

Pediatric General and Thoracic Surgery

Division Details

RESEARCH AND TRAINING DETAILS

Faculty	24
Joint Appointment Faculty	2
Research Fellows and Post Docs	8
Research Graduate Students	1
Total Annual Grant Award Dollars	\$3,388,627
Total Annual Industry Award Dollars	\$157,307
Total Publications	90

CLINICAL ACTIVITIES AND TRAINING

Clinical Fellows	6
Inpatient Encounters	6,481
Outpatient Encounters	11,041



Row 1: J Nathan, F Lim, G Tiao, R Falcone, R Dasgupta, A Bondoc

Row 2: J Peiro, N Timchenko, T Inge, B Rymeski, M Alonso

Row 3: T Jenkins, A Shaaban, M Mahe, J Frischer, D von Allmen, M Helmrath

Research Highlights

Richard Falcone Jr., MD, MPH

Pediatric trauma research continues to focus on the triage of pediatric trauma patients within the trauma system, and at the level of the pediatric trauma hospital. This work is funded, for two consecutive years, by the [Ohio Department of Public Safety](#). At the system level, this work has allowed an improved understanding of state wide under-triage of injured children, and is now focusing on a better understanding of the triage of pediatric traumatic brain injuries patients throughout the state trauma system. Extensive work by our group has also explored the appropriate triage of injured children on arrival to the pediatric trauma center based on pre-hospital information. As an expansion of this work, Cincinnati Children's is part of an important R24 funding proposal to further understand EMS triage of children, and how this interacts with trauma center triage. In addition to this important work, the group has published groundbreaking research on how adult trauma centers can significantly improve their care of injured children by partnering with a pediatric trauma center. Finally, our injury prevention work continues to explore the impact of our home safety program and our national [Buckle Up for Life program](#) on reducing pediatric injuries. This important work receives funding from [Kohl's Cares for Kids](#), [Messer Construction Company](#) and [Toyota](#).

Michael Helmrath, MD

[Dr. Helmrath](#) is the surgical director of the [Intestinal Rehabilitation Center](#). His laboratory's basic and clinical studies focus on evaluating the adaptive response of the bowel to injury and loss. Specifically, the laboratory focuses on the role of intestinal stem cells in small intestinal physiology. His work has been continuously funded by multiple [NIH](#) awards. His U01 award aims to lead to a deeper understanding of regional influence within intestinal stem cell populations that may contribute to physiological and disease specific difference commonly seen between the proximal and distal intestine. As part of the Intestinal Stem Cell Consortium ([ISCC](#), NIH), he is

actively involved in the intestinal stem cell field. His long-term research goal is to establish translational therapies for the management of patients with short bowel syndrome.

Thomas Inge, MD, PhD

[Dr. Thomas Inge](#) is a full-time attending physician in the Division of Pediatric General and Thoracic Surgery, the director of the [Surgical Weight Loss Program for Teens](#), and is also the co-director of the Center for Bariatric Research and Innovation (CBRI). He has extensive clinical expertise in medical and surgical management of patients with severe obesity. The main focus of his research is the outcomes of bariatric surgery, for which he has funding from the National Health Institutes (NIH) continuously since 2005. He is the principal investigator of the multicenter [Teen-LABS study](#) which was recently awarded five additional years of funding (2017-2022) by the [National Institute of Diabetes and Digestive and Kidney Diseases](#). The CBRI is currently partnering with Cincinnati Children's divisions and other institutions to study the changes in patients after bariatric surgery. Dr. Inge collaborated with other leading Cincinnati Children's physicians and investigators to create the Pediatric Diabetes and Obesity Center (PDOC) with an Academic and Research Committee award from the Children's Cancer Research Fund (CCRF). A PDOC research study is currently recruiting and enrolling participants to address the role of the immune system in the development and progression of obesity and obesity-associated sequelae.

Helen Jones, PhD

[Helen Jones, PhD](#), and her [lab](#) members investigate the maternal-fetal interface in a broad range of pathologies, and are developing targeted gene therapy protocols to use during pregnancy to improve placental function and fetal growth. With collaborators from the [University of Cincinnati](#), they have developed, and demonstrated, successful, cell-specific gene expression both in primary human trophoblast cultures and a mouse model of placental insufficiency, along with maintenance of normal fetal growth in the mouse model upon treatment. Current studies are underway into the inclusion of targeting peptides onto the nanoparticles for systemic delivery and incorporation of MiRNA seed sequences to address off-target effects.

In collaboration with [James Cnota, MD](#), and the [Heart Institute](#), the Jones lab has demonstrated significant alteration of placental vascular and villous development in cases of congenital heart defects, including hypoplastic left heart syndrome (HLHS), and transposition of the great arteries in humans. They have demonstrated a new mouse model of HLHS recapitulates the human placental phenotype, and will use this to investigate the heart-placenta axis throughout gestation.

Dr. Jones and her team have also established new collaborations with [Dr. Kasper Hoebe, PhD](#), the [Division of Immunobiology](#), to study the role of maternal immune modulation of placental invasion; and [Dr. Gruschen Veldtman, FRCP, MBChB](#), director of [Adult Congenital Heart Disease](#), to investigate placentation in mothers with heart diseases. Dr. Jones has maintained collaborations with Dr. Laura Woollett, [UC Pathology](#), to study the effects of cholesterol on placental development and function, as well as collaborations with Drs. [Louis Muglia, MD, PhD](#), and [Michaela Pavlicev, PhD](#), [Center for Prevention of Preterm Birth](#), to investigate placental involvement in preterm birth.

Maxime M. Mahe, PhD

[Dr. Maxime Mahe](#) is an instructor in the [Division of Pediatric General and Thoracic Surgery](#). His research goals are to study human enteric nervous system regulation of intestinal growth and its impact on gastrointestinal dysfunctions. Dr. Maxime Mahe studies the molecular and cellular mechanisms underlying the effects of the enteric nervous system on intestinal epithelial functions using integrated human gut models derived from pluripotent stem cells. The overall goal of his research is to provide insight into the gastrointestinal pathophysiology relevant to congenital dysmotilities, gastrointestinal infections, irritable bowel syndrome (IBS), and [Hirschsprung disease](#). Additionally, Dr. Mahe received the Athena Troxnel Blackburn Research Scholar Award from the [American Gastroenterology Association](#).

