RESEARCH NEWSLETTER

Summer Term 2018
Summer Term Issue

This newsletter covers the latest Pharmacy research news between March 2018 and July 2018. Please advise our new research division leads Angela Bithell (a.bithell@reading.ac.uk) or Francesca Greco (f.greco@reading.ac.uk) if there are any items you would like included in our next issue.

This newsletter reports on successful grant applications, student news, published papers and related research news.
Talks and Presentations

**Khutoryanskiy V.V.** “Nasal drug delivery: challenges and opportunities”, open lecture, Kazan State Medical University, Kazan, Russia, Invited by Dr Rouslan Moustafine (16th May 2018)

**Khutoryanskiy V.V.** “Designing muco-adhesive and muco-penetrative systems for drug delivery”, invited lecture, Institute of Macromolecular Chemistry, Prague, Czech Republic, Invited by Dr S. Filippov (16th Apr 2018)

Kaldybekov D.*, **Khutoryanskiy V.V.** “Maleimide-functionaLised liposomes and nanoparticles as mucoadhesive vehicles for drug delivery to urinary bladder”, invited lecture, Institute of Macromolecular Chemistry, Prague, Czech Republic, Invited by Dr S. Filippov (16th Apr 2018)

**Rosemary Lim** gave an invited talk entitled ‘How do people with dementia and their family carers manage medication-taking?” at the ARUK Dementia Day, 16th July 2018.

**Patrick Lewis** attended the International Parkinson’s Disease Consortium meeting at DeCode in Reykjavik on the 10th & 11th May.

**Patrick Lewis** at the International Parkinson’s Disease Consortium meeting
Talks and Presentations

Dr Parastou Donyai was invited speaker at the BHFT/TVCTU conference “Research Collaborations for Better Patient Care” on 24 May 2018, giving a talk about “Mental Health Research through an Academic Practice Unit”.

Dr Parastou Donyai was invited speaker at the BHFT “Clinical Academic Seminar” on 26 July 2018, giving a talk about “Seven years of Joint Research with BHFT and UoR: antipsychotics in dementia; drug holidays in ADHD; paliperidone LAI; medication administration errors; valproate in pregnancy; insulin dependent diabetes and dementia”

FISNA 2018

Following a collaborative project on the topological impact on non-canonical DNA structure on DNA polymerase, with Shuntaro Takahashi and Naoki Sugimoto published in PNAS in 2017, John Brazier was invited to present at the FIBER International Summit for Nucleic Acids 2018 (FISNA2018). The FIBER institute is based at Konan University in Kobe, Japan and contributes significantly to Konan University’s position as 3rd best University in Japan for research quality and impact. In recognition of his impressive publication record, James Hall was also invited to present his recent work on Ruthenium complex binding to double stranded and four stranded DNA structures. James also went on to present this work to the Graduate School of Pharmaceutical Sciences at Kyushu University in Fukuoka, Japan.

John has remained at the Graduate School of Pharmaceutical Science over the summer to present a series of lectures and workshops on Pharmaceutical Chemistry to both undergraduate and master’s level students.
Talks and Presentations

Dr Francesco Tamagnini visited the Liceo “Ghandi” in Merano/Meran, Italy on the 12th of March 2018. Merano is a small Italian town nestled within the Alps, in the region of South Tyrol.

He was invited to the Liceo (High-School / College equivalent) “Ghandi” in Merano/Meran, where he delivered a two hour seminar on neuroscience in the morning, for the students, followed by another 2 hour session in the afternoon for teachers and selected student. The morning session was a more general, lay overview on neurophysiology, while the afternoon one explored in more detail his research on electrophysiological alterations in dementia.

Gary Stephens chaired a British Pharmacological Society -sponsored symposium "Calcium signaling in the CNS: ion channels and receptors" at the 18th World Congress of Basic and Clinical Pharmacology in Kyoto, Japan in July 2nd 2018.

Gary Stephens spoke at an event in honour of the retirement of Prof Sumiko Mochida at Tokyo Medical University, Japan on July 7th.

