Department of Pediatrics

Annual Research Day

June 9, 2016

CAB 1302

8 am -11 am
### AGENDA

**Research Day**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
</table>
| 8:00-8:05 AM | **Opening Remarks**  
Patricia Whitley-Williams, MD  
Professor of Pediatric and Chair, Department of Pediatrics |
| 8:05-8:15 AM | **Podium Presentations**  
Manuel Jimenez, Roy Wade, Yong Lin, Nancy Reichman. *“Adverse childhood experiences and ADHD at age 9”* |
| 8:15-8:30 AM | Marwa Khalil, Joshua Vieth, Barry Weinberger, Anna Vetrano, Derek Sant’Angelo. *“Expression of the BTB-ZF Transcription Factor Family in Neonatal Lymphocytes”* |
| 8:30-8:45 AM | Naureen Memon, Barry I Weinberger, Thomas Hegyi, Mary O Carayannopoulos, Lauren M Aleksunes, Grace L Guo. *“Nutritional Regulation of Fibroblast Growth Factor 19 Secretion in Neonates”* |
| 8:45-9:00 AM | Anmol Tank, Anand Arikarevula, Henna Akbarzai, Nicholas J. Minar, and Michael Lewis. *“The Development of Audio-Visual Integration Abilities”* |
| 9:00-10:00 AM | **Keynote Speaker:** Glenn J. Fennelly, MD, MPH, Professor and Chair, Department of Pediatrics Rutgers New Jersey Medical School  
*“Developing a Dual Pediatric HIV & TB Vaccine: from Bedside to Bench”* |
| 10:00-10:30 AM | **Poster Viewing**  
**Poster Session Selected Podium Presentations** |
| 10:30-10:35 AM | Christina Ferrucci-Da Silva, Le Zhan, PhD, Jianliang Shen, Naureen Memon, Grace L Guo,  
*“Effect of Total Parenteral Nutrition on the Glutathione Oxidative Stress Pathway”* |
| 10:35-10:40 AM | Nelson Ching, Nicholas J. Minar, Michael Lewis.  
*“Face-Recognition Training Improves Recognition Abilities in Typically Developing Children, Children with Attention Deficit Hyperactivity Disorder and other Learning Disorders, but not Children with Autism Spectrum Disorder”* |
| 10:40-10:45 AM | Elizabeth Yen, Barry Weinberger, Robert Laumbach, Andrew Gow, Anna Vetrano1, Maya Ramagopal.  
*“Utility of Exhaled Breath Condensate (EBC) as Predictor of Bronchopulmonary Dysplasia”* |
| 10:45-11:00 AM | **Presentation of Awards and Closing Remarks** |
Department of Pediatrics Research Committee Members

**Anna Petrova, MD, PhD, MPH**
Professor of Pediatrics
Chair, Research Committee, Department of Pediatrics, Rutgers RWJMS

**Sunanda Gaur, MD**
Professor of Pediatrics
Director, Clinical Research Center
Director, Robert Wood Johnson AIDS Program
Rutgers Robert Wood Johnson Medical School

**Thomas Hegyi, MD**
Program Director, Division of Neonatology
Professor and Vice-Chair, Department of Pediatrics, Rutgers, RWJMS

**Michael Lewis, PhD**
University Distinguished Professor of Pediatrics and Psychiatry
Director, Institute for the Study of Child Development, Rutgers RWJMS

**Sally Radovick, MD**
Professor of Pediatrics
Senior Associate Dean for Clinical and Translational Research, Rutgers RWJMS

**Derek Sant’Angelo, PhD**
Professor of Pediatrics
Harold L. Paz, MD, Professor in Developmental Biology
Chief, Division of Developmental Biology, Child Health Institute of New Jersey, Rutgers RWJMS
<table>
<thead>
<tr>
<th>Authors</th>
<th>Title</th>
<th>Abstract #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minar, Lewis</td>
<td>The Antecedents and Outcomes of Early Self-Recognition</td>
<td>1</td>
</tr>
<tr>
<td>Yen, Weinberger, Laumbach, Vetrano, Gow, Ramagopal</td>
<td>Utility of Exhaled Breath Condensate in Predicting Bronchopulmonary Dysplasia</td>
<td>2</td>
</tr>
<tr>
<td>Shettigar, Savic, Sant’Angelo, Denzin</td>
<td>Ubiquitylation of the Paf oncoprotein and interaction with PCNA is essential for hematopoietic stem cell function and development</td>
<td>3</td>
</tr>
<tr>
<td>Vieth, Das, Ranaivoson, Comoletti, Denzin, Sant'Angelo</td>
<td>Induction of adipocyte resident NKT cells can be instructed by non ligand-binding motifs of the TCR β chain</td>
<td>4</td>
</tr>
<tr>
<td>Ostfeld, Schwartz-Soicher, Reichman, Teitler, Hegyi</td>
<td>Despite Increased Safe Sleep Education, Preterm Birth Remains a Major Risk Factor for Sudden Unexpected Infant Deaths”</td>
<td>5</td>
</tr>
<tr>
<td>Cabinian, Costanzo, Burley, Radovick</td>
<td>The Role of a Mutation in Gli2 in Growth Hormone Deficiency in Children Conflict</td>
<td>6</td>
</tr>
<tr>
<td>Ferrucci-Da Silva, Zhan, Shen, Memon, Guo</td>
<td>Effect of Total Parenteral Nutrition on the Glutathione Oxidative Stress Pathway</td>
<td>7</td>
</tr>
<tr>
<td>Karas, Cabinian, Novaira, Radovick</td>
<td>The Role of Kisspeptin in the Regulation of Insulin Secretion Conflict</td>
<td>8</td>
</tr>
<tr>
<td>Yen, Xia Wen, Francois, Gorczyca, Illsley, Zamudio, Aleksunes</td>
<td>Down-Regulation of the Placental BCRP Drug Transporter During Chronic Hypoxia</td>
<td>9</td>
</tr>
<tr>
<td>Huber, Weinberger, Memon, Weichung, Carayannopoulos, Oh, Kleinfeld, Hegyi</td>
<td>Elevated Levels of Unbound Free Fatty Acid (FFAu) and Unbound Bilirubin (Bf) in Preterm Infants Treated With Intralipid (IL)”</td>
<td>10</td>
</tr>
<tr>
<td>Rubio-Marrero, Vincelli, Pakos, Ranaivoson, von Daake, Comoletti</td>
<td>Structural Characterization of the Extracellular Domain of CASPR2 and Insights into Its Association with the Novel Ligand Contactin1</td>
<td>11</td>
</tr>
<tr>
<td>Lin, Wei, Vengsarkar, Markert, Rabson</td>
<td>Adaptation to histone deacetylase inhibitors reduces cMYC protein expression, reprograming of cancer cell gene expression and attenuation of the malignant phenotype “</td>
<td>12</td>
</tr>
<tr>
<td>Ching, Minar, Lewis</td>
<td>Face-Recognition Training Improves Recognition Abilities in Typically Developing Children, Children with Attention Deficit Hyperactivity Disorder and other Learning Disorders, but not</td>
<td>13</td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Intralipid Blunts the Effectiveness of Phototherapy in Reducing Unbound Bilirubin (Bf) in Preterm Infants</td>
<td>Huber, Weinberger, Memon, Shih, Carayannopoulos, Oh, Kleinfeld, Hegyi</td>
<td></td>
</tr>
<tr>
<td>Emergency Department (ED) Re-visitation in Young Children with Acute Bronchiolitis</td>
<td>Pepper, Leva, Petrova</td>
<td></td>
</tr>
<tr>
<td>Improvement in Mentoring Associated with Implementation of an Inter-Institutional Mentoring Program within Pediatric Rheumatology</td>
<td>Moorthy LN, Muscal E, Reibschleger M, Rouster-Stevens K, Ferguson P, Schneider R, Klein Gitelman, M, Brunner H, Huttenlocher A, Nigrovic P.</td>
<td></td>
</tr>
<tr>
<td>Pediatric Rheumatologists' Perceptions of Career Satisfaction, Confidence in Fulfilling Their Roles, and Burn-out</td>
<td>Moorthy LN, Muscal E, Reibschleger M, Rouster-Stevens K, Ferguson P, Schneider R, Klein Gitelman, M, Brunner H, Huttenlocher A, Nigrovic P.</td>
<td></td>
</tr>
<tr>
<td>Single clinical practice's report of testing initiation, antibody clearance, and transmission of hepatitis C virus (HCV) in infants of chronically HCV-infected mothers</td>
<td>Bal, Petrova</td>
<td></td>
</tr>
<tr>
<td>Clinical Characteristics of Children with Membranous Lupus Nephritis: The Childhood Arthritis and Rheumatology Research Alliance Legacy Registry</td>
<td>Boneparth, Wenderfer, Moorthy, Radhakrishna, Sagcal-Gironella, von Scheven, for the CARRA Registry Investigators</td>
<td></td>
</tr>
<tr>
<td>FAST and CT correlation in Pediatric Patients with Blunt Abdominal Trauma</td>
<td>Gengel, Petrova, Coyle, Lee, Pierre</td>
<td></td>
</tr>
<tr>
<td>Length of Time Looking at Faces Affects Facial Recognition</td>
<td>Ace, Minar, Lewis</td>
<td></td>
</tr>
<tr>
<td>Single clinical practice's report of testing initiation, antibody clearance, and transmission of hepatitis C virus (HCV) in infants of chronically HCV-infected mothers</td>
<td>Bal, Petrova</td>
<td></td>
</tr>
<tr>
<td>Clinical Characteristics of Children with Membranous Lupus Nephritis: The Childhood Arthritis and Rheumatology Research Alliance Legacy Registry</td>
<td>Boneparth, Wenderfer, Moorthy, Radhakrishna, Sagcal-Gironella, von Scheven, for the CARRA Registry Investigators</td>
<td></td>
</tr>
<tr>
<td>FAST and CT correlation in Pediatric Patients with Blunt Abdominal Trauma</td>
<td>Natalie Gengel, Anna Petrova, Susette Coyle, Yi-Horng Lee, Joelle Pierre</td>
<td></td>
</tr>
<tr>
<td>Length of Time Looking at Faces Affects Facial Recognition</td>
<td>Jessica Ace, Nicholas J. Minar, Michael Lewis</td>
<td></td>
</tr>
</tbody>
</table>
Abstract #1.  **The Antecedents and Outcomes of Early Self-Recognition**