Jaimie Nathan, MD

[Jaimie Nathan, MD](#), surgical director of the [Intestinal Transplant Program](#), and his team are investigating the role of intestinal microbiota in intestinal transplantation and in progression of chronic liver diseases. With grant funding from the [American Society of Transplant Surgeons](#), the team is studying the role of intestinal microbiota in acute rejection after intestinal transplantation with the goal of identifying novel non-invasive biomarkers to predict the development of rejection. Investigating the role that changes in intestinal microbiota play in

the progression of chronic liver disease and its complications, and in the development of post-liver transplantation complications in children is the focus of another study funded by the [Markham Family Award on Liver Diseases/Liver Transplantation](#).

Jose L. Peiro, MD, PhD

A research team led by [Jose L. Peiro, MD, PhD](#), director of Endoscopic Fetal Surgery at the [Cincinnati Fetal Center](#), is continuing investigating the basic mechanisms of pediatric and fetal surgical congenital malformations, focusing especially upon fetal myelomeningocele (MMC), congenital diaphragmatic hernia (CDH), and gastroschisis.

New Trends in Spina Bifida and Neural Tube Defects

Improving the fetoscopic approach for intrauterine repair by evaluating different patches and sealants in animal models (in collaboration with biomedical engineers at the [University of Cincinnati, Professor Chia-Ying Lin's Laboratory](#), and then translating these techniques for use in the human fetus is the focus in MMC. A new clinical trial will compare fetoscopic MMC repair in humans against the standardized open fetal surgery approach. They are determining the mechanistic processes and pathways activated in the neuro-inflammation and neurodegeneration that appear in open neural tube defects in rodent models. The team is also studying ways to use neural progenitor cells collected from the amniotic fluid of MMC patients as a potential form of neural regeneration (cell therapy). In collaboration with [Dr. Shaaban's lab](#), they are using a mouse model of neural tube defects to investigate how maternal immune status can influence incidence of congenital malformations.

Evaluating Fetal Surgery to Support Lung Development

In CDH, they will continue studies in animal models that indicate that early fetal tracheal occlusion may induce faster and better fetal lung growth. A new animal model of CHAOS ligation of the fetal trachea early in gestation perfectly resembles the human histology of this condition. They described comparison of a novel CDH surgically induced model in rats with gene-expression to the teratogen nitrofen-induced CDH model in a collaborative study with [Dr. Jeffrey Whitsett's research group](#). Also, an excessive reversal of epidermal growth factor receptor and ephrin signaling has discovered the following tracheal occlusion in a rabbit model of congenital diaphragmatic hernia. They started this year with fetoscopic tracheal occlusion in human fetuses with severe CDH by detachable balloon insertion. This work will contribute to the ongoing multicenter TOTAL trial.

Neuroenteric and Lymphatic Disorders Related to Gastroschisis

In gastroschisis, they are analyzing the neurodegenerative and lymphatic anomalies that associates with fetal gastroschisis and their relation with intestinal hypomotility and malabsorption in the fetal rabbit model. They are also studying the origin and presence of intrauterine growth restriction in these fetuses with gastroschisis, in collaboration with [Dr. Habli](#) and [Dr. Helen Jones' Lab](#).

Aimen Shaaban, MD

Immunologic Tolerance to In Utero Hematopoietic

Cell transplantation [Aimen F Shaaban, MD](#), is the director for the [Center for Fetal Cellular and Molecular Therapy](#). Research focuses on in utero hematopoietic cell transplantation (IUHCT) for the treatment of congenital diseases such as sickle cell disease and thalassemia with the goal of understanding the steps necessary for successful engraftment and long-term tolerance induction. In a small-animal model, the team is defining the manner in which the fetal immune system first learns to differentiate self from foreign cells. Over the past year, these studies have resulted in publications in the [Journal of Immunology](#) and [Scientific Reports](#), as well as research presentations at the [American Society of Hematology](#). Our research program is funded by support from the National Institutes of Health (NIH), and the [Children's Hospital Research Foundation](#).

Additionally, maintained productive collaborations with: 1) [Dr. Sing Sing Way](#) from the [Division of Infectious Diseases](#) in probing how fetal exposure to mother's cells affects future reproductive fitness; 2) [Dr. Helen Jones](#) in exploring how the cross-talk between the maternal and fetal immune system affects placental development; 3) Drs. [Foong-Yen Lim](#) from the [Cincinnati Fetal Center](#); [Jose Luis Peiro](#) from the [Division of Pediatric General and Thoracic Surgery](#); and [Beth Kline-Fath](#) from the [Department of Radiology](#) in the study of how the human fetal lung grows in cases of congenital diaphragmatic hernia; 4) [Dr. Kasper Hoebe](#) from the [Division of Immunobiology](#) in exploring the mechanisms underlying fetal NK cell development; and 5) [Dr. Damien Reynaud](#) from the [Division of Experimental Hematology and Cancer Biology](#) in exploring the mechanisms controlling cell-fate decisions in the hematopoietic system. These collaborative works were published in [Chimerism](#), [Prenatal Diagnosis](#), and the [Journal of Pediatric Surgery](#).

Soona Shin, PhD

[Soona Shin, PhD](#), is a member of the [Liver Tumor Program](#). Her research aims to decipher the molecular and cellular mechanism of childhood liver cancer, with a focus on adult hepatic progenitor cells, fetal hepatoblasts and hepatocytes. Facultative adult hepatic progenitor cells and fetal hepatoblasts are tissue-specific stem cells that can differentiate into hepatocytes and cholangiocytes, the two major epithelial cell populations in the liver. The research team investigates the hypothesis that while adult hepatic progenitor cells promote pathological angiogenesis, dysregulated differentiation of both fetal hepatoblasts and hepatocytes initiates tumorigenesis. The [Shin lab](#) employs molecular genetic approaches to test this hypothesis and collaborates with Drs. [Nikolai Timchenko, PhD](#), and [Anita Gupta, MD](#), to discover novel strategies for prevention and treatment of liver cancer.

