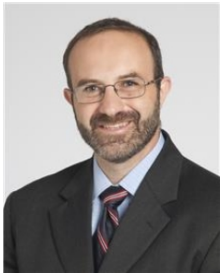
CLASS OF 2015

William Hanna: 7/1/2011 – 6/30/2015



Location after Fellowship: Cleveland Clinic Main Campus

Research Experience

2013-2014 Cincinnati Children's Hospital Center for Simulation and Research, -Using in-situ simulation throughout Cincinnati Children's Medical Center hospital, investigated whether the modification of standard simulation based training techniques through the use of a 'mid-code event pause' improves code related outcomes. In particular, focus was placed on ensuring effective positioning of code team members and vital equipment during code events.

2012-2015 Cincinnati Children's Hospital Division of Critical Care,
Acted as principle investigator in this prospective research study involving 700 patients investigating the predictive value of IL-27, a cytokine produced by antigen presenting cells, as a novel diagnostic biomarker in diagnosing bacterial infection early among the critically ill within Cincinnati Children's Hospital Pediatric ICU.

He has received a Masters of Science in Clinical and Translational Research and has submitted his thesis as a work product. His project focused on the study of serum IL-27 and procalcitonin levels as markers of bacterial infection in critically ill children. His data show that there is great potential to use these biomarkers, especially when combined to predict bacterial versus viral or sterile inflammatory responses in the critical care setting. In addition to this work, he wrote a review article entitled "Pediatric Sepsis: Challenges and Adjunctive Therapies" which was published in Critical Care Clinics in 2013. In addition, he presented 3 research abstracts nationally at the Society of Critical Care Medicine Annual Congress in 2014 and 2015 and in 2015 was awarded the SCCM Specialty Award in Infectious Disease. He gave many lectures within our division and to medical students at the University of Cincinnati College of Medicine. He also dedicated a significant amount of time to our institution's simulation program for the training of pediatric residents and as a PALS instructor. In 2014 the pediatric residents awarded him the Outstanding Fellow Teaching Award.

Awards and Honors

2013-14 Cincinnati Children's Hospital Fellow Teacher of the Year Award.

2015 Society of Critical Care Medicine Specialty Award in Infectious Disease for abstract entitled: "Performance of Interleukin 27 as a Sepsis Diagnostic Biomarker in Critically Ill Children".

Accomplishments

2015 Received Masters of Science in Clinical and Translational Research

2012-2015 Cincinnati Children's Hospital Center for Simulation and Research
formally trained to perform and debrief mock-code simulations and have personally performed and debriefed over 100 simulations at Cincinnati Children's Hospital. Settings have involved the PICU and various other hospital settings, in addition to other centers

Publications/Presentations

Peer Reviewed Journal Articles/Abstracts

Hanna W, Berrens Z, Langner T, Lahni P, Wong, H. Interleukin 27: a novel biomarker in predicting bacterial infection among the critically ill. *Crit Care Med*. 2015:19:378.

Hanna W, Wong H. Pediatric Sepsis: Challenges and Adjunctive Therapies. *Critical Care*

Clinics. 2013 Apr; 29(3): 203-222.

Invited Presentations

Lecture: IL-27: A Novel Biomarker in Predicting Bacterial Infection Among the Critically Ill. Presented at: Cincinnati Children's Hospital 8th Annual Thomas F. Boat Presentations; Cincinnati, OH, 2014.

Lecture to Third Year Medical Students. *Pediatric Sepsis and Translational Research*. University of Cincinnati College of Medicine, June 2014, Cincinnati, OH.

Lecture to Third Year Medical Students. *Pediatric Sepsis and Translational Research*. University of Cincinnati College of Medicine, May 2015, Cincinnati, OH

IL-27: A Novel Biomarker in Predicting Bacterial Infection Among the Critically Ill. Presented at: University of Cincinnati Division of Epidemiology and Biostatistics Seminar Series; Cincinnati, OH, 09/11/2014.

Lecture: *Pediatric Sepsis: New Concepts and Controversies.* Ohio Regional Advanced Practice Nurse Conference, November 11, 2014, Mason, OH.

