Franklin Women

November 2016 Newsletter

I started writing a completely different introduction for this month's newsletter until I realised it is November and this is the last newsletter of the year (whaaat!). So I have changed tack and want to take this opportunity to thank all of our members, supporters and followers for a wonderful 2016. It has been a big year for the FW team who have been working hard to grow our organisation so that we can do more towards achieving our vision of a health and medical research sector where women thrive. We are well on our way, with double the number of Carer's Travel Scholarships this year (Round 2 recipient announced in this newsletter!) and our cross-organisational mentoring program due to launch in 2017. We have also been very lucky to have supporters willing to help get FW going in cities other than Sydney in the not too distant future. Thankfully, some big organisations in the sector are wanting to invest in us so we can achieve all of this, and we are very grateful that they see our potential. But at the end of the day, we wouldn't be able to do any of it without our members who ultimately drive Franklin Women. So thank you!

We hope you enjoy our last newsletter for 2016. Our best wishes to you and yours for the silly season and the year that follows.

Melina and the FW team

PS. If you need some Xmas gift inspiration check out the ideas from our amazingly creative newsletter curator, *Amy Vassallo*, in the 'we are loving' section this month.

What happened this month

- This *study* highlighting concerns among scientists regarding career opportunities.
- Release of the 2016 *Professional Scientists Employment and Remuneration* Report.
- An Occasional Paper from the Office of the Chief Scientist was released on the topic of *busting myths about women in STEM.*
- Two amazing health researchers were awarded *Women in Research Citation Awards*
- The strategy for 2016–2021 and funding priorities for 2016–2018 for the *Medical Research Future Fund* were released.
- We held our final FW event for the year – a workshop on using Twitter and LinkedIn to promote yourself and your research. Resources are up now on our *website*.

FW Journal Club

This month's Journal Club is from Elizabeth Hinde, Cancer Institute NSW Early Career Fellow and leader of the Biophysics of Nuclear Organisation Group at UNSW. Elizabeth is also the recipient of the 2016 Round 2 Franklin Women Carer's Travel Scholarship, congratulations!

Hinde E, Thammasiraphop K, Duong HTT, Yeow J, Karagoz B, Boyer C, Gooding JJ, Gaus K. Pair-correlation microscopy reveals the role of nanoparticle shape in intracellular transport and site of drug release. *Nature Nanotechnology*. 2016, *In press.* doi:10.1038/nnano.2016.160

What were the aims of this research? Here we present a fluorescence microscopy method to track the movement of differently shaped nanoparticles through a single cultured cancer cell. Using this technology we aimed to measure how shape affects a nanoparticle's journey into the cell and whether shape influences escape from the endosomal system or access to the nucleus. This study enabled us to pinpoint which intracellular barriers caused shape dependent access and the impact this has on release of nanoparticle cargo with unprecedented spatiotemporal resolution.

What are the top 3 take home findings of your research? 1. Nanoparticles shaped like rods are more effective than spherical nanoparticles at traversing intracellular barriers and this enabled them to get all the way into the nucleus of the cell. 2. The cancer drug, doxorubicin, was most effectively delivered when the nanoparticle carrier could breach the envelope protecting the nucleus and release the drug, as distinct from the drug being released in the cytoplasm and diffusing to the nucleus. 3. Pair correlation microscopy is a great analytical tool to test the impact of nanoparticle size, shape or surface chemistry on live cell uptake and intracellular translocation.

How does this research contribute to the field? Researchers could previously see the overall distribution of their nanoparticles throughout a cell, but didn't have the microscopy tools to understand how this localisation was set up – a key limitation in drug delivery research. Pair correlation microscopy enables researchers to dissect how nanoparticles arrive at their final destination and therefore how to selectively target nanoparticle cargo to specific locations. Now we have a tool to understand the impact of different nanoparticle designs on drug delivery to specific regions of the cell and to gauge where the cargo is being dropped off. This means that other research groups can use this to assess their nanoparticles and drug delivery systems.

Who are your collaborators and how did your work relationship come about? This project was a collaboration between biophysicists from the EMBL Australia node in Single Molecule Science and chemists from the Australian Centre for Nano-Medicine (ACN), University of New South Wales. This collaboration came about from joining the ACN and attending their annual meeting in Coogee, Sydney when I first arrived at UNSW. This collaboration bridged together our expertise in imaging the diffusive route of molecules in live cells with the expertise of the chemists in fabricating novel nanoparticle structures.

What is your current role and organisation and how long have you been there for? I am currently a Cancer Institute NSW Early Career Fellow who leads the Biophysics of Nuclear Organisation Group within the EMBL node in Single Molecule Science at UNSW. I initiated my group at the beginning of 2016 and prior to that was a Vice Chancellor Research Fellow within the group of Professor Katharina Gaus. I have been at UNSW for 3 years.

What new skills or projects are you currently working on? One of the most exciting projects I am currently working on is a study of how DNA repair factors navigate three-dimensional nuclear organisation in live cells and can instantaneously arrive at a detected damage site located anywhere within the genome. Using fluorescence lifetime imaging microscopy, so far we have found that dynamic rearrangements in genome organisation create 'highways' to the damage site, that serve to funnel the DNA repair factors to the correction location.

