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CELL SCIENTISTS TO WATCH

Cell scientist to watch – Andrew Holland

Andrew received his first degree in natural sciences from the University of Cambridge and a Masters degree from the University of Manchester, followed by a PhD with Stephen Taylor in Manchester. He then moved to California in 2007 with an EMBO long-term fellowship for his postdoctoral research with Don Cleveland at the Ludwig Institute for Cancer Research. In 2013, Andrew started his own lab as an Assistant Professor in the Department of Molecular Biology and Genetics at the Johns Hopkins University School of Medicine, having been named a Kimmel Scholar and a Pew-Stewart Scholar in 2014. Andrew's lab investigates the mechanisms controlling centrosome copy numbers during cell division and the links between centrosome amplification, genome instability and tumorigenesis.

What inspired you to become a scientist?

Becoming a scientist was not part of the plan. At the end of my degree, having done no research, I went to see my advisor and told her that I would like to write a thesis rather than engage in bench research. Luckily, she convinced me that I should give research a try, so I went to the Gurdon Institute and worked in Johnathon Pines' lab. I was drawn to the intellectual freedom you enjoy as a scientist and I began to fall in love with research. I wasn't convinced at that stage that this was the career I wanted, but I kept going because I enjoyed it. It was only half way through my postdoc that I made the decision that I wanted to try to run my own lab.

Is this something that still motivates you now?

Yes, I love my job. The freedom to be curious and work on interesting questions at the boundary of human knowledge is very satisfying for me. The unexpected path of scientific discovery makes this a very exciting profession. I also get the opportunity to work with bright people and try and help them achieve their goals. It's a very rewarding career and I feel fortunate to have the privilege of doing this for a living.

What is the research focus of your lab?

During my postdoc, I developed an interest in centrosomes. These organelles direct the formation of the bipolar spindle upon which chromosomes are segregated. Cells go to great lengths to ensure that they only have two copies of centrosomes when they divide to ensure they faithfully partition the genetic information into two daughter cells. Just like DNA, the centrosomes are replicated only once per cycle. However, while the structure of DNA immediately betrayed a mechanism for how it could be replicated exactly once, there's nothing intrinsic in the structure of the centrosome that explains how you make a single copy. Part of our lab works on how you make one and only one new centrosome in each cycle. We're also interested in the consequences of abnormalities in centrosome copy number. Abnormal numbers of centrosomes are very common in human cancers, and we know several neurodevelopmental diseases are caused by mutations in centrosome proteins. We use mouse models to manipulate centrosome number and investigate how this impacts tumorigenesis and brain development.

What challenges did you face starting your lab that you didn't expect?

There is of course pressure to raise funds to run your group, but there's also a whole spectrum of additional challenges that you face when you start. One challenge is recruiting talented people and working with them to help them achieve their potential. We typically don't have a lot of training for this as bench scientists. I find helping people in the lab to achieve their goals to be one of the most satisfying parts of my job.

"I think you need to be forever young in your approach"

Do you have any advice on how to recruit the right people for your group?

I think it's important to make sure that people you recruit have the right attitude and fit with the atmosphere and culture of the lab. Obviously, when you don't have a lot of people in your lab it's important that everyone functions well together.

What other challenges do you see in the future?

The recruitment challenge is always going to be there, and funding pressure is not going away anytime soon. I think there's a reasonable amount of funding for junior group leaders, but it gets more challenging in the middle of your career as these opportunities diminish and you must compete with well-established labs to raise research funds. It's important to be continually renewing you research programme and not get stale; I think you need to be forever young in your approach and try to be doing things that are a little different from everybody else.

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Andrew with his family.

Do you attend a lot of meetings?

I usually attend about two meetings a year. I always attend the ASCB annual meeting. This is a great way to get a broader overview of what's going on in the cell biology community and to connect with people. I try not to travel much more because I like to be in the lab doing experiments and I think it is important for me to be present to offer support for people in the lab.

Do you still do a lot of experiments?

I'm not ready yet to retire to my office just yet. Whenever I get a chance, I try to run experiments. I like to start projects and when they look like they might work, hand them off to people in the lab.

What is the most important advice you would give to someone about to start their own lab?

Focus on the thrill of discovery and don't get distracted with less important issues that are not directly related to your science. There will always be trends and areas that receive more attention and funding. But things can change fast, and you should stick to working on what you find interesting.

What other elements were key to your success?

Like many scientists, I'm a perfectionist and I prefer to do a few things well and not spread myself too thin. I think the most exciting discoveries come from unexpected directions. Fortune favours a prepared mind – so keep an open mind and be ready to be surprised.

How do you achieve a work–life balance when starting a lab?

I think you shouldn't compromise on what it is that's important in your life. I recently started a family and, of course, spending time with them is important for me. Fortunately, I have many great role models in my department who are successful scientists with families. I think it is important to set aside time to unwind; this helps to keep your mind fresh.

> "Fortune favours a prepared mind – so keep an open mind and be ready to be surprised"

What is your advice on establishing successful collaborations?

I identify collaborators after reading their papers and admiring their work. I try and work with careful scientists who want the truth, not just a result.

Could you tell us an interesting fact about yourself that people wouldn't know from your CV?

One thing I really love is scuba diving. My wife and I started diving in Egypt. Since then we have scuba dived in Scotland, San Diego, the Caribbean, Australia and the Galapagos. I find it really peaceful under water, because you can't talk, so you have time to look around and appreciate the beauty of the ocean.

What's the most fun or unusual thing you saw?

Hammerhead sharks in the Galapagos. You look up and see their silhouettes circling above you in the water. It's exhilarating!

Andrew Holland was interviewed by Anna Bobrowska, Editorial Intern at Journal of Cell Science. This piece has been edited and condensed with approval from the interviewee.