Dr Mark Dallas attended the Experimental models in physiology and presented a poster entitled ‘Ionic Microdomain Formation at the Perisynatic Cradle’ which is a new collaborative study with Ulster, Manchester and Liverpool.
Dr Kenneth Shankland delivered an invited keynote speech at the 16th European Powder Diffraction International Conference (“EPDIC”) in Edinburgh on 2nd July. His presentation, “Bigger Structures, Faster” covered some recently published work with Elena Kabova on the optimisation of the simulated annealing parameters in the DASH crystal structure determination program.

Dr Shankland also had the honour of chairing the session for the EPDIC Young Powder Diffractionist Award Winner, and got a mention in the closing presentation, where his work on DASH was highlighted by Prof. Bill David, FRS.

Rosemary Lim and Claudia Manzoni presented at ARUK Dementia Day presented talks entitled ‘How do people with dementia and their family carers manage medication-taking?’ and ‘Protein network interactions in FTD’
**Talks and Presentations**

Dr Sakthi Vaiyapuri delivered a ‘Key note presentation’ at the International Conference on Pharmacology in Tokyo, Japan (June 2018).

Dr Divyashree Ravishankar presented research data as an oral presentation at the International Conference on Pharmacology in Tokyo, Japan (June 2018).

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Prof Vitaliy Khutoryanskiy and his postdoc Dr Daulet Kaldybekov visited the Institute of Macromolecular Chemistry, Prague (Czech Republic) in April 2018 to deliver lectures and to conduct joint experiments on electron spin resonance (ESR) studies of nanoparticle diffusion with Dr Sergey Filippov.

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Vitaliy, Daulet and Sergey carrying out ESR experiments
Dr Rosemary Lim organised an interactive stakeholder workshop “Managing medications in dementia: mapping the system and prioritising future directions” with colleagues from Typography, Applied Linguistics and Psychology. This workshop was held on 8th June 2018 and was funded by the Centre for Integrative Neuroscience and Neurodynamics (CINN), UoR and brought together stakeholders from the NHS, patient and public representatives, academics and third sector.

Dr Rosemary Lim organised a workshop “Systems factors associated with the use of intravenous insulin infusions – current evidence and future directions” with collaborators at the Oxford University Hospitals NHS Foundation Trust and RSOP. This workshop was held on 20th April 2018 and brought together stakeholders from NHS hospital trusts, Joint British Diabetes Societies, NHS Improvement, Pharmaceutical Companies, Expert Patient groups and academics.

Donyai P. *Teaching and assessing Pharmacy ethics through a novel workshop.* Workshop at the Advance HE (HEA) annual conference; 2018 July 3-5; Aston, UK.

Catherine Langran and Kat Bicknell ran a workshop at the Pharmacy Education conference in Manchester on June 25th on Student engagement, diversity and inclusion. This workshop was based on the research that Catherine has done on student attendance and how we can better support student learning.
Publications


Al Mahrooqi J., Mun E.A., Williams A.C., Khutoryanskiy V.V.* Controlling the size of thiolated organosilica nanoparticles, Langmuir, DOI: 10.1021/acs.langmuir.8b01556 (2018)


Calo E., Ballamy L., Khutoryanskiy V.V.* Hydrogels in wound management, in Hydrogels: Design, Synthesis and Application in Drug Delivery and Regenerative Medicine, chapter 7, CRC Press (2018)

Edited Book

Publications

Blauwendraat C, Bras JM, Nalls MA, Lewis PA, Hernandez DG, and Singleton AB for the International Parkinson’s Disease Genomics Consortium (2018) “Coding variation in GBA explains the majority of the SYT11-GBA Parkinson’s disease GWAS locus” Manuscript accepted, Movement Disorders


Publications

From fibroblasts to medicinal signalling cells: a paradigm shift in translational stem cell research
Jonathan Sheard, Thamil Selvee Ramasamy and Darius Widera

Inhibition of NF-κB signalling reduces the stemness characteristics of lung cancer stem cells
Norashikin Zakaria, Narazah Mohd Yusoff, Zubaidah Zakaria, Darius Widera and Badrul H. Yahaya
Front Oncol. 2018 May 17;8:166

Isolation and Characterisation of Neural Crest-Derived Stem Cells from Adult Ovine Palatal Tissue
Marie-Theres Zeuner, Nikolai N. Didenko, David Humphries, Sokratis Stergiadis, Taryn Morash, Ketan Patel, Wolf-Dieter Grimm and Darius Widera

Gary Stephens was communicating author on "Species-specific susceptibility to cannabis-induced convulsions. British Journal of Pharmacology. ISSN 0007-1188 doi: https://doi.org/10.1111/bph.14165.