Gregory Tiao, MD

[Dr. Greg Tiao](#) is the director for the [Division of Pediatric General and Thoracic Surgery](#) and surgical director of liver transplantation. Dr. Tiao is also a member of the [Liver Tumor Program](#) and a member of the Children's Oncology Group Rare Tumor Liver Subcommittee. Dr. Tiao's lab continues to work on the pathogenesis of Biliary Atresia through an ongoing R01 project funded by the National Institutes of Health (NIH) with the assistance of his research team including Dr. Sujit Mohanty and research assistants Bryan Donnelly and Sarah Mowery. Recently published data from his lab illustrated the role of rotavirus VP6 protein phosphorylating the mitogen activated protein kinase, ERK allowing virus replication. ERK phosphorylation leads to calcium influx in biliary epithelial cells (cholangiocytes). Pre-treatment with an ERK inhibitor or a calcium channel blocker Verapamil, resulted in lower viral yields in vitro. ERK inhibition in BALB/c pups resulted in reduced viral yield within their bile ducts and decreased symptoms of biliary atresia. In an additional study, his lab has identified a novel cell binding site on rotavirus's VP4 protein. The amino acid sequence "SRL" (445-447) within VP4 binds to the heat shock cognate protein 70 (Hsc70) expressed on cholangiocytes membrane. Utilizing an innovative reverse genetics system his lab generated a mutant virus where amino acid arginine (R) in the "SRL" sequence changing it to glycine (G). Mice injected with this mutant strain of RRV no longer develop murine biliary atresia.

Nikolai Timchenko, PhD

[Nikolai Timchenko, PhD](#), is a professor within the [UC Department of Surgery](#), and a leader of the [Liver Tumor Program](#). His lab investigate mechanisms of hepatoblastoma (HBL), hepatocellular carcinoma (HCC), and mechanisms of non-alcoholic fatty liver disease (NAFLD). Liver Cancer: The main hypothesis of cancer related studies is that the cause of HBL is a failure of hepatic stem cells to differentiate into mature hepatocytes; while development of HCC is associated with de-differentiation of hepatocytes into cancer stem cells. [Dr. Timchenko's lab](#) has generated five unique animal models with accelerated or inhibited liver cancer after treatments with certain carcinogens. Investigations of molecular pathways in these animal models revealed that the key event in the development of HCC is the proteasome-mediated elimination of tumor suppressor proteins and proteins that support differentiation status of hepatocytes. In collaborations with [Dr. Gregory Tiao, MD](#), and [Dr. James Geller, MD](#), from the [Division of Oncology](#), along with other members of Liver Tumor Program, Dr. Timchenko has analyzed a large cohort of liver samples from patients with HBL and found the elimination of tumor suppressor proteins in the majority of HBL samples. Surprisingly, a significant portion of aggressive HBL samples have elevated levels of tumor suppressor proteins which underwent modifications and lost their tumor suppressor activities. Using animal models of HBL, Dr. Timchenko identified a unique type of hepatocytes which display properties of tumor initiating cells. Current studies are examining if these hepatocytes give rise to liver cancer. These studies translate the knowledge of the molecular mechanisms of liver cancer, generated in animal models, to clinical application in human patients. NAFLD. Investigations of NAFLD by Dr. Timchenko's lab resulted in the discovery of a triggering event that causes NAFLD. This event is the elevation of cdk4 and subsequent stimulation of a cascade of pathways that lead to NAFLD. Dr. Timchenko also found that the inhibition of cdk4 prevents/reverses early steps of NAFLD. Since the FDA approved the use of cdk4 inhibitors, and are in clinical trials for liver cancer, it is possible to initiate clinical trials for NAFLD with these drugs. These studies have been recently published in Cell Reports and received extensive media coverage.

Significant Publications

Xanthakos SA, [Jenkins TM](#), Kleiner DE, Boyce TW, Mourya R, Karns R, Brandt ML, Harmon CM, [Helmrath MA](#), Michalsky MP, Courcoulas AP, Zeller MH, [Inge TH](#); Teen-LABS Consortium. [High Prevalence of Nonalcoholic Fatty Liver Disease in Adolescents Undergoing Bariatric Surgery](#). *Gastroenterology*. 2015 Sep;149(3):623-34.e8.

There is little known about the prevalence of nonalcoholic fatty liver disease (NAFLD) among severely obese adolescents or factors that determine its development. We investigated the prevalence of NAFLD in a multicenter cohort of adolescents undergoing bariatric surgery, and the factors associated with it.

Timchenko NA. Cell-type specific functions of epidermal growth factor receptor are involved in development of hepatocellular carcinoma. *Hepatology*. 2015 Jul;62(1):314-6.

The epidermal growth factor/epidermal growth factor receptor (EGF-EGFR) signaling regulates the inflammatory microenvironment, and associates with development of hepatocellular carcinoma (HCC). In this editorial, Dr. Timchenko has analyzed recently published observations showing that EGFR has opposite functions in different cell types of the liver. EGFR promotes HCC in Kupffer cells of the liver, while it inhibits HCC in hepatocytes. These observations demonstrated that the therapeutic approaches designed should be for a specific inhibition of EGFR only in macrophages, and should not affect EGFR in parenchymal cells given that the latter scenario might promote tumorigenesis.

Valanejad L, Timchenko N. Akt-FoxO1 axis controls liver regeneration. *Hepatology*. 2016 May;63(5):1424-6.

Liver regeneration after surgical resections is a complex process which includes multiple alterations in gene expression. Despite significant progress in the studies of liver regeneration, there is little known about triggering events. In this article, Valanejad and Timchenko have analyzed findings by Pauta and colleagues that revealed a critical role of serine-threonine kinase Akt/PKB-Foxo1 pathway in liver regeneration. This axis controls at least four highly significant signaling activation of this axis required for liver regeneration.

Shah AS, D'Alessio D, Ford-Adams ME, Desai AP, **Inge TH. Bariatric Surgery: A Potential Treatment for Type 2 Diabetes in Youth.** *Diabetes Care*. 2016 Jun; 39(6): 934-40.

In this study, we review the burden of type 2 diabetes in youth including its associated complications. We discuss the outcomes and complications of bariatric surgery in adolescents with diabetes. The conclusion includes recommendations for future research and options for refinement of the use of bariatric surgery in this patient population.

McGrath PS, Watson CL, Ingram C, **Helmrath MA**, Wells JM. **The Basic Helix-Loop-Helix Transcription Factor NEUROG3 Is Required for Development of the Human Endocrine Pancreas.** *Diabetes*. 2015 Jul;64(7):2497-505.

Neurogenin3 (NEUROG3) is a basic helix-loop-helix transcription factor required for development of the endocrine pancreas in mice. In contrast, humans with NEUROG3 mutations are born with endocrine pancreas function, calling into question the requirement of NEUROG3 for human endocrine pancreas development. To test this directly, we generated human embryonic stem cell (hESC) lines and disrupted both alleles of NEUROG3 using CRISPR/Cas9-mediated gene targeting. NEUROG3(-/-) hESC lines efficiently formed pancreatic progenitors but lacked detectible NEUROG3 protein and did not form endocrine cells in vitro. Moreover, NEUROG3(-/-) hESC lines were unable to form mature pancreatic endocrine cells after engraftment of PDX1(+)/NKX6.1(+) pancreatic progenitors into mice. In contrast, a 75-90% knockdown of NEUROG3 caused a reduction, but not a loss, of pancreatic endocrine cell development. We conclude that NEUROG3 is essential for endocrine pancreas development in humans and that as little as 10% NEUROG3 is sufficient for formation of pancreatic endocrine cells.

