasan	PhD	ASTech	2015	<i>Functionalised porous materials for selective extraction and pre-concentration</i>	PN Nesterenko, B Paull
Ricardo Neto	PhD	ASTech	2015	<i>Micro-sampling of whole blood and plasma-like fraction collection using porous Polymer Monolith Technology</i>	EH Hilder, D Arrua, PR Haddad
Maria Gabriela Paniagua	MSc	ACROSS	2015	<i>DNA extraction by magnetic silica beads functionalized with chitosan</i>	MC Breadmore

Sara Thomas	PhD	ASTech	2015	<i>Novel mesoporous material for sample preparation</i>	EH Hilder, D Arrua, PN Nesterenko
Ria Marni Tubaon	PhD	ACROSS	2012	<i>Green analytical chemistry: Stacking in capillary electrophoresis and electrokinetic micro-purification</i>	JP Quirino, PR Haddad
Nirved Upadhyay	PhD	ACROSS	2015	<i>Lectin modified open tubular capillary columns for selective glycoproteins extraction and isolation</i>	B Paull, PN Nesterenko, M Macka
Neeraj Verma	PhD	ASTech	2015	<i>In-vivo sampling strategies - development of a robust equilibrium approach</i>	EH Hilder, MC Breadmore
Alain Wuethrich	PhD	ACROSS	2013	<i>Green sample preparation in analytical separation sciences: Electrophoretic concentration</i>	JP Quirino, PR Haddad

SEPARATION – New Separation Media

Christopher Desire	PhD	ACROSS	2013	<i>Polymer nanoparticles and their assembled supra-colloidal monolithic structures for applications in separation science</i>	EF Hilder, RD Arrua
Emer Duffy*	PhD	ACROSS	2011	<i>Carbonaceous nanoparticles and carbon on carbon composite materials</i>	B Paull, PN Nesterenko
Aminreza Khodabandeh	PhD	ACROSS	2012	<i>Polymer nanoparticles and their supra-colloidal monolithic structures for applications in separation science</i>	EF Hilder, RD Arrua
Thomas Lawson	PhD	ACROSS	2012	<i>Micro/nanoparticle based composites</i>	B Paull, PN Nesterenko
Anton Peristyy*	PhD	ACROSS	2011	<i>Preparation and characterisation of diamond based stationary phases for ultra-high performance liquid chromatography</i>	PN Nesterenko, B Paull

SEPARATION – Multidimensional Separations and Coupled Techniques

Alfonso Rojas Cardona	PhD	ACROSS	2013	<i>Resolving dissolved organic matter: New multi-dimensional separations</i>	B Paull, PN Nesterenko, PR Haddad, RA Shellie
Mari Egeness	PhD	ACROSS	2012	<i>Modulation in two-dimensional liquid chromatography</i>	MC Breadmore, J Foley, RA Shellie, EF Hilder
Daniel Gstöttenmayr*	PhD	ACROSS	2011	<i>Development of a novel ultra-sensitive capillary electrophoresis-mass spectrometry system for the analysis of environmental pollutants</i>	MC Breadmore, JP Quirino
Matthew Jacobs	PhD	ACROSS	2012	<i>Multidimensional chromatography with resistively heated columns</i>	RA Shellie, PN Nesterenko, EF Hilder
Benjamin Savareear*	PhD	ACROSS	2010	<i>Characterisation of plant extracts using high resolution gas chromatography</i>	RA Shellie, EF Hilder

Leila Ranjbar Shourabi	PhD	ACROSS	2013	<i>Two-dimensional separation approaches for complex sample analysis</i>	RA Shellie, MC Breadmore
Elisenda Fornells Vernet	PhD	ASTech	2015	<i>New approaches for LC x LC</i>	MC Breadmore, EF Hilder, RA Shellie
Dandan Yan	PhD	ACROSS	2013	<i>Identification of the aromatic relevant compounds in hop essential oil by comprehensive two-dimensional gas chromatography - rapid scanning quadrupole mass spectrometry</i>	RA Shellie, A Koutoulis
SEPARATION – Microfluidics and Electrofluidics					
Ala Alhusban	PhD	ACROSS	2012	<i>Bioprocess monitoring using capillary electrophoresis</i>	RM Guijt, MC Breadmore, N Güven
Feng Li	PhD	ACROSS	2014	<i>Micro-fluidic devices integrated with nano-channels for sample-in/answer-out analysis of pharmaceuticals and related compounds in body fluids</i>	MC Breadmore, RM Guijt
Pavisara Nanthasurasak	PhD	ACROSS	2015	<i>Solid-state electrophoresis</i>	MC Breadmore, RM Guijt, M. Zhang
Sui Ching Phung	PhD	ACROSS	2012	<i>Isotachophoresis of cells</i>	MC Breadmore, RM Guijt, S Powell, M Macka
Mohammad Rahbar	PhD	ACROSS	2015	<i>Paper-fluidics and nanoparticles as tools for portable analysis</i>	M Macka, PN Nesterenko, B Paull
Aliaa Shallan*	PhD	ACROSS	2011	<i>Microchip methods for the separation of drugs and metabolites in biological and environmental samples</i>	MC Breadmore, RM Guijt
Faustino Tarongoy	PhD	ACROSS	2014	<i>New coatings in electro-driven separations</i>	JP Quirino, PR Haddad
Sidra Waheed	PhD	ACES	2015	<i>Integrated 3D printed electrophoresis chips for low cost analytical platforms</i>	B Paull, T Lewis, MC Breadmore
Yiing Chiing Yap*	PhD	ACROSS	2011	<i>Lab-on-a-chip platforms for understanding neuronal cellular interactions</i>	T Dickson, MC Breadmore, A King, RM Guijt
SEPARATION – Instrumentation and Platforms					
Nicolaas Bester	PhD	ACROSS	2013	<i>Construction and application of a low-cost, low power capillary electrophoresis apparatus for independent and remotely-controlled monitoring of low concentration analytes</i>	MC Breadmore, RM Guijt, HH See
James Chan	PhD	ASTech	2015	<i>Lab-in-a-syringe</i>	EF Hilder, MC Breadmore
Vipul Gupta	PhD	ACES	2014	<i>Miniaturised chromatographic technologies via additive fabrication</i>	B Paull, PN Nesterenko

Yan Li	PhD	ACROSS	2014	Portable liquid chromatographic separation platforms	M Macka, PN Nesterenko, B Paull, R Stanley
POST-SEPARATION – Detection Technologies and Data Handling					
Ross Farrell	PhD	ACROSS	2012	Rapid mass spectrometry approaches for wine industry quality control applications	RA Shellie, MC Breadmore
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
Ronda Gras	PhD	ASTech	2015	Reactive gas detection	PR Haddad, RA Shellie
Muhammed Ariful Islam	PhD	ACROSS	2015	Advanced pulsed electrochemical detection options for microfluidic and paper-fluidic platforms	M Macka, B Paull, PN Nesterenko
Manish Khandagale*	PhD	ACROSS	2010	Non-discriminatory, universal and sensitive detection technologies for fluid based separation techniques in the pharmaceutical industry	PR Haddad, EF Hilder, RA Shellie
Ansara Noori	PhD	ACROSS	2013	Atmospheric monitoring by integrated miniaturised spectro-chemical sensors on small and micro-unmanned aerial vehicles	M Macka, A Lucieer



Visitors to ACROSS 2015

Each year ACROSS hosts a significant number of visiting academics and researchers from academic institutions and centres of excellence in the analytical and separation sciences from around the globe. The following Table lists visiting professorial and post-doctoral academic and post-graduate students visiting ACROSS in 2015, together with the duration of their visit.

Professorial, academic and post-doctoral fellows			
Visitor	Institution	Country	Duration
Prof Stefan Bon	University of Warwick	United Kingdom	1 month
Prof Wolfgang Buchberger	Johannes Kepler University Linz	Austria	3 months
Prof Mei-Lan Chen	Zhejiang Shuren University	China	3 months
Prof Wei-Qing Chen	Zhejiang Shuren University	China	3 months
Dr. Damian Connolly	Waterford Institute of Technology	Ireland	2 months
Prof Joe Foley	Drexel University	USA	1 year
Prof Charles Henry	Colorado State University	North America	2 weeks
Prof Sergey Krylov	York University	Canada	5 weeks
Prof Svetlana Krylov	York University	Canada	5 weeks
Prof Matthew Linford	Brigham Young University	North America	2 weeks
Prof Charles Lucy	University of Alberta	Canada	3 week
Dr Wren Greene	Deakin University	Australia	2 weeks
Dr Rob Haselberg	VU University	The Netherlands	3 months
Dr Nantana Nuchtavorn	Siam University	Thailand	6 months
Dr Kevin Thomas	Norwegian Institute for Water Research (NIVA)	Norway	1 month
Dr Florencia Torres	National University of Córdoba	Argentina	6 months
Dr Paul Stevenson	Deakin University	Australia	1 week

International higher degree student visitors			
Visitor	Institution	Country	Duration
Mr Joan Marc Cabot	University of Barcelona	Spain	6 months
Ms Sidratul Choudhury	Dublin City University	Ireland	3 months
Mr Milos Dvorak	Brno University of Technology	Czech Republic	1 year
Ms Elisenda Fornells	University of Barcelona	Spain	6 months
Mr Wojciech Grochocki	Medical University of Gdansk	Poland	1 year
Ms Umme Kalsoom	Edith Cowan University	Australia	12 months
Mr Itsuya Kawase	Gifu University	Japan	3 months
Dr Fotouh Mansour	University of Tanta	Egypt	6 months
Mr Tuhin Roychowdhury	Brigham Young University	USA	2 weeks
Ms Lee Yien Thang	Universiti Teknologi Malaysia	Malaysia	3 months

ACROSS Seminars 2015

7 January

Dr Roderick Jones (University College Dublin, Ireland)

'The use of two dimensional liquid chromatography in metabolomics and separation science'

4 February

Prof Charles Lucy (University of Alberta, Edmonton, AB, Canada)

'Exploration and Understanding of Hydrophilic Interaction Liquid Chromatography'

25 February

Prof Sergey Krylov (York University, Toronto, Ontario, Canada)

'Kinetic Capillary Electrophoresis – An Analytical Swiss Army Knife'

11 March

Prof Charles A. Lucy (University of Alberta, Canada)

'Medium vs. Message: Teaching Chemistry in the Digital Age'

25 March

Prof Doug MacFarlane (Monash University)

'Ionic Liquids for Sustainable Chemistry: Applications in the Chemical-, Materials-, Electro- and Bio- Sciences'

15 July

Prof Matthew Linford (Brigham Young University, USA)

'New, High Capacity SPME Fibers, and Improved Data Analysis Tools'

5 August

Prof Wolfgang Buchberger (Johannes-Kepler-University, Linz, Austria)

'The role of analytical chemistry in understanding the ageing behaviour of plastic materials'

26 August

Prof Dermot Brabazon (Dublin City University, Ireland)

'Photonic assisted fabrication of advanced liquid chromatographic platforms'

11 November

Prof Paul Haddad (University of Tasmania)

'Chemical consulting: Opportunities, lessons and pitfalls'

19 November

Dr. Kevin V Thomas

'Emerging urban contaminants and the secrets that they can reveal'





ASTech is the name for the ARC Training Centre for Portable Analytical Separation Technologies. Its research focus is the discovery and creation of new technologies to enable more portable separation science applications.

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 is a partnership between the University of Tasmania and Trajan Scientific and Medical, combining research and industry knowledge to innovate in product design and manufacturing techniques, contributing to a sustainable, globally competitive manufacturing industry in Australia.

2015 Highlight

Unlocking the portable potential of Dried Blood Spot sampling with hemaPEN™

Harnessing the benefits of Dried Blood Spot (DBS) sampling in an intuitive and safe portable format, hemaPEN has the potential to change the way individuals have their blood tested - eliminating the need to visit a clinic and offering precision blood sampling with the click of a button via its familiar pen design, which can be easily used by anyone including the young, elderly and people with disabilities.

The hemaPEN is the only device of its kind in the world that allows people to collect an uncontaminated and precise volume of their own blood from the fingertip at home, eliminating the need to travel to a medical clinic – not only saving time, but the superior ready-to-use DBS sample enables the laboratory to deliver more definitive test results.

hemaPEN is the first product concept from ASTech, the ARC Training Centre for Portable Analytical Separation Technologies and has huge potential to benefit to a range of disease screening including diabetes, therapeutic drug monitoring and medical research.

ASTech Training Centre Director Professor Emily Hilder said the development of this first prototype was the first of many innovations to come.



Dr Florian Lapierre, ASTech Post-doctoral Research Fellow from University of Tasmania, currently undertaking his industry placement at Trajan Scientific and Medical - developing the hemaPEN to change the way individuals have their blood tested.

“At ASTech we are already seeing the outcomes of applying academic research to real-life applications,” said Professor Hilder.

ASTech researchers have access to University of Tasmania’s extensive facilities for separation science, as well as the opportunity to undertake industry placements with Trajan, or Trajan’s commercial partners.

The opportunity for our researchers to be immersed in a commercial setting adds new perspectives during product development.

The hemaPEN concept will be further developed through market testing.

“It has the potential to set new standards in the pathology industry, with the ability to deliver precision blood microsamples for more accurate analytical outcomes – meaning more definitive results for patients, said Professor Hilder.

