

CELL SCIENTISTS TO WATCH

Cell scientist to watch – Maya Schuldiner

Maya Schuldiner pursued her PhD degree under the guidance of Prof. Nissim Benvenisty at the Hebrew University in Jerusalem. She carried out her postdoctoral training in the laboratory of Prof. Jonathan Weissman at the University of California, San Francisco, with support from the Human Frontiers Science Program and the Sandler Fellows Program. Since 2008, Maya has been running her own laboratory at the Weizmann Institute of Sciences in Rehovot, Israel. She received the Human Frontiers Science Program Career Development Award and the NIH Pathway to Independence Award, and she is a member of the EMBO Young Investigator programme and Faculty of 1000. Her current research interests are focused on unravelling novel functions of yeast proteins that are involved in organelle biology.

Why did you become a scientist?

I really loved nature as a kid. I was always watching animals and nature around me, and my parents – both in academia – really supported me in finding a job that I would love to do. I also had a fantastic biology teacher in high school, called Raya Schurani, who continued to instil a passion for science in me. I thought I would be a medical doctor but, just a couple of days before medical school started, I realised that I want to generate knowledge myself and switched majors last minute. It was really difficult and I have a lot of people to thank for being flexible about it. And... the rest is history.

What drives you now?

What drives me most is that I love going to work. At any given moment there are a couple of questions that keep me awake at night, and I am just dying to know the answer. I wake up in the morning and I cannot wait to be in the lab again. I also love my students and I love seeing them succeed. To see how they grow up as scientists and as human beings is a bit like raising my own children and seeing what comes out. It makes me proud and happy, and is a big motivation for me.

What is your research focussed on right now?

My lab works on the model organism *Saccharomyces cerevisiae* and we are trying to understand two main basic aspects of organelle cell biology. One is how do proteins that need to reside in organelles get to the correct subcellular destination, and the second is how do organelles that are distinct compartments communicate and coordinate with each other to enable the cell to function as an optimal unit. We are also trying to discover functions for the many uncharacterised proteins that still exist in yeast – about 30% of proteins have never been characterised.

You do quite a lot to support young scientists. What motivates you to do that?

I remember how difficult it was for me. I think that every new generation brings a very new way of thinking about science and it is



wonderful to see how these new ideas and concepts are integrated into science, so it makes me really happy to try and help them make the transition more easily. Mentoring is one of the aspects of my job that I love doing.

What is the biggest experimental roadblock that you faced and how did you deal with it?

For me, the biggest roadblocks have been points in my career when I have decided to change fields. I changed from developmental biology to cellular biology between my PhD and postdoc, and when I started my own lab I made a pretty big change in the type of question that I was asking and the approaches to tackling them. Recently, I've shifted from studying the endomembrane system to mitochondria and peroxisomes. It is difficult every time I make such a transition, and there is a lag phase of at least a year until I have read all the papers, go to meetings, meet the important people in the field and understand what the important questions are. It is jumping into the water and hoping that you learn to swim quickly enough so that you do not drown. But it gets less scary the more I do it. I now know that if I decide to make a transition I need to allow myself the time to learn a new field and it will just slow me down for a bit. But I also know that it is really worth it because it keeps me excited and interested in the questions.

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Maya's children, from left to right: Daniel (13), Mattan (3) and Noam (10).

What do you think are the benefits and risks associated with changing fields?

I think, if you stay in the same field you get better known as time goes by, you can get a bigger body of work done on a specific set of questions and people may remember you for a very specific contribution. But I also think that it fixates you in your way of thinking about things. Whereas every time I change fields, I get very fresh perspectives on how things work and I bring in concepts from other fields. This gives me an edge to discover things that are interesting and that other people have not thought of looking at, and is a big benefit. In the end, it really depends on your personality. Everybody needs to do it in their own way.

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What unexpected challenges did you face when starting your own lab?

I actually did not expect any of the challenges that I encountered. When doing bench science I never quite stopped to think what I would have to do when I became a PI, and for the first three years of starting my own lab I constantly realised how much training I lacked for this position.

What were the skills that you had to learn?

Time management, how to interview people, balance finances, write grants, sit on committees, manage people in an optimal way, network... a million different skills and none of the things that I actually did as a PhD student or a postdoc. The most difficult thing I did not expect was that, as a student, my main interaction was always with my mentor, a single person; and suddenly [as a PI] you have interactions with a lot of people, and there is a responsibility that comes with that. You have to give each one the type of interaction that is optimal for them, and I did not expect how heavy suddenly taking that responsibility on myself would be.

How are the challenges that you're facing now different?

I continue to develop in every aspect; so writing grants, mentoring a student or giving a talk – all these are things that I am constantly learning. The ongoing challenge is that every new student that comes into the lab is a new individual with new passions, requirements and difficulties, and a new type of interaction has to be set up that, really, has to be created on a case-by-case basis. But I do feel that these aspects are beginning to be a bit more comfortable. I now have time to think in a broader sense of what I would like my scientific voice to be. I think an important aspect of science is that you contribute a way of doing science that is very uniquely yours.