Division Publications

1. Abd E, N, Taylor L, Troja W, Owens K, Ayres N, Pauletti G, Jones H. **Development of Non-Viral, Trophoblast-Specific Gene Delivery for Placental Therapy.** *Plos One*. 2015; 10:e0140879-e79.
2. Abd Ellah NH, Taylor L, Ayres N, Elmahdy MM, Fetih GN, Jones HN, Ibrahim EA, Pauletti GM. **Nf-Kappab Decoy Polyplexes Decrease P-Glycoprotein-Mediated Multidrug Resistance in Colorectal Cancer Cells.** *Cancer Gene Ther*. 2016; 23:149-55.
3. Aihara E, Mahe MM, Schumacher MA, Matthis AL, Feng R, Ren W, Noah TK, Matsu-ura T, Moore SR, Hong CI, Zavros Y, Herness S, Shroyer NF, Iwatsuki K, Jiang P, Helmrath MA, Montrose MH. **Characterization of Stem/Progenitor Cell Cycle Using Murine**

- Circumvallate Papilla Taste Bud Organoid.** *Sci Rep.* 2015; 5:17185.
4. Alali AS, Gomez D, Sathya C, Burd RS, Mainprize TG, Moulton R, Falcone RA, de Mestral C, Nathens A. **Intracranial Pressure Monitoring among Children with Severe Traumatic Brain Injury.** *J Neurosurg Pediatr.* 2015; 16:523-32.
 5. Alhajjat AM, Strong BS, Lee AE, Turner LE, Wadhvani RK, Ortaldo JR, Heusel JW, Shaaban AF. **Prenatal Allospecific Nk Cell Tolerance Hinges on Instructive Allorecognition through the Activating Receptor During Development.** *J Immunol.* 2015; 195:1506-16.
 6. Aoki R, Shoshkes-Carmel M, Gao N, Shin S, May CL, Golson ML, Zahm AM, Ray M, Wiser CL, Wright CV, Kaestner KH. **Foxl1-Expressing Mesenchymal Cells Constitute the Intestinal Stem Cell Niche.** *Cell Mol Gastroenterol Hepatol.* 2016; 2:175-88.
 7. Azizkhan R, Von Allmen D. **Perinatal Tumors.** In: R Carachi, J Grosfeld, eds. *The Surgery of Childhood Tumors.* New York: Springer; 2016:163-88.
 8. Bearnish A, D'Alessio D, Inge T. **Controversial Issues: When the Drugs Don't Work, Can Surgery Provide a Different Outcome for Diabetic Adolescents?** *Surg Obes Relat Dis.* 2015; 11:946-48.
 9. Bischoff A, DeFoor W, VanderBrink B, Goebel J, Hall J, Alonso M, Reddy P, Pena A. **End Stage Renal Disease and Kidney Transplant in Patients with Anorectal Malformation: Is There an Alternative Route?** *Ped Surg Int.* 2015; 31:725-28.
 10. Breaux M, Lewis K, Valanejad L, Iakova P, Chen F, Mo Q, Medrano E, Timchenko L, Timchenko N. **P300 Regulates Liver Functions by Controlling P53 and C/Ebp Family Proteins through Multiple Signaling Pathways.** *Mol Cell Biol.* 2015; 35:3005-16.
 11. Calvo-Garcia MA, Kline-Fath BM, Adams DM, Gupta A, Koch BL, Lim FY, Laor T. **Imaging Evaluation of Fetal Vascular Anomalies.** *Pediatr Radiol.* 2015; 45:1218-29.
 12. Carreras E, Maroto A, Illescas T, Melendez M, Arevalo S, Peiro JL, Garcia-Fontecha CG, Belfort M, Cuxart A. **Prenatal Ultrasound Evaluation of Segmental Level of Neurological Lesion in Fetuses with Myelomeningocele: Development of a New Technique.** *Ultrasound Obstet Gynecol.* 2016; 47:162-7.
 13. Chidambaran V, Venkatasubramanian R, Sadhasivam S, Esslinger H, Cox S, Diepstraten J, Fukuda T, Inge T, Knibbe CA, Vinks AA. **Population Pharmacokinetic-Pharmacodynamic Modeling and Dosing Simulation of Propofol Maintenance Anesthesia in Severely Obese Adolescents.** *Paediatr Anaesth.* 2015; 25:911-23.
 14. Coleman A, Habli M, Hinton RB, Polzin W, Lim FY. **Altered Amniotic Fluid Leptin Levels in Twin-Twin Transfusion Syndrome with Concurrent Placental Insufficiency.** *J Matern Fetal Neonatal Med.* 2015; 28:1647-52.
 15. Coleman A, Kline-Fath B, Stanek J, Lim FY. **Pleuropulmonary Blastoma in a Neonate Diagnosed Prenatally as Congenital Pulmonary Airway Malformation.** *Fetal Diagn Ther.* 2016; 39:234-7.
 16. Contreras-Munoz P, Fernandez-Martin A, Torrella R, Serres X, De la Varga M, Viscor G, Jarvinen TA, Martinez-Ibanez V, Peiro JL, Rodas G, Marotta M. **A New Surgical Model of Skeletal Muscle Injuries in Rats Reproduces Human Sports Lesions.** *Int J Sports Med.* 2016; 37:183-90.
 17. Cushing CC, Martinez-Leo B, Pena A, Bischoff A, Hall J, 2nd, Helmrath M, Dickie BH, Levitt MA, Zeller MH, Frischer JS. **Health Related Quality of Life and Parental Stress in Children with Fecal Incontinence: A Normative Comparison.** *J Pediatr Gastroenterol Nutr.* 2016.
 18. DeFoor WR, Asplin JR, Kollar L, Jackson E, Jenkins T, Schulte M, Inge T. **Prospective Evaluation of Urinary Metabolic Indices in Severely Obese Adolescents after Weight Loss Surgery.** *Surg Obes Relat Dis.* 2016; 12:363-7.
 19. Divanovic A, Bowers K, Michelfelder E, Jaekle R, Newman T, Marcotte M, Habli M, Cnota JF. **Intrauterine Fetal Demise after Prenatal Diagnosis of Congenital Heart Disease: Assessment of Risk.** *Prenat Diagn.* 2016; 36:142-7.
 20. Dubnov-Raz G, Inge TH, Ben-Ami M, Pienik R, Vusiker I, Yardeni D. **Body Composition Changes in Adolescents after Laparoscopic Sleeve Gastrectomy.** *Surg Obes Relat Dis.* 2016; 12:322-9.

