PROFILES IN OPEN: THOMAS DURCAN

THOMAS DURCAN is an assistant professor in the department of Neurology and Neurosurgery at McGill University and a member of the Neurodegenerative Disease research group at the Montreal Neurological Institute-Hospital (The Neuro). Dr. Durcan received his BSc from University College Dublin, Ireland, before moving to the USA where he obtained his PhD in Cell and Molecular Biology from the University of Notre Dame. Dr. Durcan runs a research laboratory and manages The Neuro's Early Drug Discovery Unit (EDDU), a unique platform central to The Neuro's Open Science initiative.

Tell us a bit about your research interests.

My research focuses on using patient-derived stem cells to develop standardized (or well-characterized) discovery assays and 3D mini-brain models for neurodegenerative and neurodevelopmental disorders. As group leader of The Neuro's EDDU, I manage a team of over 35 research staff and students committed to applying novel stem cell technology combined with CRISPR genome editing, mini-brain models and new microfluidic technologies towards explaining the underlying causes of complex neurological disorders. Combined with new approaches towards building MultiOmics profiles of patient-derived induced pluripotent stem cells (iPSC), the long-term strategy is to identify new personalized precision therapies that can be applied to building clinical trials on a dish.

What did your funder ask of you with respect making your research open?

The only criteria my funders had was for me to make my publications open access. However, in recent years, I have become more interested going beyond this in making sure that protocols, posters, manuscripts, and (soon) software developed by my group are distributed early and in an openly accessible way. In my experience, feedback from researchers, patients, funders and industry has been very positive and has driven me to keep finding new ways to make my research more open. There are many benefits to making our work open and available. Other researchers and the broader community can see how we do things. It also helps to start conversations with other scientists who might see something useful or point to something we are doing wrong so that we can make changes and improvements.

How did you feel about that?

I started becoming more open by writing my Open Lab Notebook blog. I am a private person, so having an online platform open for scrutiny was nerve-wracking and stressful at first. But, as I put more content online, people started reaching out to me – from scientists to patients – telling me how much they enjoy reading my experiences and the type of work we do at The Neuro. It is invigorating to engage with the wider community through open science. I am confident that together, our efforts will help drive research forward, and lead to new treatments for patients and their families.

For me, the blog is open science – a way to communicate our research findings, explain the intricacies of our work and detail the materials and methods we use to a broad audience. Scientific papers typically only reach a scientific audience, but the blog allows me to make my work more accessible, personal and relevant to anyone interested in taking a more active role in science research. I am committed to open science and continue to look for new and exciting ways to open our work to others.

How did you make your research outputs available?

My goal from the outset has been to make the protocols, reagents, publications, software for my group open and accessible, which led me to upload my research outputs for the group online through SGC Open Notebooks. Rachel Harding got the ball rolling years ago and has been a trendsetter in open notebooking along with Dr. Mathieu Shapiro. With their work as an example of best practice, I set out to create my own blog.

I need about an hour to write each blog before linking the protocols and data I am openly sharing in Zenodo. Through this process, all SOPs, posters, and so forth are published online with an open creative license and a digital object identifier (DOI). Social media has also helped attract more people to read and learn from my open lab notebook. That is why I share each blog on my LinkedIn and Twitter pages - to raise awareness and engage with wider audiences online.

Did making your work more open lead to subsequent analysis and debate about your findings? If so, how does this experience impact your attitude toward open sharing? Yes, the most rewarding part of practicing open science is the number of people who reach out in support. People want to know what goes on in labs, and as researchers we have a responsibility to open up the doors and share what we are doing to find cures or treatments for diseases like Parkinson's, Alzheimer's and ALS. By being open, we are making sure that people get accurate scientific information from the source.

In my experience, we need to do more as researchers to communicate our work in an accessible way. Patients and their families want to engage with us, and we should not be afraid to work together so that we can make a difference in people's lives over the next ten years.

What advice would you give to other researchers who are contemplating making their work more open?
I would say dive right in, feet first. It is scary to write about yourself, to put yourself and your life's work out there for people to scrutinize and criticize. But, by opening up, you become more transparent. People see what you are doing, they can test your work, and see if it is reproducible. If it isn't, they can tell you and problems can solved together. In science, we need to be open and try new things.

With social media, the Internet and open platforms for disseminating information, we can be active participants, telling our stories, getting our data in the public domain to speed up our efforts at making new and better treatments for the people who need it the most.

What would you like to tell funders who are thinking about embedding open science principles into their grants?
Do it. It's the right thing to do, and nothing is gained from keeping things private. Do you really want to fund three groups to do the same thing or would you rather they share information and work together to solve these complex problems? Change is slow, but it needs to happen in funding and publishing research. By making science more open and accessible, it provides a starting point and a driver for real, positive and lasting solutions.

Do you have anything else to add on this topic?
Open sharing and communication should be standard practice and more scientists need to do the same. The efforts by the Neuro over the past three years to adopt an institute-wide policy of openness and accessibility have been truly inspiring. This has really driven me to make more of an effort to become more open, in making our protocols and reagents accessible. Many already give out their protocols and publish in open access journals, but there is still a lot of work to do. I hope to provide some inspiration for others to take what I am doing and make it better. By being open and doing simple things like putting our protocols, our data, and our notebooks online, we can do research faster, better and more reproducible so that in the next decade, we can have new and better treatments for devastating disorders of the brain. Patients are frustrated by the lack of progress in developing new therapies and being open will be a new driver that hopefully will bring new and effective treatments into the clinic.

Additional Resources

Profiles in Open are a service of the Open Research Funders Group (ORFG). The ORFG is a partnership of funding organizations committed to the open sharing of research outputs. Visit our website (www.orfg.org) for more resources including:

- **"Open 101" Tip Sheets**, designed to help specific audiences understand the benefits of open science
- The **"HowOpenIsIt?" Guide to Research Funder Policies**, created to help philanthropic organizations develop open policies consistent with their values
- **The ORFG Curated Reading List**, containing a wealth of scholarly research and real-world case studies that demonstrate the myriad ways in which open access and open data benefit researchers and society alike