AsTech web page: <http://www.atech.org.au/>



Inaugural ASTech Bi-annual Conference held at Trajan Medical and Scientific, Melbourne

The Federal Government funded ACES through the Australian Research Council in 2014 to turn our knowledge of materials into the next generation of 'smart devices' for the benefit of the community. ACES considers a smart device as one that uses the advanced materials made within its laboratories to create new health and energy solutions that improve people's lives. Led by the University of Wollongong, ACES incorporates six Australian collaborators, including the University of Tasmania, and five international partner organisations, each known for their expertise in materials and device fabrication. Together they bring a critical mass of the best minds across all disciplines to develop innovative solutions based on advanced next-generation electromaterials.

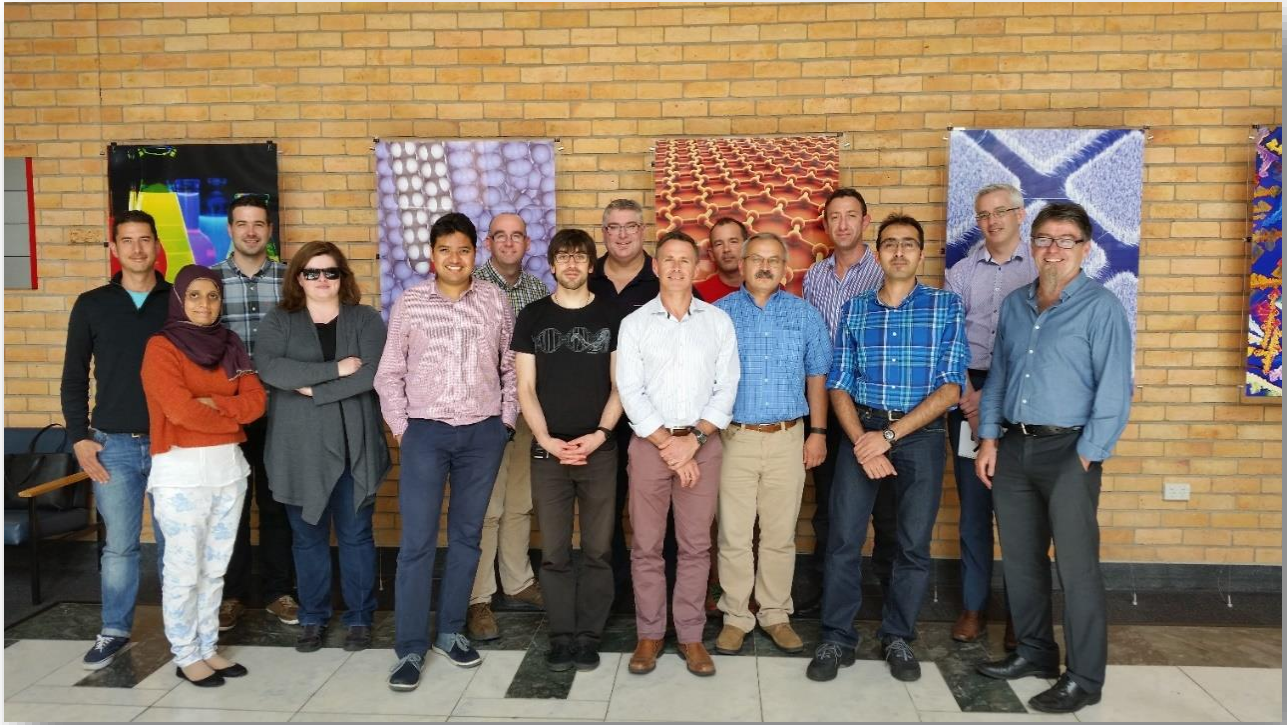
2015 Highlight

Series of workshops on micro- and fibre-based fluidics for future diagnostics

The first event, organized within the ACES Electrofluidics and Diagnostics Theme, held in May 2015 at the University of Tasmania, focused on the development and application of microfluidics, with an emphasis on the use of 3D printing, and was held to demonstrate how ACES can facilitate building partnerships and bringing like minds together.



From Left: Dr. Joan Marc, Dr. Sinead Currivan, Dr. Niall Macdonald discussing the potential applications of 3D printed devices



ACES Electrofluidics and diagnostics group at the fibre fluidics workshop, University of Tasmania, November 2015.

Approximately 30 attendees, including industry representatives from Romar Engineering and Trajan Medical and Scientific (ASTech), learnt about the application of 3D printing to microfluidic analytical devices, the development of microscale bio- and chemical reactors and the design and development of microfluidic platforms to stimulate and study cell growth and function.

A follow-up event was held in November, which saw ACROSS (University of Tasmania) based researchers and University of Tasmania members of ACES host a workshop on fibre based fluidics. The workshop was attended by ACES members from the University of Wollongong, St. Vincent's Hospital, Melbourne, and Swinburne University of Technology. A very positive and exciting day had by all.

"There was an obvious excitement among attendees that the rapid progress of 3D fabrication technologies is going to significantly speed up the development of new coupled micro-fluidic technologies, with talk of integrated systems of fluid delivery, cell culture, and post-culture solution based analysis,"

....."This paves the way for intimate control of the environment in which such cultures are studied and better understanding, in real time, of biochemical processes taking place."

Prof. Brett Paull, (ACES Electrofluidics and Diagnostics Theme leader).



Members of ACROSS at the ACES all Centre meeting, Deakin University, Geelong, Victoria, July 2015.

ACES Webpage: <http://www.electromaterials.edu.au/>

Appendices – Key Personnel, Grant Income, Publications

Key Personnel

ACROSS Chief Investigators

Prof Brett Paull

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

Brett Paull 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), where he currently holds an Adjunct Professorial position. 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 boards of *Analytical Methods* and *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.

A/Prof Andrew Bowie

PhD, MSc, BSc(Hons), MRSC, CChem
Senior Research Scientist, Antarctic Climate and Ecosystems Cooperative Research Centre, Institute for Marine and Antarctic Studies IMAS

Andrew Bowie holds the degrees of BSc and MSc from the University of Leeds and the University of Manchester in England. He then conducted his PhD research at the University of Plymouth. He relocated to the University of Tasmania in 2001 and in 2006 commenced a new position as Senior Research Scientist, working jointly in the 'Carbon' subprogram in the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC), and ACROSS. His research interests lie in the general fields of environmental analytical chemistry and chemical oceanography, with specific emphasis on trace metal chemistry in



aquatic systems. His research is strongly focused on the development of novel analytical methods to answer key questions in marine biogeochemistry.

- AR Bowie, P van der Merwe, F Qu  rou  , T Trull, M Fourquez, F Planchon, G Sarthou, F Chever, AT Townsend, I Obernosterer, JB Sall  e, S Blain. Iron budgets for three distinct biogeochemical sites around the Kerguelen Archipelago (Southern Ocean) during the natural fertilisation study. *KEOPS-2. Biogeosciences*. 12 (2014) 4421-4445.
- PW Boyd, AJ Watson, CS Law, ER Abraham, T Trull, R Murdoch, DCE Bakker, AR Bowie, KO Buesseler, H Chang, M Charette, P Croot, K Downing, R Frew, M Gall, M Hadfield, J Hall, M Harvey, G Jameson, J LaRoche, M Liddicoat, R Ling, MT Maldonado, RM McKay, S Nodder, S Pickmere, R Pridmore, S Rintoul, K Safi, P Sutton, R Strzepek, K Tanneberger, S Turner, A Waite, J Zeldis. Phytoplankton bloom upon mesoscale iron fertilisation of polar Southern Ocean waters. *Nature*. 407 (2000) 695-702.
- AR Bowie, EP Achterberg, RFC Mantoura, PJ Worsfold. Determination of sub-nanomolar levels of iron in seawater using flow injection with chemiluminescence detection. *Anal. Chim. Acta*. 36 (1998) 189-200.

Prof Michael Breadmore

PhD, BSc(Hons), FRACI, CChem

Professor and ARC Future Fellow, School of Physical Sciences

Michael Breadmore was awarded his PhD 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 associate editor of the *Australian Journal of Chemistry*, and a member of the editorial boards of *Electrophoresis*, *Journal of Chromatography A*, *Journal of Visualised Experiments* and *Aviation Security International*.



- 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.
- AI 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
- 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.

Dr Rosanne Guijt

PhD, Drs (BioPharmSci), MRACI, CChem

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

Rosanne Guijt 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 in 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, applications include therapeutic drug monitoring and personalized medicine, as well as bioprocess control and neuroscience.

- 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.
- Al 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 Physical Sciences

Foundation Director, ACROSS

Paul Haddad 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 editor of *Journal of Chromatography A*, a 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.
- SH Park, RA Shellie, G Schuster, M Talebi, PR Haddad, R Szucs, JW Dolan and CA Pohl. Enhanced methodology for porting ion chromatography retention data. *J. Chromatogr. A.* 1436 (2016) 59-63.



Prof Emily Hilder

PhD, BSc(Hons), FRACI CChem

Professor and Head of Chemistry, University of Tasmania
Director, ARC Training Centre for Portable Analytical Separation Technologies

Emily Hilder is a graduate of the University of Tasmania, where she obtained the degrees of BSc(Hons) and PhD. She has held postdoctoral positions at Johannes Kepler University (Austria) and the E.O. Lawrence Berkeley National Laboratory (USA), and subsequently held an ARC Postdoctoral (2004-2007) and Future Fellowship (2010-2014) at ACROSS. Her research interests lie in the general area of separation science, in particular the



development and application of novel polymeric monolithic materials as selective adsorbents and chromatographic stationary phases. She is also interested in miniaturised analytical systems, particularly for applications in clinical diagnostics, counter-terrorism and environmental monitoring. She is an editor of the *Journal of Separation Science*.

- T Rohr, EF Hilder, JJ Donovan, F Svec, JM Fréchet. Photografting and the control of surface chemistry in three-dimensional porous polymer monoliths. *Macromolecules*. 36 (2003) 1677-1684.
- EF Hilder, F Svec, JM Fréchet. Latex-functionalized monolithic columns for the separation of carbohydrates by micro anion-exchange chromatography. *J. Chromatogr. A*. 1053 (2004) 101-106.
- M Talebi, RA Shellie, EF Hilder, NA Lacher, PR Haddad. Semiautomated pH gradient ion-exchange chromatography of monoclonal antibody charge variants. *Anal. Chem.* 86 (2014) 9794-9799.

Prof Mirek Macka

PhD, RNDr, FRACI, CChem, MRSC

Professor and ARC Future Fellow, School of Physical Sciences

Mirek Macka 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 Ryvolová, J Preisler, P Krásenský, F Foret, PC Hauser, B Paull, M Macka. Single point of detection combined contactless conductometric, photometric and fluorimetric on-capillary detector for capillary separation methods. *Anal. Chem.* 82 (2010) 129-135.



Prof Pavel Nesterenko

DSc, PhD, MSc, MRACI CChem

New Stars Professor, School of Physical Sciences

Pavel Nesterenko obtained his degrees from the Lomonosov Moscow State University in Russia, focusing his MSc in petrochemistry and organic catalysis, and his PhD and DSc in analytical chemistry. He is currently a Professor within ACROSS at the University of Tasmania. His research area is associated

with the development, investigation and application of new adsorbents and chromatographic columns for different separation techniques, including high-performance liquid chromatography, ion chromatography, chiral phase chromatography and ligand-exchange. He is editor-in-chief of *Current Chromatography*, and



a member of the editorial boards of *Analytica Chimica Acta*, *Encyclopedia of Analytical Chemistry*, *Open Journal of Analytical Chemistry*, *Modern Chemistry and Applications*, and *International Journal of Analytical Chemistry*.

- 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 Robert Shellie

PhD, BAppSc(Hons), MRACI CChem

A/Professor and ARC Australian Research Fellow, School of Physical Sciences

Robert Shellie obtained postgraduate training in ACROSS at RMIT University. Prior to his arrival in Tasmania in 2005, he held a post-doctoral position at the Max-Planck Institute of Molecular Plant Physiology in Golm, Germany. Robert's research is supported by the Australian Research Council and his research interests include multidimensional separations, high-speed chromatography, mass spectrometry, flavour and fragrance chemistry, sample preparation, and modelling of chromatographic retention behaviour.



- P Marriott, R Shellie. Principles and applications of comprehensive two-dimensional gas chromatography. *TrAC- Trend. Anal. Chem.* 21 (2002) 573-583.
- PJ Marriott, R Shellie, C Cornwell. Gas chromatographic technologies for the analysis of essential oils. *J. Chromatogr. A.* 936 (2001) 1-22.
- R Shellie, P Marriott, P Morrison. Concepts and preliminary observations on the triple-dimensional analysis of complex volatile samples by using GC×GC-TOFMS. *Anal. Chem.* 73 (2001) 1336-1344.

A/Prof Joselito Quirino

PhD, MSc, BSc

A/Professor and ARC Future Fellow, School of Physical Sciences

Joselito Quirino holds a BSc in industrial pharmacy (1992) from the University of the Philippines and an MSc (1998) and PhD (1999) in material science from the Himeji Institute of Technology (HIT), Japan. He was a postdoctoral fellow at HIT (1999-2000) and Stanford University (2000-2001), and has five years' experience in the USA working as an analytical development scientist in the biotechnology and pharmaceutical industry. Joselito's research is supported by the Australian Research Council and his research interests are on the fundamentals and applications of on-line sample preconcentration in capillary zone electrophoresis, electrokinetic chromatography, electrochromatography, and the applications of separation science to drug discovery and development.



- JP Quirino, S Terabe. Exceeding 5000-fold concentration of dilute analytes in micellar electrokinetic chromatography. *Science.* 282 (1998) 465-468.
- JP Quirino, PR Haddad. Online sample preconcentration in capillary electrophoresis using analyte focusing by micelle collapse. *Anal. Chem.* 80 (2008) 6824-6829.