21. Ehrlich PF, Hamilton TE, Gow K, Barnhart D, Ferrer F, Kandel J, Glick R, Dasgupta R, Naranjo A, He Y, Perlman EJ, Kalapurakal JA, Khanna G, Dome JS, Geller J, Mullen E. **Surgical Protocol Violations in Children with Renal Tumors Provides an Opportunity to Improve Pediatric Cancer Care: A Report from the Children's Oncology Group.** *Pediatr Blood Cancer.* 2016; 63:1905-10.
22. Ehsan Z, Nathan JD, Kercksmar CM. **An Infant with a Hyperlucent Chest Mass: An Unexpected Diagnosis.** *Pediatr Pulmonol.* 2015; 50:E52-4.
23. Emery S, Hasley S, Catov J, Miller R, Moon-Grady A, Baschat A, Johnson A, Lim F, Gagnon A, O'Shaughnessy R. **North American Fetal Therapy Network: Intervention Versus Expectant Management for Stage I Twin-Twin Transfusion Syndrome.** *Am J Obstet Gynecol.* 2016; 215:e1-7.
24. Endres L, DeFranco E, Conyac T, Adams M, Zhou Y, Magner K, O'Rourke L, Bernhard KA, Siddiqui D, McCormick A, Abramowicz J, Merkel R, Jawish R, Habli M, Floman A, Magann EF, Chauhan SP, Caog Far Research Network. **Association of Fetal Abdominal-Head Circumference Size Difference with Shoulder Dystocia: A Multicenter Study.** *AJP Rep.* 2015; 5:e099-104.
25. Englum BR, Rothman J, Leonard S, Reiter A, Thornburg C, Brindle M, Wright N, Heeney MM, Jason Smithers C, Brown RL, Kalfa T, Langer JC, Cada M, Oldham KT, Scott JP, St Peter SD, Sharma M, Davidoff AM, Nottage K, Bernabe K, et al. **Hematologic Outcomes after Total Splenectomy and Partial Splenectomy for Congenital Hemolytic Anemia.** *J Pediatr Surg.* 2016; 51:122-7.
26. Falcone RA, Jr. **Alone We Can Do So Little, Together We Can Do So Much.** *J Trauma Acute Care Surg.* 2016; 80:685-8.
27. Falcone RA, Jr., Milliken WJ, Bensard DD, Haas L, Daugherty M, Gray L, Tuggle DW, Garcia VF. **A Paradigm for Achieving Successful Pediatric Trauma Verification in the Absence of Pediatric Surgical Specialists While Ensuring Quality of Care.** *J Trauma Acute Care Surg.* 2016; 80:433-9.
28. Fischer K, Hogan V, Jager A, von Allmen D. **Efficacy and Utility of Phone Call Follow-up after Pediatric General Surgery Versus Traditional Clinic Follow-Up.** *Perm J.* 2015; 19:11-4.
29. Fleet T, Zhang B, Lin F, Zhu B, Dasgupta S, Stashi E, Tackett B, Thevananther S, Rajapakshe KI, Gonzales N, Dean A, Mao J, Timchenko N, Malovannaya A, Qin J, Coarfa C, DeMayo F, Dacso CC, Foulds CE, O'Malley BW, et al. **Src-2 Orchestrates Polygenic Inputs for Fine-Tuning Glucose Homeostasis.** *Proc Natl Acad Sci U S A.* 2015; 112:E6068-77.
30. Galloway D, Danziger-Isakov L, Goldschmidt M, Hemmelgarn T, Courter J, Nathan JD, Alonso M, Tiao G, Fei L, Kocoshis S. **Incidence of Bloodstream Infections in Small Bowel Transplant Recipients Receiving Selective Decontamination of the Digestive Tract: A Single-Center Experience.** *Pediatr Transplant.* 2015; 19:722-9.
31. Goldschmidt ML, Kocoshis SA, Tiao GM, Alonso MH, Nathan JD. **Limited Surgical Resection for Graft Salvage Following Recovery from Complicated Exfoliative Rejection in Pediatric Intestinal Recipients.** *Pediatr Transplant.* 2015; 19:E170-6.
32. Goncalves FL, Figueira RL, Gallindo RM, Simoes AL, Coleman A, Peiro JL, Sbragia L. **Tracheal Occlusion and Ventilation Changes the Nitric Oxide Pathway in Congenital Diaphragmatic Hernia Model.** *J Surg Res.* 2016; 203:466-75.
33. Goruppi I, Arevalo S, Gander R, Molino JA, Oria M, Carreras E, Peiro JL. **Role of Intraluminal Bowel Echogenicity on Prenatal Ultrasounds to Determine the Anatomical Level of Intestinal Atresia.** *J Matern Fetal Neonatal Med.* 2016:1-6.
34. Graziano K, Islam S, Dasgupta R, Lopez ME, Austin M, Chen LE, Goldin A, Downard CD, Renaud E, Abdullah F. **Asymptomatic Malrotation: Diagnosis and Surgical Management: An American Pediatric Surgical Association Outcomes and Evidence Based Practice Committee Systematic Review.** *J Pediatr Surg.* 2015; 50:1783-90.
35. Illescas T, Rodo C, Arevalo S, Gine C, Peiro JL, Carreras E. **The Quantitative Lung Index and the Prediction of Survival in Fetuses with Congenital Diaphragmatic Hernia.** *Eur J Obstet Gynecol Reprod Biol.* 2016; 198:145-8.
36. Inge T. **A New Look at Weight Loss Surgery for Children and Adolescents with Prader-Willi Syndrome.** *Surg Obes Relat Dis.* 2016; 12:110-12.
37. Inge T, Courcoulas A, Xanthakos S. **The Authors Reply.** *N Engl J Med.* 2016; 374:1989-90.