Travis Langner: 7/1/2012 – 6/30/2015

Location after Fellowship: Mercy Children's Hospital, University of Kansas School of Medicine

Research Experience

2012 - 2015 Validating IL-27 as a sepsis biomarker
Cincinnati Children's Hospital Medical Center, Division of Critical Care
Advisor: Basilia Zingarelli MD, PhD
In this project, we are inducing SIRS and bacterial sepsis in mice in order to validate IL-27 as a novel biomarker in the early identification of bacterial sepsis.

2014- 2015 Use of IL-27 in predicting sepsis in critically ill children
Cincinnati Children's Hospital Medical Center, Division of Critical Care
Advisor: Hector Wong, MD
In this project, we are evaluating plasma levels of IL-27 from critically ill children admitted to the intensive care unit in order to establish its predictive value in the early identification of bacterial sepsis.

2014 - 2015 ABC PICU
Cincinnati Children's Hospital Medical Center, Division of Critical Care
Advisor: Erika Stalets,
In this project, we are participating institution in the randomized clinical trial assessing the clinical consequences of red blood cell storage duration.

Focus was the role of IL-27 in a mouse model of septic shock. His data supports a protective role for IL-27 in septic shock as indicated by higher serum inflammatory cytokine levels. Survival benefit was only seen in male mice suggesting a possible role for estrogens in the regulation of IL-27 production and/or activity. He also collaborated with another fellow looking at the role of serum IL-27 levels in bacterial infection in critically ill children giving him a robust bench to bedside experience.

He presented this work at the Shock Society annual meeting in 2014 and was awarded a New Investigator Travel Grant and at the Society of Critical Care Medicine Annual Congress in 2015 where his abstract was among the top scored abstracts and selected for oral presentation. He also collaborated with another fellow in a project exploring fluid resuscitation in murine septic shock that was also presented at the SCCM Annual Congress in 2015.

Dr. Langner also developed a medical device that will be a very important bedside tool in the ICU and on transport. He collaborated with medical engineers from the University of Cincinnati to build a prototype.

During his fellowship he participated in 2 medical missions to Jamaica to provide care for children undergoing repair for congenital heart disease.

Scholarships, Nominations, and Awards

2014 New Investigator Travel Grant, Shock Society Conference.

Publications

Hanevold C.D., **Langner, T.R**., et al. (2014). Kidney Transplantation. Pediatric *Critical Care Medicine*. D. S. Wheeler, H. R. Wong and T. P. Shanley, Springer. London: 443-454. 2nd edition

Hanna WJ, Berrens Z, **Langner T**, Lahni P, Wong HR. Interleukin-27: a novel biomarker in predicting bacterial infection among the critically ill. *Critical Care*. 2015; 19:378.

Ayalon I, Alder MN, **Langner TR**, Hafberg ET, Miethke AG, Kaplan JM. A Case of Salicylate Intoxication Complicated by Coagulopathy, Pulmonary Edema, and Pancreatitis. *Am J Ther*. 2016 Jan 27.

Abstracts

Elevated Levels of Plasma Interleukin – 27 in Murine Models of Systemic Inflammatory Response. Shock Society Conference. June 9, 2014.

Fluid Resuscitation Improves Survival in Murine Endotoxemia. Society of Critical Care Medicine, Phoenix, Arizona January 20, 2015.

Oral Presentations

EBI–3 Modulates Inflammation in Mice Subjected to Sepsis. Society of Critical Care Medicine, Phoenix, Arizona January 18, 2015.

Respiratory Mechanics, Monitoring, and Waveforms – Practical Applications for Practitioners. Bustamante Children's Hospital, Kingston, Jamaica. April 23, 2015.