- A Wuethrich, PR Haddad, JP Quirino. Green sample preparation for liquid chromatography and capillary electrophoresis of anionic and cationic analytes. *Anal. Chem.* 87 (2015) 4117-4123.

ACROSS Post-Doctoral Research Fellows

Dr Ruth Amos

PhD, BSc(Hons), MRACI

Lecturer and ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Ruth Amos 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.



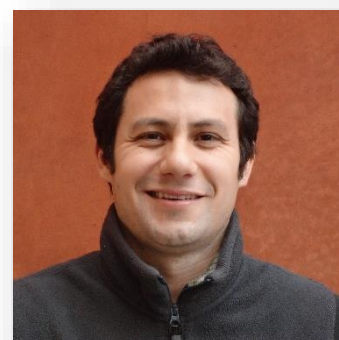
- RIJ Amos, BS Gourlay, PP Molesworth, JA Smith, OR Sprod. Annulation of pyrrole: Application to the synthesis of indolizidine alkaloids. *Tetrahedron*. 61 (2005) 8226-8230.
- RIJ Amos, BS Gourlay, BF Yates, CH Schiesser, TW Lewis, JA Smith. Mechanistic investigation of the oxidation of hydrazides: Implications for the activation of the TB drug isoniazid. *Org. Biomol. Chem.* 11 (2013) 170-176.
- RIJ Amos, F Heinroth, B Chan, S Zheng, B Haynes, C Easton, AF Masters, L Radom, T Maschmeyer. Hydrogen from formic acid through its selective disproportionation over sodium germinate - a non-transition-metal catalysis system. *Angew. Chemie. Int. Ed.* 53 (2014) 11275-11279.

Dr Dario Arrua

PhD, BSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Dario Arrua graduated from the National University of Córdoba in Argentina, obtaining his BSc in 2003 and PhD in 2009. Before joining ACROSS in August 2010, he held a postdoctoral position at the National University of Santiago del Estero (Argentina), working on the development of polymeric materials with antiradical activity. His current research interests are related to the synthesis and chemical surface modification of macroporous polymers, to be used as stationary phases for the separation of biomolecules.



- R. Dario Arrua, Emily F. Hilder. Highly ordered monolithic structures by directional freezing and UV-initiated cryopolymerisation. Evaluation as stationary phases in high performance liquid chromatography. *RSC Adv.* 5 (2015) 71131-71138.

- RD Arrua, AP Hitchcock, WB Hon, M West, EF Hilder. Characterisation of polymer monoliths containing embedded nanoparticles by scanning transmission X-Ray microscopy (STXM). *Anal. Chem.* 86 (2014) 2876-2881.
- RD Arrua, A Nordborg, PR Haddad, EF Hilder. Monolithic cryopolymers with embedded nanoparticles. I. Efficient capillary chromatography of proteins using neutral embedded nanoparticles. *J. Chromatogr. A.* 1273 (2013) 26-33.

Dr Sinéad Currivan

PhD, BSc(Hons), MRSC

ACROSS Postdoctoral Research Fellow, School of Physical 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.



- JM Cabot, E Duffy, S Currivan, A Ruland, R Jalili, AJ Mozer, PC Innis, GG Wallace, M Breadmore, B Paull. Characterisation of graphene fibres and graphene coated fibres using capacitively coupled contactless conductivity detector. *Analyst.* 141 (2016) 2774-2782.
- S Currivan, 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 Currivan, 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.

Dr Naama Karu

PhD, MSc, BSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Naama Karu completed her BSc and MSc in biochemistry and food sciences at the Hebrew University in Israel, from 2000 to 2005. Naama obtained her PhD in separation science in 2012, as a Pfizer student scholar at ACROSS. Her research concentrated on the analysis of pharmaceuticals by ion chromatography, coupled to universal detectors. She stayed in ACROSS for a postdoctoral fellowship to conduct research in mass spectrometry for clinical biochemistry application.



- N Karu, R Reifen, Z Kerem. Weight gain reduction in mice fed panax ginseng saponin, a pancreatic lipase inhibitor. *J. Agric. Food. Chem.* 55 (2007) 2824-2828.

- N Karu, GW Dicinoski, M Hanna-Brown, PR Haddad. Determination of pharmaceutically related compounds by suppressed ion chromatography: I. Effects of organic solvent on suppressor performance. *J. Chromatogr. A.* 1218 (2011) 9037-9045.
- N Karu, JP Hutchinson, GW Dicinoski, M Hanna-Brown, K Srinivasan, CA Pohl, PR Haddad. Determination of pharmaceutically related compounds by suppressed ion chromatography: IV. Interfacing ion chromatography with universal detectors. *J. Chromatogr. A.* 1253 (2012) 44–51.

Dr Tom Kazarian

PhD, BSc(Hons)

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Tom Kazarian graduated from the University of Tasmania, receiving BSc(Hons) and PhD degrees. His doctorate work focused on the analysis of carbohydrates and their preconcentration using capillary electrophoresis and microfluidic platforms. After completing his PhD, he held postdoctoral positions at the Dalian Institute of Chemical Physics in China, and the Pfizer Analytical Research Centre in Hobart. He was also briefly involved with intellectual property law at Griffith Hack in Melbourne. His scientific research interests and expertise lie in the field of liquid chromatography, with a focus on the analysis of pharmaceutical formulations using a variety of detection platforms.



- MC Breadmore, JRE Thabano, M Dawod, AA Kazarian, JP Quirino, RM Guijt. Recent advances in enhancing the sensitivity of electrophoresis and electrochromatography in capillaries and microchips (2006–2008). *Electrophoresis.* 30 (2009) 230-248.
- AA Kazarian, EF Hilder, MC Breadmore. Online sample pre-concentration via dynamic pH junction in capillary and microchip electrophoresis. *J. Sep. Sci.* 34 (2011) 2800-2821.
- AA Kazarian, EF Hilder, MC Breadmore. Utilisation of pH stacking in conjunction with a highly absorbing chromophore, 5-aminofluorescein, to improve the sensitivity of capillary electrophoresis for carbohydrate analysis. *J. Chromatogr. A.* 1200 (2008) 84-91.

Dr Dimitar Mitev

PhD, MSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Dimitar Mitev completed his MSc studies at the St. Clement of Ohrid University of Sofia (Bulgaria), and was awarded his PhD at the Space Research Institute, located at the Bulgarian Academy of Sciences. Here he worked on blasting technologies for synthesis and treatment of materials, and in particular detonation nanodiamond. In 2010, he moved to the Institute of Metal Science, Equipment and Technologies at the Bulgarian Academy of Sciences, where he continued his work on the application of blasting- and pyro-technologies for anti-terrorism and defence purposes. In 2011, he moved to the University of Tasmania as a postdoctoral fellow to develop novel methods of purification and continue with the characterisation of nanodiamond at ACROSS.



- D Mitev, R Dimitrova, M Spassova, CH Minchev, S Stavrev. Surface peculiarities of detonation nanodiamonds in dependence of fabrication and purification methods. *Diam. Relat. Mater.* 16 (2007) 776-780.

- DP Mitev, AT Townsend, B Paull, PN Nesterenko. Direct sector field ICP-MS determination of metal impurities in detonation nanodiamond. *Carbon*. 60 (2013) 326-334.
- T Tsoncheva, M Dimitrov, L Ivanova, D Paneva, D Mitev, B Tsintsarski, I Mitov, S Stavrev, C Minchev. Iron oxide modified diamond blends containing ultradispersed diamond. *J. Colloid. Interface. Sci.* 300 (2006) 183-189.

Dr Anton Peristyy

PhD, MSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Anton Peristyy 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 Physical Sciences

Estrella Sanz Rodríguez obtained the degrees of BSc and PhD in analytical chemistry from the University Complutense of Madrid (Spain). She covered positions such as Laboratory Technician, either at Environmental Laboratories from private sector as at University Analytical Services, and such as scientific researcher at the Complutense University and the Spanish Institute of Cultural Heritage. She has over 19 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 the ACROSS on August 2014 being involved since then 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 ice cores, seawater, etc. In September 2015, she was awarded an Ian Potter Foundation Science Grant for the project 'Creating an ice core record from Antarctic samples using capillary-ion chromatography coupled to mass-spectrometry'.



She joined the ACROSS on August 2014 being involved since then 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 ice cores, seawater, etc. In September 2015, she was awarded an Ian Potter Foundation Science Grant for the project 'Creating an ice core record from Antarctic samples using capillary-ion chromatography coupled to mass-spectrometry'.

- E Sanz, R Muñoz-Olivas, C Cámara. Alternative extraction methods for arsenic speciation in hair using ultrasound probe sonication and pressurised liquid extraction. *J. Anal. Atom. Spectrom.* 22 (2007) 131-139.
- E Sanz, A Arteaga, MA García, C Cámara, C Dietz. Chromatographic analysis of Indigo from Maya Blue by LC-DAD-QTOF. *J. Archaeol. Sci.* 39 (2012) 3516-3523.

- E Sanz Rodriguez, S Poynter, M 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. Chromatogr. A*. 1409 (2015) 182-188.

Dr Sara Sandron

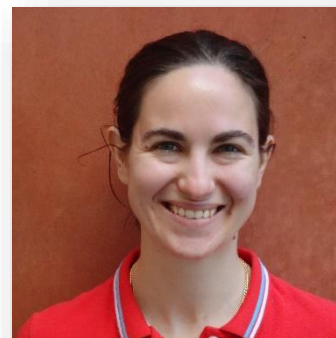
PhD, MSc, BSc

ACROSS Postdoctoral Research Fellow, University of Tasmania

From 2006 to 2008, Sara Sandron held a fellowship at the Experimental Pharmacologic and Clinical Unit, Oncologic Reference Centre in Italy. Here she investigated analytical method development and validation in relation to pharmacokinetic studies of anticancer and antiretroviral drugs. From 2007 to 2009, Sara completed her Masters in organic biomolecular chemistry, looking at synthesis and functionalisation of carbon-based structures for the targeted delivery of pharmaceuticals. Most recently, Sara completed her PhD at Dublin City University, in

multi-dimensional and multimodal separation of dissolved organic matter (DOM). Sara's research interests include multidimensional separations, high-performance counter current chromatography, mass spectrometry, sample preparation which are applied in the separation and understanding of a complex environmental mixture such as DOM.

- A Rojas, S Sandron, R Wilson, NW Davies, PR Haddad, RA Shellie, PN Nesterenko, B Paull. Simple, quantitative method for the determination of dissolved organic matter in natural waters using high performance counter-current chromatography. *Anal. Chim. Acta*. 909 (2016) 129-138.
- S Sandron, A Rojas, NW Davies, PN Nesterenko, R Wilson, PR Haddad, RA Shellie, B Paull. Chromatographic methods for the isolation, separation and characterisation of dissolved organic matter. *Environ. Sci.: Process. Impacts*. 17 (2015) 1531-1567.
- S Sandron, B Paull, PN Nesterenko. Investigation on selectivity of mercaptopropylsilica and silver nanoparticles-functionalised mercaptopropylsilica. *Curr. Chromatogr.* 2 (2015) 122-135.



Dr Georg Schuster

PhD, Dipl.-Ing.

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Georg Schuster obtained his degree as Dipl.-Ing. of Pharmaceutical Chemistry at the NTA Isny in Germany, where his thesis was focused on developing capillary electrophoresis methods for the analysis of liquid biopharmaceutical drug formulations. Later on he was working with Wolfgang Linder at the University of Vienna where he was awarded a Dr. rer. nat. for developing new stationary phases for hydrophilic liquid chromatography and investigating the retention mechanism thereof. His postdoctoral research at ACROSS is focused on predicting liquid chromatography retention data based on structure-retention relationships using molecular modelling tools.

- G Schuster, W Lindner. Comparative characterization of hydrophilic interaction liquid chromatography columns by linear solvation energy relationships. *J. Chromatogr. A*. 1273 (2013) 73-94.
- G Schuster, W Lindner. Additional investigations into the retention mechanism of hydrophilic interaction liquid chromatography by linear solvation energy relationships. *J. Chromatogr. A*. 1301 (2013) 98-110.



- G Schuster, W Lindner. Chocolate HILIC phases: development and characterization of novel saccharide-based stationary phases by applying non-enzymatic browning (Maillard reaction) on amino-modified silica surfaces. *Anal. Bioanal. Chem.* 400 (2011) 2539-2554.

Dr Mohammad Talebi

PhD, MSc, BSc

ACROSS Research Assistant, School of Physical Sciences

Mohammad graduated 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 method development and optimisation using design of experiments. Upon completion of his PhD in 2013, Mohammad was appointed Research Assistant in ACROSS. Current studies include retention prediction and modelling of liquid chromatography data based on structure-retention relationships and Quality-by-Design principles.



- M Talebi, RA Shellie, EF Hilder, NA Lacher, PR Haddad. Semi-automated pH gradient ion-exchange chromatography of monoclonal antibody charge variants. *Anal. Chem.* 86 (2014) 9794-9799.
- M Talebi, RD Arrua, A Gaspar, NA Lacher, PR Haddad, EF Hilder. Epoxy-based monoliths for capillary liquid chromatography of small and large molecules *Anal. Bioanal. Chem.* 405 (2013) 2233-2244.
- G Abedi, N Hatambeygi, M Talebi. Method development and validation for optimised separation of salicylic, acetyl salicylic and ascorbic acid in pharmaceutical formulations by hydrophilic interaction chromatography and response surface methodology. *J. Chromatogr. A.* 1218 (2011) 5995-6003.

Dr Laura Tedone

PhD, MSc, BSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Laura Tedone 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 visiting student in Chemistry/ACROSS (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 in 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.

