

2015 Pediatric Research Conference

June 22, 2015

Emory Conference Center and Hotel







Children'sSM Healthcare of Atlanta

100th ANNIVERSARY



Share Your Story: choa.org/100years

This display represents a snapshot of our 100-year history. Visit our website to learn more about the stories, moments and milestones that make up our journey.



"Every child we help has the potential to make a difference in our future, to be a hero to the next generation. We have the opportunity to make a difference all around the world, to give a future to those less fortunate and make dreams come true to those who have never thought it possible."

-Julie Wile, Children's Healthcare of Atlanta Assistant Public Strategy Area

The story of Children's Healthcare of Atlanta began in 1915, with 20 hospital beds in two small cottages in Decatur. A century of discovery later, Children's has evolved to three hospitals, 24 neighborhood locations, 80 pediatric specialties and programs, 850,000 patient visits annually, and recognition as one of the top pediatric health care institutions in the country.

Our story is one of hope and will. The hope for a better future for children and the will to make it happen.





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Child: Mike Children's Healthcare of Atlanta, Research Public, Chicago, June

The story of Children's Healthcare of Atlanta began in 1915, with 26 founders back in two small cottages in "District" A, a patch of dilapidated, children-evaded-to these quarters, 24 neighborhood doctors, and a group of patients and progress. 100,000 patients were served, and many more in the two pediatric health care institutions in the country.

Our story is one of hope and will. The hope for a better future for children and the will to make it happen.



"There is no shortcut to excellence in the care of children. Physicians have to be able to devote the necessary time and effort to make a correct diagnosis, and then plan the course of treatment. Through it all, we had the most rewarding part of that experience in the smiling eyes of our young patients."

Dr. Robert A. Smith, Children's Healthcare of Atlanta



"We're a world-class system. From our state-of-the-art facilities to the special touches, we make every day that makes children and their parents smile. We've always been committed to our families, though, so we'll keep striving for excellence."



RESEARCH AND TEACHING

Research and teaching are the cornerstone of our commitment to providing the best care. Together with Emory University School of Medicine, Georgia Institute of Technology and Emory University, Children's is a leader in the most challenging, multidisciplinary medical conditions, including genomics and cancer, and genetic disease, as well as the next generation of physicians, researchers and leaders. We are dedicated to the pursuit of learning, the lives of children better today and healthier tomorrow. This is done in partnership with a major research, and the beginning of a new era in pediatric medicine.

MEDICAL BREAKTHROUGHS

The first 100 years are highlighted by numerous milestones in the history of Children's Healthcare of Atlanta. From the first polio vaccine, leading to breakthrough medicines for the most common childhood disease, to the first pediatric cancer treatment in the country, including the discovery of a genetic mutation, and organ donation, the history of Children's Healthcare of Atlanta is a testament to the power of research and innovation. The story of Children's Healthcare of Atlanta is a testament to the power of research and innovation. The story of Children's Healthcare of Atlanta is a testament to the power of research and innovation.











**Inflammation in Pediatric Health:
Improving care through innovation and technology**

June 22, 2015
Emory Conference Center Hotel



Emory
CONFERENCE CENTER



**Inflammation in Pediatric Health:
Improving care through innovation and technology**

June 22, 2015

Emory Conference Center Hotel











































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The University of Oklahoma





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ABOUT CORPH

The CORPH centralizes and coordinates outcomes and epidemiologic research throughout the child healthcare system, emphasizing strong ties to the Rollins School of Public Health at Emory University and to the Centers for Disease Control and Prevention. The Center synergizes with Children's Healthcare of Atlanta's plans for new wellness initiatives impacting the health of Georgia's children. Researchers in this center focus on identifying new methods to measure and improve pediatric healthcare outcomes. Emphasis is placed upon evaluating comparative effectiveness in a variety of clinical areas including birth and neonatal outcomes, neurodevelopmental outcomes and transition of care from the teenage years into adulthood for those populations who suffer from chronic illnesses. Important current focus areas include asthma, cardiac, surgical, neonatal outcomes and on wellness including health promotion and obesity prevention.

EPIC AND DATA WAREHOUSE REQUESTS

Thinking about CORPH related research, we are here to help!

For all your data needs, we have simplified the process of requesting data.

- If you are a CHOA facility, there are three ways you can contact us:
- Just send us an e-mail to: data@choa.org, especially if you are a non-CHOA facility.
- If you are a CHOA faculty and your data needs are 'Routine' (please see below for what is 'Routine' request) you can access and fill out the Report request form, after logging into CareForce.

Routine Requests and Report Portal

Path: Careforce> Departments> Outcomes Center> Report Requests

URL: <http://apps/reportrequests/Pages/Home.aspx>

"Routine Requests" will be answered within 24 hours!

"Routine Requests" must meet the following criteria:

- Data exists and is available
- Data has been validated
- Report exists but needs modification
- Break fix
- Work effort is equal or less than 24 hours
- This will not result in additional requests.

- If you are a CHOA faculty and if your request is for a more complicated data set (e.g. multiple data sources), or you require Outcome Center or BI resources such as REDCap form development and data collection, statistical or economic analysis support, or data abstraction / data entry, you can access and fill out the 'Care Transformation Prioritization Request' form, after logging into CareForce.

DATA REQUEST WORKFLOW

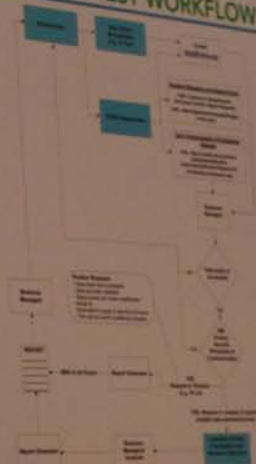


Figure 1: Epic and Data Warehouse Data Request, Reporting and Management

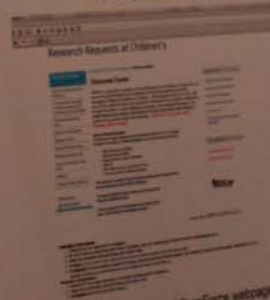


Figure 2: Screen shot of CareForce webpage

USEFUL CONTACTS

- For more information about CORPH:
- Paul Spearman, MD
Acting Center Director
paul.spearman@choa.org
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Paul Spearman, MD
Acting Center Director
paul.spearman@choa.org





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Care Transformation Prioritization Request

Path: Careforce> Departments> Outcomes Center> Care Transformation Prioritization Request

URL: careconnection/Departments/Quality/Outcomes/202Center/Prioritization-Request.aspx