Nicholas J. Minar & Michael Lewis
Institute for the Study of Child Development - Rutgers Robert Wood Johnson Medical School

Visual self-recognition, along with personal pronoun use and pretend play, emerge during the middle of the second year of life. These measures are thought to represent the emergence of a reflective self, a mentalistic capacity which underlies the development of self-conscious emotions and which allows for perspective taking and the emergence of emotional knowledge. In a longitudinal study of 164 children, two questions were explored that bear on this developmental sequence: 1) Do early risk factors, including overall environmental risk, along with mother-child interaction behaviors, drug exposure, and gender relate to emergence of self-referential behavior as measured in mirror recognition; and 2) Does self-referential behavior relate to later emotional knowledge (EK)? Consistent with previous data on self-recognition, approximately 40% of the children show self-recognition by 18-months. Mother-child interaction behaviors, environmental risk, drug exposure, and gender were not related to self-recognition. Furthermore, self-referential behavior uniquely predicted emotional knowledge in these children at 4.5 years of age, with environmental risk also contributing to this capacity. These findings support the idea that individual differences in self-referential behavior are related to children’s later knowledge about their own and others’ emotions.

**Results:** Among the 84 infants on full feeds, 9.5% had received exclusive breast milk (Group 1), 79.8% received partial breast milk (Group 2) and 10.7% had received high calorie preterm formula (Group 3). All babies on exclusive breast milk and 92.5% on partial breast milk feeding received fortified human milk. Infants in Group 1 were born at lower gestational age and birthweight than in Group 2 and 3 (P<0.03 and P<0.02). The mean duration of NPO and age at which feeding started were comparable between the studied groups. Full feedings were achieved at a mean age of 31.9+/−14.2 days in Group 1, 18.1+/−12.4 days in Group 2, and 16.9+/−6.7 days in Group 3 (P< 0.011). In Group 1 and Group 2 the changes in weight at Point 1 was 10.8% (95%CI 5.9%-15.7%) and 8.8% (95%CI 7.6%-10.0%), respectively ( P>0.05), which was significantly higher than in Group 3 [3.3% (95%CI -3.1%-9.7%)]. At Point 2, the difference in the change of weight between the groups did not reach statistical significance: Group 1 (14.4%, 95%CI 7.4%-21.3%), Group 2 (14.0%, 95%CI 12.8%-15.3%), and Group 3 (11.2% 95%CI 4.3%-18.0%), P=0.379. Adjustment to covariance (see Methods) confirmed an association between increase in weight after 7 days of full feeding and inclusion of breast milk in the feeding. None of the covariance included in the model had an independent effect on the infant’s growth after both, day 7 and day 10 of full feeding (P>0.05).

**Conclusion:** The growth pattern of very preterm born infants who have been on full feeds for 7 days is improved by the use of human milk.
Abstract #2. Utility of Exhaled Breath Condensate (EBC) as Predictor of Bronchopulmonary Dysplasia

Elizabeth Yen¹, Barry Weinberger¹, Robert Laumbach², Andrew Gow³, Anna Vetrano¹, Maya Ramagopal⁴

¹Rutgers Robert Wood Johnson Medical School (RWJMS), Division of Neonatology, New Brunswick, NJ
²Rutgers RWJMS, Environmental & Occupational Health Sciences Institute, Piscataway, NJ
³Rutgers Ernest Mario School of Pharmacy, Piscataway, NJ
⁴Rutgers RWJMS, Pediatric Pulmonology, New Brunswick, NJ

Purpose: Bronchopulmonary dysplasia (BPD) is responsible for long-term morbidity in premature neonates requiring mechanical ventilation. BPD is characterized by the accumulation of inflammatory cells in the lung, leading to oxidative injury. One of these markers is nitric oxide. Nitric oxide binds readily to oxygen radicals and is quickly metabolized to nitrogen reactive species, among which are nitrite and nitrate. Nitrite and nitrate can be quantified using exhaled breath condensate (EBC) and serve to monitor disease progression in older populations. This method, however, has not been widely established in neonatal population.

We would like to test feasibility of collecting nitrite and nitrate in EBC of ventilated premature infants. We hypothesize that increased nitrate and nitrite levels in EBC from infants ≤28 weeks gestation on conventional mechanical ventilation in the first week of life are associated with the development of BPD. If proven, EBC could become a novel, non-invasive method of collection as an alternative and/or adjunct to tracheal aspirate—a conventional, but rather invasive method of collection in ventilated premature infants.

Methods: We conducted a pilot prospective cohort study with samples of 48 subjects. EBC samples were collected on days of life (DOL) 3 and 7 from premature infants who fulfilled the inclusion criteria (≤28 weeks gestation, birth weight (BW) <1500 grams, on conventional mechanical ventilation at the time of collection). EBC was collected over 20 minutes using R tube™ (Respiratory Research, Charlottesville, VA) in line with the exhalation flow of the ventilator. Nitrite and nitrate levels were measured by Sievers chemiluminescence.

Continuous data were analyzed using t-test, categorical data were compared using Chi-square. Statistical significance applies to any p values of <0.05

Results: Among the 23 infants recruited in the study to date, 16 developed BPD (mean age 25 weeks gestation, mean BW 694 grams). Nitrite level collected in the first week of life was significantly higher in infants who developed BPD compared to those who did not develop BPD (p=0.031). Further analysis demonstrated that nitrite level collected as early as DOL3 was significantly elevated in infants who developed BPD compared to those without BPD (p<0.001). No significant difference was found with nitrate.

Conclusion: We demonstrate feasibility of collecting and measuring nitrite and nitrate levels in EBC from ventilated premature infants. EBC is safe and non-invasive, and is a promising alternative to tracheal aspirate. Elevated level of nitrite in EBC in the first week of life (particularly on DOL 3) is associated with the development of BPD.
Abstract #3. Adverse Childhood Experiences, Literacy and Kindergarten Problems

Manuel Jimenez, Roy Wade, Yong Lin, Nancy Reichman

Background: Adverse Childhood Experiences (ACE) have been linked to poor adult health. Less is known regarding the impact of early childhood ACEs on early literacy and Kindergarten experience which are strong predictors of educational trajectory. Understanding such relationships could identify underlying pathways connecting toxic stress to poor outcomes and potential targets for intervention.

Objective: To examine the association between ACEs and early literacy, disability and attention problems in Kindergarten.

Design/Methods: We conducted a secondary analysis of data from the Fragile Families and Child Wellbeing urban birth cohort 5 year follow-up. The study sample was limited to children for whom teacher survey information and mother report information on 8 ACE exposures was available. Dependent variables included teacher rating of child literacy, attention problems on Child Behavior Checklist (CBCL), and report of child disability as well as parent-rated attention problems on the CBCL attention subscale. ACEs consisted of mother reported exposure to mental illness, incarceration, domestic violence, substance use, as well as physical, sexual, psychological abuse and neglect. We created an ACE score by summing individual child adversities. We examined the association between ACEs and dependent variables using multivariable logistic regression controlling for potential confounders including child gender, age, race, ethnicity, and household income as well as maternal education and parent relationship status at childbirth.

Results: In total, 1008 children were included in our analysis. 46% were African American, 57% of mothers had a high school diploma or less at baseline. Slightly more than half of the children (53%) experienced at least one ACE and 26% experienced 2 or more ACEs. ACE score of 2 or more was associated with teacher reported below average literacy skills (AOR: 1.7; 95% CI: 1.2- 2.4), disability (AOR: 1.8; 95% CI: 1.04- 3.1) and top 10 percentile score in attention problems (AOR: 3.0; 95% CI: 1.8-4.9) as well as top 10 percentile score in parent reported attention problems (AOR: 4.6; 95% CI: 2.6- 8.3).

Conclusions: In this study of urban children, experiencing two or more ACEs in early childhood was associated with teacher reported below average literacy, disability, and attention problems in Kindergarten. These findings emphasize the importance of strategies that address the developmental needs of vulnerable children including literacy promotion.
Abstract #4. Ubiquitylation of the Paf oncoprotein and interaction with PCNA is essential for hematopoietic stem cell function and development.