Dr Yiing Chiing Yap

PhD, MSc, BSc (Hons)

ARCROSS Postdoctoral Research Fellow, School of Physical Sciences

Yap 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 CO₂ 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. *Biomicrofluidic*. 8 (2014) 044110.



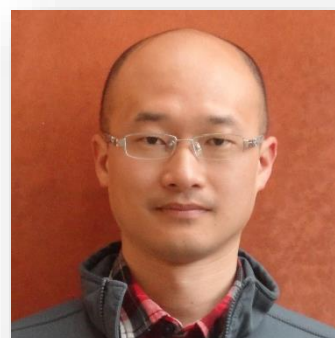
Dr Min Zhang

PhD, BSc

ACROSS Postdoctoral Research Fellow, School of Physical Sciences

Min Zhang studied environmental science at Xiamen University, China, receiving his Ph.D. 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 1 year. In April 2015, he joined the University of Tasmania mainly working on miniaturized analytical separation instruments.

- M Zhang, BN Stamos, N Amornthammarong, PK Dasgupta. Capillary scale admittance detection. *Anal. Chem.* 86 (2014) 11538-11546.
- M Zhang, BN Stamos, PK Dasgupta. Admittance detector for high impedance systems: Design and applications. *Anal. Chem.* 86 (2014) 11547-11553.
- B Yang, M Zhang, T Kanyanee, BN Stamos, PK Dasgupta. An open tubular ion chromatograph. *Anal. Chem.* 86 (2014) 11554-11561.



ACES

Dr Joan-Marc Cabot

PhD, MSc, BSc(Hons)

ACES Postdoctoral Research Fellow, Electrofluidics and Diagnostics Theme, School of Physical Sciences

Joan-Marc Cabot graduated from University of Barcelona, receiving BSc(Hons) in Chemistry, MSc in Advanced Chemistry and PhD in Analytical Chemistry. Before finishing his Bachelor, he was awarded with a 6-months scholarship from the 'Ministerio de Educación y Ciencias de España' to collaborate with the PhysChem Analytical Chemistry research group. Once finished the Bachelor, he got a 2-years fellowship to work at part-time in the GC/MS department of the CCiT while doing a Master degree 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, undertaking research on the development of new electrofluidic scaffolds for the next generation of chemical, bio-sensing and diagnostic devices.



- JM Cabot, E Fuguet, M Rosés, P Smejkal, M Breadmore. Novel instrument for automated pK_a determination by internal standard capillary electrophoresis. *Anal. Chem.* 87 (2015) 6165-6172.
- 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. Internal standard capillary electrophoresis as a high-throughput method for pK_a determination in drug discovery and development. *ACS Combinator. Sci.* 16 (2014) 518-525.

Dr Niall Patrick Macdonald

PhD, MEng

ACES Postdoctoral Research Fellow, Electrofluidics and Diagnostics Theme, School of Physical Sciences

Niall Macdonald 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.



- S Waheed, JM Cabot, NP Macdonald, R Guijt, T Lewis, B Paull, MC Breadmore. 3D printed microfluidic devices: Enablers and barriers. *Lab. Chip.* 16 (2016) 1993-2013.
- NP Macdonald, F Zhu, CJ Hall, J Reboud, PS Crosier, EE Patton, D Wlodkowic, JM Cooper. Assessment of biocompatibility of 3D printed photopolymers using zebrafish embryo toxicity assays. *Lab. Chip.* 16 (2016) 291-297.

- F Zhu, J Skommer, NP Macdonald, T Friedrich, J Kaslin, D Wlodkowic. Three-dimensional printed millifluidic devices for zebrafish embryo tests. *Biomicrofluidics*. 9 (2015) 046502.

ASTech

Dr Gregory Joseph Barbante

PhD, BSc (Hons)

ASTech Postdoctoral Research Fellow, School of Physical Sciences

Gregory Barbante 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 the completion of his PhD, Greg accepted a postdoctoral position at Deakin University, Geelong to work with Prof. Paul Francis. This work involved the development of novel electrochemically active luminescent materials for sensing and solid state catalytic applications. From there, he accepted a postdoctoral role in ASTech at the University of Tasmania 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 Physical Sciences

Florian Lapierre 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 the ASTech program, 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.



- F Lapierre, M Harnois, Y Coffinier, R Boukherroub, V Thomy. Split and flow: Reconfigurable capillary connection for digital microfluidic devices. *Lab. Chip*. 14 (2014) 3589-3593.

- F Lapierre, 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.
- F Lapierre, M Jonsson-Niedziolka, Y Coffinier, SJ Parry, F Zoueshtiagh, T Foat, V Thomy, R Boukherroub. EWOD driven cleaning of bioparticles on hydrophobic and superhydrophobic surfaces. *Lab. Chip.* 11 (2011) 490–496.

Dr Masoomeh Tehrani Rokh

PhD, MSc, BSc

ASTech Postdoctoral Research Fellow, School of Physical 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.

ACROSS Technical and Administrative Staff

Ms Marina Lanz

Administrative Assistant, University of Tasmania

Dr Petr Smejkal

Research Technician, University of Tasmania



ACROSS Honorary Associate Members

Name	Affiliation	Duration	
A/Prof Alireza Ariafard	University of Tasmania, Australia	01-Jul-2015	30-Jun-2018
Mr Mike Bailey	Trajan Scientific Australia Pty Ltd, Australia	01-Jan-2015	31-Dec-2017
Dr Richard Barber	Trajan Scientific Australia Pty Ltd, Australia	01-Jan-2015	31-Dec-2017
Dr Mei-Lan Chen	Zhejiang Shuren University, China	01-Dec-2014	31-Dec-2016
Dr Wei-Qing Chen	Zhejiang Shuren University, China	01-Dec-2014	31-Dec-2016
Dr Damian Connolly	Waterford Institute of Technology, Ireland	09-Jul-2015	09-Jul-2016
Dr Pascal Craw	CSIRO Marine And Atmospheric Research, Australia	30-Jun-2014	30-Jun-2018
Dr Greg Dicinoski	Reserve Bank of Australia, Australia	04-Mar-2013	03-Jun-2017
Dr Cristiano Funari	São Paulo State University, São Paulo, Brazil	09-Nov-2012	31-Dec-2016
Dr Adam Gaudry	KD Analytical, Australia	30-Sep-2014	30-Sep-2018
Dr Andrew Gooley	Trajan Scientific Australia Pty Ltd, Australia	01-Feb-2011	31-Dec-2017
Mr Wojciech Grochowski	Medical University of Gdansk, Poland	20-Apr-2015	30-May-2016
Dr Rob Haselberg	VU Amsterdam, The Netherlands	01-Jun-2014	31-May-2017
Dr Wei Boon Hon	Trajan Scientific Australia Pty Ltd, Australia	15-Aug-2012	31-Dec-2017
Dr Joe Hutchinson	Analytical Services Tasmania, Australia	01-Aug-2015	01-Aug-2016
Ms Umme Kalsoom	Edith Cowan University, Australia	24-Sep-2013	31-Jul-2016
Dr Parvez Mahbub	University of Tasmania, Australia	01-Apr-2014	31-Dec-2016
Dr Fotouh Mansour	Tanta University, Egypt	30-Sep-2015	29-Sep-2016
Dr Cari Sängervan de Griend	Kantisto BV, The Netherlands	10-Sep-2013	09-Sep-2016
Dr Maria Florencia Torres	University of Cordoba, Argentina	13-Apr-2015	31-Dec-2016
Mr Andrew Uhe	Trajan Scientific Australia Pty Ltd, Australia	01-Jul-2015	31-Dec-2017
Dr Hans-Jürgen Wirth	Trajan Scientific Australia Pty Ltd, Australia	01-Jan-2015	31-Dec-2017
Mr Bing Han Yap	University of Tasmania, Australia	05-Jan-2015	31-Dec-2015

Research Funding

Australian Research Council (ARC)

Future Fellowships

- Bowie AR. *Natural iron fertilisation of oceans around Australia: linking terrestrial dust, marine biogeochemistry and climate*. \$108,982.
- Breadmore MC. *Highly integrated miniaturised total analysis systems for pharmaceuticals in biological and environmental samples*. \$217,911.
- Macka M. *Solid-state light sources for bio-imaging and microfluidics*. \$227,792.

Discovery Grants

- Breadmore MC, Guijt RM, Dickson TC, King AE. *Microfluidic technology to help understand physical damage to brain cells*. \$138,500.
- Hearn MTW, Haddad PR, Boysen R, Reinhard I, Quirino JP. *Selectivity enhancement in separation science using responsive materials*. \$160,000.
- Hilder EF. *Polymer nanoparticles and their assembled supracolloidal monolithic structures for applications in separation science*. \$110,000.
- Nesterenko PN. *Carbonaceous adsorbents for ultra-high performance liquid chromatography*. \$111,366.
- Nesterenko PN, Paull B, Shellie RA, Haddad PR, Davies NW, Wilson RR, Kelleher B. *Resolving dissolved organic matter: new multi-dimensional separation approaches*. \$160,000.
- Paull B. *Lectin based open tubular micro-reactors for probing protein-protein binding*. \$106,666.
- Shellie RA. *A field-portable comprehensive multidimensional gas chromatograph*. \$105,000.

Linkage Grants

- Breadmore MC, Guijt RM, Barber R. *Miniaturised electrophoretic systems for distributed environmental sensing*. (Grey Innovation Pty Ltd) \$200,000.
- Shellie RA, Koutoulis A, Whittock S. *Hop flavoromics for distinctive beer*. (Hop Products Australia) \$120,000.
- Doble PA, Macka M. *Chip liquid chromatography-inductively coupled plasma-mass spectrometry: A new hyphenated microfluidic instrument for metallomics*. (Agilent Technologies) \$52,500.
- Haddad PR, Shellie RA. *Rapid method development in pharmaceutical analysis using quality-by-design principles*. (LC Resources Inc; Pfizer; Thermo Fisher Scientific Australia) \$350,000.
- Virtue P, Nicol S, Kawaguchi S, Nichols P, Hilder EF, Bengtson Nash S. *Utilising innovative fishing technology to address key questions on the biology of Antarctic krill*. (Aker BioMarine, Australian Antarctic Division, CSIRO-Division of Marine Research, Griffith University) \$163,602.

Industrial Transformation Training Centres

- Hilder EF, Shellie RA, Haddad PR, Breadmore MC, Paull B, Nesterenko PN, Guijt RM. *ARC Training Centre for Portable Analytical Separation Technologies*. (Trajan Scientific and Medical Pty Ltd) \$848,145.
- Ross T, Stanley RA, Close DC, Tamplin ML, Breadmore MC, O'Cass AG, Gracie AJ, Fei J. *ARC Industrial Transformation Training Centre for Innovative Horticultural Products*: (Woolworths, Houstons Farm) \$686,835.

ARC Centres of Excellence

- Wallace GG, Forsyth M, MacFarlane DR, Officer DL, Cook M, Dodds SM, Spinks GM, Gursel A, Moulton S, in het Panhuis M, Kapsa R, Higgins M, Mozer A, Crook J, Innis P, Coote M, Wang X, Howlett P, Paull B. *ARC Centre of Excellence for Electromaterials Science (ACES)*. \$3,571,428.

Industry and Foundations

- Bowie AR, Ratnarajah L. *Effects of natural iron fertilisation by whales on the Southern Ocean carbon cycle*. (Holsworth Wildlife Research Endowment) \$7,000.
- Hilder EF, Shellie RA, Candish E. *Elite scholarship support – Esme Candish*. (SGE Analytical Science) \$3,750.
- Shellie RA, Breadmore MC. *Optimising oak expression in wine through real-time flavour profiling of maturation products*. (Australian Grape and Wine Authority) \$10,848.
- Sanz Rodriguez E, Paull B, Curran MAJ. *Creating an ice core record from Antarctic samples using Capillary-Ion Chromatography coupled mass-spectrometry*. (Ian Potter Foundation) \$30,000.
- Paull B, Sandron S. Purification of gas chromatography stationary phases by means of HPLC, (Trajan Scientific and Medical Innovation Fund) \$15,000.

Miscellaneous

- Arrua RD. *Polymer/metal-organic frameworks core-shell microparticles. Application as stationary phases in separation science*. (University of Tasmania: Grant-Research Enhancement (REGS)) \$16,890.
- Shellie RA, Karu N, Wilson RR, Hamede Ross RK, Hilder EF. *Metabolomics for Tasmanian devil DFTD biomarkers discovery* (University of Tasmania Foundation Inc: Grant-Dr Eric Guiler Tasmanian Devil Research Grant) \$33,000.
- Prichard JP, Paull B, Bruno RB. *Measuring Prison Drug use Through Wastewater Analysis: A Preparatory Study of the A.C.T Prison*. (University of Tasmania Cross-Disciplinary Incentive Grant) \$6,998.
- Nesterenko PN, Peristyy A, Duffy E. *Investigation of the fine structure of synthetic diamond by small-angle neutron scattering*. 2015. (Australian Nuclear Science and Technology Organisation grant P4432) \$53,705.
- Paull B. ACROSS Gathering. (University of Tasmania Group Career Development) \$4,100.

Media Reports

Annual power list of the top 100 most influential people in the world of analytical science



ACROSS researchers Professor Paul Haddad (at 13th place) and Professor Emily Hilder from University of Tasmania have been celebrated amongst the top 100 most influential people in the world of analytical science, as published in The Analytical Scientist Power List for 2015.

Checkout the list at https://theanalyticalscientist.com/.../pdf.../TAS_Issue_1015.pdf.

Interview for LCGC



Professor Brett Paull, Director of ACROSS, was interviewed by LCGC about the possible applications of 3D printing in the area of separation science, The Column, in September 2015.