DATA REQUEST WORKFLOW

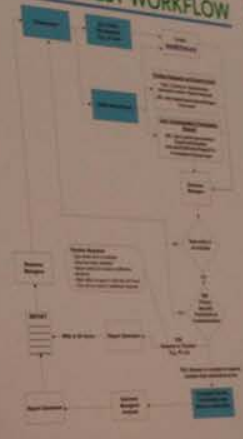


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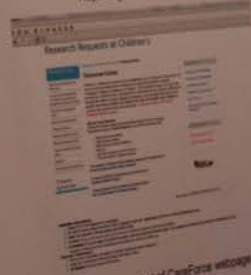


Figure 2: Screen shot of CareForce webportal

USEFUL CONTACTS

- For more information about CORPH:
- Paul Spearman, MD
Acting Center Director
pspearman@choa.org
 - Karen Karmali, PhD
Program Coordinator
karmali@choa.org

- For more information about using data:
- Phyllis A. Thomas, MD, MS
Director of Data Analytics
phyllis.thomas@choa.org
 - Todd Wiley
Data Analyst
toddwiley@choa.org











Center for Clinical Genome Research and Public Health

DATA REQUEST WORKFLOW

1. Identify the data you need
2. Contact the data manager
3. Review the data request form
4. Submit the data request form
5. Wait for the data to be processed
6. Receive the data

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Children's Center for Neurosciences Research

EMORY UNIVERSITY

NEUROIMAGING & NEUROPHYSIOLOGY CORE

MISSION

Our mission is to provide a world-class, state-of-the-art, multi-disciplinary research environment for the study of pediatric neurosciences. We are committed to providing a supportive and collaborative environment for our faculty, staff, and students.

STRATEGIES

We employ a multi-pronged approach to research, including clinical, basic, and translational research. We are committed to providing a supportive and collaborative environment for our faculty, staff, and students.

RESEARCH FOCUS

Epilepsy

Our research focuses on the genetic and molecular basis of epilepsy, as well as the development of novel therapies. We are committed to providing a supportive and collaborative environment for our faculty, staff, and students.

Neuroimaging

We employ a multi-pronged approach to research, including clinical, basic, and translational research. We are committed to providing a supportive and collaborative environment for our faculty, staff, and students.

RECENT RESEARCH

Genetic Basis of Epilepsy

Our research focuses on the genetic and molecular basis of epilepsy, as well as the development of novel therapies. We are committed to providing a supportive and collaborative environment for our faculty, staff, and students.

Neuroimaging

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NEW RECRUITS

Dr. David Tompa, MD, PhD

Treatment of Epilepsy in Adult Patients

Dr. Michael S. Lesch, MD, PhD

Neuroimaging and Gene-Brain-Epilepsy

















Pediatric Research Center



ABOUT THE PROGRAM

The Children's Research Center is the Atlanta-based research center for the Atlanta Children's Research Institute (ACTSI). The center provides infrastructure, innovative research, and family support services. The center includes:

CURRENT RESEARCH

HOW TO ACCESS

Send your study proposal to: pedresearch@emory.edu

For more information, please call: [404.712.7000](tel:4047127000)

The center also provides research support services including:

• Research & Training

• Research Support Services

THE COLLECTION





Pediatric HIV cure: a rhesus macaque model

140

Authors: E.R. Colegrave, B. Lantieri, R. Paredes, J. Cohen, F. Miller, A.J. Spector, A. Sautter, J. Hooper, K.J.J. Hooper

Stanford University, USA; The Children's Hospital of Philadelphia, USA

Abstract

Introduction

Methods

Results

Conclusion

References

This poster displays a grid of 12 small graphs, each with a yellow sticky note attached to it. The graphs show various data points and trends, likely related to the pediatric HIV cure study.

Afric

141

Authors: [unreadable]

Abstract

Introduction

Methods

Results

Conclusion

This poster features several diagrams and graphs. One prominent diagram shows a cell with internal organelles and a central nucleus, possibly illustrating a biological process. The text is organized into sections with headings.

Bacterial nanospikes improve calcium handling in living cardiac myocytes

142

Authors: [unreadable]

Abstract

Introduction

Methods

Results

Conclusion

This poster contains multiple bar charts and line graphs. The bar charts show data points for different conditions, while the line graphs show trends over time or across different parameters. The text is arranged in a structured layout with clear headings.



Temperature Programmed Sample Collection from EBC for Multi-dimensional GC Analysis

Sukhrata Sarayya, Joshua J. Prindle, Peter J. Hsieh, Lee Ann S. Ross, Jon Mark S. Diamond

Introduction

An analytical chemistry tool for monitoring of hazardous organic volatile brominated compounds (EBC) has been developed. This is a 2-Dimensional GC system. We have developed a system for the capture of the volatile organic compounds (VOC) in air, and a liquid phase, ambient air, in a 1-D and 2-Dimensional GC. The system includes an air inlet system, a 1-D GC column, a 2-D GC column, and a detector. The system is designed to capture VOCs from ambient air and analyze them using 2-Dimensional GC. The system is designed to capture VOCs from ambient air and analyze them using 2-Dimensional GC. The system is designed to capture VOCs from ambient air and analyze them using 2-Dimensional GC.



Figure 1. Diagram of the stage break sampling system.

Experimental

Sample Preparation

A schematic of the sample collection system is shown in Fig. 1. The apparatus is designed to collect both the volatile and non-volatile VOCs from ambient air. The sample collection system is designed to collect both the volatile and non-volatile VOCs from ambient air. The sample collection system is designed to collect both the volatile and non-volatile VOCs from ambient air.

Instrumentation

- 1-D GC: Agilent 6890N GC with HP-5MS column (30m x 0.25mm x 0.5µm)
- 2-D GC: Agilent 6890N GC with HP-5MS column (30m x 0.25mm x 0.5µm)
- Detector: Agilent 5973B MS

Figure 2. Diagram of GC/MS/MS instrument.

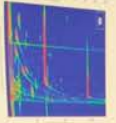
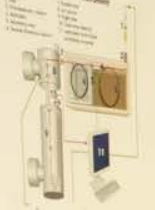


Figure 3. Comparison of GC/MS/MS instrument.

Results and Discussion

A typical analysis of a sample is shown in Fig. 3. The analysis shows a peak at 10.5 minutes. The peak is identified as 1,1,1-trichloroethane. The analysis shows a peak at 10.5 minutes. The peak is identified as 1,1,1-trichloroethane. The analysis shows a peak at 10.5 minutes. The peak is identified as 1,1,1-trichloroethane.

The data presented in this paper is preliminary. Further work is needed to optimize the system for the detection of other VOCs. The data presented in this paper is preliminary. Further work is needed to optimize the system for the detection of other VOCs.



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Children's Environmental Health Initiative

Supporting the development of a healthy future for all children.

Children's Environmental Health Initiative

Supporting the development of a healthy future for all children.