38. Inge TH, Courcoulas AP, Jenkins TM, Michalsky MP, Helmrath MA, Brandt ML, Harmon CM, Zeller MH, Chen MK, Xanthakos SA, Horlick M, Buncher CR, Teen Labs Consortium. **Weight Loss and Health Status 3 Years after Bariatric Surgery in Adolescents.** *N Engl J Med.* 2016; 374:113-23.
39. Inge TH, Courcoulas AP, Xanthakos SA. **Weight Loss and Health Status after Bariatric Surgery in Adolescents Reply.** *N Engl J Med.* 2016; 374:1989-90.
40. Inge TH, Prigeon RL, Elder DA, Jenkins TM, Cohen RM, Xanthakos SA, Benoit SC, Dolan LM, Daniels SR, D'Alessio DA. **Insulin Sensitivity and Beta-Cell Function Improve after Gastric Bypass in Severely Obese Adolescents.** *J Pediatr.* 2015; 167:1042-8 e1.
41. Jin J, Valanejad L, Nguyen T, Lewis K, Wright M, Cast A, Stock L, Timchenko L, Timchenko N. **Activation of Cdk4 Triggers Development of Non-Alcoholic Fatty Liver Disease.** *Cell Reports.* 201; 16:744-56.
42. Johnston JH, Kline-Fath BM, Bitters C, Calvo-Garcia MA, Lim FY. **Congenital Overinflation: Prenatal Mri and Us Findings and Outcomes.** *Prenat Diagn.* 2016; 36:568-75.
43. Jones HN, Olbrych SK, Smith KL, Cnota JF, Habli M, Ramos-Gonzales O, Owens KJ, Hinton AC, Polzin WJ, Muglia LJ, Hinton RB. **Hypoplastic Left Heart Syndrome Is Associated with Structural and Vascular Placental Abnormalities and Leptin Dysregulation.** *Placenta.* 2015; 36:1078-86.
44. Kelly AS, Ryder JR, Marlatt KL, Rudser KD, Jenkins T, Inge TH. **Changes in Inflammation, Oxidative Stress and Adipokines Following Bariatric Surgery among Adolescents with Severe Obesity.** *Int J Obes (Lond).* 2016; 40:275-80.
45. Kinder JM, Jiang TT, Ertelt JM, Xin L, Strong BS, Shaaban AF, Way SS. **Cross-Generational Reproductive Fitness Enforced by Microchimeric Maternal Cells.** *Cell.* 2015; 162:505-15.
46. Knod J, Bondoc A, Garrison A, Bischoff A, Dickie B, Frischer J. **Concurrent Esophageal Atresia with Tracheoesophageal Fistula and Hirschsprung Disease.** *J Pediatr Surg Case Rep.* 2015; 3:499-500.
47. Knod JL, Crawford K, Dusing M, Collins MH, Chernoguz A, Frischer JS. **Angiogenesis and Vascular Endothelial Growth Factor- α Expression Associated with Inflammation in Pediatric Crohn's Disease.** *J Gastrointest Surg.* 2016; 20:624-30.
48. Knod JL, Crawford K, Dusing M, Frischer JS. **Murine Colitis Treated with Multitargeted Tyrosine Kinase Inhibitors.** *J Surg Res.* 2016; 200:501-7.
49. Lin TK, Palermo JJ, Nathan JD, Tiao GM, Hornung LN, Fei L, Abu-El-Haija M. **Timing of Cholecystectomy in Children with Biliary Pancreatitis.** *J Pediatr Gastroenterol Nutr.* 2016; 62:118-21.
50. Lobeck I, Dupree P, Falcone R, Lin T, Trout A, Nathan J, Tiao G. **Transduodenal Resection of a Choledochocoele (Type Iii Choledochal Cyst) with Sphincteroplasty: A Case Report.** *J Pediatr Surg Case Rep.* 2016; 9:26-30.
51. Martinez-Leo B, Chesley P, Alam S, Frischer J, Levitt M, Avansino J, Dickie B. **The Association of the Severity of Anorectal Malformations and Intestinal Malrotation.** *J Pediatr Surg.* 2015.
52. McGrath PS, Watson CL, Ingram C, Helmrath MA, Wells JM. **The Basic Helix-Loop-Helix Transcription Factor Neurog3 Is Required for Development of the Human Endocrine Pancreas.** *Diabetes.* 2015; 64:2497-505.
53. Mezoff E, Hawkins J, Ollberding N, Karns R, Morrow A, Helmrath M. **The Human Milk Oligosaccharide 2'-Fucosyllactose Augments the Adaptive Response to Extensive Intestinal.** *Am J Physiol Gastrointest Liver Physiol.* 2016; 310:G427-G38.
54. Miller NJ, Schick K, Timchenko N, Harrison E, Roesler WJ. **The Glutamine-Alanine Repeat Domain of Tcerg1 Is Required for the Inhibition of the Growth Arrest Activity of C/Ebalpha.** *J Cell Biochem.* 2016; 117:612-20.
55. Moon C, Zhang W, Sundaram N, Yarlagadda S, Reddy VS, Arora K, Helmrath MA, Naren AP. **Drug-Induced Secretory Diarrhea: A Role for Cfr.** *Pharmacol Res.* 2015; 102:107-12.