Read full interview at <http://www.chromatographyonline.com/three-dimensional-thinking-3d-printing-separation-science>.

Article in Aviation Security International Magazine



Professor Michael Breadmore carrying research on explosives detection technology, expressed his personal view on the security screening industry in the article, "A Personal View", featured in Aviation Security International Magazine in 2015.

Read full article at <https://www.asi-mag.com/personal-view-expressed-prof-michael-breadmore/>.

ACROSS in Mercury News



Prof Michael Breadmore and Prof. Emily Hilder's recognition in the *Analytical Scientist* magazine's inaugural Top 40 Under 40 listing attracted Mercury News attention in 2015.

Read full details at <http://www.themercury.com.au/news/tasmania/tasmanian-chemistry-researchers-make-global-top-40-under-40/news-story/d4f0538848bf51a8a5273cd0a4606ea6>.

Analytical Chemistry's Most Popular Papers of 2014



ACROSS, University of Tasmania, research paper "Semiautomated pH Gradient Ion-Exchange Chromatography of Monoclonal Antibody Charge Variants" by Mohammad Talebi, Robert A. Shellie, Emily F. Hilder, Nathan A. Lacher, and Paul R. Haddad was listed in "Top Ten Chromatography, Mass Spectrometry, and Lab Automation Papers" in C&EN Supplements, the flagship magazine of the American Chemical Society, March 2015.

Check out the list at <http://cen.acs.org/content/dam/cen/supplements/CEN-supplement-03022015.pdf>.

ACROSS research in C&en News



ACROSS research on "Novel instrument for automated pKa determination by internal standard capillary electrophoresis" by Joan M. Cabot, Elisabet Fuguet, Martí Rosés, Petr Smejkal, and Michael C. Breadmore was reported in C&EN News in June 2015.

Find more information at <http://cen.acs.org/articles/93/web/2015/06/Automated-Method-Quickens-Acidity-Measurements.html>.

Research by Ross Farrell (ACROSS PhD student) on “Real-time mass spectrometry monitoring of oak wood toasting: Elucidating aroma development relevant to oak-aged wine quality” was reported in C&EN News in December 2015.

Find more information at <http://cen.acs.org/articles/93/web/2015/12/Monitoring-Oak-Wood-Toasting-Fly.html?type=paidArticleContent>.

ACROSS Analytical Scientist, Leading the Way in Chromatography

**the
Analytical Scientist**

ACROSS-University of Tasmania's research in the area of chromatography was recognised amongst the 'Power Institutions' leading the way in chromatography by The Analytical Scientist, a scientific magazine on analytical chemistry, in March 2015.

Read the full article at <https://theanalyticalscientist.com/issues/a-briefcase-full-of-nmr/the-cream-of-chromatography/>.

UTAS Media Reports

Australian Research Council Training Centre for Portable Analytical Separation Technologies (ASTech) reported in UTAS news.

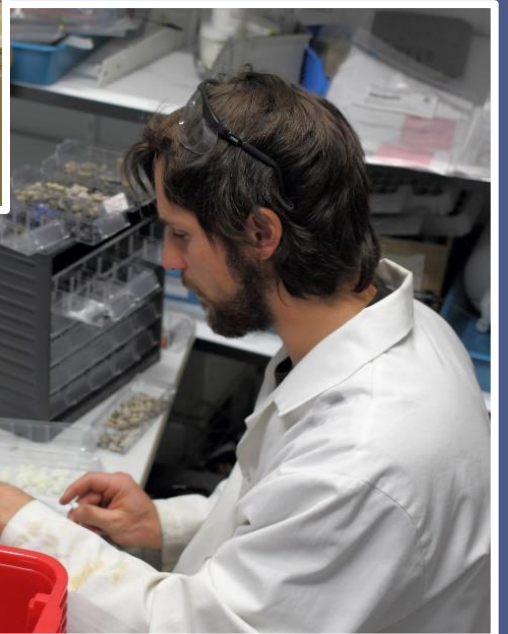
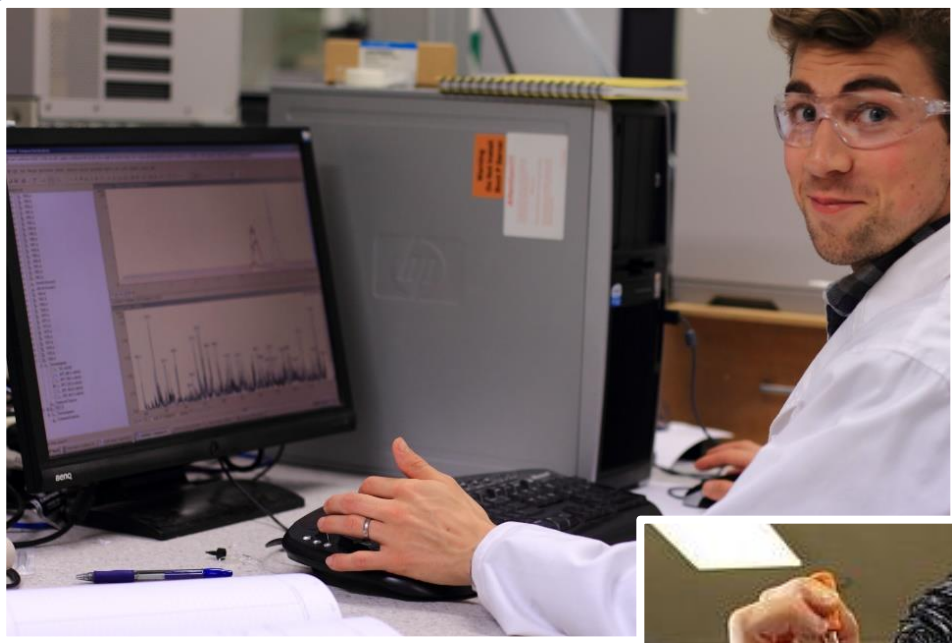
Details available at <http://www.utas.edu.au/news/2015/9/2/13-your-smartphone-transformed-into-a-mobile-lab/>

ACROSS PhD student, Vipul Gupta's selection by the Australian Academy of Science to attend the Nobel Laureates meeting and invitation to attend the 2015 Junket was highlighted by UTAS media.

Details available at <http://www.utas.edu.au/latest-news/utas-homepage-news/phd-candidate-selected-to-attend-nobel-laureates-meeting>.

<http://www.media.utas.edu.au/general-news/all-news/phd-candidate-finds-the-most-nobel-pursuit-is-for-curiosity-and-self-belief> - September 2015

<http://www.media.utas.edu.au/general-news/all-news/phd-student-among-nations-leading-thinkers>.

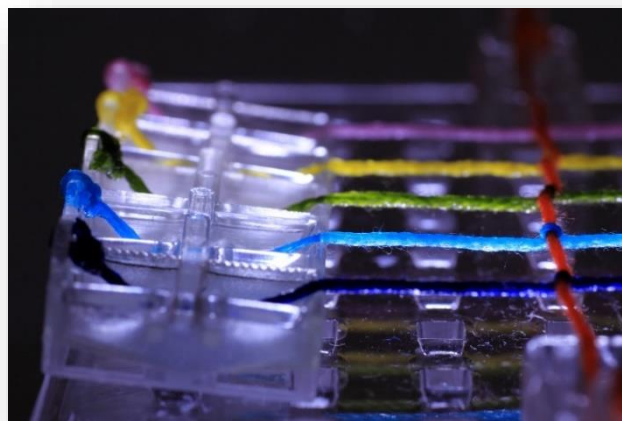


Publications

1. A Alwy, SP Clarke, DF Brougham, B Twamley, B Paull, B White, D Connolly. Development of a silica monolith modified with Fe₃O₄ nano-particles in centrifugal spin column format for the extraction of phosphorylated compounds. *J. Sep. Sci.* 38 (2015) 283-290.
2. JA Ardila, CS Funari, AM Andrade, AJ Cavaleiro, RL Carneiro. Cluster analysis of commercial samples of Bauhinia spp. using HPLC-UV/PDA and MCR-ALS/PCA without peak alignment procedure. *Phytochem. Anal.* 26 (2015) 367-373.
3. RD Arrua, EF Hilder. Highly ordered monolithic structures by directional freezing and UV-initiated cryopolymerisation. Evaluation as stationary phases in high performance liquid chromatography. *RSC Adv.* 5 (2015) 71131-71138.
4. MC Breadmore, RM Tubaon, AI Shallan, SC Phung, AS Abdul Keyon, D Gstoettenmayr, P Prapatpong, AA Alhusban, L Ranjbar, HH See, M Dawod, JP Quirino. Recent advances in enhancing the sensitivity of electrophoresis and electrochromatography in capillaries and microchips (2012–2014). *Electrophoresis.* 36 (2015) 36-61.
5. JM Cabot, E Fuguet, M Roses, P Smejkal, MC Breadmore. Novel instrument for automated pKa determination by internal standard capillary electrophoresis. *Anal. Chem.* 87 (2015) 6165-6172.
6. E Candish, H-J Wirth, AA Gooley, RA Shellie, EF Hilder. Characterization of large surface area polymer monoliths and their utility for rapid, selective solid phase extraction for improved sample clean up. *J. Chromatogr. A.* 1410 (2015) 9-18.
7. S Currivan, D Connolly, B Paull. Stepped gradients on polymeric monolithic columns by photoinitiated grafting. *J. Sep. Sci.* 38 (2015) 3795-3802.
8. NW Davies, S Sandron, PN Nesterenko, B Paull, R Wilson, P Haddad, R Shellie, A Rojas. Comment on "Structural characterization of dissolved organic matter: a review of current techniques for isolation and analysis" by EC Minor, MM Swenson, BM Mattson, and AR Oyler, *Environ. Sci.: Processes Impacts*, 2014, 16, 2064. *Environ. Sci.: Processes Impacts.* 17 (2015) 495-496.
9. E Duffy, X He, EP Nesterenko, D Brabazon, A Dey, S Krishnamurthy, PN Nesterenko, B Paull. Thermally controlled growth of carbon onions within porous graphitic carbon-detonation nanodiamond monolithic composites. *RSC Adv.* 5 (2015) 22906-22915.
10. E Duffy, X He, PN Nesterenko, B Paull. Hierarchical porous graphitic carbon monoliths with detonation nanodiamonds: synthesis, characterisation and adsorptive properties. *J. Mater. Sci.* 50 (2015) 6245-6259.
11. E Duffy, DP Mitev, SC Thickett, AT Townsend, B Paull, PN Nesterenko. Assessing the extent, stability, purity and properties of silanised detonation nanodiamond. *Appl. Surf. Sci.* 357 (2015) 397-406.



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13. M Fitzgerald, MG Gardiner, D Armit, GW Dicinoski, C Wall. Confirmation of the molecular structure of tetramethylene diperoxide dicarbamide (tmdd) and its sensitiveness properties. *J. Phys. Chem. A.* 119 (2015) 905-910.
14. CS Funari, RL Carneiro, MM Khandagale, AJ Cavalheiro, EF Hilder. Acetone as a greener alternative to acetonitrile in liquid chromatographic fingerprinting. *J. Sep. Sci.* 38 (2015) 1458–1465.
15. ES Gilchrist, PN Nesterenko, NW Smith, LP Barron. Organic solvent and temperature-enhanced ion chromatography-high resolution mass spectrometry for the determination of low molecular weight organic and inorganic anions. *Anal. Chim. Acta.* 865 (2015) 83-91.
16. K Gras, J Luong, M Lin, R Gras, RA Shellie. Determination of ethylene glycol in lubricants by derivatization static headspace gas chromatography. *Anal. Methods.* 7 (2015) 5545-5550.
17. W Grochocki, MJ Markuszewski, JP Quirino. Multidimensional capillary electrophoresis. *Electrophoresis.* 36(2015) 135-143.
18. W Grochocki, MJ Markuszewski, JP Quirino. Three-step stacking of cationic analytes by field-enhanced sample injection, sweeping, and micelle to solvent stacking in capillary electrophoresis. *J. Chromatogr. A.* 1424 (2015) 111-117.
19. D Gstoettenmayr, J Quirino, CF Ivory, M Breadmore. Stacking in a continuous sample flow interface in capillary electrophoresis. *J. Chromatogr. A.* 1408 (2015) 236-242.
20. RM Guijt. Versatile electrophoresis-based self-test platform. *Electrophoresis.* 36 (2015) 644-645.
21. MR Jacobs, R Gras, PN Nesterenko, J Luong, RA Shellie. Back-flushing and heart cut capillary gas chromatography using planar microfluidic Deans' switching for the separation of benzene and alkylbenzenes in industrial samples. *J. Chromatogr. A.* 1421 (2015) 123-128.
22. C Johns, JP Hutchinson, RM Guijt, EF Hilder, PR Haddad, M Macka, PN Nesterenko, AJ Gaudry, GW Dicinoski, MC Breadmore. Micellar electrokinetic chromatography of organic and peroxide-based explosives. *Anal. Chim. Acta.* 876 (2015) 91–97.
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26. C Kukusamude, S Srijaranai, JP Quirino. Interface-free two-dimensional heart-cutting capillary electrophoresis for the separation and stacking of anionic and neutral analytes. *J. Sep. Sci.* 38 (2015) 2532–2537.

27. Y Li, M Dvorak, PN Nesterenko, R Stanley, N Nuchtavorn, LK Krcmova, J Aufartova, M Macka. Miniaturised medium pressure capillary liquid chromatography system with flexible open platform design using off-the-shelf microfluidic components. *Anal. Chim. Acta*. 896 (2015) 166-176.