Megha Shettigar, Miloje Savic, Derek B. Sant’Angelo, Lisa K. Denzin

Hematopoietic stem cells (HSCs) are critical for the lifelong production and maintenance of all blood cell types. The molecular mechanisms that guide this process remain poorly understood. The 15kDa proliferating cell nuclear antigen (PCNA) associated factor (Paf) is a potent oncogene that is over-expressed in most cancers. We have previously shown that Paf is essential for HSC and progenitor function and development. Paf deficient mice (Paf-/-) are leukopenic due to reduced number of HSCs and committed progenitors. Paf-/- HSCs failed to maintain quiescence, to self-renew and to support long term hematopoietic reconstitution. To determine the in vivo molecular interactions and pathways by which Paf functions to mediate hematopoiesis, we introduced mutant versions of Paf into the Paf-/- mice. These unique mouse models allowed us to show that Paf-PCNA interactions and Paf ubiquitylation are both essential for hematopoiesis. Furthermore, biochemical analyses of cells from these mice showed that Paf interaction with PCNA was essential for nuclear localization and proper ubiquitylation of Paf. Collectively, therefore, our studies show that Paf function is dependent upon the ability to interact with PCNA and that the ubiquitylation of Paf regulates Paf’s function during hematopoiesis. Analyses are ongoing to further delineate the molecular mechanism by which Paf mediates HSC function and development.
Abstract #5. Induction of adipocyte resident NKT cells can be instructed by non ligand-binding motifs of the TCR β chain

Joshua A. Vieth, Joy Das, Fanomezana M. Ranaivoson, Davide Comoletti, Lisa K. Denzin and Derek B. Sant’Angelo

Invariant Natural Killer T (NKT) cells, a CD1d-restricted subset of αβ T cells, have been increasingly recognized for their role in a wide variety of functions associated with autoimmunity, cancer, infection, tolerance, and obesity. The semi-invariant TCR expressed by NKT cells is unique in its recognition of glycolipids presented by CD1d, heterodimer rigidity, and limited binding footprint compared to conventional TCR:MHC interactions. This distinctive interaction has been studied extensively in vitro, though the role of the rigid α:β heterodimer in the selection and development of NKT cells remains elusive. We investigated a hydrophobic patch on the β chain of the NKT TCR, suggested to play a role in heterodimer stability. Partial disruption of this patch, while permissive of ligand binding, resulted in decreased populations of NKT cells, diminished development, and effector function. Complete disruption of the patch resulted in the ablation of the NKT cell compartment entirely, while still accommodating of conventional T cell development. NKT cells expressing the mutant NKT TCR acquired an adipose-resident NKT phenotype while in the thymus, and accumulated in the adipose tissue in mice. Hence, we show that in vivo, nonlig and binding regions of the NKT TCR are critical for the development of these important immune cells, and mediate the selection of adipose-resident NKT cells.
Despite Increased Safe Sleep Education, Preterm Birth Remains a Major Risk Factor for Sudden Unexpected Infant Deaths


BACKGROUND: Preterm birth is a well-established risk factor for Sudden Unexpected Infant Deaths (SUID), including Sudden Infant Death Syndrome (SIDS), leading to enhanced recommendations by the American Academy of Pediatrics (AAP) in 2011 for the provision of risk reducing safe sleep education in neonatal intensive care units (NICU's).

OBJECTIVE: To determine the association between gestational age (GA) and the rate of the three categories of SUID (SIDS, Accidental Suffocation and Strangulation in Bed-ASSB, and Ill-defined and Unknown Causes) in U.S. births subsequent to the release in 2011 of the Safe Infant Sleep Guidelines of the AAP.

DESIGN/METHODS: Births in the United States linked infant birth and death certificate period files for 2012 and 2013 were downloaded from the National Center for Health Statistics and combined, totaling 7,907,113. The sample was then limited to births with a GA between 24 and 42 completed weeks and a birth weight between 400 and 6,000 grams. Only deaths >27 days of age, occurring out-of-hospital, and receiving an autopsy were included. Sudden unexpected infant deaths were coded by the International Classifications Disease-revision 10 codes and included SIDS, ASSB, and Ill-defined and Unknown Causes. Deaths from other causes were excluded. The resulting sample contained 7,057,122 cases.

RESULTS: For each GA group, the mortality rate is presented by cause of death. Gestational Age

<table>
<thead>
<tr>
<th>Gestational Age</th>
<th>SIDS, Rate per 1000 live births</th>
<th>Ill-defined and Unknown Causes, Rate per 1000 live births</th>
<th>Accidental Suffocation/Strangulation, Rate per 1000 live births</th>
</tr>
</thead>
<tbody>
<tr>
<td>24-28 weeks</td>
<td>1.09</td>
<td>1.02</td>
<td>0.53</td>
</tr>
<tr>
<td>29-32 weeks</td>
<td>0.93</td>
<td>0.48</td>
<td>0.39</td>
</tr>
<tr>
<td>33-36 weeks</td>
<td>0.56</td>
<td>0.36</td>
<td>0.27</td>
</tr>
<tr>
<td>37-42 weeks</td>
<td>0.29</td>
<td>0.15</td>
<td>0.13</td>
</tr>
</tbody>
</table>

In a logistic regression model, short GA was more predictive of SUID, the combined term for all three causes of death, than was maternal education ≤ high school, non-Hispanic Black race/ethnicity, late onset prenatal care, gravid ≥2 or young maternal age. Only prenatal smoke exposure was more predictive.

CONCLUSIONS: The rates for SUID remain inversely associated with GA despite recommendations by the AAP in 2011 for increased safe infant sleep education in the NICU. Only prenatal exposure to smoking was more predictive. We speculate that the vulnerability to SUID associated with preterm birth has multiple etiologies that bear continued investigation, including the efficacy of current education programs in the NICU.
Abstract #7. The Role of a Mutation in Gli2 in Growth Hormone Deficiency in Children

Allison Cabinian¹, Luigi Di Costanzo²; Stephen Burley², Sally Radovick¹.

¹Department of Pediatrics, Rutgers University- Robert Wood Johnson Medical School- Child Institute of New Jersey, New Brunswick, NJ

²Department of Chemistry and Chemical Biology- Center for Integrative Proteomics Research- RCSB Protein Data Bank- Rutgers University, Piscataway, NJ

Rationale: Growth failure in children may be due to abnormalities in growth hormone production as a result of pituitary or hypothalamic disease or from intrinsic abnormalities within growing tissues. Yet, despite its common clinical presentation, the etiology of growth failure is unknown. In many cases, the clinical and biochemical evaluations of growth failure in current practice are uninformative and the molecular etiology has only been identified among a small group of children.

Objective: We aim to establish the role of single gene mutation in Gli2 affecting the GH-IGF-1 axis in the etiology of childhood growth hormone deficiency. We will provide a genetic mechanism that explains the growth abnormality in children.

Methods: We utilized whole exome sequencing (WES) and single nucleotide polymorphism) SNP arrays in a patient diagnosed with growth hormone deficiency. An atomic level structural model of the Zinc Finger portion of human Gli2 Cys535→Ser was generated using the SWISS-MODEL resource interactive modeling workspace of the Protein Model Portal. We transfected NIH3T3 cells with the mutant and WTGLI2 construct via Luciferase reporter using the Dual Luciferase Reporter Assay System to thoroughly analyze the effect of C535S mutation.

Results: We studied a 5-year old boy with postnatal growth retardation. His serum IGF-1 level was low and GH stimulation tests revealed GH deficiency. He had no additional pituitary hormone deficiencies. Pituitary MRI study revealed a hypoplastic pituitary. The proband’s sister had a similar presentation with growth failure due to GHD. The parents and another male sibling had normal stature. We identified a heterozygous nonsynonymous substitution in the hedgehog related transcription factor, GLI2 resulting in a C535S amino acid substitution involving the Cys2His2 domain of the 4th zinc finger in the patients with growth hormone deficiency by WES. Our molecular modeling suggests that this point mutation may alter the structural integrity of 4th zinc finger by losing its ability to coordinate a divalent metal ion, resulting in an unfolded protein. This protein may no longer operate as a DNA binding site, thereby causing a significant alternation in its function. The co-transfection of NIH3T3 cells demonstrated that the mutant C535S alters normal cell function suggesting that the mutation of Gli2 protein may play a pivotal role in childhood growth hormone deficiency.
Abstract #8. *Effect of Total Parenteral Nutrition on the Glutathione Oxidative Stress Pathway*

Christina Ferrucci-Da Silva, MD1, Le Zhan, PhD2,3, Jianliang Shen, MS2, Naureen Memon, MD1, and Grace L. Guo, MBBS, PhD2
1. Department of Pediatrics, Robert Wood Johnson Medical School, Rutgers University, New Brunswick, NJ, 08901, USA
2. Department of Pharmacology and Toxicology, Rutgers University, Piscataway, New Jersey 08854, USA
3. Rutgers Cancer Institute of New Jersey, New Brunswick, New Jersey, 08903, USA

Background: Parenteral nutrition-associated liver disease (PNALD) is defined as liver dysfunction as a result of a complex set of risk factors present in patients receiving total parenteral nutrition (TPN). Glutathione levels are reduced with TPN and their metabolism may play a key role in PNALD via an oxidative injury pathway. One of the mechanisms implicated in PNALD is down-regulation of hepatic anti-oxidative pathways and therefore an increase in oxidative injury to the liver. The difference in lipid compositions of soybean oil parenteral nutrition (PN) and Omegaven® may also play a role in the development of cholestasis.

Objective: The genes involved in the glutathione anti-oxidative stress pathway in the liver include, but are not limited to, Glutathione S-transferase, pi 1 (Gstp1), Glutathione S-transferase, mu 1 (Gstm1), Glutathione S-transferase, mu 3 (Gstm3), Glutathione S-transferase, mu 6 (Gstm6), and Glutathione peroxidase 3 (Gpx3). We hypothesize that soybean oil PN reduces the expression of these specific genes as a mechanism of liver injury. Our second hypothesis is that Omegaven® could reduce oxidative injury compared to intralipid, due to higher concentrations of antioxidant properties and lack of phytosterols. The objective of this current study is to determine the RNA expression of these genes in a mouse model of TPN.

