The role of transforming growth factor beta in cardiopulmonary pathophysiology.

We are interested in understanding the causes and discovering therapies for several genetic diseases that result in either aneurysms or impaired lung septation (emphysema). We have found using genetic, biochemical and pharmacological approaches that the cytokine transforming growth factor beta (TGF-β) is a critical molecule in these processes in mouse models and human patients. We are dissecting the mechanism of TGF-β action in the vasculature and lungs and are attempting to test both upstream and downstream mediators of TGF-β with the hope that this will yield therapeutic targets. A significant part of our work is done in collaboration with clinicians with interests in vascular and pulmonary medicine at various institutions.

During a concentration, a student would examine the effect of targeting specific molecules on vessel or lung development and function. This would be done using tissue samples from mouse models and measurement of tissue properties and protein content and activity by immunological and biochemical approaches, i.e. immunohistochemistry, Q-PCR, Western blots, and TGF-β assays.

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