Matthew Alder: 7/1/2012 – 6/30/2015

Location after Fellowship: Cincinnati Children's Hospital, Critical Care Medicine

Research Experience

The Role of Olfactomedin 4 in Sepsis

The focus of his project was the role of Olfactomedin 4 in sepsis. He examined genomic changes in OLFM4 in children with septic shock and found it to be profoundly upregulated especially in nonsurvivors and from that he derived the hypothesis that OFLM4 plays a pathologic role during septic shock. In a mouse model of septic shock, he demonstrated OLFM4 upregulation and also demonstrated its primary cellular sources. He constructed an OLFM4 knockout mouse and will be using that tool in the coming years as he continues to explore this very relevant cytokine. He presented his work at the Society of Critical Care Medicine's Annual Congress in 2015, where he was a Research Citation Finalist.

This work has served as the foundation for 4 grant submissions – the first was selected as the University of Cincinnati College of Medicine's submission to the Burroughs Welcome Foundation. Although this was not funded, his final grant preparation was excellent. In addition, he was appointed to the T32 grant program here at CCHMC for 2 years. He also was awarded the highly competitive NIH Loan Repayment Program. He has already submitted a K-12 grant application (May 2015) and this application was reviewed favorably. We are very fortunate to have recruited this fine clinician scientist to our division starting July 1, 2015.

Abstracts

Alder M, Lahni P, Wong H, and Hildeman D. A potential novel role for Olfactomedin 4 in sepsis. SCCM 2015.

Alder MN, Sholl A, England LG, Ling L, Caldwell CC, Pamer EG and Hildeman DA. Prior Infection Alters the Bacterial Microbiome and Improves Survival after Septic Challenge. SCCM 2014.

Publications

Alder MN, Lindsell CJ, Wong HR. The pediatric sepsis biomarker risk model: potential implications for sepsis therapy and biology. *Expert Rev Anti Infect Ther*. 2014 Apr 22.

Textbook Chapters

Alder M, Sandquist M, and Wong H. Sepsis. In Pediatric Critical Care. Furhman B and Zimmerman J eds. 5th edition. Elsevier Saunders, Philadelphia, 2015 in press.

Alder MN and Wong HR. (2015). Zinc Supplementation in Murine Sepsis. In Rajendram, Rajkumar, Preedy, Victor R., Patel, Vinood B. (Eds.) *Diet and Nutrition in Critical Car.* Springer. 2015

Theodore DeMartini: 7/1/2012 – 6/30/2015

Location after Fellowship: Pennsylvania State Hershey Children's Hospital

Research Experience

Site PI: VAIN2. "Ventilator Criteria" Group Lead

The focus of this project was the impact of obesity on the cardiomyopathy seen in sepsis. He used a mouse model of diet-induced obesity and a mouse model of sepsis and examined the impact on myocardial expression of key signaling proteins, markers of cardiac injury and echocardiographic assessment of myocardial performance. His data showed that in this obesity model, sepsis-induced myocardial dysfunction, inflammatory cytokine expression and activation of a key signaling molecule called STAT3 was worsened compared with non-obese mice.

In another project, he examined the relationship between serum bilirubin levels and measured oxygen saturation in the blood of critically ill children. He presented data from both of these projects at the Society of Critical Care Medicine's Annual Congress in 2015.

Dr. DeMartini also conducted a quality improvement project focusing on documentation of code status for all patients in the PICU. His efforts led to a dramatic improvement in documentation of code status in the EHR for our critically ill patients.

Abstracts

Adipose tissue is altered in obese mice after sepsis. 2013. Shock Society Conference

Adiponection's anti-inflammatory actions on mouse macrophages are dependent on STAT3. 2014. Shock Society Conference

Obesity alters cardiac dysfunction in septic mice through the STAT3 pathway. Crit Care Med 2015; 42:956

Can the Pulse-Ox versus arterial oxygen saturation difference predict mortality in critically ill pediatric bone marrow transplant recipients. Crit Care Med 2015; 42:766.

Publications

Theodore DeMartini; Marchele Nowell; Jeanne James; Lauren Williamson; Patrick Lahni; Hui Shen; Jennifer Kaplan. 2016. High Fat Diet-Induced Obesity Increases Myocardial Injury and Alters Cardiac STAT3 Signaling in Mice after Polymicrobial Sepsis. *BBA - Molecular Basis of Disease June 2017*