Children's Environmental Health Initiative

Supporting the development of a healthy future for all children.

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Children's Environmental Health Initiative

Supporting the development of a healthy future for all children.

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Supporting the development of a healthy future for all children.

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Children's Environmental Health Initiative

Supporting the development of a healthy future for all children.





120

Children's
Hospital of Philadelphia

The Role of Stress Echocardiography in a Large Pediatric Cardiology Program: A Programmatic Perspective


Author: [Name], [Title], [Institution]

Background: [Text describing the study's purpose and context]

Methods: [Text describing the study design and data collection]

Results: [Text describing the findings of the study]

Conclusions: [Text summarizing the study's implications]





KIDS Georgia Kids and Families Impacting Disease through Science

Executive Board: Chanté Kelly, Melissa Darney, Olivia Chapman, Jack Hale, Mykal Walcott, Teagan Thompson, Erica Massey
James Bask, Hampton Woods, Jake Heywood, Ashley Kochman
Advisory: Stephanie Matson, R.N., Linda Kelly, K.D., Edress Darney, Pharm.D.

BACKGROUND

Kids and Families Impacting Disease through Science (KIDS) is an advisory group of children, adolescents and families focused on understanding, communicating and improving medicine, research and innovation for children.

KIDS is a collaboration between the American Academy of Pediatrics (AAP) Section on Advances in Therapeutics and Technology (SOATT), local AAP Chapters, children's hospitals, local schools and other partners.

KIDS Georgia received Georgia AAP Chapter approval June 2014 and held their first meeting December 2014.

MEMBERSHIP

Children ages 8 to 18 (and their families) who have

- Experience in a clinical trial
- Experience using hospital services
- Chronic medical conditions and/or take medication regularly
- Interest in medicine and/or research

Current KIDS Georgia Chapter:

- >30 active members + their families
- 60% with medical condition
- 40% healthy with interest in medicine/research/science
- Membership requires attendance to 60% of chapter meetings, 80% if on executive board

OBJECTIVES

- Learn, teach and advocate for medicine, research and innovation that improves the health and well-being of children
- Engage in the process through projects and consultation activities with hospitals, researchers, and other partners in the public and private sectors
- Provide input on research ideas, innovative solutions, unmet pediatric needs and priorities
- Contribute to the design and implementation of clinical studies for children
- Serve as a critical voice for children and families in the medical, research and innovation process



Kids using their voice to advance medicine



ICAN

The International Children's Advisory Network (ICAN) is the umbrella organization for all KIDS groups in the U.S. and abroad, including Young Person Advisory Groups in the U.K. and Scotland, and the KIDScan group in Canada.

While the network has already begun to roll out, its official launch will be in June 2015 at the first annual ICAN Research Summit. This event will draw between 100-150 children, families, and team advisors from the United States, Canada, United Kingdom, Scotland, Australia, Spain, France, and elsewhere. KIDS Georgia will have 10 members and 2 adult advisors in attendance.



SERVICES

- Pediatric input on research projects during any stage of development by our KIDS Georgia panel
- Feedback request can be pushed out to other KIDS chapters and ICAN network
- Helps fulfill patient-centered outcome requirements many grant applications now request

HOW TO ACCESS

KIDS Georgia: www.kidsgeorgia.org
ICAN: www.icanresearch.org
Email: KidsGeorgia@icanresearch.org



KIDS Georgia Kids and Families Impacting Disease through Science



Executive Board: Claire Kelly, Melissa Sawyer, Olivia Clapper, Jack Hale, Mykal Watson, Tregina Thompson, Erica Marney
 Junior Board: Hampton Woods, Jake Hargood, Abbey Rodman
 Adult Advisors: Stephanie Malvest, B.N., Linda Kelly, M.D., Eileen Darsney, Pharm.D.

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While the network has already begun to roll out, its official launch will be in June 2015 at the first annual iCAN Research Summit. This event will draw between 100-150 children, families, and team advisors from the United States, Canada, United Kingdom, Scotland, Australia, Spain, France, and elsewhere. KIDS Georgia will have 10 members and 2 adult advisors in attendance.



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HOW TO ACCESS

KIDS Georgia: www.kidsgeorgia.org
 iCAN: www.icanresearch.org
 Email: KidsGeorgia@childrensjax.org





















Inflammation in Pediatric Health:
Improving care through innovation and technology
Paul





Advancing to Public Health
Empowering communities through innovation and technology

Paul
Spearman

Executive Director
Department of Health Services

























Collaboration to Patients Benefit
Empowering care through innovation and technology

**Erin
Buckley**
Erin Buckley, George Park















Administration for Public Health
Improving the Health of Atlanta and Surrounding Areas

Yasmin
Tyler Hill
Morehouse College of Business


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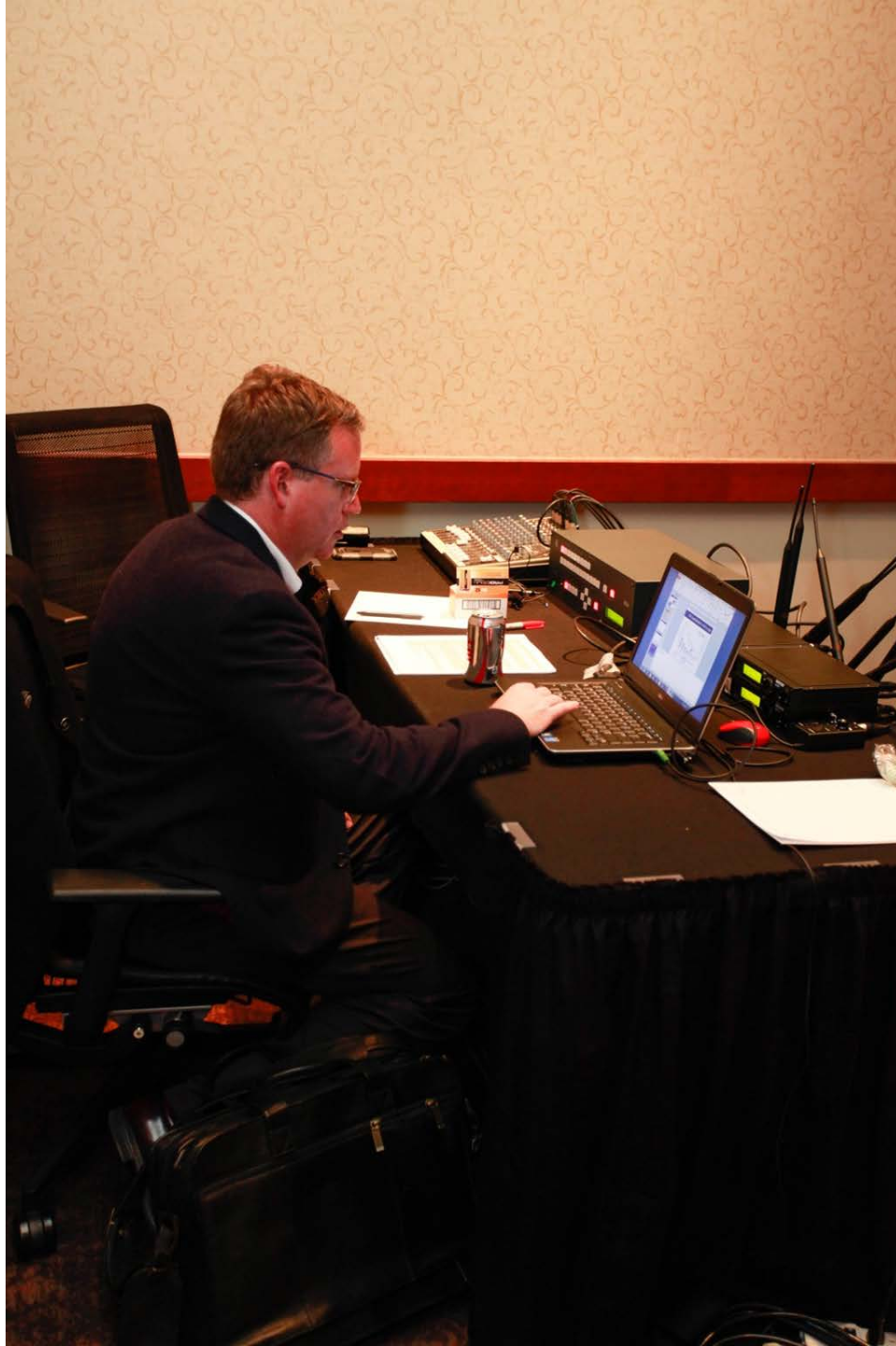
