Design/Methods: Either soybean oil PN or Omegaven® was administered at 8-10 mL/d to male C57BL/6J mice at 6-10 weeks of age (n = 8 mice in the soybean oil PN group, n = 3 mice in the Omegaven® group); control group received saline infusion and were allowed to feed ad libitum (n = 7 mice). At 8-14 days of soybean oil PN, Omegaven®, or saline infusion, mice were sacrificed and livers were harvested for analysis. Total RNA was isolated using TRI reagent (Sigma, St. Louis, MO) according to the manufacturer’s instructions. Liver mRNA expression of the aforementioned genes involved in glutathione metabolism was analyzed by real-time quantitative polymerase chain reaction (RT-qPCR).

Results: Microarray data showed down-regulation of Gstp1, Gstm1, Gstm3, Gstm6, and Gpx3 in the livers of mice receiving soybean oil PN compared to saline. RT-qPCR confirmed the microarray results in the soybean oil PN group, with statistically significant down-regulation of Gstp1 (p-value <0.001), Gstm1 (p-value <0.001), Gstm3 (p-value <0.01), and Gstm6 (p-value <0.01). Gpx3 was down-regulated as well, but not found to be statistically significant. RT-qPCR results comparing soybean oil PN, Omegaven® and saline revealed statistical significance on ANOVA testing: Gstp1 (p-value <0.01), Gstm1 (p-value <0.001), Gstm3 (p-value <0.01), and Gstm6 (p-value <0.001). Gpx3 was not significant on ANOVA testing. The difference between saline and Omegaven® was statistically significant on Tukey testing for genes Gstp1 (p-value < 0.001), Gstm3 (p-value < 0.05), and Gstm6 (p-value < 0.01). Gstm1 expression was not statistically different from saline and was statistically different from soybean oil PN when compared to Omegaven® (p-value < 0.05).
Conclusions: The mRNA expression of genes involved in glutathione metabolism, including Gstp1, Gstm1, Gstm3, and Gstm6, is down-regulated in mice receiving soybean oil PN when compared to saline. Compared with mice receiving soybean oil PN, there is preservation of Gstm1 with use of Omegaven®. The dysregulation of GSH homeostasis, may contribute to PNALD as a result of diminished antioxidative activity in the liver.

Figure 1.

**RT-PCR Results of Gene Expression in Wild Type Mice with Soybean Oil PN**

![Graph showing mRNA expression of genes involved in glutathione metabolism in wild type mice with soybean oil PN.](image)

* p < 0.001  
† p < 0.01

- Saline  
- PN

Figure 2.

**RT-PCR Results of Gene Expression in Wild type Mice with Omegaven® and Soybean Oil PN**

![Graph showing mRNA expression of genes involved in glutathione metabolism in wild type mice with Omegaven® and soybean oil PN.](image)

ANOVA  
* p < 0.05  
** p < 0.01

- Tukey test  
† p < 0.05 vs. saline  
†† p < 0.01 vs. saline

- Omegaven  
††† p < 0.001 vs. saline

- Saline  
- PN  
- Omegaven
Abstract #9. The Role of Kisspeptin in the Regulation of Insulin Secretion

Authors: Brittany Karas, Allison Cabinian, Horacio Novaira, Sally Radovick.

Rationale: It has been well established that the kisspeptin has integral function in the onset of puberty, during pregnancy within the placenta, and in the attainment of normal reproductive function by acting as a component of the hypothalamic gonadotropin-releasing hormone (GnRH) mechanisms; however, additional roles of kisspeptin are being elucidated. Recent studies from our laboratory have shown that by stimulating cAMP-PKA-CREB glucagon signaling results in downstream hepatic production of the neuropeptide kisspeptin1, which interacts with pancreatic β cells to suppress glucose-stimulated insulin secretion (GSIS). Synthetic kisspeptin can suppress GSIS in vivo in mice and in isolated liver islets via kisspeptin1 receptor (kiss1R)-dependent manner; additionally, kisspeptin1 levels are augmented in liver and serum from humans with type 2 diabetes mellitus as well as induced diabetes mellitus in mouse models. Interestingly, in hyperglucagonemic glucose-intolerant, high-fat-diet fed mice, liver kiss1 knockdown increases GSIS and improves glucose tolerance.

Objective: Our research aim is to investigate the relationship between increasing concentrations of kisspeptin in high and low glucose conditions and the effect on insulin and GnRH secretion.

Methods: We utilized the insulinoma cell line MIN6 derived from transgenic mouse pancreatic β cells and the rat immortalized hypothalamic GT1-7 cell line to study the effect of kisspeptin in the GSIS assays via ELISA. We also analyzed the mRNA expression of kiss1R, and two functional insulin genes, INS1 and INS2, levels in MIN6 and kiss1R and GnRH receptor levels in GT1-7. Additionally, total protein and insulin content was measured by ELISA kit.

Results: Our data showed that kiss1R, Ins1, and Ins2 mRNA levels in Min6 were increased after kisspeptin treatment. Also, kiss1R and GnRH were increased after kisspeptin treatment. Although the insulin secretion in Min6 were not suppressed after kisspeptin treatment, the regulation of kisspeptin may be concentration or time dependent. Our studies suggest that kisspeptin may play a regulator role in GSIS. A correlation between kisspeptin1 expression and insulin secretion may serve as a biomarker for increased glucose tolerance could suggest possible therapeutic purposes for kisspeptin1 antagonism in diabetes mellitus or gestational diabetes.
Nutritional Regulation of Fibroblast Growth Factor 19 Secretion in Neonates

Naureen Memon, M.D.¹, Barry I Weinberger, M.D.², Thomas Hegyi, M.D.¹, Mary O Carayannopoulos, Ph.D.³, Lauren M Aleksunes, Pharm.D., Ph.D.⁴ and Grace L Guo, M.B.B.S., Ph.D.⁴.

1Pediatrics, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, United States; 2Cohen Children’s Medical Center of NY, Hyde Park, NY, United States; 3Pathology, Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ, United States and 4Pharmacology and Toxicology, Rutgers University, Piscataway, NJ, United States.

Background: The fibroblast growth factor 19 (FGF19) hormone is secreted mainly by the terminal ileum and its primary function is to control the hepatic biosynthesis of bile acids and regulation of glucose and lipid metabolism. Animal and adult human studies have shown that circulating FGF19 concentrations are low in the fasting state and increase in response to enteral feedings. Nutritional regulation of FGF19 secretion has not been evaluated in preterm and term infants.

Objective: The objective of this study was to compare serum FGF19 concentrations in preterm, late preterm, and term infants at birth and after full enteral feedings have been established (≥ 80 ml/kg/d). We hypothesized that serum FGF19 concentrations are low at birth and increase after enteral feedings have been achieved.

Methods: Using enzyme-linked immunosorbent assay, plasma FGF19 concentrations were quantified in prospectively enrolled term (n = 6), late preterm (n = 4), and preterm (n = 9) AGA infants. FGF19 concentrations were measured at birth while infants were NPO, and on a weekly basis until full enteral feeds had been achieved. Serum FGF19 levels were also measured in a cohort of 5 healthy fasting adult volunteers. Data were analyzed using one-way ANOVA, Newman Keuls post-test on GraphPad Prism (V5). Statistical significance was set at p < 0.05.

Results: Compared to adults (132.5 ± 15.2 pg ml-1), FGF19 concentrations (mean ± SE) were significantly lower in term and late preterm infants at birth (47.9 ± 7.5 pg ml-1 and 53.1 ± 20.7 pg ml-1 respectively). FGF19 concentrations were comparable between adults and preterm infants at birth (98.1 ± 18.1 pg ml-1). FGF19 concentrations remained low in term (45.3 ± 20.9 pg ml-1) and late preterm (22.3 ± 5.4 pg ml-1) infants receiving full enteral feeds on day of life (DOL) 7. FGF19 concentrations significantly decreased over time in preterm infants (22.9 ± 17.7 pg ml-1 on DOL 14 and 16.9 ± 2.2 pg ml-1 on DOL 28).

Conclusions: In this study, we have shown that in term and late preterm infants, FGF19 concentrations are low at birth and remain low after establishment of full enteral feeds, suggesting that the neonatal gut requires postnatal development beyond the first few weeks of life to achieve a mature function. In contrast, preterm infants have adult-like FGF19 concentrations at birth that significantly decrease with increasing postnatal age and volume of enteral feeds. These results suggest that newborns may have increased susceptibility to liver disease as FGF19 prevents and protects against cholestasis. (Supported by the Charles and Johanna Busch Memorial Fund at Rutgers University).
Abstract #11. Down-Regulation of the Placental BCRP Drug Transporter During Chronic Hypoxia

Elizabeth Yen, MD1, Xia Wen, PhD2, Lissa Francois, MD3, Ludwick Gorczyca, BA2, Nicholas Illsley, DPhil2, Stacy Zamudio, PhD3 and Lauren Aleksunes, PhD3. 1Pediatrics-Neonatal Perinatal Medicine, Rutgers-Robert Wood Johnson Medical School, NJ, 2Pharmacology and Toxicology, Rutgers-Environmental and Occupational Health Sciences Institute, NJ, 3Maternal Fetal Medicine, Kaiser Permanente, Baldwin Park, CA, 4Obstetrics and Gynecology-Maternal Fetal Medicine & Surgery, Hackensack University Medical Center, NJ.