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

Get a lot of support! It sounds trivial but I think that most people starting their new lab want to try and show that they can do it by themselves, and it is scary to say that you do not know how to do something. So many people just try to push through completely independently, and it is really difficult, painful and much less optimal than getting all the support that you can from around you. Get a mentor, someone from the more-established people in your institute that you trust and turn to for advice and help. Find colleagues that are more your age and have dealt with similar issues to the ones that you're dealing with right now. Also find ways to get emotional help, because it is a very taxing period. It is extremely important to understand that it is OK to ask for help. When I started as a young PI at the Weizmann institute, we set up a support group of all the young scientists that were just establishing their labs. We met every two weeks and brought external lecturers on technical aspects of how to do things in the lab but, also, we raised issues that came up for us in setting up the lab. It was really supportive to see that everybody was dealing with similar issues and, collectively, we found a lot of creative solutions. This has been an enormous aspect of support for me in setting up my lab and I would really recommend setting up something like that.

What elements, inside or outside the lab, were key to your success?

Inside the lab the key to success is working with people that I love and enjoy spending time with. Outside of the lab I would say that the most important thing is my husband. I could not have done it without him. I think for a woman to balance work and life well, without having to give up one or the other, really depends on having a relationship with someone who is a true partner and will truly support your will and ability to succeed, and that is what I found with my husband. Finally, mentors from all aspects: formal, like my PhD and my postdoc advisors, but also mentors that I have adopted when I started as a PI, and the young PI group, where we were all basically mentors to one another.

How do you balance your work with your life, especially when you are establishing yourself?

I love being a scientist and I love my family, so it makes it worthwhile to try and combine the two, but it is very difficult and requires constant creative thinking. For example, I have been learning time management skills. There is a lot of expertise

nowadays and picking up these tips and tools is very important for making it work. Another thing I have learnt – and it has taken me time – is that I have to take care of myself. I used to think that if I did not spend time on things that are important to me I would have more time to spend on work and family. I realised that this is not a long-term solution and I need a lot of emotional energy that only comes from spending the time I need to take care of myself – psychologically, physically, the whole aspect. So every week I make sure to have time to exercise, take care of my food, go out with friends, go to courses that I like – do things that are important and just for me.

In addition, there are three really important things. Firstly, always set priorities. Priorities change all the time, so it is something I have to constantly be aware of. By setting priorities I know that, at a given moment, I am allocating my time efficiently and not spending it on things that for now I can maybe tune down. Secondly, learn to say ‘no’. It is very difficult, and it is a skill I had to learn. It took me about a year of being a PI to say ‘no’ because I wanted to be OK with everyone. I now realise that you cannot do everything that people ask you to do, so I have to decide what is important to me and say ‘no’ to things that I cannot do optimally at that moment. Finally, and this is something that I feel scientists are often not great at, learn to just be ‘good enough’. We are all perfectionists, but trying to always do everything in the most-perfect way is very tiring. Letting go a tiny bit and learning to live with something being just OK is another skill that I am slowly starting to learn – and it really allows me to stay sane.

How important is it for you to attend meetings?

I think that meetings are an extremely important part of the scientific process. You hear about science that has not been published yet but much more important than that is what happens at the breaks. Personal interactions and being able to chat about biological problems are a really great way to think about biology for me. I find it very difficult to think in isolation; I prefer chatting to people, getting their view, and going back and forth on ideas. I get a lot of very stimulating ideas and this drives our work forwards.

How do you get the most out of going to meetings?

One thing that I learnt is that I get much more out of meetings when I am proactive. I, actually, sit down ahead of time and think who the people that would be interesting for me to chat to are. I then either set [up] meetings with them in advance or I make sure to bump into them at the coffee or the poster session. And if I am presenting a poster and would like somebody to see it, I email them and say “come at 5 pm, meet me next to the poster, if you have time”. Do not wait for it to happen. Practise coming up, presenting yourself, telling people why you would like their opinion on your work, and ask them to come and to talk to you about it. I think this is something PhD students can learn. It is scary and not always very comfortable but it is a skill. You get the advantages of getting to know people in the field and them knowing who you are, and that is very important.

How do you balance being at meetings with being in the lab?

Together with my husband, who is also a scientist, we made a decision that we each attend six meetings a year. This way twelve times a year one parent is out of the household, but it also gives us the opportunity to be at enough meetings to network, meet people and hear the news in our fields. It is sometimes difficult to abide by this number but it keeps me sane because, in a way, it puts borders on what I do outside of the lab, and gives me enough time to work in the lab.

What would people be surprised to find out about you?

I think the most surprising thing would be that I am very, very shy. Usually, when people see me, they think that I am very confident and outgoing but I am, actually, an extremely shy person. Over the years I taught myself to chat to people, and appear outgoing and more confident than I am, so I managed to fool most people into thinking that I am actually an extremely confident individual.

Video interview

An additional, short video interview with Maya Schuldiner is also available, and can be viewed directly here: <http://jcs.biologists.org/lookup/suppl/doi:10.1242/jcs.180869/-DC1> or on the JCS Interviews page: <http://jcs.biologists.org/content/cell-scientists-watch>.

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

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