

# A mitoPodCast Interview with Dr. Carolyn Cummins



## MEET DR. CUMMINS

Dr. Carolyn Cummins is an Associate Professor with the Leslie Dan Faculty of Pharmacy at the University of Toronto. As a postdoctoral fellow at the University of Texas Southwestern Medical Center, she helped identify the first binding molecule for a nuclear receptor in a nematode worm, and identified a role for the liver X receptor in controlling levels of stress hormone production.

## BACKGROUND OF RESEARCH

Dr. Cummins studies receptors in the nucleus of cells called PPAR-alpha and PPAR-gamma. These receptors are essential for the proper storage and utilization of fatty acids. Mitochondria act as gatekeepers of proper utilization of fatty acids that allow for energy production that is vital for our bodies to function.



## WHAT HAS SHE FOUND?

The Cummins lab and collaborators tested a compound resembling fatty acids in the body. In obese mice, it activates PPAR-alpha and gamma receptors, which promotes weight loss and the sensitivity of cells in the body to insulin, which can reduce blood sugar. The weight loss seen appears related to an enhanced burning of fat that occurs through a mitochondrial uncoupling process.

## WHAT ARE HER NEXT STEPS?

Test of this compound using other animal models of type 2 diabetes are needed. Long-term dosing studies are needed to see if any unexpected toxicities arise. The compound being tested is exciting as it is derived from an abundant natural byproduct of the cashew nut shell industry of Brazil. If it ever becomes a therapeutic, it would be a very economical.





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## THOUGHTS ON NOVEL THERAPIES?

There have been very prominent recent success stories and these new classes of compounds are very effective at decreasing blood glucose and have an added side benefit of improving chronic kidney disease as well as cardiovascular disease. The exact mechanisms are quite debated but it is still a significant advance for the field of metabolic disorders.

## ACCELERATING DRUG DEVELOPMENT?

We need to promote the concept of open science and open drug discovery so that data can be shared between researchers as quickly as possible. A system parallel to Big Pharma could be developed to advance open drug discovery and provide new therapies for patients.



## WHY BRING DIVERSE VOICES TOGETHER?

It was very moving to hear the patient voices at the MITO2019 conference. It was an excellent reminder of the true importance of research: to help patients manage their diseases and improve their quality of life. Collaboration also opens up new avenues of thought.

## FINAL MESSAGE AND HOW TO GET IN TOUCH

Keeping an open mind to where discoveries are coming from will lead to the development of innovative therapies.

To learn more about what the Cummins lab does, visit [www.cumminslab.com](http://www.cumminslab.com). Follow Dr. Cummins on Twitter [@CumminsLab](https://twitter.com/CumminsLab) or [@CarolynLCummins](https://twitter.com/CarolynLCummins).