Background: Breast Cancer Resistance Protein (BCRP) is an efflux transporter that protects the fetus by extruding chemicals from the placenta back to the maternal circulation. Hypoxic conditions are known to up-regulate BCRP protein expression in a variety of cell types by activating HIF1α (hypoxia inducible factor-1α) transcription factor. In our laboratory, however, incubation of choriocarcinoma cells and term placental explants under low oxygen (3% O2) or with the hypoxia mimetic cobalt chloride resulted in down-regulation of BCRP expression and function. Low oxygen tension, therefore, may have an opposite regulatory effect in placenta. To examine this effect in vivo, we assessed the expression of BCRP protein in placentas from healthy pregnancies exposed to chronic hypoxia (high altitude) compared to that at moderate altitude.

Objective: The expression of BCRP is down-regulated in high-altitude placentas compared to moderate-altitude placentas.

Design/Methods: Fifteen placentas were obtained from Colorado, USA. Eight were from Denver (1600m, moderate altitude), and the remainder from Leadville (3100m, high altitude). The protein expression of BCRP on placental microvillous membrane was analyzed with Western Blot. Glucose transporter 1 (GLUT1)—a known hypoxia responsive protein—was used as a positive control of hypoxia in these placentas.

Results: GLUT1 was induced by 32% in placentas from women at high altitude (p<0.05). In contrast, BCRP expression was significantly decreased by 16% in high-altitude placentas (p<0.05).

Conclusions: BCRP expression is down-regulated in placentas from women with chronic hypoxia at high altitude. Maternal conditions that restrict oxygen carrying capacity in the placenta, therefore, may lead to undesirable effects on the growing fetus by reducing BCRP levels and compromising the protective placental barrier.
Abstract #12. Elevated Levels of Unbound Free Fatty Acid (FFAu) and Unbound Bilirubin (Bf) in Preterm Infants Treated With Intralipid (IL)

Andrew Huber, Barry Weinberger, Naureen Memon, Joe Weichung, Mary Carayannopoulos, William Oh, Alan Kleinfeld, Thomas Hegyi. Fluoresprobe Sciences, San Diego, CA; Pediatrics, Rutgers University, New Brunswick, NJ; Pediatrics, Alpert Medical School of Brown University, Providence, RI.

BACKGROUND: Intralipid, a source of calories and essential FFA in high-risk preterm infants may increase FFAu and Bf levels to potentially toxic ranges without affecting total serum bilirubin (TSB).

OBJECTIVE: To determine the relationship of Bf to FFAu and TSB in preterm infants in response to increasing dosages of Intralipid. DESIGN/METHODS: Seventy preterm infants with birth weight between 500 and <2000g and gestational ages between 23 and 34 weeks were enrolled to investigate the effect of IL infusion on Bf and FFAu. FFAu levels were measured using the fluorescent probe ADIFAB2 in plasma samples diluted 50-fold and Bf by the fluorescent Bf sensor BL22P1B11-Rh in 8-fold diluted plasma.

RESULTS: Bf and FFAu increased with increasing IL dosage. Despite wide variability in the values reflected by the large SDs these increases are significant by ANOVA.

<table>
<thead>
<tr>
<th>Intralipid (g/kg/day)</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFAu (nM)</td>
<td>11 ± 6</td>
<td>18 ± 11</td>
<td>42 ± 93</td>
<td>79 ± 207</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Bf (nM)</td>
<td>7 ± 2</td>
<td>12 ± 5</td>
<td>15 ± 7</td>
<td>16 ± 10</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Bf was highly correlated with FFAu for IL ≥ 1g/kg/day and the strength of the correlation increased with increasing dosage of IL, as indicated by the slope and the Pearson p value.
Conversely Bf is well correlated with TSB before IL infusion but not for IL ≥ 2g/kg/day.

CONCLUSIONS: 1. Increasing IL dosage results in increasing FFAu levels which compete with bilirubin binding sites on albumin and increase Bf. 2. TSB is highly correlated with Bf at IL ≤ 1 g/kg/day but not correlated at ≥ 2 g/kg/day.
Abstract #13. Structural Characterization of the Extracellular Domain of CASPR2 and Insights into Its Association with the Novel Ligand Contactin1

Rubio-Marrero EN, Vincelli G, Pakos IS, Ranaivoson FM, von Daake S, Comoletti D
Child Health Institute of New Jersey and Departments of ‡Neuroscience and Cell Biology and Pediatrics, Robert Wood Johnson Medical School, Rutgers University, New Brunswick, New Jersey 08901

Contactin-associated protein-like 2 (CNTNAP2) encodes for CASPR2, a multidomain single transmembrane protein belonging to the neurexin superfamily that has been implicated in a broad range of human phenotypes including autism and language impairment. Using a combination of biophysical techniques, including small angle x-ray scattering, single particle electron microscopy, analytical ultracentrifugation, and biolayer interferometry, we present novel structural and functional data that relate the architecture of the extracellular domain of CASPR2 to a previously unknown ligand, Contactin1 (CNTN1). Structurally, CASPR2 is highly glycosylated and has an overall compact architecture. Functionally, we show that CASPR2 associates with micromolar affinity with CNTN1 but, under the same conditions, it does not interact with any of the other members of the contactin family. Moreover, by using dissociated hippocampal neurons we show that microbeads loaded with CASPR2, but not with a deletion mutant, co-localize with transfected CNTN1, suggesting that CNTN1 is an endogenous ligand for CASPR2. These data provide novel insights into the structure and function of CASPR2, suggesting a complex role of CASPR2 in the nervous system.

This work was supported, in whole or in part, by National Institutes of Health Grant RO1 MH092906, National Science Foundation Grant MCB-1450895 (to D. C.), and Robert Wood Johnson Foundation Grant 67038 support of the Child Health Institute of New Jersey.
The ability to integrate audio and visual attributes of the world around us is a critical perceptual ability that is necessary for everyday functioning. This integration involves the emergence of central brain processes and allows one to perceive incoming sensory signals as a coherent percept rather than a disjointed series of sensory events. The ability to integrate sensory signals changes in early development as a result of the developing brain’s plasticity. Developmental deficits may arise during this period as a result of atypical sensory information processing, leading to abnormal audio-visual integration trajectories. In order to examine the developmental progression of this ability, an extensive literature review was conducted, focusing on 21 studies that examined audio-visual integration in a wide range of typically developing infants and one study that examined children with a learning disorder. Audiovisual synchrony threshold values were obtained from participants ranging from a mean age of 4 months (16 weeks) to about 10 years (504 weeks). These data were initially examined using a linear regression model but subsequent analysis indicated that a nonlinear regression yielded a better model fit, as indicated by the R2 values of 0.49 and 0.54, respectively. These data can be seen in Figure 1 along with the fitted negative, exponential curve. The non-linear regression, using the formula $y = A*\text{EXP}(B*X)$, demonstrated that the literature indicates a decreasing audio-visual integration threshold as participants’ age increases, thus narrowing the audio-visual binding window over time. These findings lay the foundation of charting the typical developmental trajectory of this ability and support the notion that critical audio-visual perceptual development occurs in infancy. Future studies will examine audio-visual integration development in typically developing and infants at risk for sensory processing deficits, such as autism spectrum disorder.

![Figure 1: Developmental Progression of Audio-Visual Integration](image.png)
Abstract #15. Adaptation to histone deacetylase inhibitors reduces cMYC protein expression, reprogramming of cancer cell gene expression and attenuation of the malignant phenotype

HsinChing Lin¹, George Wei¹, Diana Vengsarkar¹, Elke Markert², Arnold Rabson¹,²
¹Child Health Institute of New Jersey, Rutgers University-RWJMS, New Brunswick, New Jersey 08901, USA.
²Cancer Institute of New Jersey, Rutgers University, New Brunswick, NJ 08903, USA.

**Background:** Vorinostat a histone deacetylase inhibitor (HDACi) approved for treatment of cutaneous T cell lymphomas, inhibits the growth of cancer cell lines and human tumor xenografts. HDACi’s increase acetylation of many proteins including histones, and lead to changes in cellular gene expression, however their mechanisms and optimal therapeutic uses are not known. HDACi’s have multiple effects on cancer cell lines, ranging from induction of differentiation to apoptosis, senescence, and autophagy. We hypothesized that chronic treatment of malignant cells with HDAC inhibitors would attenuate the malignant phenotype by inducing reprogramming of cancer cell gene expression.

**Methods:** We derived a subclone of SW480 colon cancer cells (S3 cells, with K-Ras, p53 and APC mutations), which were treated with step-wise increases of vorinostat (to 3μM) resulting in vorinostat-adapted cells (SH80). SH80 cells were studied for growth rate, colony formation, and tumorigenicity in nude mice. Gene expression arrays (Affymetrix U133A2.0) were performed and gene expression changes validated by qPCR. cMYC expressing plasmids were introduced into SH80 cells. cMYC-SH80 cells will be study for growth rate and colony formation.

