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FIRST PERSON

First person – Alexandra Lubin

First Person is a series of interviews with the first authors of a selection of papers published in Biology Open, helping early-career researchers promote themselves alongside their papers. Alexandra Lubin is first author on 'A versatile, automated and high-throughput drug screening platform for zebrafish embryos', published in BiO. Alexandra is a postdoctoral research associate in the lab of Elspeth Payne at University College London (UCL), London, UK, investigating high-throughput automated drug screening in live zebrafish to discover novel therapeutics for myelodysplastic syndrome (MDS) and acute myeloid leukaemia (AML).

What is your scientific background and the general focus of your lab?

Unable to choose between the sciences, I studied natural sciences at Cambridge University, eventually specializing and completing my master's in chemistry. From there, I moved to Imperial College London, where I completed my PhD, investigating potential new therapeutic avenues to treat malaria using proteomics. I then moved to Beth Payne's lab at the UCL Cancer Institute as a postdoc in 2018, which is where the work in this paper was conducted, and where I still am today. After my PhD, I really wanted to continue in the field of drug discovery and medical research, but wanted to change angle, moving away from chemistry towards more molecular biology, and learn more biological techniques. Having always had an interest in cancer, the Payne lab was a great fit!

In our lab, we study MDS and AML. We use zebrafish as a model organism, alongside patient samples, to validate our findings. The goal of our research is to understand the molecular mechanisms of the diseases we study and to screen for novel therapeutics. It was the goal of screening for novel therapeutics using zebrafish that led to the work presented here.

How would you explain the main findings of your paper to non-scientific family and friends?

Zebrafish are small, stripy fish commonly found in pet shops, but also in research labs all round the world. Their development is remarkably similar to humans; for example, they share all the same types of blood cell that we make, which means scientists can use them to study human diseases, such as cancer. One way they can be used is to look for new treatments – the disease is modelled in the fish, and then the fish can be treated with different drugs to try and find one to help cure the disease. We have found a way to make this easier on a larger scale by automating parts of the process, and this paper describes the method for other scientists who might want to use it too.

"[…] the best thing about the screening platform we present here is its versatility."

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Alexandra Lubin

What are the potential implications of these results for your field of research?

I think the best thing about the screening platform we present here is its versatility. From our side, it will allow us to screen for potential therapeutics for AML, looking for compounds that will target only the cells that carry mutations associated with the disease, which will hopefully pave the way for future treatment. But, due to the broad versatility of the system, I hope others will be able to utilize this platform to perform drug screens in other areas, to search for potential therapeutics for other diseases.

What has surprised you the most while conducting your research?

To be honest, the biggest surprise was quite how easy it was to use and adapt the system, as someone without much computer knowledge. We set out to automate our drug screen, but fully expected to need to develop a bespoke solution, so it was nice to be able to help develop something that not only suits our needs, but can be easily adapted to other things as well!

What, in your opinion, are some of the greatest achievements in your field and how has this influenced your research?

As a zebrafish researcher, it is hard to overlook the work by Kimmel in 1995 describing the stages of embryonic development in

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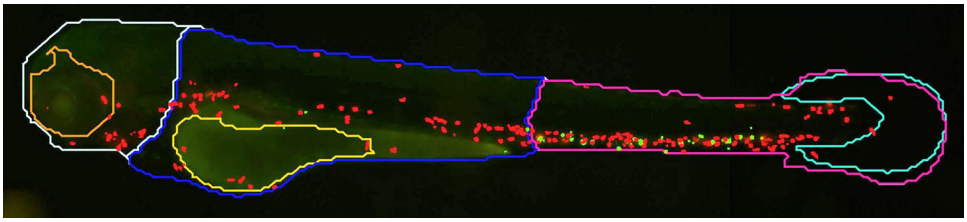

Automatic detection of a 3 days post-fertilization zebrafish embryo, with fluorescent green haematopoetic stem cells and red myeloid cells, detecting the eye (orange), yolk (yellow), fin (turquoise), head (white), trunk (blue) and tail (pink).

zebrafish – it is something all zebrafish researchers use almost every day. He described all the different stages of development, including using a camera lucida to sketch out the development stages in full! This allows researchers round the world to accurately stage their embryos, which is vital to accurate and consistent work across the field.

“[…] many early-career scientists feel as if they don’t have much control over their futures – specific funding available to young scientists could help this.”

What changes do you think could improve the professional lives of early-career scientists?

There is a lot of pressure on early-career scientists, who I think can feel pulled in lots of directions. There is huge pressure to publish, which means you feel like you need to get involved with as many things as possible whilst also making a success of your own project. There is also pressure to network and make a name for yourself, which can be quite challenging as the number of platforms available to young scientists is quite limited, although efforts such as these interviews are trying to change this. I think many early-career scientists feel as if they don’t have much control over their futures – specific funding available to young scientists could help this.

What’s next for you?

At the moment I am still in the Payne lab at UCL. This paper describes how we have set up a screening platform, now I actually need to conduct the screen! Hopefully, we will get some interesting results that I hope will have the potential to treat patients in the near future.

Reference

Lubin, A., Otterstrom, J., Hoade, Y., Bjedov, I., Stead, E., Whelan, M., Gestri, G., Paran, Y. and Payne, E. (2021). A versatile, automated and high-throughput drug screening platform for zebrafish embryos. *Biology Open* **10**, bio058513. doi:10.1242/bio.058513