Gary Stephens acted as Editor British Journal of Pharmacology Themed Issue "Targeting ion channels to treat chronic pain", which was completed and published in June 2018 (see https://bpspubs.onlinelibrary.wiley.com/toc/14765381/2018/175/12).

He contributed an Editorial along with his co-editor Edward Stevens (Metrion Biosciences).


The University Executive Board has approved funding for the University Research Committee’s decision to invest up to £440K in FY18/19 for the purchase of a new, state-of-the-art single-crystal X-ray diffractometer, to be run within CAF. This was the result of a strong proposal to the research committee by the team of Ann Chippindale (CAF Diffraction Lead), Christine Cardin, James Hall, Kenneth Shankland, Laurence Harwood (CAF Director) and Nick Spencer (CAF X-ray technician), with contributions from many other interested parties.

The diffraction team are looking forward to working with the procurement team and potential equipment suppliers in order to get the new instrument in place as soon as possible. They will then be arranging a launch event, in order to engage with as many users as possible within the University and beyond, once the instrument is up and running.

One of the instruments in the running is the Rigaku XtaLAB Synergy-S shown below. It represents a massive step forward in capability relative to the current Oxford Diffraction Gemini instrument. Aside from the ability to work with much smaller crystals, the instrument can collect data much faster, facilitating the study of crystal structures as a function of temperature, humidity and pressure. Automatic screening of small protein crystals, prior to visiting a synchrotron source, is also possible with this equipment, opening up exciting new research possibilities.
Awards

Dr Sakthi Vaiyapuri is a ‘Winner’ of ‘Research Engagement and Impact Award 2018’ for ‘Embark’ category and a Finalist for ‘Inspire’ category for his research outreach activities on developing awareness about snakebites to children in rural areas of India.

Photo shows Sakthi’s family members including Dr Raj Vaiyapuri (from the School of Pharmacy, University of Reading Malaysia) and his family holding the awards and certificates along with Mr Harry Williams (Sakthi’s PhD student) and Mr Harry Layfield (Sakthi’s technician) who are working on venoms.

Patrick Lewis also attended the Research Engagement and Impact Awards event on the 19th June and was presented with an ‘Inform’ award.

Patrick Lewis with his ‘Inform’ award co-winner Sally Bromley, Chair of the Oxford Parkinson’s UK branch.
During April – July Prof Khutoryanskiy’s research group hosted 9 visitors from Nazarbayev University (Kazakhstan) to receive training in various aspects of pharmaceutics, colloid and polymer science.

These visits are part of Erasmus+ grant on staff exchange between the University of Reading and Nazarbayev University.

Prof Khutoryanskiy with some of the Erasmus Visitors

Darius Widera is currently Guest Editor for the Research Topic ‘Tissue Repair and Regenerative Mechanisms by Stem/Progenitor Cells and their Secretome’ in Frontiers in Medicine


Al Edwards made a productive research visit to the University of Oviedo, Asturias, Spain. Building research links with past Erasmus exchange MSC student Barbara Nogueira, and new Pharmacy PhD student Marcos Ladreda – photo above.
Dr. Rosemary Lim was recently awarded ‘New Research Collaborators with Berkshire Healthcare NHS Foundation Trust for 2017/18’ in recognition of her study which explored medication management in people with Alzheimer’s and family carers.

We welcome Sarah Needs, postdoc on Al Edwards’ Newton Institutional Links grant with Thailand, who will be based at Reading but also spending time in Bangkok testing new dengue fever blood tests.