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31. J Luong, R Gras, K Gras, RA Shellie. Piston-cylinder based micro liquid–liquid extraction with GC–qMS for trace analysis of targeted chlorinated organic compounds in water. *Can. J. Chem.* 93 (2015) 1283-1289.

32. P Mahbub, P Zakaria, R Guijt, M Macka, G Dicoski, M Breadmore, PN Nesterenko. Flow injection analysis of organic peroxide explosives using acid degradation and chemiluminescent detection of released hydrogen peroxide. *Talanta*. 143 (2015) 191-197.

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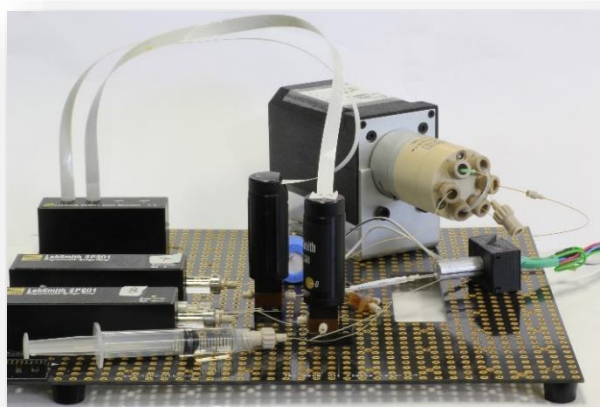
34. S Mukdasai, U Crowley, M Pravda, X He, EP Nesterenko, PN Nesterenko, B Paull, S Srijaranai, JD Glennon, E Moore. Electrodeposition of palladium nanoparticles on porous graphitized carbon monolith modified carbon paste electrode for simultaneous enhanced determination of ascorbic acid and uric acid. *Sens. Actuators, B*. 218 (2015) 280-288.

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37. 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.

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LabSmith platform for portable HPLC



3D printing in separation and detection science

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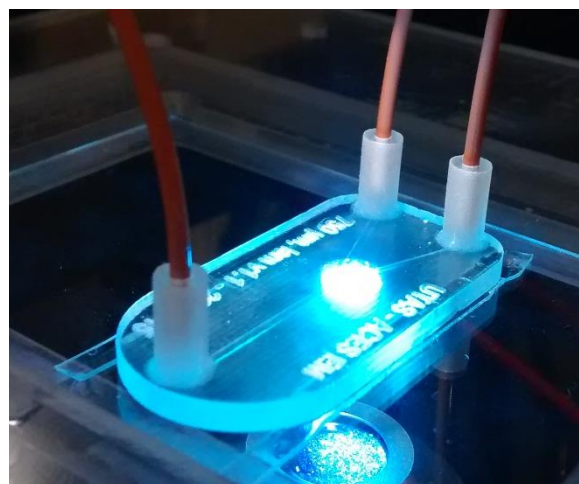
44. S Sandron, A Rojas, R Wilson, NW Davies, PR Haddad, RA Shellie, PN Nesterenko, BP Kelleher, B Paull. Chromatographic methods for the isolation, separation and characterisation of dissolved organic matter. *Environ. Sci. Process. Impacts.* 17 (2015) 1531-1567.

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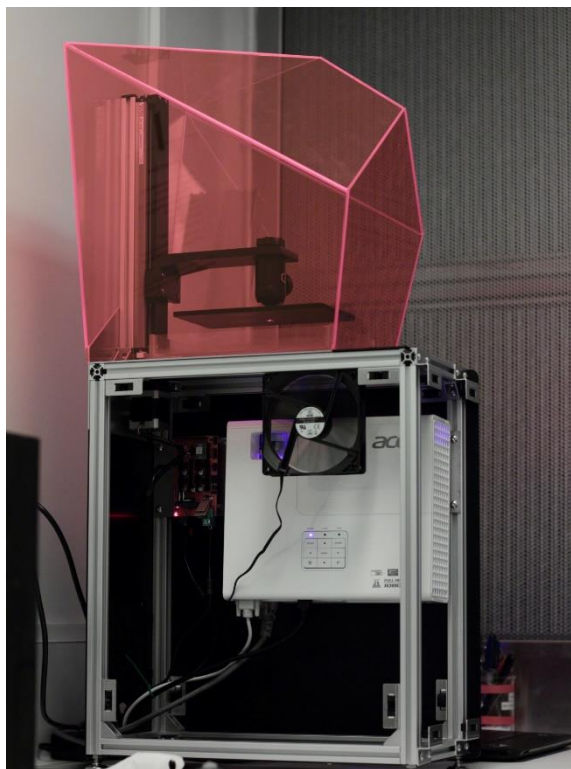
46. Al Shallan, RM Guijt, MC Breadmore. Electrokinetic size and mobility traps for on-site therapeutic drug monitoring. *Angew. Chem. Int. Ed.* 54 (2015) 7359-7362.

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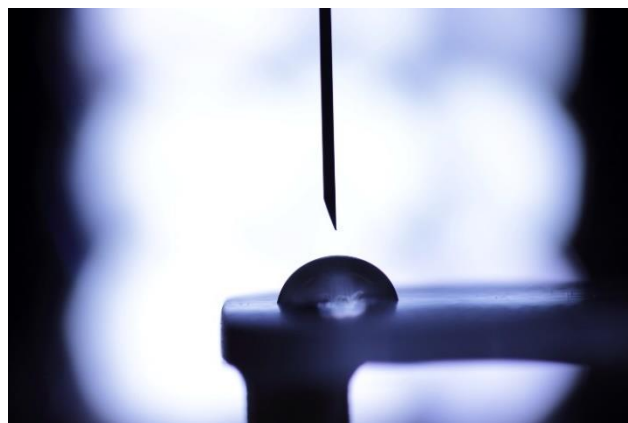
Microfluidic devices for portable analysis



Stereolithographic 3D printer

- 49.A Soliven, GR Dennis, EF Hilder, RA Shalliker. The retention characteristics of a novel phenyl analytical scale first generation monolith. *J. Liq. Chrom. Relat. Tech.* 38 (2015) 781-788.
- 50.M Talebi, G Schuster, RA Shellie, R Szucs, PR Haddad. Performance comparison of partial least squares-related variable selection methods for quantitative structure retention relationships modelling of retention times in reversed-phase liquid chromatography. *J. Chromatogr. A.* 1424 (2015) 69-76.
- 51.LY Thang, S Shahir, HH See. Determination of tamoxifen and its metabolites in human plasma by nonaqueous capillary electrophoresis with contactless conductivity detection. *Electrophoresis.* 36 (2015) 2713-2719.
- 52.E van Tricht, L Geurink, B Pajic, J Nijenhuis, H Backus, M Germano, GW Somsen, CE Sanger-van de Griend. New capillary gel electrophoresis method for fast and accurate identification and quantification of multiple viral proteins in influenza vaccines. *Talanta.* 144 (2015) 1030-1035.

- 53.E Tyteca, SH Park, RA Shellie, PR Haddad, G Desmet. Computer-assisted multi-segment gradient optimization in ion chromatography. *J. Chromatogr. A.* 1381 (2015) 101-109.
- 54.M Vaculovicova, M Akther, P Maaskant, D Brabazon, M Macka. Fibre coupled micro-light emitting diode array light source with integrated band-pass filter for fluorescence detection in miniaturised analytical systems. *Anal. Chim. Acta.* 871 (2015) 85-92.
- 55.Z Wei, S Sandron, AT Townsend, PN Nesterenko, B Paull. Determination of trace labile copper in environmental waters by magnetic nanoparticle solid phase extraction and high-performance chelation ion chromatography. *Talanta.* 135 (2015) 155-162.
- 56.A Wuethrich, PR Haddad, JP Quirino. Electrophoretic concentration and sweeping-micellar electrokinetic chromatography analysis of cationic drugs in water samples. *J. Chromatogr. A.* 1401 (2015) 84-88.
- 57.A Wuethrich, PR Haddad, JP Quirino. Green sample preparation for liquid chromatography and capillary electrophoresis of anionic and cationic analytes. *Anal. Chem.* 87 (2015) 4117-4123.



Contact angle measurement for surface characterisation

Other Publications

Plenary Conference Presentations

MC Breadmore. KISSing Chips: The prince(ss) or the frog? Plenary, 6th Australia and New Zealand Nano-Microfluidics Symposium, 31 March–2 April 2015, Melbourne, Australia.

MC Breadmore, AI Shallan, NP Macdonald, U Kalsoom, P Smjekal, MC Boyce, RM Guijt, B. Paull. Electrophoretic systems and devices: fabrication, design and applications, Plenary Lecture, 7th International Symposium on Microchemistry and Microsystems (ISMM2015), 8–10 June 2015, Kyoto, Japan.

MC Breadmore. Seeing while CE-ing, Plenary Lecture, CE Pharm 2015, 20–24 September 2015, New York, USA

Keynote Conference Presentations

E Hilder, Preparation, characterization and applications of porous polymer monoliths for chromatography and sample preparation, keynote lecture, 39th International Symposium on Capillary Chromatography, 16–21 May, 2015, Fort Worth, Texas, USA.

E Hilder, Monolithic materials for rapid sample preparation, keynote lecture, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June, Geneva, Switzerland.

PR Haddad, A Wuethrich, JP Quirino. Purely aqueous electrophoretic preconcentration of charged analytes using glass micropipettes and hydrogel, Invited keynote lecture, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June, Geneva, Switzerland.

R Szucs, M Hanna-Brown, PR Haddad, SH Park, M Taraji, G Schuster, M Talebi. The role of quantitative structure retention relationships in quality by design chromatographic method development: optimisation of retention models. Invited keynote lecture, 42nd International



Professor Paul Haddad addressing the HPLC conference

Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June 2015, Geneva, Switzerland.

M Macka. How analytical chemistry controls our lives, public lecture invited by the Royal Australian Chemical Institute within a session “Can Science save the Humanity” organised as part of the National Science Week, 23 August 2015, Canberra, Australia.

PN Nesterenko, EP Nesterenko, B Paull. Recent advances in high-performance chelation ion chromatography, 8th Asia-Pacific Symposium on Ion Analysis, 31 August–3 September 2015, Chiba, Japan.

B Paull, S Sandron, AR Cardona, NW Davies, R Wilson, J Horne, RA Shellie, PR Haddad, PN Nesterenko. Revealing the complexity of marine dissolved organic matter – Lessons in analytical multidimensionality. 18th edition of Euro Analysis. The European Conference on Analytical Chemistry. 6–10 September, 2015, Bordeaux, France.

RM Guijt, P Schmejkal, NP McDonald, AI Shallan, B Paull, MC Breadmore. 3D printing for microfluidics. 18th edition of Euro Analysis. The European Conference on Analytical Chemistry. 6–10 September, 2015, Bordeaux, France.

PR Haddad, Park SH, M Taraji, RA Shellie, GW Dicoski, G Schuster, M Talebi, R Szucs, CA Pohl, JW Dolan. Prediction of retention times in reversed-phase, HILIC

and ion chromatography based on chemical structures of analytes, Invited keynote lecture, 43rd International Symposium on High Performance Liquid Phase Separations and related Techniques HPLC 2015, 21–25 September, 2015, Beijing, China.

A Wuethrich, JP Quirino, PR Haddad. Miniaturised solventless electrophoretic sample enrichment and clean-up, Invited keynote lecture, 15th Asia-Pacific International Symposium on Microscale Separations and Analysis APCE 2015, 15–18 November, 2015, Tainan, Taiwan.

Invited Conference Papers

B Paull. Nanostructured phases for separation science, Invited talk, Nanolytica, 9 February, Melbourne, Australia.

MC Breadmore, AI Shallan, NP Macdonald, P Smjekal, RM Guijt, B Paull. 3D printed microfluidic devices using consumer-focused printers, Invited lecture, Pittcon 2015, 6–10 March 2016, New Orleans, USA.

MC Breadmore, D Gstoettenmayer, AJ Gaudry, A Alhusban, JM Cabot, L Ranjbar, HH See, P Smjekal, RM Guijt. Sequential injection –capillary electrophoresis: Fundamental design and applications, Invited lecture, General Meeting of the Korean Chemical Society, 16 April 2015, Seoul, South Korea.

A Al Husban, N Gueven, MC Breadmore, RM Guijt. Sequential injection capillary electrophoresis for monitoring cell culture and fermentation, Implementation of Microreactor Technology in Biotechnology IMTB, 10–13 May 2015, Opatija, Croatia.

M Macka. 3D printed sweet dreams are made of this: Detection devices for microfluidics, Mini-Symposium on Applied 3D Fluidics at University of Tasmania, 15 May 2015, Hobart, Australia.

B Paull, V Gupta, S Sandron, M Talebi, PN Nesterenko. 3D printed titanium capillary columns with internal monoliths, Invited talk, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques, HPLC 2015, 21–25 June 2015, Geneva, Switzerland.

Y Li, M Dvorak, N Nuchtavorn, PN Nesterenko, R Stanley, M Macka. Portable LC: An ‘open-platform’ flexible modular

capillary system based on a microfluidic platform and off-the-shelf components, International Symposium on Separation Science - ISSS 2014, 30 June–3 July 2015, Ljubljana, Slovenia.

Y Li, M Dvorak, N Nuchtavorn, PN Nesterenko, R Stanley, M Macka. Flow analysis and portable capillary liquid chromatography using a modular flexible microfluidic open platform based on off-the-shelf components, Flow Analysis XIII, 5–10 July 2015, Prague, Czech Republic.

M Macka. Novel analytical approaches to on-site analysis applicable to nutrition and food analysis, 15th International Nutrition and Diagnostics Conference, 5–8 October 2015, Prague, Czech Republic.

