

Qi-Jing Li: The hallway immunologist

Entering the lab on his first day as a PhD student, Qi-Jing Li “looked like a kid in a candy store,” recalls Manuela Martins-Green, Li’s doctoral advisor at the University of California, Riverside. Twelve years later, his expression hasn’t changed much. Li strolls into his brand-new lab at Duke University Medical Center and shows off his new microscope, equipped with two cameras and a controlled environment chamber for real-time imaging of T-cells. Li is an up-and-coming star in the study of microRNAs and T-cell response, but his path to success was anything but straightforward.

As a child, Li—whose parents were engineers—had no intention of pursuing life science. But a high school teacher changed his mind, and after finishing an undergraduate degree in biochemistry, Li left China for Martins-Green’s chemokine laboratory, eager to study cell-to-cell interactions. Li became Martins-Green’s most prolific student, publishing over 10 papers in 4 years.

“If you give him an idea that you can fit on the tip of a finger, he comes back a week later imagining the whole arm,” says Martins-Green. In 2001, Li detailed the previously unknown mechanism of how thrombin, a coagulation protein, activates chemokine gene expression!

Near the end of his PhD, Li met Vladimir Parpura, a newly hired Riverside faculty member studying glia-neuron signaling. A hallway conversation with Parpura convinced Li to use live-cell imaging to study cell-to-cell interactions. Three months of experiments convinced him: “I found the tool I always needed.”

In 2002, Li joined Mark Davis’s world-renowned imaging immunology lab at Stanford University. With his usual enthusiasm, “Li immediately took advantage of the resources in the lab,” says Davis. Li collaborated with Arup Chakraborty, a chemical and biological engineer then at UC Berkeley and now at MIT. The two published a detailed model of T-cell sensitivity relating to CD4 coreceptors and local concentrations of tyrosine kinase Lck.²

After his initial success, Li floundered until another serendipitous meeting altered his course. In another hallway, Li bumped into Chang-Zheng Chen, a new faculty member at Stanford. Chen suggested an examination of miRNA in the immune system, and Li hit the ground running.

“All my major decisions are based on hallway conversations,” Li laughs. After testing only 7 mouse miRNAs, they found mi181a, a potent modulator of T-cell sensitivity. “But Li didn’t just say, ‘That’s great,’ and write a paper,” recalls Davis. Li profiled miR-181a expression in various stages of T-cell development and tested its mechanism of action.³ “It’s a mark of a good scientist,” says Davis. “That paper in *Cell* is a real model of a thorough and important study.”

Now an assistant professor at Duke, Li took his miRNA work from mice to humans, developing a technology platform to profile miRNA expression in small populations of cells, such as tumor or HIV samples. The ultimate goal is to determine which of those tiny strands of RNA can be used as biomarkers or drug targets, says Li. Davis has no doubt about the future success of Li’s lab. “He’s catalytic,” says Davis. “He has great talents and wants others to do their best, too. He’ll lead them in fruitful directions.” —Megan Scudellari

Title: Assistant Professor of Immunology, Duke University Medical Center

Age: 36

Representative publications:

1. Q-J Li et al., “MAP kinase phosphorylation-dependent activation of Elk-1 leads to activation of the co-activator p300,” *EMBO J*, 22:281–91, 2003. (Cited in 56 papers)
2. Q-J Li et al., “CD4 enhances T cell sensitivity to antigen by coordinating Lck accumulation at the immunological synapse,” *Nat Immunol*, 5:791–99, 2004. (Cited in 80 papers)
3. Q-J Li et al., “miR-181a is an intrinsic modulator of T cell sensitivity and selection,” *Cell*, 129:147–61, 2007. (Cited in 90 papers)