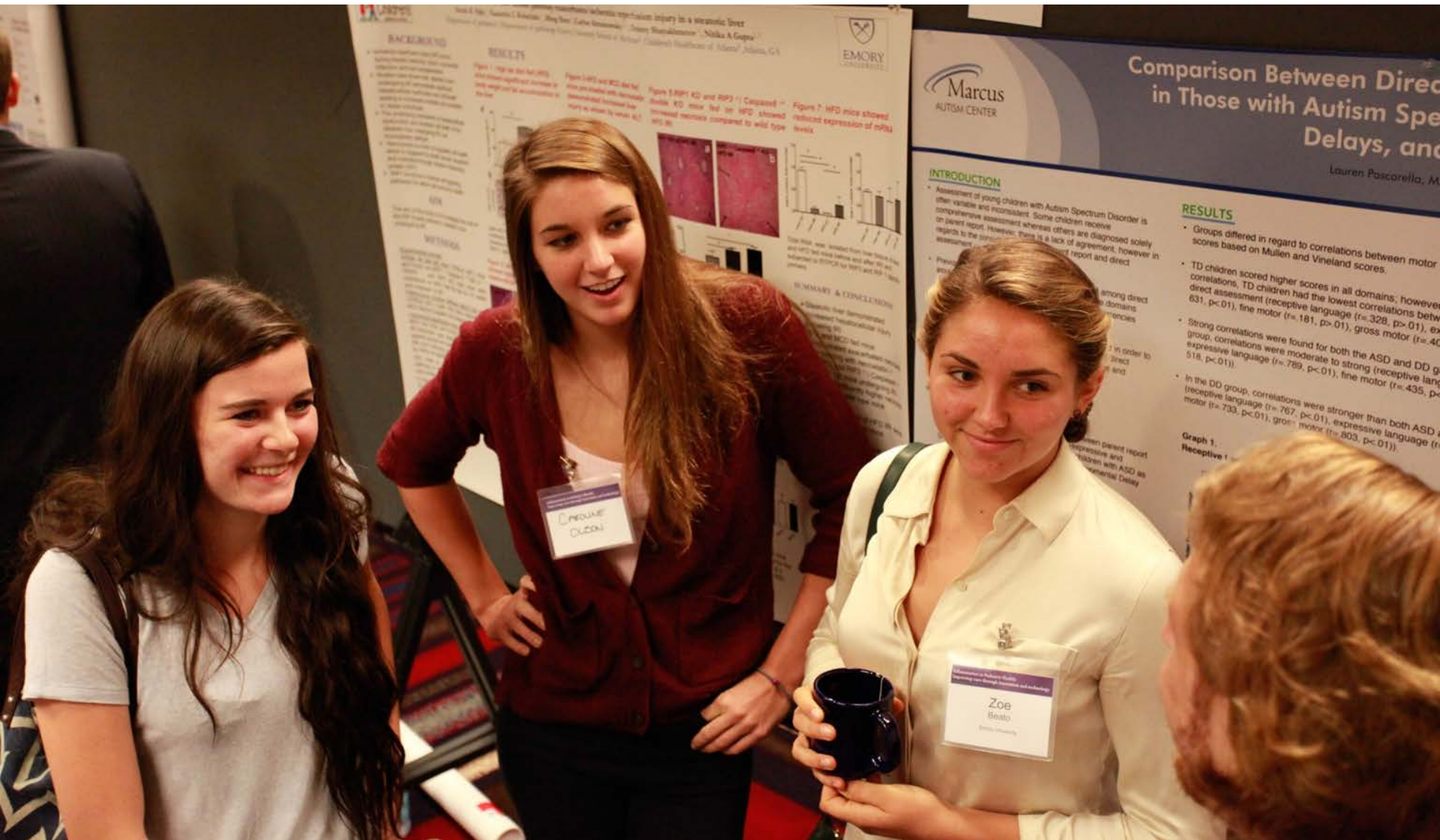












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Children's

Role of RIP kinase pathway activation in infant reperfusion injury in a steatotic liver

David F. Hill, Sumathi S. Anandhi, Ming-Yen Lwin, Aronim, J. Shetty, Mayank Maheshwari, Nitika A. Gupta

Department of Pathology, Emory University School of Medicine, Children's Healthcare of Atlanta, Atlanta, GA

BACKGROUND

Reperfusion injury (RI) is a major cause of liver failure after liver transplantation. The mechanism of RI is still unclear, but it is thought to involve oxidative stress and inflammation. The RIP kinase pathway is a key signaling pathway in the liver that regulates cell survival and apoptosis. We hypothesized that activation of the RIP kinase pathway contributes to liver injury in a steatotic liver.

RESULTS

Figure 1: High fat diet (HFD) mice showed increased liver weight and steatosis compared to low fat diet (LFD) mice. HFD mice also showed increased expression of RIP1 and RIP3, and decreased expression of p-RIP3. HFD mice also showed increased expression of caspase-8 and caspase-3, and decreased expression of Bcl-2.