RM Guijt. Micro/nanofluidic devices for therapeutic drug monitoring, CECE-International Interdisciplinary Meeting on Bioanalysis, 21–23 September 2015, Brno, Czech Republic.

M Rosés, E Fuguet, JM Cabot. Determination of the acidity of poorly water-soluble drugs by the internal standard – capillary electrophoresis method. 4th World Conference on Physico-Chemical Methods in Drug Discovery and Development. 21–24 September 2015, Rovinj, Croatia.

B Paull. Electrofluidics and diagnostics: Pushing boundaries in 3 dimensions, Nanobionics: An ACES and Collaborators Showcase Event, 20 November 2015, Melbourne, Australia.

S Currivan, B Paull. Monolithic materials; fabrication, characterisation, and applications, Theo Murphy Australian Frontiers of Science Materials for the 21st century: From Design to Application, 11 December, 2015, Melbourne, Australia.



Natural product extracts for GC analysis

Y Li, M Dvorak, N Nuchtavorn, PN Nesterenko, R Stanley, M Macka. Portable LC platforms: Concepts, technical issues, applicability, Invited talk, Pacificchem, 15–20 December 2015, Honolulu, USA.

A Wuethrich, JP Quirino, PR Haddad. Miniaturised solventless electrophoretic sample enrichment and clean-up. Invited lecture, Pacificchem 2015, 15–20 December 2015, Honolulu, USA.

PR Haddad, SH Park, M Taraji, RA Shellie, GW Dicinoski, G Schuster, M Talebi, R Szucs, CA Pohl, JW Dolan. Use of quantitative structure-retention relationships to choose the optimal chromatographic techniques. Invited lecture, Pacificchem 2015, 15–20 December 2015, Honolulu, USA.

Other Conference Papers and Presentations

B Paull, T Kazarian, J Deverell. Nano-structured functionalised porous layers in open tubular 'Parallel Hole' capillary formats for bioaffinity applications. 7th Biennial Australian Colloid and Interface Science, ACIS-2015. 1–5 February 2015, Hobart, Australia.

PN Nesterenko, E Duffy, Z Wei, B Paull, A Townsend. Microwave assisted purification of detonation nanodiamonds and stabilisation of its aqueous suspensions. 7th Biennial Australian Colloid and Interface Science, ACIS-2015. 1–5 February 2015, Hobart, Tasmania, Australia.

NP Macdonald; F Zhu; E Patton; D Wlodkowic; JM Cooper; M Breadmore; B Paull. 3D printed microfluidic devices. 10th Annual International Electromaterials Science Symposium - Program, 11–13 February 2015, Wollongong, Australia.

V Gupta, M Talebi, S Beirne, J Deverell, S Sandon, PN Nesterenko, F Thompson, GG Wallace, B Paull. 3D printed compact titanium capillary column with organic-monolith for liquid chromatography. 10th Annual International Electromaterials Science Symposium, 11–13 February 2015, Wollongong, Australia.

SC Phung, YH Nai, M Macka, RM Guijt, SM Powell, MC Breadmore. Fluorescence in situ hybridisation of cells using ITP. Fabrication and evaluation of poly(dimethylsiloxane)-diamond electrophoretic chip. 6th Australia

New Zealand Nano and Microfluidic conference (ANZNMf), 31 March–2 April 2015, Melbourne, Australia.

U Kalsoom, RM Guijt, MC Boyce, AT Townsend, R Haselberg, MC Breadmore. Direct electrokinetic injection of inorganic cations from whole fruits and vegetables for capillary electrophoresis analysis. 6th Australia New Zealand Nano and Microfluidic conference (ANZNMf), 31 March–2 April 2015, Melbourne, Australia.

RA Shellie, L Ranjbar, MC Breadmore. Design and implementation of IC × CE for comprehensive two-dimensional analysis of ionic and ionogenic analytes. Lecture, 39th International Symposium on Capillary Chromatography, 16–21 May, 2015, Fort Worth, Texas, USA.

J Luong, X Guan, S Xu, Q Xu, R Firor, R Gras, RA Shellie. Thermal independent modulator in comprehensive two-dimensional gas chromatography: Practical industrial applications. Lecture, 12th GC × GC Symposium, 16–21 May, 2015, Fort Worth, Texas, USA.

AT Sutton, KK Tran, E Read, J-D Marty, S Harrison, M Destarac, M Gaborieau, P Castignolles. Characterising the chemical structure of block copolymers both long and short. Sydney Surfaces and Soft Stuff meeting (SASSY), 10 June 2015, Sydney, Australia.

E Sanz Rodriguez, S Poynter, M Curran, PR Haddad, PN Nesterenko, B Paull. Capillary ion chromatography with on-column focusing for ultra-trace analysis of organic and inorganic species in volume limited Antarctic ice core samples. 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques, HPLC 2015. 21–25 June 2015, Geneva, Switzerland.

V Gupta, M Talebi, S Beirne, J Deverell, S Sandon, PN Nesterenko, F Thompson, GG Wallace, B Paull. 3D printed compact titanium capillary column with organic-monolith for liquid chromatography. HPLC 2015, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques. 21–25 June 2015, Geneva, Switzerland.

SH Park, G Schuster, M Talebi, GW Dicinoski, RA Shellie, PR Haddad, R Szucs, JW Dolan, CA Pohl. Quantitative structure-retention relationships for inorganic ions in ion chromatography. 42nd International



Hops for volatile compounds profiling in beer

Symposium on High Performance Liquid Phase Separations and Related Techniques. 21–25 June 2015, Geneva, Switzerland.

PN Nesterenko, E Duffy, B Paull. Preparation and characterisation of trimodal porous graphitic carbon monolithic composites containing detonation nanodiamonds and thermally induced nanocarbons. 12th International Conference “Advanced Carbon Nanostructures”, 29 June–3 July 2015, St. Petersburg, Russia.

NP Macdonald, MC Breadmore, B Paull. 3D printing for microfluidic applications. ACROSS the gathering II, Hobart, Australia, 2–3 August 2015.

M Rosés, E Fuguet, JM Cabot. Determination of the pK_a of sparingly soluble drugs by capillary electrophoresis. 22nd International Symposium on Electro- and Liquid Phase-Separation Techniques, 30 August–2 September 2015, Helsinki Finland.

E Hilder. Polymeric monolithic materials for miniaturised and automated sample preparation. 21st International Reid Bioanalytical Forum, 7–10 September, 2015, Guildford, UK

JY Park, RM Guijt, A Manz. Online connection of free-flow isotachopheresis chip to an electrospray ionisation mass spectrometer. CECE- International Interdisciplinary Meeting on Bioanalysis, 21–23 September 2015, Brno, Czech Republic.

AT Sutton, E Read, J-D Marty, M Destarac, M Gaborieau, P Castignolles. Assessing block copolymer purity by capillary electrophoresis in the critical conditions.

RACI NSW Analytical Symposium, 18 November 2015, Sydney, Australia.

AT Sutton, D Arrua, M Gaborieau, P Castignolles, EF Hilder. Characterisation of oligoacrylates and their block co-oligomers, RACI NSW Polymer Symposium. 20 November 2015, Sydney, Australia.

RM Guijt, AI Shallan, MC Breadmore. Towards point of care analysis of ampicillin from whole blood. APSA-ASCEPT, 27–30 November 2015, Hobart, Australia.

RM Tubaon, PR Haddad, JP Quirino. One-step selective electrokinetic removal of inorganic anions from small volume and its possible application as sample clean-up for mass spectrometric techniques. 17th International Symposium on Advances in Extraction Technologies, 7–11 November 2015, Guangzhou, China.

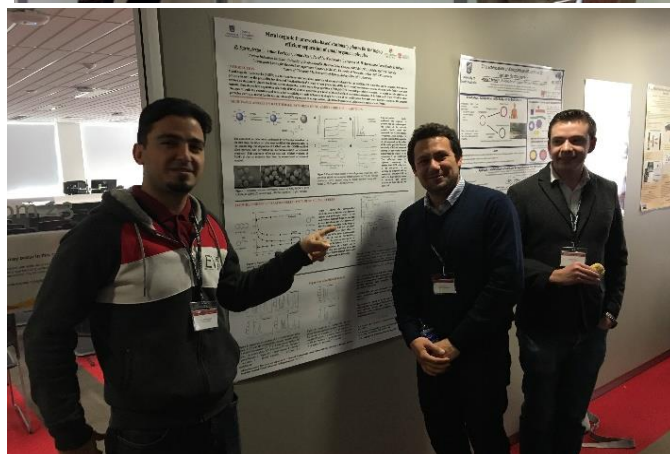
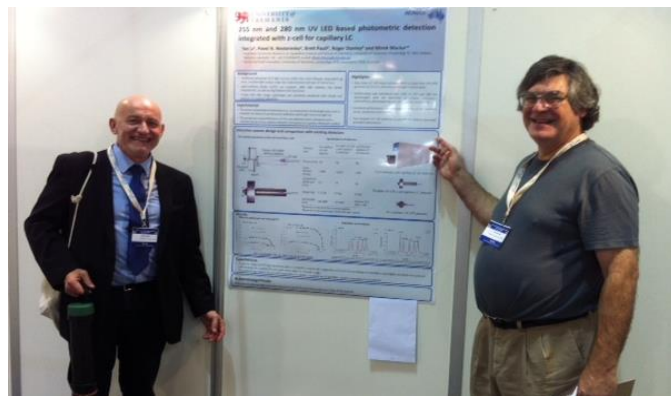
Y Li, M Dvorak, PN Nesterenko, R Stanley, M Macka. Miniaturised medium pressure capillary liquid chromatography system with flexible open platform design using off-the-shelf microfluidic components. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

F Cecil, P Smejkal, P Nesterenko, MC Breadmore, A Henderson, A Cole, RM Guijt, M Macka. Low cost on-capillary photometric detector for multiple detection tubing's fabricated by 3D printing. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

S Waheed, JM. Cabot, NP Macdonald, T Lewis, MC Breadmore, B Paull. Fabrication and evaluation of poly (dimethylsiloxane)-diamond electrophoretic chip. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

Poster Presentations

E Duffy, X He, S Krishnamurthy, E Nesterenko, P Nesterenko, B Paull. Adsorption of aqueous dyes by hierarchical porous graphitic carbon monolithic composites containing detonation nanodiamonds and thermally induced nanocarbons. 7th Biennial Australian Colloid and



From Left: Professor Pavel Nesterenko at Zhejiang University, Hangzhou, China for an invited lecture; Prof. Mirek Macka (on the left) and Dr Dario Arrura (in the middle) presenting posters at conference.

Interface Science, ACIS-2015. 1–5 February 2015, Hobart, Australia. PP019. P.198

Z Wei, E Duffy E, PN Nesterenko, B Paull. Surface modification of synthetic diamond by adsorption of aluminium and 1-pyrenecarboxylic acid to increase its aqueous suspension stability. 7th Biennial Australian Colloid and Interface Science, ACIS-2015. 1–5 February 2015, Hobart, Australia. PP020. P.199.

A Khodabandeh, DR Arrua, CT. Desire, SAF Bon, EF Hilder. Amphiphilic macro-RAFT agent as a sole emulsifier for stabilizing an inverse high internal phase emulsion. Australian Colloid and Interface Symposium (ACIS 2015), 1–5 February 2015, Hobart, Australia.

Y Li, M Dvorak, N Nuchtavorn, M Macka. Portable medium pressure capillary liquid chromatography based on a modular microfluidic system using off-the-shelf components. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Pittcon 2015. 8–12 March, 2015. New Orleans, LA, USA. 1150-10P.

N Nuchtavorn, M Macka. Technical drawing pens as a fabrication method of paper-based microfluidic devices for antioxidant

activity evaluation. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Pittcon 2015. 8–12 March, 2015. New Orleans, LA, USA. 550-32 P.

P Prapatpong, N Nuchtavorn, MC Breadmore, RM Guiji, M Macka, L Suntornsuk. Automated sensitive analysis of amantadane drugs by in-line derivatization capillary electrophoresis with photometric detection. Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Pittcon 2015. 8–12 March, 2015. New Orleans, LA, USA. 1230-29 P.

AT Sutton, AR Maniego, P Castignolles, M Gaborieau. Precision of branching quantification in polymers branching: From solid to solution state NMR. Symposium on NMR, MRI and Diffusion, 31 March 2015, Sydney, Australia.

F Li, RM Guijt, MC Breadmore. Microfluidic devices with integrated nanochannels for sample-in/answer-out analysis of pharmaceuticals from body fluids. The 6th Australia and New Zealand Nano Microfluidics Symposium (ANZNMF), 31 March–2 April 2015, Melbourne, Australia.

N Nuchtavorn, M Macka. Technical drawing pens for paper-based microfluidic devices

(μ PADs) as a flexible, simple, rapid and low-cost alternative fabrication method for paperfluidics. Australia and New Zealand Nano-micro-fluidics Symposium (ANZ NMFS) 2015, 30 March–2 April 2015, Melbourne, Australia.

M Dvorak, Y Li, N Nuchtavorn, PN Nesterenko, M Macka. New generation deep-UV LED for portable robust low cost optical detection in microfluidic and miniaturised analysis. Australia and New Zealand Nano-micro-fluidics Symposium (ANZ NMFS) 2015, 30 March–2 April 2015, Melbourne, Australia.

R Gras, J Luong, T Hayward, RA Shellie. Reductive gas detection in gas chromatography, 39th International Symposium on Capillary Chromatography, 16–21 May, 2015, Fort Worth, Texas, USA.