Who is a woman that inspires you? Elizabeth Bennet from *Pride and Prejudice*.

What food have you eaten too much of in your life? Milo

Have you published recently? Firstly congratulations! Secondly drop us a line at hello@franklinwomen.com. We'd love to hear from you and are always on the lookout for journal club contributors for our newsletter. ☺

Reach out: driving research through community engagement

There were a lot of negative news stories about careers in science this month, so we hope this article from researcher, writer and FW Roving Reporter Clare Watson helps to remind us all what health and medical research careers are really all about.

Time is short for researchers – no argument there. Often with multiple projects on the go and those pesky grant deadlines never out of mind, the year can feel like it is quickly racing by. On top of this, organising or attending community outreach events may feel like one commitment too many.

Outreach events pop up frequently and, in the health and medical research sphere, bring together lab-based scientists, health professionals involved in clinical research and people affected by a particular condition – who might not otherwise cross paths. Research institutes or individual research groups may invite patients and their families to attend *seminars* to hear an update of current studies or offer lab tours to give people a behind-the-scenes look

at how the science happens. For more general audiences, there are social events like *Pint of Science* and fundraising may be an element too.

These events, whilst focused on engaging the community, are rewarding for researchers too. Without them, I think I would have drifted away from research. After many hours in the lab or office, head buried in pipette tip boxes or paperwork, participating in community outreach events might reaffirm your personal motivations or reignite the drive to persevere with important research. It's a chance to recognise the impact of your research and also an opportunity to show your appreciation where patients have generously donated tissue to, participated in or funded research!

Shu Yang, a research fellow at Macquarie University and recent interviewee for the *Franklin Women blog*, agrees. "I use patient samples in my research and I am very grateful – my research wouldn't be possible without their contribution. I think it's very important to let [people] know what kind of research we are doing and what progress has been made."

Like Shu, my research focuses on motor neurone disease (MND) and recently I attended the *#MNDConnect16* day hosted by *MND Australia*. It followed the annual research meeting of the MND Research Institute of Australia (MNDRIA). The parallel between the two days was insightful: the scientific meeting showcased the breadth of ambitious research set to decode MND, while the community day featured a summary of this research alongside stories of patient experience and panel discussions. Here, patients had many questions of their own regarding nutrition, exercise and environmental factors.

In this way, conversations sparked during community outreach events can direct researchers to important research questions awaiting attention. In the case of MND, research at the genetic and cellular level, which is seeking to understand the mechanism of the disease to devise therapeutic treatments, imparts hope to patients and their families (*two preliminary clinical trials* recently opened in Australia). But my impression is that research into nutrition and exercise is also needed to answer questions concerning physical care. These events are a place for starting conversations, and for listening too.

Shyuan Ngo, who organised the MND Connect event in Brisbane this year, explains: "I have learnt so much from the MND community and, over the last few years, it is their stories and the questions that they ask of me that has really helped me refine my own research questions and direction. Sometimes we go about our day-to-day lives in research asking questions that we think are important – there is no denying that all scientific questions have merit – but in my experience, it is a person's story that provides new insights that we potentially never consider."

Community outreach events also break down the perceived barriers separating the general public and academia. Most researchers passionate about their work would, I'm going to

guess, be happy to take phone calls and answer inquiries about their research, but the public don't see us as approachable until we invite them in.

MND Australia offers a telephone support line for patients, their families and carers through the state MND associations. Through this service, MND Advisors can provide information for people recently diagnosed with MND, assist people living with MND identify the services they may need, and give advice regarding referral to clinical and community services.

***Clare* is a regular contributor to *SBS Science* and a monthly columnist for *Lateral Magazine* covering topics in environmental science, biomedical science, psychology and materials science. By day, Clare works with the Motor Neurone Disease (MND) Research Team and the Targeted Therapeutics Group at the University of Wollongong. She still dreams of taking another *surfing adventure* with her partner-in-crime (fiancé), Dean.**

We are loving right now...

***The holiday season*!! With 2016 drawing to a close (what a year it has been hey?), attention is turning to the silly season. So to help you get started on your shopping, here are some of the favourites from our Christmas wish list…**

- Get all your interstate pressies sorted with these *boutique gifts and hampers,* there's something for everyone here!
- This *raincoat* is all kinds of amazing, just perfect for a summer rain shower.
- For your literary friends, head straight to *Litographs*, where the text of your favourite books is lifted off the page and into your wardrobe.
- Get ready for 2017 with this *page-a-day calendar* of the smartest things ever said.
- Dads are the hardest to buy gifts for, right? Check out this *website* dedicated to the men in your life.
- And to truly get you in the holiday spirit, I'll leave you with some *animals opening Christmas gifts*, aww <3

We want to include your contributions in our newsletter. If you have published your work recently or are doing (or know of) something that other women in our field would be interested in, drop us a ***line***. Want to receive our newsletters directly to your in-box? *Subscribe here*.