Figure 2: HFD and RIP3^{-/-} mice protected with caspase-8 inhibitor, Z-IETD-fmk, showed reduced liver injury compared to HFD mice. HFD mice also showed increased expression of caspase-8 and caspase-3, and decreased expression of Bcl-2.

Figure 3: RIP3^{-/-} mice showed reduced liver injury compared to wild type mice. RIP3^{-/-} mice also showed reduced expression of caspase-8 and caspase-3, and increased expression of Bcl-2.

Figure 4: HFD mice showed reduced expression of miR142.

METHODS

Mice were fed either a low fat diet (LFD) or a high fat diet (HFD) for 12 weeks. Liver tissue was harvested and analyzed for weight, steatosis, and gene expression. RIP3^{-/-} mice were generated using CRISPR/Cas9 technology.

SUMMARY & CONCLUSIONS

Steatotic liver demonstrated increased RIP1 and RIP3 expression, which was associated with increased liver injury. Inhibition of caspase-8 and RIP3^{-/-} mice showed reduced liver injury and improved liver function. Our findings suggest that the RIP kinase pathway plays a key role in liver injury in a steatotic liver.



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Marcus
AUTISM CENTER

Comparison Between Direct Assessment and Parent Report in Those with Autism Spectrum Disorder, Developmental Delays, and Typically Developing Children

Lauren Pascarella, M.A.; Anusha Challo, B.A.; Cheryl Klaiman; Ph.D. Marcuz Autism Center, Children's Healthcare of Atlanta

INTRODUCTION

Assessment of young children with Autism Spectrum Disorder is often variable and inconsistent. Some children receive comprehensive assessment whereas others are diagnosed solely on parent report. There is a lack of agreement, however, in assessing the child's abilities on parent report and direct assessment.

RESULTS

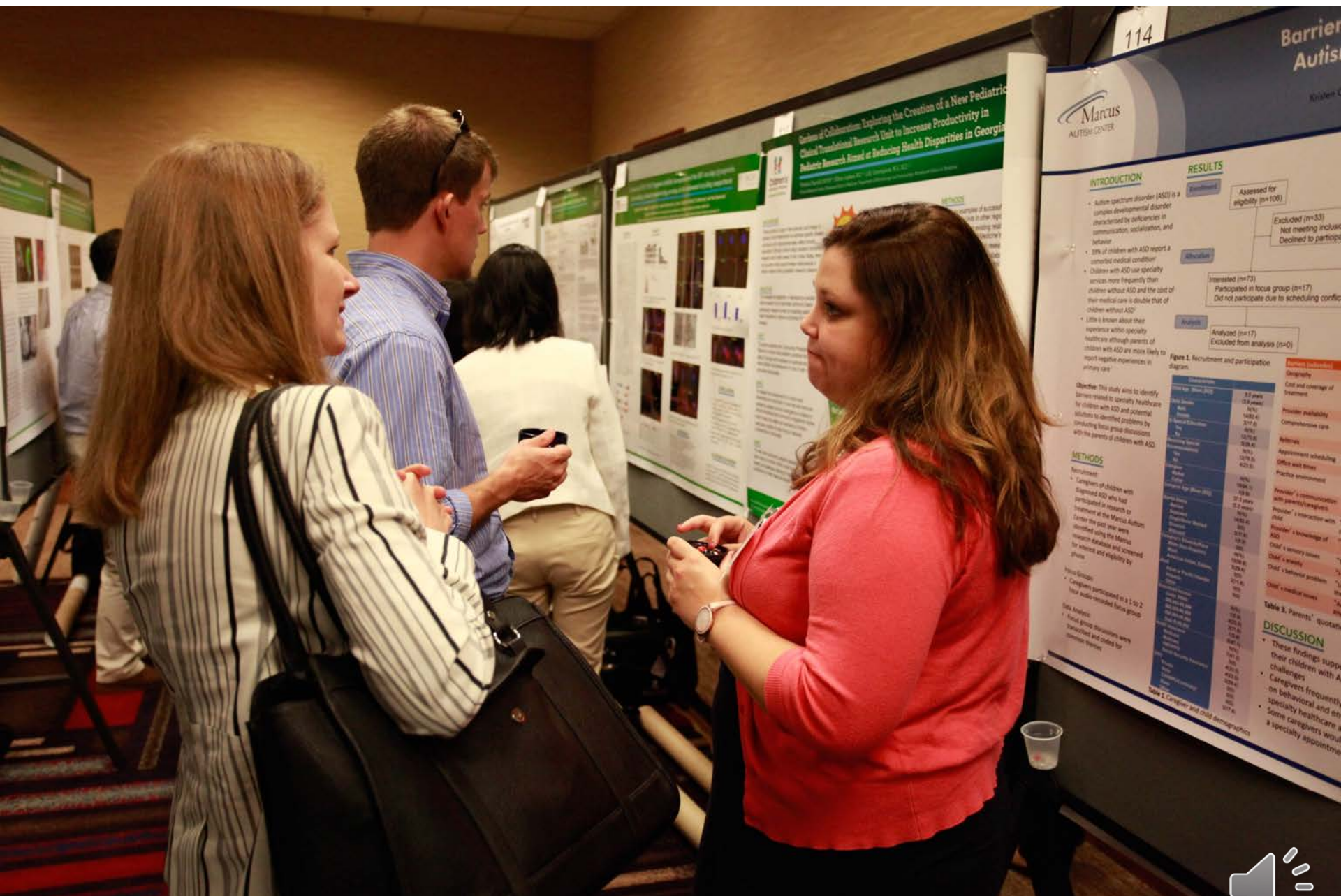
- Groups differed in regard to correlations between motor and communication scores based on Mullen and Vineland scores.
- TD children scored higher scores in all domains; however, in regard to direct assessment (receptive language ($r = 614, p < .01$), expressive language ($r = 631, p < .01$), fine motor ($r = 181, p < .01$), gross motor ($r = 400, p < .01$)).
- Strong correlations were found for both the ASD and DD groups. In the ASD group, correlations were moderate to strong (receptive language ($r = 518, p < .01$), expressive language ($r = 789, p < .01$), fine motor ($r = 435, p < .01$), gross motor ($r = 733, p < .01$), expressive language ($r = 803, p < .01$), fine motor ($r = 733, p < .01$), gross motor ($r = 803, p < .01$)).

CONCLUSIONS

- Data from the direct assessment and parent report correlations are not consistent for children.
- This may be due to differences in assessment with developmental delays.
- Also, toddlers often have difficulty understanding multiple perspectives.
- Future studies and help parents understand may assessments and greater parental accuracy.







