My laboratory is interested in understanding the fundamental mechanisms by which signals are transmitted from cell surface receptors to the cytoplasm and nucleus. Our efforts are focused on the role of lipid and protein phosphorylation and dephosphorylation in the regulation of signal transduction and epigenetic effector mechanisms. In this regard, I am primarily interested in the regulation of signal transduction pathways in mammalian cells which might encode pathophysiologic states in pediatric and adult diseases. More recently, we have focused on the study of the epigenetic mechanisms that regulate important mammalian signaling events the immune system and oncogenesis. We are interested in converting target discovery and validation into drug discovery and drug development in particular as it relates to specific kinases and/or epigenetic effectors and translating this basic science information from "bench to bedside" in pediatric medicine. This includes hematologic, immunologic and oncologic diseases in my subspecialty and other disease processes outside of this clinical specialty area e.g. fibrosis, microbiome and infectious diseases, etc. To this end, my laboratory in collaboration with SignalRx Pharmaceuticals have utilized in silico computational chemistry to design and synthesize nM potent dual and triple inhibitory chemotypes against dominant synthetic lethalities and highly synergistic immuno-oncology targets in an effort to develop novel, safe and efficacious combinatorial therapeutic agents for cancer and other diseases.

Biography
Finally, as a board certified practicing attending pediatric hematologist-oncologist at UCSD, I am actively involved in the development and execution of Phase I and Phase II clinical trials of targeted and immunotherapies in cancer patients at the UCSD/Rady Children's Hospital and Moores Cancer Center and participation in our weekly molecular tumor boards. I understand the potential challenges to drug development in the pediatric population including but not restricted to cancer. I hope to apply these combinatorial dual and triple inhibitory chemotypes in a precision medicine, multiple-omics and systems biologic setting of adult and pediatric cancer and other diseases in Phase I and II trials.