

An interview with Patrick Oakes—Loyola University Chicago, IL, USA

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1 | WOULD YOU EXPLAIN WHAT YOUR RESEARCH GROUP IS STUDYING?

My research group is interested in how cells sense, use, and respond to mechanical signals, especially in how they turn them into biochemical signals that affect cellular functions. This process of mechanotransduction is a fundamental component of a whole range of cellular behaviors. It can be accomplished through both passive and active mechanisms, and through single molecules and the collective behavior of molecules. It's a really fascinating area, in my opinion, with tons of outstanding questions, and so that's what we work on.

2 | WHY DID YOU CHOOSE A CAREER IN THE CYTOSKELETON?

I'm a physicist by training, and my initial graduate research was on actin as a liquid crystal. When I started reading all the papers about actin, there's obviously a lot more that it does, which to me, was much more fascinating than whether it can undergo a first-order phase transition. I became really interested in all that the cytoskeleton does and how it's so intimately related to mechanics. When I saw people looking at this through microscopes and how you can watch these things in real-time—microscopy and the cytoskeleton just became passions for me.

3 | WHICH OF YOUR RESEARCH PROJECTS IS YOUR FAVORITE AND WHY?

I don't have favorites. They are just like kids. They're all my favorite!

4 | WHAT DO YOU CONSIDER TO BE THE MORE EXCITING TOPICS IN THE FIELD?

I think there's so many exciting topics! Personally, I love doing science at the interface. I love taking the expertise that I have and finding someone else who has an expertise that we don't have and doing something that neither of us could do on our own. Walking that fine line where we get to do even more expansive and creative projects by merging techniques and merging perspectives ideas and knowledge, that's my happy place.

5 | WHAT ARE YOUR VIEWS ON THE FUTURE OF THE FIELD?

That I have no idea where it's going—but in a good way. If you'd asked me 5 years ago, where I would be with my own projects, I probably couldn't have told you 75% of the things that we're currently doing in the lab or the data that we have. We have a paper that's just come out that combines machine learning with traction force microscopy and I have just been utterly blown away by the capabilities of A.I. and what it can do. I feel completely incapable of trying to predict what's going to be next because the pace of development and the rate of discovery is just increasing exponentially. I think we're going to all be flooded in 10 years by the kinds of science we can do and where it's going to go.

6 | WHAT ARE YOUR FAVORITE PASTIMES OUTSIDE OF SCIENCE?

Currently, I have a three-year-old and a five-year-old. Parenting is a full-time job, as everyone who's had kids knows, so I don't currently

have a ton of time for alternative pastimes. Pre kids, I loved to play pool. I learned to play from my grandfather, but really picked it up in graduate school. I played 9-ball in a local league with a group of graduate students and met some incredible people. We won the state championship in Rhode Island and got to go play in the national tournament in Las Vegas one year. When I first moved to Chicago for my postdoc, one of the first things I did was find a team and join a league. It was a great way to meet people and to get away from lab for a bit. I haven't played in a couple years at this point, but I would love to get back to it.

7 | WHAT OBJECT IS MOST IMPORTANT TO YOU?

The most important thing has to be my family. I have been super lucky to have an incredible group of people, both immediate family and through my wife and her family, in my life. I am where I am today because of their support. I have so much fun hanging out with my family. My kids especially are at such a fun, creative age, and it's amazing to see their unique personalities develop and to contemplate what life might be like for them in the future. I love spending time with them, seeing what they're doing, and just being around them.

Realizing now the actual question was about an object, if we're talking physical objects, I try to be pretty minimalist. If I had to pick, I'd probably say the microscope because we literally depend on it for all our research!

8 | WHAT IS THE FIRST THING YOU DO WHEN YOU WAKE UP?

Usually, I go downstairs, start the coffee, and get breakfast started for our kids.

9 | WHAT IS IN YOUR POCKETS RIGHT NOW?

No magic rings I'm afraid, just my phone.

AUTHOR BIOGRAPHY



Patrick W. Oakes, Born in Maine, he studied physics at Boston College, before attending Brown University where he received his PhD in physics while working in the lab of Jay Tang. After graduating, he took the Woods Hole Physiology course before joining Margaret Gardel's lab at the University of Chicago.

In 2016, he started his own independent laboratory at the University of Rochester in the Department of Physics. In 2019, he moved to Loyola University Chicago Stritch School of Medicine where he is currently an Associate Professor in the Department of Cell and Molecular Physiology.

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