56. Moon-Grady AJ, Morris SA, Belfort M, Chmait R, Dangel J, Devlieger R, Emery S, Frommelt M, Galindo A, Gelehrter S, Gembruch U, Grinenco S, Habli M, Herberg U, Jaeggi E, Kilby M, Kontopoulos E, Marantz P, Miller O, Otano L, et al. **International Fetal Cardiac Intervention Registry: A Worldwide Collaborative Description and Preliminary Outcomes.** *J Am Coll Cardiol.* 2015; 66:388-99.
57. Nagaraj UD, Peiro JL, Bierbrauer KS, Kline-Fath BM. **Evaluation of Subependymal Gray Matter Heterotopias on Fetal Mri.** *AJNR Am J Neuroradiol.* 2016; 37:720-5.
58. Peiro JL, Scorletti F, Sbragia L. **Prenatal Diagnosis of Cloacal Malformation.** *Semin Pediatr Surg.* 2016; 25:71-5.
59. Pelizzo G, Mimmi MC, Ballico M, Marotta M, Goruppi I, Peiro JL, Zambaiti E, Costanzo F, Andreatta E, Tonin E, Calcaterra V. **Congenital Pulmonary Malformations: Metabolomic Profile of Lung Phenotype in Infants.** *J Matern Fetal Neonatal Med.* 2016; 29:143-7.
60. Phithakwatchara N, Coleman A, Peiro JL, Lee AE, Keswani SG, Kline-Fath B, Lim FY, Shaaban AF. **Differential Patterns of Prenatal Ipsilateral and Contralateral Lung Growth in Cases of Isolated Left-Sided Congenital Diaphragmatic Hernia.** *Prenat Diagn.* 2015; 35:769-76.
61. Polzin W, Lim F, Habli M, Van Hook J, Minges M, Jaekle R, Crombleholme T. **Use of an Amnioport to Maintain Amniotic Fluid Volume in Fetuses with Oligohydramnios Secondary to Lower Urinary Tract Obstruction or Fetal Renal Anomalies.** *Fetal Diagn Ther.* 2016.
62. Puligandla PS, Grabowski J, Austin M, Hedrick H, Renaud E, Arnold M, Williams RF, Graziano K, Dasgupta R, McKee M, Lopez ME, Jancelewicz T, Goldin A, Downard CD, Islam S. **Management of Congenital Diaphragmatic Hernia: A Systematic Review from the Apsa Outcomes and Evidence Based Practice Committee.** *J Pediatr Surg.* 2015; 50:1958-70.
63. Radhakrishnan R, Merhar S, Meizen-Derr J, Haberman B, Lim FY, Burns P, Zorn E, Kline-Fath B. **Correlation of Mri Brain Injury Findings with Neonatal Clinical Factors in Infants with Congenital Diaphragmatic Hernia.** *AJNR Am J Neuroradiol.* 2016; 37:1745-51.
64. Salloum R, Fox CE, Alvarez-Allende CR, Hammill AM, Dasgupta R, Dickie BH, Mobberley-Schuman P, Wentzel MS, Chute C, Kaul A, Patel M, Merrow AC, Gupta A, Whitworth JR, Adams DM. **Response of Blue Rubber Bleb Nevus Syndrome to Sirolimus Treatment.** *Pediatr Blood Cancer.* 2016; 63:1911-4.
65. Schmidt AF, Goncalves FL, Figueira RL, Scorletti F, Peiro JL, Sbragia L. **Combined Antenatal Therapy with Retinoic Acid and Tracheal Occlusion in a Rat Model of Congenital Diaphragmatic Hernia.** *Pediatr Surg Int.* 2016; 32:591-8.
66. Scott-Finley M, Woo JG, Habli M, Ramos-Gonzales O, Cnota JF, Wang Y, Kamath-Rayne BD, Hinton AC, Polzin WJ, Crombleholme TM, Hinton RB. **Standardization of Amniotic Fluid Leptin Levels and Utility in Maternal Overweight and Fetal Undergrowth.** *J Perinatol.* 2015; 35:547-52.
67. Shah AS, D'Alessio D, Ford-Adams ME, Desai AP, Inge TH. **Bariatric Surgery: A Potential Treatment for Type 2 Diabetes in Youth.** *Diabetes Care.* 2016; 39:934-40.
68. Shi Y, Geller JI, Ma IT, Chavan RS, Masand PM, Towbin AJ, Chintagumpala M, Nuchtern JG, Tiao GM, Thompson PA, Vasudevan SA. **Relapsed Hepatoblastoma Confined to the Lung Is Effectively Treated with Pulmonary Metastasectomy.** *J Pediatr Surg.* 2016; 51:525-9.
69. Shin S, Wangensteen KJ, Teta-Bissett M, Wang YJ, Mosleh-Shirazi E, Buza EL, Greenbaum LE, Kaestner KH. **Genetic Lineage Tracing Analysis of the Cell of Origin of Hepatotoxin-Induced Liver Tumors in Mice.** *Hepatology.* 2016; 64:1163-77.
70. Sinkey R, Habli M, South A, Gibler W, Burns P, Eschenbacher M, Warshak C. **Sonographic Markers Associated with Adverse Neonatal Outcomes among Fetuses with Gastroschisis: An 11-Year, Single-Center Review.** *Am J Obstet Gynecol.* 2016; 214:275e1-75e7.
71. Spitznagel M, Alosco M, Inge T, Rochette A, Strain G, Devlin M, Crosby R, Mitchell J, Gunstad J. **Adolescent Weight History and Adult Cognition: Before and after Bariatric Surgery.** *Surg Obes Relat Dis.* 2015.

