VANDERBILT SCHOOL OF MEDICINE | Basic Sciences

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Biosketch

Dr. Zanic received her PhD in Physics from the University of Texas at Austin, followed by postdoctoral training at the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden, Germany. She spent a year as an Associate Research Scientist at Yale University prior to starting her independent laboratory at Vanderbilt in 2014. The Zanic laboratory combines the tools of biology and physics to elucidate the fundamental mechanisms underlying dynamic intracellular architecture. Zanic is a recipient of the Career Development Award from the Human Frontier Science Program, the Maximizing Investigators' Research Award from the NIH, and the Searle Scholars Award.

Key Publications

"Microtubule minus-end aster organization is driven by processive HSET-tubulin clusters," *Nature Communications*, 9:2659, 2018

"Human CLASP2 specifically regulates microtubule catastrophe and rescue," *Molecular Biology of the Cell*, 29(10):1168-1177, 2018

"Synergy between XMAP215 and EB1 Increases Microtubule Growth Rates to Physiological Levels," *Nature Cell Biology*, 15(6):688-93, 2013

"Building the cell's skeleton to understand how cells change shape, move, and divide"

A look inside of every living cell reveals a world of dynamic intracellular structures. One of the core cellular building blocks are **microtubule polymers**, vital for processes such as **cell division, intracellular transport and neuronal development**. Not surprisingly, **misregulation of the microtubule network causes human disease**, including many types of cancers, as well as neurological disorders.

Our research aims to discover the molecular mechanisms that drive dynamic remodeling of the microtubule network architecture, essential for its proper cellular function. What are the molecular rules that govern whether a microtubule grows or shrinks at any given moment in time? What are the mechanisms used by the microtubule-associated proteins that regulate microtubule behavior? How does this complex network of regulators collectively orchestrate dynamic remodeling of the microtubule cytoskeleton in vastly diverse cellular contexts? To address these questions we take an interdisciplinary approach, **combining molecular and cell biology, biochemistry, engineering and physics**.

Uniting the tools of many disciplines, our work aims to **provide a fundamental understanding of how cells engineer large-scale, dynamic structures essential for life**. Understanding of the underlying mechanisms will allow us to manipulate dynamic intracellular architectures, ultimately facilitating new, better strategies to fight human disease.