**Results:** SH80 vorinostat-adapted cells exhibited a marked decrease in cell growth, colony formation and tumorigenicity in nude mice, as well as features of differentiation including gland formation, increased intestinal alkaline phosphatase production, and increased cell size. Decreased growth rate and colony formation were seen even following drug withdrawal (for >12weeks), suggesting that drug-adaptation resulted in a relatively stable phenotype. Gene expression microarrays demonstrated >2 fold changes in expression of more than 10% of transcripts. Increased expression of colonocyte differentiation markers, putative tumor antigens and tumor suppressor genes was observed, as was decreased expression of several oncogenes and colonocyte-associated transcription factors. These changes were distinct from those observed in SAHA-resistant cells obtained as survivors of acute drug treatment, which maintained oncogenic characteristics despite exhibiting resistance to vorinostat. Similarly, long term low dose (1μM) vorinostat treatment of HCT116 colon cancer cells also resulted in decreased growth rate and reduced colony formation. SH80 exhibited reduction of c-MYC upregulated target genes, suggesting that c-MYC may play a role in the observed phenotype. Interestingly, strong reduction of c-Myc protein in SH 80 cells was observed, although the levels of c-Myc RNA were unchanged. Shorter c-MYC protein half-life was detected in SH80 cells, suggesting that lower level of c-MYC is mainly due to the change of protein stability. Overexpression of stable c MYC (T58A) mutant in SH80 resulted in a more spindle-like morphology (S3 parental cells like). The potential of cMYC on reversing the attenuated growth, including cell proliferation and colony formation, will also be analyzed.

**Conclusions:** Chronic HDAC inhibitor treatment induces a reprogramming of cancer cell epigenetic modifications and gene expression, even in the presence of multiple oncogenic mutations, leading to attenuation of the malignant phenotype.
Abstract #16. **Face-Recognition Training Improves Recognition Abilities in Typically Developing Children, Children with Attention Deficit Hyperactivity Disorder and other Learning Disorders, but not Children with Autism Spectrum Disorder**

Nelson Ching, Nicholas J. Minar, Michael Lewis Institute for the Study of Child Development – Rutgers Robert Wood Johnson Medical School

Recognizing facial and emotional expressions is critical for effective social functioning and the development of social cognition. Children with high-functioning ASD (formerly Asperger’s) have problems in recognizing faces as well as emotional facial expressions, leading to social difficulties. Previous studies have demonstrated that children with ASD fail to process facial features holistically and tend to identify and process faces on a part-by-part basis. These problems in face recognition leave children with ASD without the skills to extract the necessary social information that faces convey during typical face-to-face interactions. This study examined the effect of a face-recognition training intervention in three different clinical groups of children, as identified by a behavioral and development pediatrician: high-functioning autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD) and/or general learning disability (LD), and typically developing (TD). All participants were administered a face recognition task. A subgroup of children received a guided face-recognition training program which forced them to look at facial stimuli. Our hypothesis was that the guided perceptual training would improve face-recognition in all children but those with ASD. Preliminary analysis indicated that the intervention improved face-recognition abilities of typically developing, as well as those with ADHD and LD, but not ASD children. Our results demonstrate that the guided face-recognition training employed in the current study is sufficient to improve face recognition skills in clinically diagnosed children. This training did not seem to affect children classified with ASD. These results provide a better understanding of how the attention to faces in general increases children’s ability to recall faces. It also indicates that this training does not work for ASD children, either because more elaborate training is required or that attention distribution is not the only source of error for children with ASD.
Abstract #17. Expression of the BTB-ZF Transcription Factor Family in Neonatal Lymphocytes

Authors: Marwa Khalil¹, Joshua Vieth¹, Barry Weinberger², Anna Vetrano¹, & Derek Sant’Angelo¹

Affiliations: 1. Department of Pediatrics, Robert Wood Johnson Medical School, New Brunswick, NJ
2. Department of Pediatrics, Hofstra Northwell School of Medicine, New Hyde Park, NY

Background: The BTB/POZ-ZF [Broad complex, Tramtrack, Bric a`brac or poxvirus and zinc finger (POZ)-zinc finger] is a protein family of transcriptional regulators. Members of this family, including PLZF, ThPOK, and BCL6, are involved in a wide variety of biological processes, including gastrulation and limb formation, control of DNA damage, cell cycle progression, maintenance of the stem cell pool, and gamete formation. They have also been shown to be essential in the development and function of several different cell types of the immune system.

Hypothesis: Because the expression of these transcription factors has been shown to be highly specific for the function of individual lymphocyte populations, we hypothesize that expression of the BTB-ZF gene family in neonatal lymphocytes may be a biomarker for immune system function and development.

Objectives: Herein, we compare the expression profiles of BTB/POZ-ZF transcription factors in lymphocytes from neonatal cord blood and adult peripheral blood to determine the transcriptional control of naïve populations at birth versus adulthood.

Design/Methods: Lymphocytes were isolated from umbilical cord blood from infants delivered at term by elective non-complicated cesarean section. For comparison, lymphocytes were also isolated from adult peripheral blood lymphocytes using lymphocyte separation media and gradient centrifugation. Cells were manually counted and assessed for viability. RNA was extracted and cDNA generated by reverse transcription PCR. Relative expression of BTB/POZ-ZF genes was assessed by quantitative real-time PCR using a panel of primers that has been previously described in preliminary data. The expressions of these genes were interrogated at the single-cell level using the Fludigim BioMark™ HD System after sorting them with FACs sorter at cancer institute of New Jersey.

Results: Cord blood lymphocytes as well as bulk Naïve CD4 T cells express significantly higher levels of both ThPOK and BCL6 than adult lymphocytes. The expression of ZBTB-genes A and B were heterogeneously expressed among the homogenous population of individually isolated Naïve CD4 T cells from cord blood.

Conclusion: Neonatal Naïve Cd4 T cells express higher levels of two BTB-ZF genes (ThPOK, BCL6) that are responsible for CD4 T-cell differentiation and T follicular helper cell development, respectively. These findings suggest that the maturation of T-cells is developmentally regulated in the neonatal period, and that may play a role in the maintenance of immune function during adaptation to extrauterine life.
**Abstract # 18. Intralipid Blunts the Effectiveness of Phototherapy in Reducing Unbound Bilirubin (Bf) in Preterm Infants**

Andrew Huber, Barry Weinberger, Naureen Memon, Weichung Shih, Mary Carayannopoulos, William Oh, Alan Kleinfeld, Thomas Hegyi. Fluoresprobe Sciences, San Diego, CA; Rutgers University, New Brunswick, NJ; Alpert Medical School of Brown University, Providence, RI.

**BACKGROUND:** Intralipid (IL), a major source of calories and essential FFA in high-risk preterm infants, increases serum unbound free fatty acid (FFAu) and Bf levels by displacing bilirubin from albumin. The increase in Bf occurs without affecting total serum bilirubin (TSB) in infants receiving IL. Therefore in the presence of IL, phototherapy (PT) may have a different effect on TSB and Bf levels.

**OBJECTIVE:** To determine levels of FFAu, Bf and TSB before and after phototherapy in preterm infants receiving increasing doses of IL.

**DESIGN/METHODS:** Seventy preterm infants with BW between 500-2000g and gestational ages (GA) between 23 and 34 weeks were enrolled to investigate the effect of IL infusion on Bf, FFAu and TSB. FFAu levels were measured using the fluorescent probe ADIFAB2 in plasma samples diluted 50-fold. Bf was measured with the fluorescent Bf sensor BL22P1B11-Rh in 8-fold diluted plasma and TSB with the diazo method. We analyzed a subset of 46 infants who had paired measurements of Bf, FFAu and TSB before and after PT (initiation age 45±25h, duration= 32±41h). IL doses were increased by providers per NICU guidelines from 1 to 3 g/kg/day during PT.

**RESULTS:** The increases in IL dose during PT resulted in a trend towards increasing FFAu. PT significantly reduces the TSB but not Bf. (*p paired T test and values are averages and standard deviations)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Before</th>
<th>After</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>FFAu nM</td>
<td>17.4 ± 10.8</td>
<td>59 ± 162</td>
<td>0.09</td>
</tr>
<tr>
<td>TSB mg/dL</td>
<td>7.6 ± 2.0</td>
<td>5.1 ± 1.8</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Bf nM</td>
<td>14.8 ± 6.3</td>
<td>13.1 ± 6.3</td>
<td>0.1</td>
</tr>
</tbody>
</table>

Further analysis based on gestational age reveals that infants with GA ≤ 28 weeks have an increase in FFAu that is greater than for GA>28 weeks. TSB decreased in both gestational age cohorts with PT while the Bf was unchanged in lower GA and decreased in the higher GA cohort.

<table>
<thead>
<tr>
<th>GA</th>
<th>≤ 28 wks</th>
<th>≥ 29 wks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td>FFAu nM</td>
<td>TSB mg/dL</td>
</tr>
<tr>
<td>Before PT</td>
<td>18.1±12.9</td>
<td>5.7±9.2</td>
</tr>
<tr>
<td>After PT</td>
<td>123±268</td>
<td>3.2±0.8</td>
</tr>
<tr>
<td>p*</td>
<td>0.14</td>
<td>&lt;.001</td>
</tr>
</tbody>
</table>

**CONCLUSIONS:** Decoupling of Bf from TSB by FFAu reduces the ability of phototherapy to reduce the toxic fraction (Bf) of TSB, especially for infants ≤ 28 wks.
Abstract #19. Emergency Department (ED) Re-visitation in Young Children with Acute Bronchiolitis

Matthew Pepper, Ernest Leva, Anna Petrova

Introduction: Bronchiolitis is the most common infectious cause of hospitalization of infants in the US and accounts for up to 16% of all hospitalizations in the first two years of life, with hospital admission rates of 32% to 40% reported. Physicians’ decisions regarding patient disposition are often subjective, leading to variation in practice. Studies have estimated that up to 29% of admissions of children with bronchiolitis are unnecessary and 6% of ED discharges for this illness may be inappropriate. Unscheduled returns to the ED within 72 hours of discharge from the ED are a known quality care indicator. Therefore, identification of factors associated with ED re-visitation of children with bronchiolitis is of clinical importance.

