



VANDERBILT
SCHOOL OF MEDICINE

Basic Sciences

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Biosketch

Yi Ren grew up in China and became interested in science at an early age. Her father, a chemical engineer, had set up a home laboratory where Yi spent time watching and playing after school. She went to Fudan University in Shanghai for college. She then came to the US and received her PhD from Princeton University, followed by postdoctoral training with late Nobel laureate Dr. Günter Blobel at the Rockefeller University. Yi joined the faculty at Vanderbilt in 2016. Work in her lab centers on the process of nuclear mRNA export, which is critical for cellular life and is exploited by diverse viruses to counteract host defenses.

Key Publications

"Structural Basis for Influenza Virus NS1 Protein Block of mRNA Nuclear Export" Manuscript submitted for publication.

"Structural and Biochemical Analysis of the DEAD-box ATPase Sub2 in Association with THO or Yra1" *Elife* 2017, e20070

"Vesiculoviral Matrix (M) Protein Occupies Nucleic Acid Binding Site at Nucleoporin Pair (Rae1•Nup98)" *PNAS* 2014, 111(25):9127-32

Evading the Invaders: Reverting unhealthy nuclear imprisonment of human RNA by viruses

All cellular life relies on the integrity of gene expression. Human cells carry more than 20,000 different mRNAs. Fully processed mRNAs in the nucleus are exported to the cytoplasm where protein translation occurs. This **nuclear mRNA export process** is exploited by a large number of **viruses to block host gene expression as a strategy to counteract host defenses**.

The Ren lab combines the power of biochemistry, structural biology, and cell biology to **elucidate the molecular details of viral strategies targeting nuclear mRNA export**.

- **Influenza A Virus (IAV)**
Influenza virus remains a major public health threat killing ~250,000-500,000 people yearly. Specific questions being studied include: **What is the cellular target of IAV?** How does **IAV inhibit nuclear mRNA export**? Which **mRNAs are retained in the host nucleus** upon IAV infection? How does **blockage of nuclear mRNA export** contribute to inhibition of host immunity?
- **Vesicular Stomatitis Virus (VSV)**
VSV blocks host mRNA export and limits expression of interferons, a family of signaling proteins that activate host defense systems. **We seek to understand the molecular underpinnings of VSV mediated host mRNA export blockage**.

Our work brings conceptual novelty to the fields of virology, immunology, and cell biology of nuclear transport. **Results** generated from these studies will provide significant implications for **developing therapeutic interventions** aiming to revert nuclear imprisonment of host mRNAs by viruses.