Barriers of Collaboration: Exploring the Creation of a New Pediatric Clinical Translational Research Unit to Increase Productivity in Pediatric Research Aimed at Reducing Health Disparities in Georgia

INTRODUCTION

- Autism spectrum disorder (ASD) is a complex developmental disorder characterized by deficiencies in communication, socialization, and behavior.
- 30% of children with ASD report a comorbid medical condition.
- Children with ASD use specialty services more frequently than children without ASD and the cost of their medical care is double that of children without ASD.
- Little is known about their experience within specialty healthcare although parents of children with ASD are more likely to report negative experiences in primary care.

Objective: This study aims to identify barriers related to specialty healthcare for children with ASD and potential solutions to identified problems by conducting focus group discussions with the parents of children with ASD.

METHODS

- Recruitment:**
 - Caregivers of children with diagnosed ASD who had participated in research or treatment at the Marcus Autism Center the past year were identified using the Marcus research database and screened for interest and eligibility by phone.
- Focus Groups:**
 - Caregivers participated in a 1 to 2 hour audio-recorded focus group.

Data Analysis:
 1. Focus group discussions were transcribed and coded for common themes.

RESULTS

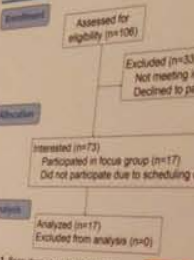


Figure 1. Recruitment and participation diagram.

| Characteristic | n | % |
|--------------------|-------------|------|
| Gender | | |
| Male | 10 | 58.8 |
| Female | 7 | 41.2 |
| Age | | |
| Mean (SD) | 37.2 (10.8) | |
| Range | 22-58 | |
| Education | | |
| High School | 1 | 5.9 |
| Some College | 2 | 11.8 |
| College Graduate | 12 | 70.3 |
| Postgraduate | 2 | 11.8 |
| Employment | | |
| Unemployed | 1 | 5.9 |
| Part-time | 1 | 5.9 |
| Full-time | 15 | 88.2 |
| Insurance | | |
| Medicaid | 10 | 58.8 |
| Medicare | 1 | 5.9 |
| Private | 6 | 35.3 |
| Other | 0 | 0 |
| Child's Age (Mean) | 10.8 (2.1) | |
| Child's Gender | | |
| Male | 10 | 58.8 |
| Female | 7 | 41.2 |
| Child's Diagnosis | | |
| ASD | 17 | 100 |
| Other | 0 | 0 |
| Child's Location | | |
| Urban | 10 | 58.8 |
| Suburban | 1 | 5.9 |
| Rural | 6 | 35.3 |
| Other | 0 | 0 |

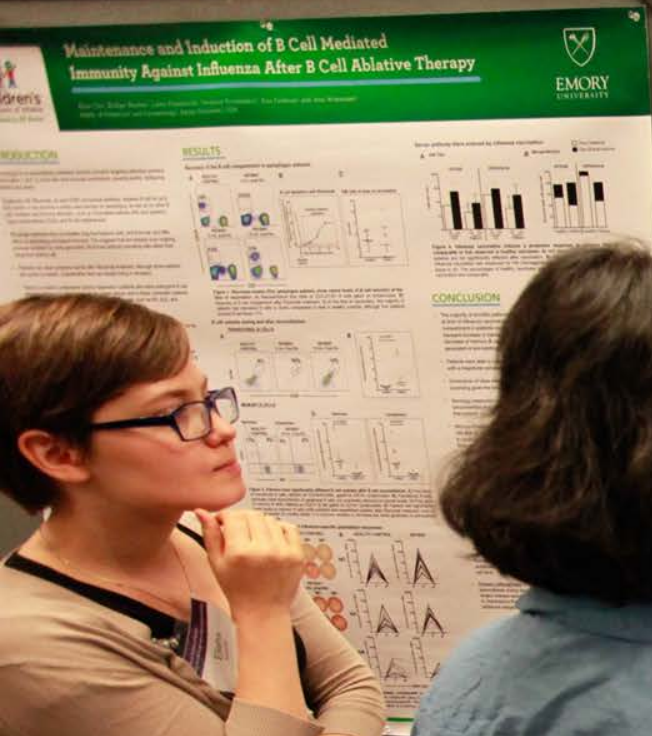
Table 1. Caregiver and child demographics

Table 3. Parents' quotes

- These findings support their children with ASD challenges.
- Caregivers frequently on behavioral and specialty healthcare are some caregivers would a specialty appointment.

DISCUSSION





112

A truncated FIP1C/RCP fragment inhibits incorporation of the HIV envelope glycoprotein into budding virions by sequestering envelope in the endosomal recycling compartment

Children's EMORY UNIVERSITY

Junghwa Choi¹, Mingli Qi¹, Lingmei Ding¹, Jason Hammonds¹, Lynne A. Lapierre², James R. Goldensring², and Paul Spearman¹
¹Department of Pediatrics, Emory University School of Medicine, and Children's Healthcare of Atlanta, Atlanta GA
²Departments of Surgery and Cell and Developmental Biology, Epithelial Biology Center, Vanderbilt University School of Medicine, Nashville, TN

ABSTRACT

HIV-1 envelope assembly takes place on the plasma membrane of T cells and involves several steps. The process of envelope incorporation into budding virions is a critical step in HIV-1 assembly that requires the presence of HIV-1 RNA and the HIV-1 envelope glycoprotein (Env) on the plasma membrane. The HIV-1 envelope glycoprotein (Env) is a heterotrimeric protein consisting of two surface glycoprotein (gp120) subunits associated with a transmembrane glycoprotein (gp41) subunit. The HIV-1 envelope glycoprotein (Env) is a heterotrimeric protein consisting of two surface glycoprotein (gp120) subunits associated with a transmembrane glycoprotein (gp41) subunit. The HIV-1 envelope glycoprotein (Env) is a heterotrimeric protein consisting of two surface glycoprotein (gp120) subunits associated with a transmembrane glycoprotein (gp41) subunit.