72. Strong BS, Newkold TJ, Lee AE, Turner LE, Alhajjat AM, Heusel JW, Shaaban AF. **Extrinsic Allospecific Signals of Hematopoietic Origin Dictate Inkt Cell Lineage-Fate Decisions During Development.** *Sci Rep.* 2016; 6:28837.
73. Strong BS, Ryken KO, Lee AE, Turner LE, Wadhvani RK, Newkold TJ, Alhajjat AM, Heusel JW, Shaaban AF. **Prenatal Alloeneic Tolerance in Mice Remains Stable Despite Potent Viral Immune Activation.** *J Immunol.* 2015; 195:4001-9.
74. Szabo FK, Hornung L, Oparaji JA, Alhosh R, Husain SZ, Liu QY, Palermo J, Lin TK, Nathan JD, Podberesky DJ, Lowe M, Fei L, Abu-El-Haija M. **A Prognostic Tool to Predict Severe Acute Pancreatitis in Pediatrics.** *Pancreatology.* 2016; 16:358-64.
75. Tiao G, Geller J, Timchenko N. **Generation of Plc-Pdx Platforms for Pediatric Liver Cancer: A Critical Stage in the Development of Anti-Cancer Treatments.** *Hepatology.* 2016.
76. Timchenko NA. **Cell-Type Specific Functions of Epidermal Growth Factor Receptor Are Involved in Development of Hepatocellular Carcinoma.** *Hepatology.* 2015; 62:314-6.
77. Trout AT, Towbin AJ, Klingbeil L, Weiss BD, von Allmen D. **Single and Multidimensional Measurements Underestimate Neuroblastoma Response to Therapy.** *Pediatr Blood Cancer.* 2016.
78. Utzinger L, Gowey M, Zeller M, Jenkins T, Engel S, Rofey D, Inge T, Mitchell J, Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) Consortium. **Loss of Control Eating and Eating Disorders in Adolescents before Bariatric Surgery.** *Int J Eat Disorder.* 2016.
79. Valanejad L, Timchenko N. **Akt-Foxo1 Axis Controls Liver Regeneration.** *Hepatology.* 2016; 63:1424-6.
80. Van Landeghem L, Santoro MA, Mah AT, Krebs AE, Dehmer JJ, McNaughton KK, Helmrath MA, Magness ST, Lund PK. **Igf1 Stimulates Crypt Expansion Via Differential Activation of 2 Intestinal Stem Cell Populations.** *FASEB J.* 2015; 29:2828-42.
81. von Allmen D, Wijnen RM. **Bridging the Gap in the Repair of Long-Gap Esophageal Atresia: Still Questions on Diagnostics and Treatment.** *Eur J Pediatr Surg.* 2015; 25:312-7.
82. Walther A, Falcone R, Pritts T, Hanseman D, Robinson B. **Pediatric and Adult Trauma Centers Differ in Evaluation, Treatment, and Outcomes for Severely Injured Adolescents.** *J Pediatr Surg.* 2015; 51:1346-50.
83. Walther A, Mohanty SK, Donnelly B, Coots A, Lages CS, Lobeck I, Dupree P, Meller J, McNeal M, Sestak K, Tiao G. **Rhesus Rotavirus Vp4 Sequence-Specific Activation of Mononuclear Cells Is Associated with Cholangiopathy in Murine Biliary Atresia.** *Am J Physiol Gastrointest Liver Physiol.* 2015; 309:G466-74.
84. Walther AE, Coots AC, Goebel JW, Alonso MH, Ryckman FC, Tiao GM, Nathan JD. **Laparoscopic Donor Nephrectomy for the Pediatric Recipient Population: Risk Factors for Adverse Outcomes.** *Pediatr Transplant.* 2015; 19:836-43.
85. Webster DL, Fei L, Falcone RA, Kaplan JM. **Higher-Volume Hypertonic Saline and Increased Thrombotic Risk in Pediatric Traumatic Brain Injury.** *J Crit Care.* 2015; 30:1267-71.
86. Xanthakos SA, Jenkins TM, Kleiner DE, Boyce TW, Mourya R, Karns R, Brandt ML, Harmon CM, Helmrath MA, Michalsky MP, Courcoulas AP, Zeller MH, Inge TH, Teen Labs Consortium. **High Prevalence of Nonalcoholic Fatty Liver Disease in Adolescents Undergoing Bariatric Surgery.** *Gastroenterology.* 2015; 149:623-34 e8.
87. Zambaiti E, Bussani R, Calcaterra V, Zandona L, Silvestri F, Peiro JL, Marotta M, Andreatta E, Pelizzo G. **Myocardial Effects of Fetal Endoscopic Tracheal Occlusion in Lambs with Cdh.** *Prenat Diagn.* 2016; 36:362-7.
88. Zani A, Ford-Adams M, Ratcliff M, Bevan D, Inge TH, Desai A. **Weight Loss Surgery Improves Quality of Life in Pediatric Patients with Osteogenesis Imperfecta.** *Surg Obes Relat Dis.* 2015.
89. Zeller MH, Noll JG, Sarwer DB, Reiter-Purtill J, Rofey DL, Baughcum AE, Peugh J, Courcoulas AP, Michalsky MP, Jenkins TM, Becnel JN, Group TS, in Cooperation With Teen Labs Consortium. **Child Maltreatment and the Adolescent Patient with Severe Obesity: Implications for Clinical Care.** *J Pediatr Psychol.* 2015; 40:640-8.

Grants, Contracts, and Industry Agreements

Annual Grant Award Dollars

Investigator	Title	Sponsor	ID	Dates	Amount
Anusua Roshni Dasgupta, MD	Timing of Inguinal Hernia Repair in Premature Infants: A Randomized Trial	National Institutes of Health (Vanderbilt University)	U01 HD076733	6/1/2015 - 5/31/2016	\$2,075
Richard A Falcone, MD	Multi-Center Evaluation of Defined Pediatric Trauma Activation Criteria	Laerdal Foundation (Children's Hospital Los Angeles)	CH-LA - Falcone,Rich	1/1/2015 - 12/31/2016	\$7,684
Marilyn J Haas RN-CNP	Understanding State-Wide Pediatric Trauma Under-Triage	Ohio Department of Public Safety	ODPS - HAAS,LYNN	7/21/2015 - 6/30/2016	\$63,296
Michael Anthony Helmrath, MD James Wells, PHD	Establishment of In Vitro and In Vivo Models of Human Gastrointestinal Organoids with a Functional ENS	National Institutes of Health	U18 EB021780	9/30/2015 - 7/31/2017	\$143,520
Michael Anthony Helmrath, MD James Wells, PHD Noah Shroyer	Investigation of Regional Identity in Human Intestinal Stem Cells	National Institutes of Health	U01 DK103117	9/1/2014 - 8/31/2019	\$122,567
Thomas Inge, MD-PHD	PCORnet Bariatric Study	Patient-Centered Outcome Research Inst. (Group Health Cooperative)	OBS-1505-30683	2/1/2016 - 1/31/2018	\$72,603
Thomas Inge, MD-PHD	Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS)	National Institutes of Health	UM1 DK072493	9/23/2011 - 8/31/2016	\$1,118,270
Todd M Jenkins, PHD	Teen Longitudinal Assessment of Bariatric Surgery (Teen-LABS) renewal? Data Coordinating Center	National Institutes of Health (University of Cincinnati)	UM1 DK095710	9/23/2011 - 8/31/2016	\$721,479
Helen Nichola Jones, PHD	Insulin-like Growth Factor 1 Gene Therapy; Correction of Placental Insufficiency	National Institutes of Health	R00 HD068504	4/1/2014 - 3/31/2017	\$235,413
Donna Laake	Health Improvement and Wellness, Health Promotion, Violence and Injury Prevention	Ohio Department of Health	GG-2016-SA-00-00-003	11/16/2015 - 9/30/2017	\$39,638

Maxime M Mahe, PHD	Human in vivo model to study the role of a functional enteric nervous system on intestinal development and maturation	AGA Fdn for Digestive Health & Nutrition	AGA - Mahe,Maxime	10/1/2015 - 9/30/2018	\$90,000
Jaimie Nathan, MD	The role of intestinal microbiota in acute rejection in patients after small bowel transplantation	American Society of Transplant Surgeons	ASTS - NATHAN,JAIMIE	7/1/2015 - 6/30/2017	\$50,000
Aimen Shaaban, MD	The NK Cell Response to Prenatal Allotransplantation	National Institutes of Health	R01 HL103745	3/5/2013 - 6/30/2017	\$371,083
Nikolai Timchenko, PHD	NAFLD: Mechanisms and Treatments	National Institutes of Health	R01 DK102597	1/1/2015 - 12/31/2018	\$351,000
Total Annual Grant Award Dollars					\$3,388,627

Annual Industry Award Dollars

Investigator	Industry Sponsor	Amount
Anusua Roshni Dasgupta, MD	Navidea Biopharmaceuticals	\$157,307
Total Annual Industry Award Dollars		\$157,307