Objectives: We designed this study to determine the frequency of hospitalization and ED re-visitation for young children with bronchiolitis and the factors associated with these outcomes.

Study Design and Methods: A retrospective cohort study of patients < 36 months old with an ED visit to the RWJUH ED for acute bronchiolitis between December 2013 and February 2015 was performed. Patients with chronic lung disease and ventilator dependence were excluded. Demographic, clinical, laboratory, diagnostic, and treatment data were collected from the medical records. Study outcomes were discharge (Group 1), discharge with ED re-visit within 72 hours (Group 2), and hospital admission (Group 3). We used ANOVA, Chi-squared, and Multivariate regression analyses to determine the independent effects of selected variables on patient outcome.

Results: Among 383 identified patients, 350 met inclusion criteria. The majority of patients (88.6%) were discharged, 32 children (9%) re-visited the ED after initial discharge, and 8 (2.3%) were hospitalized. The groups were comparable for age, gender, race/ethnicity, and insurance coverage. No difference in severity of respiratory characteristics was recorded between Group 1 and 2. The mean level of oxygen saturation was significantly lower in Group 3 than in Groups 1 and 2. In addition, patients in Group 3 were more likely than those in Groups 1 and 2 to be treated with antibiotics and to receive oxygen and albuterol. Of the 32 patients who re-visited the ED, 6 (18.7%) were admitted to the hospital and 25 (81.3%) were discharged including one patient who re-visited the ED a second time. When compared with Group 1, patients in Group 2 were less likely to have visited their pediatrician for the current illness prior to the ED visit, less likely to have wheezing on an exam, and were less frequently evaluated by Pediatric Emergency Medicine (PEM)-trained pediatricians. When compared with patients in Group 3, patients in Group 2 were also less likely to have wheezing on exam and had higher oxygen saturations.

Conclusions: Around 10% of children who present to the ED with bronchiolitis re-visit the ED within 72 hours after initial discharge, and upon revisit have a greater than 20% probability of admission and/or additional ED re-visit. The risk for ED re-visitation increases with lack of wheezing on exam, lack of prior PMD visit, and management by non PEM trained pediatricians.
Abstract # 20. Improvement in Mentoring Associated with Implementation of an Inter-Institutional Mentoring Program within Pediatric Rheumatology


“Podium presentation at the American College of Rheumatology 2015 (Nov)

Background/Purpose: Mentoring is a key contributor to success in academic medicine. In pediatric rheumatology, surveys have repeatedly identified mentoring as a major career unmet need of fellows and junior faculty. In response, in 2011 the American College of Rheumatology (ACR) and the Childhood Arthritis & Rheumatology Research Alliance (CARRA) launched a subspecialty-wide inter-institutional mentoring program for pediatric rheumatologists, the ACR/CARRA Mentoring Interest Group (AMIGO). The program has been shown to be feasible and has robust process outcomes. Our objective is to evaluate if implementation of AMIGO was associated with improved access to mentoring in pediatric rheumatology.

Methods: US and Canadian pediatric rheumatology fellows, junior faculty (assistant professor and below) and senior faculty (associate professors and above) were surveyed in 2011 (pre-AMIGO) and again in 2014 (post-AMIGO). Participants were asked to report access to mentoring in domains relevant to academic rheumatology: clinical practice, teaching, research, setting career goals, and identifying how to achieve career goals. Respondents reported whether mentoring in each domain was available at the home institution, at an outside institution, at both or neither, and were asked to rate overall satisfaction with career mentoring.

Results: Respondents to each survey included >50% of pediatric rheumatologists in the US and Canada (n=277 in 2011; n=177 in 2014 and 59% AMIGO participants). By 2014, 86% of fellows and 31% of junior faculty were AMIGO mentees. In 2011, fellows were substantially less likely than senior faculty to have mentoring outside the home institution. This difference resolved by 2014. By 2014, the proportion of fellows with outside mentors increased markedly in the domains of research, setting career goals, and achieving career goals (Figure 1). No change was observed in clinical or teaching domains. Overall, fellows but not junior faculty reported an increase in satisfaction with career mentoring between 2011 and 2014.

Conclusion: The implementation of AMIGO was associated with improved access to mentoring beyond the home institution for fellows in pediatric rheumatology as well as an increase in satisfaction with career mentoring measureable at the level of the whole community. These findings support the feasibility and efficacy of the subspecialty-wide AMIGO mentoring program, and suggest that AMIGO may serve as a model for mentoring programs in adult rheumatology and in other domains of medicine.

Figure 1: Access to Mentoring in 2011 and in 2014
Abstract #21.

These authors will be published in a supplement of the Arthritis & Rheumatology journal as well as the abstracts section of the annual meeting website (www.ACRannualmeeting.org). Lakshmi N. Moorthy, Rutgers-Robert Wood Johnson Medical School, Eyal Muscal, Baylor College of Medicine, Texas Children's Hospital, Meredith Riebschlegler, University of Michigan, Marisa S. Klein-Gitelman, Ann & Robert H. Lurie Children's Hospital of Chicago, Lise E. Nigrovic, Division of Emergency Medicine, Boston Children's Hospital, Kelly A. Rouster-Stevens, Emory Univ School of Medicine, Polly J. Ferguson, University of Iowa, B. Anne Eberhard, Schneider Children's Hospital, Hermine I. Brunner, Pediatric Rheumatology Collaborative Study Group, Cincinnati Children's Hospital Medical Center, Sampath Prahalad, Emory University School of Medicine and Children's Healthcare of Atlanta, Rayfel Schneider, The Hospital for Sick Children and University of Toronto and Peter A. Nigrovic, Department of Medicine, Division of Rheumatology, Immunology and Allergy, Brigham and Women’s Hospital, Harvard Medical School

**Background/Purpose:** Mentoring usually targets academic advancement in medicine, but it may also foster success in non-academic aspects of professional life, such as work-life balance. The American College of Rheumatology (ACR) and the Childhood Arthritis & Rheumatology Research Alliance (CARRA) developed the ACR/CARRA Mentoring Interest Group (AMIGO) in 2011 to foster mentoring in pediatric rheumatology. We assessed pre-AMIGO measures of career satisfaction in pediatric rheumatology, including career aspirations, confidence with professional tasks, and self-reported burnout.

**Methods:** Internet-based survey of US and Canadian pediatric rheumatologists in 2011, before AMIGO implementation.

**Results:** Respondents included 277 pediatric rheumatologists, estimated at >75% of pediatric rheumatologists in the US and Canada. Of 129 who responded to the question about their “ideal job,” 81% indicated that the ideal job included doing “primarily clinical work”; 61% reported it included “mentoring in clinic”; 57% reported “research,” 20% reported “mentoring in research,” and 5% reported “administration.” About 50% responded that they were likely to obtain their ideal job.

Of the 198 who responded to questions about confidence in work-related tasks, most respondents stated they were quite/extremely confident about advocating for patients, contributing to educational programs and meeting clinical productivity goals (Table 1). Most reported being somewhat/slightly/not at all confident in accessing grant funding, working with industry, achieving work-life balance, advocating for themselves at work, and managing their practices (Table 1). Of 190 who responded to questions about burn out, 31% reported burn out at work at least once a week.

**Conclusion:** Most pediatric rheumatologists feel confident about meeting their clinical and educational responsibilities but a significant proportion have concerns about their ability to obtain grants, work with industry, manage administrative aspects of their jobs and achieve work-life balance. Burn-out is reported by a substantial fraction. Follow up evaluations of AMIGO mentees will assess whether improved access to mentoring through AMIGO has helped to address these needs. Further exploration of reasons behind burnout and work-life balance concerns is warranted.
Table 1: Data on confidence among pediatric rheumatologists

<table>
<thead>
<tr>
<th>Activity</th>
<th>Not confident at all</th>
<th>Slightly/ somewhat confident</th>
<th>Quite/ extremely confident</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet goals for clinical productivity</td>
<td>2 (1%)</td>
<td>60 (30%)</td>
<td>128 (63%)</td>
<td>9 (5%)</td>
</tr>
<tr>
<td>Advocate for patients</td>
<td>2 (1%)</td>
<td>29 (15%)</td>
<td>158 (80%)</td>
<td>9 (5%)</td>
</tr>
<tr>
<td>Contribute to educational programs</td>
<td>2 (1%)</td>
<td>66 (33%)</td>
<td>128 (64%)</td>
<td>3 (1.5%)</td>
</tr>
<tr>
<td>Keep track of teaching activities</td>
<td>7 (4%)</td>
<td>90 (43%)</td>
<td>96 (48%)</td>
<td>6 (3%)</td>
</tr>
<tr>
<td>Access grant funding</td>
<td>61 (31%)</td>
<td>86 (43%)</td>
<td>37 (19%)</td>
<td>15 (8%)</td>
</tr>
<tr>
<td>Work with industry</td>
<td>52 (26%)</td>
<td>82 (41%)</td>
<td>28 (14%)</td>
<td>37 (19%)</td>
</tr>
<tr>
<td>Manage your practice</td>
<td>27 (14%)</td>
<td>76 (38%)</td>
<td>60 (30%)</td>
<td>36 (18%)</td>
</tr>
<tr>
<td>Advocate for yourself at work</td>
<td>18 (9%)</td>
<td>105 (53%)</td>
<td>76 (38%)</td>
<td></td>
</tr>
<tr>
<td>Achieve success in your job (as defined by the person)</td>
<td>7 (4%)</td>
<td>87 (44%)</td>
<td>105 (53%)</td>
<td></td>
</tr>
<tr>
<td>Work-life balance</td>
<td>19 (10%)</td>
<td>111 (56%)</td>
<td>66 (33%)</td>
<td>2 (1%)</td>
</tr>
</tbody>
</table>
Abstract # 22. Single clinical practice's report of testing initiation, antibody clearance, and transmission of hepatitis C virus (HCV) in infants of chronically HCV-infected mothers

Aswine Bal, Anna Petrova

**Background:** Perinatally acquired Hepatitis C virus (HCV) is the main source of pediatric HCV infection. However, the best time for initiation of screening and follow up of these infants is still unknown. Analysis of the clinical data of infants born to HCV infected mothers, transmission rates, and pathway of HCV testing could be important for optimization of their management.