RESULTS

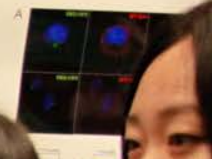
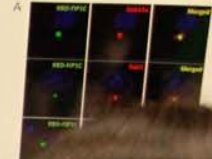
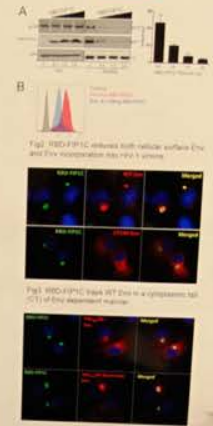


Fig 1. HIV-1 Envelope Incorporation into HIV-1 Virions

Fig 2. RED-FIP1C RNAi RT-2013 is a cytoplasmic 50-55% of Env dependent reduction

Fig 3. RED-FIP1C RNAi RT-2013 is a cytoplasmic 50-55% of Env dependent reduction

CONCLUSION



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Abstracts

CONCLUSION

FUTURE DIRECTIONS

EMORY UNIVERSITY

A truncated FIP1C/RCP fragment inhibits incorporation of the HIV envelope glycoprotein into budding virions by sequestering envelope in the endosomal recycling compartment

Jungwha Choi¹, Mingli Qi¹, Jason Hammonds¹, Lynne A. Lapierre², James R. Goldenring², and Paul Spearman¹
¹Department of Pediatrics, Emory University School of Medicine, and Children's Healthcare of Atlanta, Atlanta, GA
²Departments of Surgery and Cell and Developmental Biology, Epithelial Biology Center, Vanderbilt University School of Medicine, Nashville, TN

ABSTRACT

HIV-1 viral particle assembly takes place in the absence of a transmembrane glycoprotein (Env) incorporation into budding virions in a manner that is similar to that of other enveloped RNA viruses. To investigate the mechanism of Env incorporation, we generated a truncated FIP1C/RCP fragment (trFIP1C/RCP) and found that it sequestered Env in the endosomal recycling compartment (ERC), thereby inhibiting its incorporation into budding virions. The trFIP1C/RCP fragment sequestered Env in the ERC by interacting with the ERC marker protein, EEA1, and by inhibiting the activity of the ERC marker protein, Rab11. The trFIP1C/RCP fragment also inhibited the activity of the ERC marker protein, Rab11. These results indicate that the trFIP1C/RCP fragment sequesters Env in the ERC by interacting with the ERC marker protein, EEA1, and by inhibiting the activity of the ERC marker protein, Rab11.

RESULTS

Fig 1. trFIP1C/RCP inhibits Env incorporation into budding virions. A: Western blot analysis of HIV-1 Env incorporation into budding virions. B: Bar graph showing the percentage of Env incorporation into budding virions. C: Confocal microscopy images of HIV-1 Env incorporation into budding virions. D: Confocal microscopy images showing the effect of trFIP1C/RCP on Env incorporation into budding virions.

Fig 2. trFIP1C/RCP sequesters Env in the ERC. A: Confocal microscopy images showing Env sequestration in the ERC. B: Bar graph showing the percentage of Env sequestration in the ERC. C: Confocal microscopy images showing the effect of trFIP1C/RCP on Env sequestration in the ERC.

Fig 3. trFIP1C/RCP inhibits Env incorporation into budding virions. A: Confocal microscopy images showing Env incorporation into budding virions. B: Bar graph showing the percentage of Env incorporation into budding virions. C: Confocal microscopy images showing the effect of trFIP1C/RCP on Env incorporation into budding virions.

CONCLUSION

trFIP1C/RCP inhibits HIV-1 Env incorporation into budding virions by sequestering Env in the ERC.

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Gardens of Collaboration: Expanding Clinical Translational Research and Pediatric Research Aimed at Reducing Health Disparities

Children's Healthcare of Atlanta

Victoria Churchill, M.P.H., Ellen Lipton, M.D., Lyle DeWitt, M.D., and the Emory University School of Medicine, Department of Pediatrics

BACKGROUND

There currently is a gap in the diversity and linkage of pediatric clinical researchers to access specific disease conditions which disproportionately affect minority populations. Although units to align pediatric clinicians in research exist in other areas of the United States, there is not a system to fully support these collaborations in Atlanta, despite a strong pediatric research presence.