Through Al Edwards’ recent dengue fever diagnostic test grants, an original Prusa i3 MK3 was purchased to 3D print prototype blood test devices—see attached picture. It is extremely useful for making small plastic models or devices for anything from illustrating drug structure, all the way up to patient compliance aids and making pills. PLEASE JUST ASK if you are interested in 3D printing anything for teaching or research purposes!

Darius Widera has been appointed Academic Editor for the journal Stem Cells International (IF: 3.989, https://www.hindawi.com/journals/sci/editors/)

Expert reviewer

Dr Parastou Donyai was invited as expert reviewer for the 2018 College of Mental Health Pharmacy’s Research Bursary Award applications.
Epiplex, which is a drug based on a cannabis-derived compound CBD whose role in preventing seizures was shown at the University of Reading, has been developed by GW Pharmaceuticals PLC and will now be available in the US following approval by the Food and Drug Administration (FDA). The drug has been approved by the United States Food and Drug Administration for the treatment of seizures associated with Lennox-Gastaut syndrome (LGS) or Dravet syndrome in patients two years of age or older. Ongoing GW Pharmaceutical-sponsored work involving PhD projects led by Alister McNeish, Angela Bithell, Mark Dallas and Graeme Cottrell are investigating mechanisms of action of CBD.

This work has been commented on by Gary Stephens:

http://blogs.reading.ac.uk/the-forum/2018/06/26/cannabis-oil-for-epilepsy-what-you-need-to-know/

Dr Parastou Donyai’s comments on new research looking at the link between antidepressants and bladder medicines and dementia later in life were quoted by The Guardian and BBC News and other international news websites, 26 April 2018.

An article in The Pharmaceutical Journal about the feasibility of allowing medicines reuse included comments by Dr Parastou Donyai. DOI: 10.1211/PJ.2018.20205091

Fran Greco, Kathryn Hill (AZ) and Philipp Seib (University of Strathclyde), as chairs of the APS nanomedicine focus group, organised a meeting on “Nanomedicines for the Delivery of Biologics”, which was held in the Meadow Suite at the University of Reading.
Competition success

Dr Parastou Donyai and Dr James Hall won third place in the Pharmaceutical Journal’s 2018 writing competition ‘Future Pharmacist’ with an article entitled ‘Medicines at a touch of a button’.

https://www.pharmaceutical-journal.com/opinion/blogs/medicines-at-a-touch-of-a-button/20205120.blog

Congratulations

Congratulations to Mark Dallas and Sakthi Vaiyapuri for their promotions from lecturer to associate professor, and to Parastou Donyai and Katja Strohfeldt-Venables for their promotion to professor.

Dr Sakthi Vaiyapuri has been appointed as a ‘Visiting Professor in Applied Biochemistry & Cardiovascular Diseases’ in Trichy SRM Medical College Hospital and Research Centre, Tamil Nadu, India (Photo below) in June 2018.

Academic Visitors

Mr Louis Le Guen is an academic visitor to Sakthi Vaiyapuri’s research group for two months from the University of Clermont Auvergne, France.

Dr Raj Vaiyapuri is an academic visitor to Sakthi Vaiyapuri’s research for two months from the School of Pharmacy, University of Reading Malaysia.
Funding Success

Vitaliy Khutoryanskiy was awarded the H2020-MSCA-RISE-2018 Marie Skłodowska-Curie Research and Innovation Staff Exchange grant “Soft Biocompatible Polymeric Nanostructures: A Toolbox for Novel Generation of NanoPharmaceuticals in Ophthalmology” (in partnership with Crete, France, Finland, Brazil, Russia and Kazakhstan)

Dr Rosemary Lim recently received funding to extend ongoing work in dementia and medication management. Brian Revell Memorial Fund, circa £1k.

Dr Rosemary Lim recently received funding to extend work in developing and evaluating an educational intervention to improve antimicrobial prescribing in primary care by non-medical prescribers. Cardiff University ESRC Impact Accelerator Account, circa £20k.

