

James M. Wells, PhD

Assistant Professor

Department of Pediatrics; Division of Developmental Biology

Description of Research:

Dr. Wells' research focuses on intestinal development. Dr. Wells has identified that fibroblast growth factor 4 (FGF4)-mediated signaling is necessary and sufficient for establishing midgut and hindgut domains in vivo. He has also identified that a secreted FGF binding protein (FGFbp1) regulates FGF4 activity. Dr. Wells is also studying the mammalian transcription factor Sox17. He has shown that Sox17 promotes the degradation of beta-catenin and T-cell specific transcription factors in a non-canonical fashion. He has found that Sox17 is expressed in crypt cells of the gut and by basal cells of the conducting airway in the lung. Currently Dr. Wells is investigating if Sox17 is involved in stem/progenitor cell activity in the gut and the lung using a tetracycline-inducible Sox17 transgenic line that he has generated. Additionally, Dr. Wells is trying to promote endodermal differentiation of embryonic stem cells by using a tetracycline inducible approach to express Sox17. He is presently analyzing these cell lines for their ability to differentiate into endoderm and its derivatives in vitro. Ultimately, he plans to study the therapeutic potential of embryonic stem cell-derived gastrointestinal cells in animal models of gastrointestinal disease.

Collaborations:

Dr. Wells has used the **Bioinformatics and Microarray Cores** in collaboration with Drs. Aronow, Bates, Warner, and Zorn to study the role of embryonic endoderm regulatory factors in the gut development and adaptation. He also collaborates with Dr. Bezerra studying how plasminogen regulates liver cell plasticity.

Representative Figure:

