Division Summary

**RESEARCH AND TRAINING DETAILS**

- Number of Faculty: 10
- Number of Joint Appointment Faculty: 1
- Number of Research Fellows: 1
- Number of Research Students: 2
- Number of Support Personnel: 1
- Direct Annual Grant Support: $325,000
- Direct Annual Industry Support: $147,572
- Peer Reviewed Publications: 20

**CLINICAL ACTIVITIES AND TRAINING**

- Number of Clinical Staff: 3
- Number of Staff Physicians: 6
- Number of Clinical Fellows: 1
- Number of Other Students: 3
- Inpatient Encounters: 693
- Outpatient Encounters: 6,122

**Significant Accomplishments**

**The Genetics of Craniofacial Development**

Samantha Brugmann, PhD, was awarded a grant from the National Institute of Dental and Craniofacial Research for her work on the role primary cilia play in a mouse model of craniofacial development. With Rolf Stottmann, PhD, Human Genetics, Brugmann uses next-generation sequencing technology to identify genetic variants in three families being cared for at Cincinnati Children’s. The research could significantly influence their care and lead to crucial discoveries in developmental biology.

**Producing neurons and glial cells from iPSCs**

Brugmann and James Wells, PhD, Developmental Biology, use pluripotent stem cells to generate neural crest cells that can differentiate into enteric neurons and glial cells. Their goal is to integrate a generated enteric nervous system into a human intestinal organoid and make it capable of intestinal contraction.

To understand the cellular mechanisms of palate development, Yu Lan, PhD, has established a mouse model for cleft palate research using ENU mutagenesis and exome sequencing approaches. Lan was awarded a grant from the National Institute of Dental and Craniofacial Research for her work with the role of Golgi function in cleft palate syndrome.

Lan and Rulang Jiang, PhD, Developmental Biology, explore molecular mechanisms involving odd-skipped family transcription factors in patterning mammalian dentition and tongue. They collaborate with Jing Hu, DDS, PhD, at Sichuan University in China, on the critical role of Smad7 in regulating cranial suture development.
Working with mouse mandibles, Donna Jones, PhD, has shown that muscle forces affect bone shape by altering bone deposition and resorption, particularly during early growth. She presented findings in September 2014 at the national meeting of the American Society for Bone and Mineral Research.

Research to Improve Reconstruction
Christopher Gordon, MD; Alessandro DeAlarcon, MD; and Michael Rutter, MD, have produced a tissue-engineered neotrachea. The grafts appear fully mucosalized with ciliated respiratory epithelium, crucial to translating this technology to a human model. Gordon also is pursuing tissue-engineered mandible reconstruction as an alternative to microsurgical reconstruction.

Using shape analysis from 3D photographs, Donna Jones, PhD, characterizes growth curves of craniofacial shape in children. Analyzing ear position and symmetry demonstrates that ear placement alters through growth, and developmental constraint of the ears is less than that of the midface, providing important guidelines for surgical planning.

Ann Schwentker, MD; Brian Pan, MD; and Bruce Aronow, PhD, are investigating the impact of autologous and cultured adipocyte injections in a porcine model of hypertrophic burn scarring.

Skin Sciences Program
Marty Visscher, MD, studies premature infants who lack vernix caseosa and are predisposed to infection. She studies the ontogeny of stratum corneum barrier in premature infants, measuring barrier integrity, hydration, pH, and collecting skin surface samples to determine lipid composition, structural proteins and specific cytokines.

Visscher collaborates with researchers from Johns Hopkins University to study the effect of topical oils on neonatal skin integrity. Using high-resolution color imaging, thermal imaging and three-dimensional surface scans, she characterizes the disease and healing processes of skin conditions, including hemangiomas, pressure ulcers, contact dermatitis and burn scars.

Division Publications

Faculty, Staff, and Trainees

Faculty Members

David Billmire, MD, Professor  
Leadership Director, Pediatric Plastic Surgery

Samantha Brugmann, PhD, Assistant Professor  
Research Interests Craniofacial Development

Christopher Gordon, MD, Associate Professor

Donna Jones, PhD, Assistant Professor

Yu Lan, PhD, Associate Professor

Brian Pan, MD, Assistant Professor

Ann Schwentker, MD, Associate Professor

Marty Visscher, PhD, Associate Professor
Leadership
Director, Skin Sciences Program

Research Interests Skin Science

Kevin Yakuboff, MD, Professor

Leadership Co-Director, Hand and Upper Extremity Center

Thomas Sitzman, MD, Assistant Professor

Joint Appointment Faculty Members

Rulang Jiang, PhD, Professor (Developmental Biology)

Clinical Staff Members

- Dawn Rothchild, RN, PNP
- Stacey Ruth, RN, MSN, CFNP
- Lynn Olberding, RN, PNP

Trainees

- William Abouhassan, MD, Resident, 2004, Cleveland Clinic, PGY-9
- Haithem Elhadi, MD, Resident, 2000, Kasturba Medical College, PGY-6
- Darlene Guse, MD, Resident, 2010, Mayo Clinic, PGY-4
- Sarah Evans, MD, Resident, 2006, Duke University, PGY-8
- Ching-Fang Chang, PhD, Research Fellow, 2012, University of Alabama at Birmingham
- Scott Rapp, MD, Resident, 2008, Medical College of Ohio, PGY-4
- Chris Runyan, MD, Resident, 2009, University of Cincinnati, PGY-3
- Betsy Shock, Graduate Student, University of Cincinnati

Grants, Contracts, and Industry Agreements

Grant and Contract Awards

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Current Year Direct $325,000

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