Dr Rosemary Lim led an application involving colleagues from Typography, Applied Linguistics and Psychology, and was successful in receiving pump-priming funds from the Centre of Integrative Neuroscience and Neurodynamics (CINN), UoR. 1K

Dr Parastou Donyai was awarded an Alzheimer’s Society summer studentship as co-applicant, (lead, Kate Masters, BHFT), ‘Dementia and diabetes: improving the safety of insulin’, £1,650, April 2018

Dr Parastou Donyai was awarded an Alzheimer’s Society dissemination grant as lead applicant, (co-applicant, Sundus Jawad, East Berkshire CCG), ‘Sharing dementia research with care homes through stories’, £2,500, July 2018

Dr Parastou Donyai received funding from the Masonic Lodge Berkshire, to support a postgraduate studentship in pharmacy, total £5,000 (July 2018).

Impact Funding Success

Dr Parastou Donyai was successful in her application to the BOISP programme based on her research, ‘Making medication reuse a reality in the UK’

Beamtime Success

John Brazier has been awarded 16 days of circular dichroism beamtime, over two years, as a programme access award to support his current BBSRC project.

James Hall has been awarded 1.33 days of beamtime to use two different techniques, biological X-ray diffraction and circular dichroism.
Poster Presentations

Ways T.M.M.*, Lau W.-M., Khutoryanskiy V.V. PEGylated chitosan nanoparticles for nasal drug delivery

4th Annual Keele Nanopharmaceutics symposium, Keele University, 29th June 2018

Al Mahrooqi J.*, Khutoryanskiy V.V., Williams A.C. The effect of varying catalyst type and concentration on characteristics of thiolated organosilica nanoparticles

4th Annual Keele Nanopharmaceutics symposium, Keele University, 29th June 2018
Student news

Kolawole O.*, Lau W.M., Khutoryanskiy V. Methacrylated chitosan with improved mucoadhesiveness for transmucosal application

UKICRS Symposium 2018, Queen’s University of Belfast, 5 June 2018

Dami with her poster

Darius Widera’s PhD Student, Marie Zeuner has been invited to participate in the highly selective Roche Continents Programme (https://roche-continents.com/home.html). Roche Continents is an interdisciplinary leadership programme, exploring innovation at the intersection of arts and science.

Every year, Roche invites 100 of Europe’s most talented students and young postdocs to Salzburg in Austria. The participants of the programme are selected by a jury in a competitive process from an applicant pool composed of top-students nominated by their schools across all Europe.
From 28-30th July, **Yiming Meng, Darius Widera’s** PhD student, participated to the Lancashire Science Festival (http://www.lancashiresciencefestival.co.uk/). As one of the volunteers for the Biochemical Society, she explained cell biology and biochemistry topics to children from primary schools and the general audience.

**Yiming Meng (first from left) at the Lancashire Science Festival**

**Jethro Beamish-Cook**, a PhD student supervised jointly by **Kenneth Shankland** and Paz Vaqueiro, delivered an invited talk in one of the microsymposia, at the 16th European Powder Diffraction International Conference (“EPDIC”) in Edinburgh on 2nd July discussing his work on crystal structure elucidation from powders produced by mechanochemical synthesis.

**Jethro Beamish-Cook giving his talk**
Az Alddien Natfji (Supervisors: Francesca Greco and Helen Osborn) attended the 12th International Symposium on Polymer Therapeutics in Valencia, Spain from 28-30th May 2018. He presented his PhD work as a poster and a 3-min flash presentation with the title: “Polymer-Haloperidol conjugate, a peripherally localised agent with a retained biological activity. He received a travel bursary from conference organisers”.

At the beginning of June (4th-7th) Marleen Wilde (Supervisors: Francesca Greco and Rebecca Green) presented her work in a 20 min talk entitled: “Biophysical Studies of PAMAM interactions with membrane models” at the Biodendrimer Conference in Urbino, Italy.

Marleen was awarded UoR Graduate School Travel Bursary and the D.H. Richards Memorial Bursary (Macro Group) to fund her travel and conference expenses.

Marleen Wilde (Supervisors: Francesca Greco and Rebecca Green) was awarded a space on the Synchrotron Radiation School, taking place from 16th -21st September at the Jesus College in Oxford and the Diamond Light Source in Harwell. Costs for the school are covered by parts of the UoR Graduate School Travel Bursary.
Student news

UROP student Hadiqa Ali (MPharm Part2) started her summer project at the beginning of July, under the supervision of Marleen Wilde, Francesca Greco and Rebecca Green. She will be establishing a robust manufacturing protocol for lipid vesicles as membrane models suitable for drug interaction studies.

ERASMUS student Marta Favaron from the University of Padova, Italy joined Francesca Greco’s group to study the biological effect of PAMAM dendrimers in cancer cell lines and also their antimicrobial activity. She stays for approximately 6 months and will return to Italy in the beginning of September.

Mais Iflaifel, PhD student supervised by Dr Rosemary Lim and Professor Kath Ryan, was shortlisted and took part in the 3 minute thesis competition at this year’s University of Reading Doctoral Research Conference held on 20th June 2018. Mais’ talk was entitled: Thinking of safety differently in the use of injectable insulin.

Mais Iflaifel won the most passionate, energetic and interesting presentation prize at the PhD consortium, Chartered Institute of Ergonomics and Human Factors annual conference held on 23rd April 2018, Birmingham. Her talk was entitled: Understanding safety differently: an exploration of the use of intravenous insulin infusions in hospital in-patients. (Photo of Mais above)
Student news

UROP students recruited

Dr Parastou Donyai successfully recruited the following MPharm undergraduate students for summer research projects:

Zeenat Beg, project entitled “Using conversation analysis to examine pharmacy student OSCEs”, working with Dan Grant

Eslam Abd Al-Shakour, project entitled “Dementia and diabetes: improving the safety of insulin”, working with Kate Masters

Juhi Gayatri Rathor, project entitled “Designing a questionnaire for studying medication reuse practices”

Ms Alexandra Soundy is a UROP project student with Sakthi Vaiyapuri’s research group for six weeks from the School of Biological Sciences, University of Reading.

Conference Presentations

Presented by Dr Hamza Alhamad whose PhD supervisors were Dr Parastou Donyai (PI) and Nilesh Patel:

Alhamad H (presenter), Patel N, and Donyai P (PI). Beliefs and intentions towards reusing medicines in the future: a large-scale, cross-sectional study of patients in the UK. Health Services Research and Pharmacy Practice conference; 2018 April 12-13; Newcastle, UK. Published: Int J Pharm Prac Vol 26 Issue S1.

Alhamad H, Patel N and Donyai P (PI). Validity and reliability testing of the Medication Reuse Questionnaire. Presentation at the 13th United Kingdom Society for Behavioural Medicine Annual Scientific Meeting; 2017 Dec 13-14; Liverpool, UK.
PhD success

Hamza Alhamad (PhD supervisors were Dr Parastou Donyai (PI) and Nilesh Patel) defended his PhD thesis successfully, passing his viva with minor corrections on 8 December 2017. Hamza’s thesis is entitled: "Sustainability and medicines waste: investigating public attitudes towards reuse of medicines returned to community pharmacies" and the external examiner was Professor Charles Morecroft an expert in the field of pharmacy practice and psychology. The internal examiner was Professor Helen Osborn.

Mr Kahdr Alatawi, (PhD supervisor Sakthi Vaiyapuri), has presented his research data as poster presentation at the 1st Early Career Research Meeting organised by the Platelet Society, UK at Manchester (July 2018).
Student news

Conference presentation

Mr Kahdr Alatawi (PhD student with Sakthi Vaiyapuri) presented his research data as an oral presentation at the International Conference on Pharmacology in Tokyo, Japan (June 2018).

Ms Chi Ut Kitty Iun, a MPharm student has won the ‘Physiological Society Best Project Award’ for her final year research project from Sakthi Vaiyapuri’s research group.

Emily Roashan (PhD Student of Angela Bithell, pictured left) also presented at the Experimental models in physiology. ‘A Quantitative Systems Pharmacology Approach to Understanding Drug Mechanisms of Action’

Alessia Frigo (an Erasmus student, pictured right) supervised by Dr Widera and Dr Dallas presented her poster entitled ‘Fibrillar and non-fibrillar amyloid-β₁₋₄₂ peptides induce neuroinflammation via TLR4.’ at the Alzheimer’s Research UK Oxford Network Dementia Research Day