**Methods:** The present study was designed to describe the management patterns of infants born to mothers with chronic HCV infection being followed at a single clinical setting, the rate of HCV transmission, and HCV testing results with respect to the infant's age at HCV testing initiation, and their follow up. We analyzed the factors influencing initiation of HCV testing in these children and rate of HCV transmission as demonstrated by consecutive HCV antibody and HCV ribonucleic acid (RNA) amplification testing. Children of mothers with chronic HCV infection, who were followed between 1998 and 2013 at the pediatric infectious disease clinic for the first 18 month of their life, were eligible for enrollment.

**Data Analysis:** Incidence of vertical transmission of HCV was calculated by dividing the number of the HCV infection diagnosed infants by the total number of infants that were perinatally exposed to HCV infection. The results of initial testing for HCV antibodies and HCV RNA were assessed using χ² test for comparison with respect to the infant's age (months) at which samples were obtained. We used multiple regression models to analyze the link between the number of tests performed for HCV antibodies and HCV RNA during the first 18 months with the infant's age at which initial HCV testing was performed. Results (positive or negative) of the initial HCV testing (anti-HCV and HCV RNA) were included in the models. Correlation analysis was used to identify the relationship between the infant's year of birth and age at initiation of anti-HCV antibody testing. We used multiple regression analysis to identify the factors associated with the infant's age at detection of clearance of maternal HCV antibody. Data are presented as mean ± standard deviation, percentage, and 95% confidence interval (CI) of proportion, regression coefficient ± standard error, and correlation coefficient (r).

**Results:** One hundred and forty two mother-infant pairs were enrolled. The majority of mothers were intravenous drug users (IVDU), had carried to term and delivered vaginally. A high proportion of infants had at least one positive anti-HCV antibody assay without viremia. True HCV infection and intermittent viremia were recorded in 3.5% and 1.4% of infants, respectively. Initiation of HCV testing after 10 months of age was associated with a significant decline in the probability of obtaining a positive HCV-antibody of maternal origin.

**Conclusions:** The low likelihood for detection and confirmation of true HCV transmission prior to 10 months of age could challenge the early initiation of HCV screening of infants exposed to maternal HCV infection but may affect the parental need for early monitoring and counseling.

Alexis Boneparth, MD¹, Scott E. Wenderfer, MD², L. Nandini Moorthy, MD, MS¹, Suhas M. Radhakrishna, MD, Anna Carmela P. Sagcal-Gironella, MD, MS2, and Emily von Scheven, MD, MAS4 for the CARRA Registry Investigators

¹Rutgers-Robert Wood Johnson Medical School, New Brunswick, NJ, ²Baylor College of Medicine, Houston, TX, ³Rady Children’s Hospital, San Diego, CA, 4University of California at San Francisco, San Francisco, CA.

Background: Patients with membranous lupus nephritis (MLN) make up 8-30% of pediatric LN cases. For patients diagnosed initially with pure class V LN, risk of progression to proliferative LN is difficult to ascertain, given variable treatment practices and the limited availability of data from repeat renal biopsies. Although consensus guidelines for management of LN have been formulated, these recommendations are based on evidence from adult studies, and treatment of pediatric LN is largely empirical. The degree of variability in current treatment practices for patients with pediatric class V LN is largely unknown.

Methods: Subjects with pediatric systemic lupus erythematosus (SLE) and class V lupus nephritis (LN) from the Childhood Arthritis and Rheumatology Research Alliance (CARRA) Legacy Registry were included. Demographic, disease and medication-related data were collected between 2010 and 2014 from 59 CARRA Legacy Registry sites. Data were utilized to describe demographic, clinical, and treatment characteristics in this cohort.

Results: A total of 132 subjects had MLN, either in isolation or in combination with proliferative LN. Seventy-four subjects had pure class V LN. The proportion of subjects with daily corticosteroid treatment was similar among groups (96%, 91%, and 96%, for class III+V, IV+V, and V, respectively, P=0.67). Proportion of subjects exposed to mycophenolate was significantly different among groups, with a trend toward more frequent mycophenolate exposure in the pure class V group (83%, 74%, 92% for class III+V, IV+V, and V, respectively, P=0.045). Proportion of subjects exposed to any disease-modifying antirheumatic drug (DMARD) or biologic was similar among the three groups (83%, 91%, 95% for class III+V, IV+V, and V, respectively, P=0.189). Proportion of subjects with decreased glomerular filtration rate (less than 90 ml/min/1.73m2) was significantly different among groups (4%, 38%, and 4%, for class III+V, IV+V, and V, respectively, P<0.0001).

Conclusions: To date, this is the largest reported cohort of children with MLN. Practice patterns may vary among centers and may not reflect the published LN consensus treatment guidelines. More research is needed to confirm the trends observed in this analysis of the CARRA Legacy Registry data.
Abstract # 24. FAST and CT correlation in Pediatric Patients with Blunt Abdominal Trauma

Natalie Gengel, Anna Petrova, Susette Coyle, Yi-Horng Lee, Joelle Pierre

BACKGROUND:

There is continued interest in the ability for FAST to identify clinically significant blunt abdominal trauma (BAT) thereby avoiding the radiation from computerized tomography (CT).

METHODS:

The data was collected retrospectively and stratified with respect to the agreement between FAST and CT. Group 1 equals agreement and Group 2 equals no agreement. Level of agreement was determined using Cohen’s Kappa (κ) statistic. Descriptive statistics, including ANOVA and X2 were used to compare clinical factors. Factors with difference P<0.1 entered into multivariate logistic regression model.

RESULTS:

Of the 123 children with BAT, 43% (n=53) showed agreement between the imaging (Group 1) and among those, majority (86.8%) had positive FAST and CT results. Most of the patients with BAT were male (n=90, 73.2%). We found no difference between Group 1 and 2 in gender, clinical presentation of trauma, including symptoms of bleeding and number of organs injured during trauma. Children in Group 1 were younger than in Group 2 (P=0.051). A very good agreement between FAST and CT was recorded only if the US result was positive (κ =0.833, 95% Confidence Interval 0.734-0.932). The agreement was very poor (less than 15 %) with negative US.

CONCLUSIONS:

FAST exam identifies significant abdominal injuries in pediatric patients. Negative FAST does not rule out injury and can miss some solid organ injuries. However the clinical significance of these “missed” injuries varies. Further analysis may show that CT can be used more selectively.
Abstract #25. **Length of Time Looking at Faces Affects Facial Recognition**

Jessica Ace, Nicholas J. Minar, Michael Lewis  Institute for the Study of Child Development – Rutgers Robert Wood Johnson Medical School

Individuals with Autism Spectrum Disorder (ASD) have difficulty recognizing faces, underlying their impairments in non-verbal communication and social relations. Many studies have speculated that individuals with ASD look at specific features of the face, such as the mouth, but struggle with configural processing. When cued to look at multiple facial characteristics, however, these individuals have the capability of processing faces the way typically functioning individuals do. In order to see if looking time affects facial recognition, we devised a test that examined the effect of facial-recognition training in two groups, age 6-30, of individuals from the general population. Our hypothesis is that the longer an individual looks at a face, the more accurate he/she will be in identifying the face.

All participants completed the Social Responsiveness Scale-Form 2 (SRS-2), a self-reported scale used to identify the presence of social impairment in ASD. The subjects were also administered a computerized facial-recognition task. This task consisted of two parts. Participants were shown a series of faces in the first part of the task. The “no training” group could proceed at their own pace while the “training” group was verbally instructed to focus on specific facial features, such as the eyes, nose, and mouth. Participants in the “training” group could not proceed to the next face until the verbal instructions were complete. The second part of the task randomly showed 16 familiar and 16 novel faces, drawn from a pool of 128 possible faces, and asked participants to identify if they had seen the faces before. Participants also indicated their confidence on a scale from 1 to 5, with 1 being not confident and 5 being confident. The participants’ performance was evaluated in terms of the number of correctly identified faces, looking time during face encoding and recall, and average confidence in recognizing faces.

Results demonstrate a significant difference in the number of correctly identified faces between the two groups, $t (228) = -5.88, p < .001$, indicating that the facial-recognition training acted as an effective intervention. Our next step is to see if individuals with high functioning ASD, as identified by the SRS-2 autoscore form, perform better on face recognition when prompted to look longer at facial features.
June 2015 to June 2016

Publications


deletion produces multiple neurodevelopmental defects in monoamine systems, forebrain structures and neurogenesis and behavior. *Hum Mol Genet*. 2015;24:5805-27


**20.** Figueiredo L, Cole PD, **Drachtman RA.** Asparaginase Erwinia chrysanthemi as a component of a multi-agent chemotherapeutic regimen for the treatment of patients with acute lymphoblastic leukemia who have developed hypersensitivity to E. coli-derived asparaginase. *Expert Rev Hematol.* 2016; 9:227-34


Books and Chapters