AT Sutton, E Read, J-D Marty, M Destarac, M Gaborieau, P Castignolles. Purity of Double Hydrophilic Block Copolymers Revealed by Capillary Electrophoresis in the Critical Conditions. Virtual Symposium on Applied Separation Science, 25–29 May 2015, online at www.vsass.org.

M Taraji, G Schuster, M Talebi, G Dicinoski, R Shellie, P Haddad, R Szucs, J. Dolan, C Pohl. HILIC method development in pharmaceutical analysis, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June, Geneva, Switzerland.

E Tyteca, SH Park, RA Shellie, PR Haddad, G Desmet. Possibilities of computer-assisted multi-segment gradient optimization in ion chromatography, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June, Geneva, Switzerland.

Y Li, M Dvorak, N Nuchtavorn, PN Nesterenko, R Stanley, M Macka. Portable capillary LC as a flexible design modular system based on a microfluidic platform and designed with off-the-shelf components, 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques. 21–25 June 2015, Geneva, Switzerland.

V Gupta, P Smejkal, PN Nesterenko, B Paull. Exploring multi-microchannel capillaries for production of higher pressure electro-osmotic pumps housed within 3D printed polymer platforms. 42nd International

Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2015), 21–25 June, Geneva, Switzerland.

RM Guijt, AI Shallan, MC Breadmore. Towards Point of Care Analysis of Ampicillin from Whole Blood. Helmholtz Institute for Pharmaceutical Science, 2 July 2015, Saarbrücken, Germany.

JM Cabot, MC Breadmore, B Paull. Electrofluidic thread-based analytical devices (eTAD). ACES full centre meeting, 12 August 2015, Melbourne, Australia.

N Upadhyay, S Currivan, M Macka, P Nesterenko, B Paull. Preparation and growth of solid gold layers within 4 μ m channels of photonic crystal fibers, Graduate Research Conference at University of Tasmania, 3 September 2015, Hobart, Australia.

AA Kazarian, ES Rodríguez, N Upadhyay, S Currivan, M Macka, PN Nesterenko, B Paull. Nano-structured functional layers within multi-channel photonic crystal fibres for bioaffinity applications. 18th European Conference on Analytical Chemistry, Euro Analysis 2015, 6–10 September 2015, Bordeaux, France. P.459.

V Gupta, M Talebi, S Beirne, J Deverell, S Sandon, PN Nesterenko, F Thompson, GG Wallace, B Paull. 3D printed titanium columns with internal monolithic phases for liquid chromatography. 18th European Conference on Analytical Chemistry (Euroanalysis), 6–10 September 2015, Bordeaux, France. P.490.

M Dvořák, Y Li, N Nuchtavorn, PN Nesterenko, M Macka. New generation of deep-UV LEDs incorporated in portable robust low cost detectors for microfluidic and miniaturized analysis. International Interdisciplinary Meeting on Bioanalysis, CECE-2015. 21–23 September 2015, Brno, Czech Republic.

JY Park, A Manz, RM Guijt. Online connection of free-flow isotachopheresis chip to an electrospray ionisation mass spectrometer. The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences, 25–29 October 2015, Gyeongju, Korea.

YC Yap, TC Dickson, AE King, RM Guilt, MC Breadmore. Microfluidic maze for studying the role of neuron-glia signalling in neuronal network. 19th International Conference on

Miniaturized Systems for Chemistry and Life Sciences, 25–29 October 2015, Gyeongju, Korea.

SC Phung, YN Nai, SM Powell, M Macka, RM Guijt, MC Breadmore. Microfluidic isotachophoretic fluorescence in situ hybridisation of bacteria cells. The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences, 25–29 October 2015, Gyeongju, Korea.

HH See, RM Guijt, MC Breadmore. Wall-less stationary pH boundary for stacking proteins on a glass microchip. The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences, 25–29 October 2015, Gyeongju, Korea.

AI Shallan, RM Guijt, MC Breadmore. Nanofluidic trap for DNA extraction from biological samples. The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences, 25–29 October 2015, Gyeongju, Korea.

MN Alves, PN Nesterenko, B Paull, M Macka. Approaches to portable analysis of bioanalytes using micro- and paperfluidic platforms utilising enzymatic activities. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

MA Islam, Y Li, PN Nesterenko, B Paull, M Macka. Advanced pulsed electrochemical detection options for microfluidic and paperfluidic platforms. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

M Rahbar, PN Nesterenko, B Paull, M Macka. Exploring the potential of nanoparticles in microfluidic paper-based analytical devices for rapid portable analysis targeted at food and agriculture areas. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

CT Desire, A Khodabandeh, DR Arrua, EF Hilder. The development of porous polymers from emulsion templates for separation science. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

E Fornells, B Barnett, M Bailey, E Hilder, R Shellie, MC Breadmore. Membrane assisted evaporative concentration. 23rd Annual Royal Australian Chemical Institute

Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

A Noori, M Macka, A Lucieer, J Parry. Portable IR-LED Based Atmospheric monitoring: Automated data handling of large data streams, 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

AT. Sutton, D Arrua, S Thickett, M Gaborieau, P Castignolles, EF Hilder. Characterisation of nanoparticle interactions by capillary electrophoresis. 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.

V Gupta, M Talebi, P Smejkal, J Deverell, S Sandron, PN Nesterenko, B Heery, F Thompson, S Beirne, GG Wallace, B Paull. 3D printed miniaturized analytical devices (3D MADe). 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December, 2015, Melbourne, Australia

Conferences Attended

MT Rokh. The 6th Australia and New Zealand Nano Microfluidics Symposium (ANZNMf), 31 March–2 April 2015, Melbourne, Australia.

Seminars to Universities and Companies

S Sandron, A Rojas, PN Nesterenko, N Davies, R Wilson, J Horne, R Shellie, P Haddad, B Paull. Resolving dissolved organic matter: New multidimensional approaches, University of South Carolina, Marine Science Program, 3 March 2015, Columbia, South Carolina.

M Macka. Portable analysis - Needs, successes and failures. University of Texas Arlington, 16 March, 2015 TX, USA.

RM Guijt. Electrodriven separations. Korea Institute of Science and Technology Europe, 15 April 2015, Saarbrücken, Germany.

MC Breadmore, D Gstoettenmayer, AJ Gaudry, A Alhusban, JM Cabot, L Ranjbar, HH See, P Smejkal. Sequential injection – capillary electrophoresis: Fundamental design and applications. 16 April 2015, Seoul, Korea.

RM Guijt. μ TAS @ UTAS – Past, present and Future. Research Seminar Department of Chemical Engineering, Vrije Universiteit Brussels, June 2015, Brussels, Belgium.

MC Breadmore. Electrophoretic systems and devices: fabrication, design and applications. University of Texas, 25 September 2015, Arlington, USA.

MC Breadmore. Electrophoretic systems and devices: fabrication, design and applications. University of Melbourne, 29 September 2015, Melbourne, Australia

MC Breadmore. Electrophoretic systems and devices: fabrication, design and applications. University Technology Malaysia, 21 October 2015, Johor Baru, Malaysia.

M Macka. Novel analytical approaches to on-site analysis: Paper-based microfluidics and portable liquid chromatography. Invited Lecture at Zhejiang University, Xixi Campus, 22 October 2015, Hangzhou, China.

Invited Workshops

MC Breadmore, RM Guijt, Al Shallan, H Ho. 3D printed microchips, Invited workshop at “The 19th International Conference on Miniaturized Systems for Chemistry and Life Sciences”, 25–29 October 2015, Gyeongju, Korea

MC Breadmore. Introduction to capillary electrophoresis, Invited conference

workshop at “UTM Capillary Electrophoresis Workshop”, 21–23 September 2015, Johor Baru, Malaysia.

Other Workshops

A. Khodabandeh. EDS & Mapping Workshop, The 13th Australian Microbeam Analysis Symposium at University of Tasmania, 9 February 2015, Hobart, Australia.

A. Khodabandeh. TEM Workshop, The 13th Australian Microbeam Analysis Symposium at University of Tasmania, 10 February 2015, Hobart, Australia

V Gupta. ARC Centre of Excellence for Electromaterials Science workshop at University of Wollongong, 12 February 2015, Wollongong, Australia.

NP Macdonald. ARC Centre of Excellence for Electromaterials Science workshop at University of Wollongong, 12 February 2015, Wollongong, Australia.

MT Rokh. Pre-symposium workshop on “Bringing laboratory fluidic concepts into commercial reality” at Monash University, 31 March- 2April 2015, Melbourne, Australia.

U Kalsoom. Pre-symposium workshop on “Bringing laboratory fluidic concepts into commercial reality” at Monash University, 31 March- 2April 2015, Melbourne, Australia.



Prof. Michael Breadmore discussing 3D printing and its applications at a workshop in Gyeongju, Korea, October 2015.



From Left: Leila Ranjbar Shourabi being awarded the first prize for the “Best Presentation”; Aliaa Shallan receiving the “Most Cited Original Paper” award at the ACROSS Gathering 2015

NP Macdonald. Mini-Symposium on Applied 3D Fluidics at University of Tasmania, 15 May 2015, Hobart, Australia.

F Cecil. Mini-Symposium on Applied 3D Fluidics at University of Tasmania, 15 May 2015, Hobart, Australia

JM Cabot. Characterisation of graphene fibers using C4D, Mini-Symposium on Applied 3D Fluidics at University of Tasmania, 15 May 2015, Hobart, Australia.

JM Cabot. Electrofluidic Thread-based Analytical Devices. Fibre fluidics workshop at University of Tasmania, 9 November 2015, Hobart Australia.

JM Cabot. Characterisation of graphene fibers and coatings using C4D. Fibre fluidics workshop at University of Tasmania, 9 November 2015, Hobart Australia.

NP Macdonald. 3D printing for microfluidic applications. Fibre fluidics workshop at University of Tasmania, 9 November 2015, Hobart Australia.

V Gupta. ARC Centre of Excellence for Electromaterials Science, Electrofluidics and Diagnostics theme workshop at University of Tasmania, 9 November 2015, Hobart Australia.

S Waheed. ARC Centre of Excellence for Electromaterials Science, Electrofluidics and Diagnostics theme workshop at

University of Tasmania, 9 November 2015, Hobart Australia.

AWARDS

Student Awards

JM Cabot. Extraordinary distinction award for “Thesis title: Determination of acidity constants of biological compounds by capillary electrophoresis” from all defended PhD thesis in the academic year 2014–2015, University of Barcelona.

M Dvorak, F Li. Awarded the joint “1st Poster Prize”, M Dvorak for “M Dvorak, N Nuchtavorn, PN Nesterenko, M Macka, New generation deep-UV LED for portable robust low cost optical detection in microfluidic and miniaturised analysis” and F Li for “F Li, RM Guijt, MC Breadmore, Microfluidic Devices with Integrated Nanochannels for Sample-in/Answer-out Analysis of Pharmaceuticals from Body Fluids” at The 6th Australia and New Zealand Nano Microfluidics Symposium (ANZNMF), 31 March–2 April 2015, Melbourne, Australia.

AT Sutton. Awarded the “1st Oral Presentation Prize” for “AT Sutton, D Arrua, M Gaborieau, P Castignolles, EF Hilder, Characterisation of oligoacrylates and their block co-oligomers” at RACI NSW Polymer

symposium. 20 November 2015, Sydney, Australia.

S Sandron. Endeavour Research Fellowship, Australian Government, Department of Education and Training, 2015.

CT Desire. Endeavour Research Fellowship, Australian Government, Department of Education and Training, 2015.

A Khodabandeh. Awarded the “Outstanding Contribution Award” at Australian Centre for Research on Separation Science (ACROSS) gathering, 2015.

AI. Shallan. Awarded the “Most Cited Original Paper” award for the “Cost-effective three-dimensional printing of visibly transparent microchips within minutes” at the ACROSS Gathering 2015.

LR Shourabi. Awarded the first prize for Best Presentation at the ACROSS Gathering 2015.

V Gupta. Invited as top 200 young leaders and thinkers of Australia for Junket, 1–3 November 2015, Canberra, Australia.

V Gupta. Selected as one of the top 13 young researchers from Australia for 65th Lindau Nobel Laureate Meeting, 28 June–3 July, Lindau, Germany.

V Gupta. Awarded with Science and Industry Endowment Fund – Australian

Academy of Science (SIEF-AAS) Fellowships to the Lindau Nobel Laureates Meetings, 2015.

D Choudhury. Received won the Judges Award (\$500) for “Overcoming thermal instability limitations of polymer stationary phases by graphene oxide modification” at Virtual Symposium on Applied Separation Science (VSASS), June 2015.

V Gupta. Invited as an Early- and Mid-Career Researcher for Science at the Shine Dome, 26–28 May 2015, Canberra, Australia.

SH Park. University of Tasmania graduate research conference and travel fund scholarship to attend and present at 42nd International Symposium on High Performance Liquid Phase Separations and Related Techniques - HPLC 2015, University of Tasmania, Australia

RM Tubaon. University of Tasmania graduate research conference and travel fund scholarship to attend and present at 17th International Symposium on Advances in Extraction Technologies, 7–11 November 2015, Guangzhou, China,

CT Desire. Awarded the “Best Poster Award” for “The Development of Porous Polymers from Emulsion Templates for Separation Science” at 23rd Annual Royal Australian Chemical Institute Research and Development Topics, 6–9 December 2015, Melbourne, Australia.



From Left: Chris Desire, awarded the “Best Poster Award” at 23rd Annual Royal Australian Chemical Institute Research and Development Topics, December 2015, Melbourne, Australia; Disha Choudhury awarded the Judges Award (\$500) for poster in the recent Virtual Symposium on Applied Separation Science (VSASS).



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