

Our newest molecular detectives

When Tim Megraw moved from Dallas to Tallahassee in August, he didn't come alone. There was Ling-Rong Kao, his wife and research partner of eight years. There was their daughter, Carina, age 4. There were hundreds of boxes loaded with the instruments – and fruit flies – that now inhabit his lab at the College of Medicine.

And then, shortly after he arrived, there was that four-year, \$1.2 million grant from the National Institutes of Health. Now Megraw, an associate professor, and Kao, an assistant in research, are continuing the work they began in 2003 at the University of Texas Southwestern Medical Center.

Researchers are cellular detectives. They know that cancer is caused by runaway cell division. They slice off different pieces of the division process in attempts to discover how it's supposed to work and why it goes awry. For Megraw, the focus is on a cell component called the centrosome, which organizes the microtubules essential to cell division. Much has been discovered in recent years, by Megraw and others, about how these puzzle pieces fit together. Yet, as Megraw noted in his grant application, "the centrosome 'parts list' is still being compiled."

"We're interested in how centrosomes are organized and regulated – both their numbers and their activity," he said recently. "What regulates their assembly and duplication and then how do they function: Both of those goals are outlined in this new grant – goals to understand bits of those processes."

The awareness of centrosome-based diseases is fairly recent. Megraw had always been fascinated with studying at the molecular level. Then, when he was a postdoctoral fellow, someone in the lab where he was working discovered the protein centrosomin. It was a game-changer.

"At the time we knew almost nothing about the molecular makeup of centrosomes or how they worked," he said. "That was something I could jump in on. So I did, and it took my research in a new direction."

He's been following that path ever since. Who knows where it might lead?

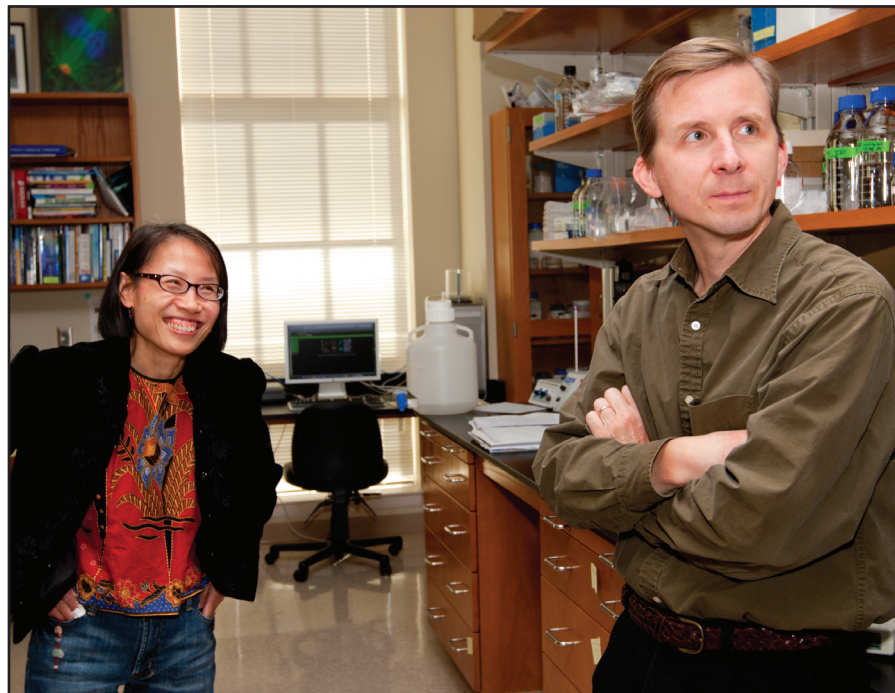
"Just today, I finalized inviting somebody who's coming to speak at Grand Rounds [in April] about ciliopathies, diseases that underlie the polycystic diseases of the kidneys. I call them centrosome-based diseases in general; most of them affect these little hair-like structures that stick out of our cells – cilia." Until fairly recently, people thought cilia were totally useless. "Now," he said, "they appear to be key signaling centers. I have trouble keeping up with the list of diseases that are now associated with defective cilia."

It helps to have married someone who's as fascinated as he is, someone who understands the magnetic pull of the lab. One of their recent papers, on centrosomin's role in the formation of furrows associated with cell division, was written up prominently in *Current Biology* and *Faculty of 1000*.

"She's the first [listed] author of that paper," Megraw said. "We're pretty proud of that. That study was a breakthrough for us. It works well, our partnership."



Associate Professor Tim Megraw and his wife, Ling-Rong Kao, an assistant in research, are two key additions to the Department of Biomedical Sciences.



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