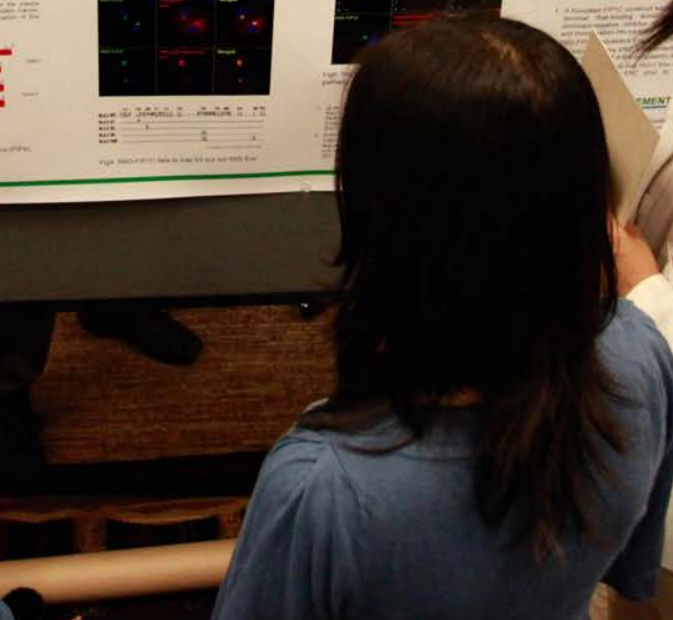
OBJECTIVE

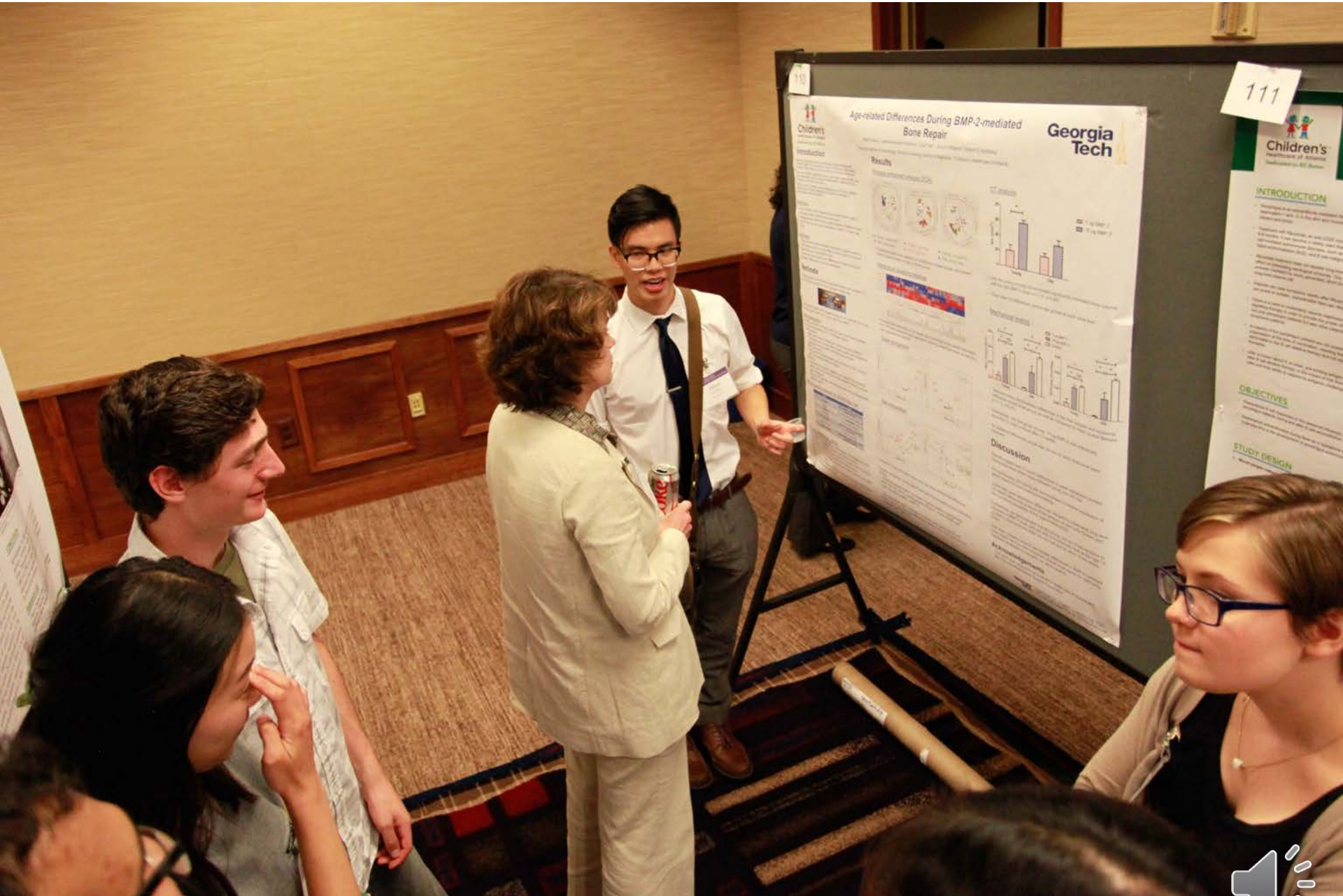
To facilitate the feasibility of developing a pediatric clinical research network to facilitate community-based research aimed at reducing pediatric health disparities.

CONCLUSION

This network will facilitate the development of a pediatric clinical research network to facilitate community-based research aimed at reducing pediatric health disparities.

Academic Networks
GA ESP
CDC
Community Providers





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Age-related Differences During BMP-2-mediated Bone Repair

Children's Healthcare of Atlanta
Georgia Tech

Introduction

Results

Methods

Discussion

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Children's Healthcare of Atlanta

INTRODUCTION

OBJECTIVES

STUDY DESIGN



Collaboration: Exploring the Creation of a New Pediatric Translational Research Unit to Increase Productivity in Research Aimed at Reducing Health Disparities in Georgia

Dr. Liam Laghate, M.S., Lilly Immergluck, M.S., MD

Department of Microbiology and Immunology, Morehouse School of Medicine

METHODS
Based on examples of successful Pediatric Clinical Translational Units in other regions, we propose to explore ways to strengthen existing relationships in the Morehouse School of Medicine's Clinical Research Center and other pediatric clinical research settings and other sites within the pediatric clinical research setting in the state of Georgia to form a collaborative effort in identifying and addressing the needs of underserved populations. We will provide resources to facilitate this process, including a strategic plan to establish a pediatric research unit to continue our role in pediatric research.

CONCLUSION
Our proposal is the utilization of existing research resources through the creation of a Pediatric Clinical Translational Research Unit to increase and broaden the implementation of collaborative efforts in pediatric research and improve patient care in Georgia.

COLLABORATION

- Emerging Infectious Diseases
- Asthma
- Stroke Care
- Obesity

ACTSI, RTRN, CDC, Community Providers, GA EIP, Academic Networks

Barriers to Access to Genetic Testing in African American Stroke Research Populations



Collaboration: Exploring the Creation of a New Pediatric Translational Research Unit to Increase Productivity in Georgia Aimed at Reducing Health Disparities in Georgia

Laghia, M.S.¹; Lilly Immergluck, M.S., M.D.^{2*}
¹Department of Microbiology and Immunology, Morehouse School of Medicine
²Department of Microbiology and Immunology, Morehouse School of Medicine



METHODS
Based on examples of successful Pediatric Clinical Translational Units in other regions, we propose to explore ways to strengthen existing relationships among Morehouse School of Medicine's Clinical Research Center and other pediatric clinical research organizations in the state of Georgia to form a collaborative research setting and areas of need within our potential to create and We plan to then focus on our potential to create and promote resources to facilitate the implementation of research within the community. Finally, we hope to develop a strategy to evaluate and sustain our efforts to continue our role in pediatric research.

CONCLUSION
Our exploration in the proposal of pediatric research through the creation of the Pediatric Clinical Translational Research Unit will assist us with the resources and support the implementation of collaborative efforts to address health disparities among children in Georgia.



















EMORY UNIVERSITY
Department of Public Health,
Reporting and Global Development
Marty
Moore
Director of Public Health,
Reporting and Global Development at Emory

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HOTEL

















Performance in Public Health
Learning from Health Innovation and Technology

Jason
Hammonds

Emory University











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Leanne
1998

Cynthia
1998

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KIDS Georgia Kids and Families Impacting Disease through Science



Executive Board: Chase Kelly, Madison Darsey, Olivia Chapes, Jack Hale, Mykal Watson, Teagan Thompson, Erica Marney
Junior Board: Hampton Woods, Jake Haygood, Abby Kochman
Adult Advisors: Stephanie Meisner, R.N., Linda Kelly, M.D., Edress Darsey, Pharm.D.

BACKGROUND

Kids and Families Impacting Disease through Science (KIDS) is an advisory group of children, adolescents and families focused on understanding, communicating and improving medicine, research and innovation for children.

KIDS is a collaboration between the American Academy of Pediatrics (AAP) Section on Advances in Therapeutics and Technology (SOATT), local AAP Chapters, children's hospitals, local schools and other partners.

KIDS Georgia received Georgia AAP Chapter approval June 2014 and held their first meeting December 2014.

MEMBERSHIP

Children ages 6 to 18 (and their families) who have:

- Experience in a clinical trial
- Experience using hospital services
- Chronic medical conditions and/or take medication regularly
- Interest in medicine and/or research

Current KIDS Georgia Chapter

- >50 active members + their families
- 60% with medical condition
- 40% healthy with interest in medicine/research/science
- Membership requires attendance to 60% of chapter meetings, 80% if on executive board

OBJECTIVES

- Learn, teach and advocate for medicine, research and innovation that improves the health and well-being of children
- Engage in the process through projects and consultation activities with hospitals, researchers, and other partners in the public and private sectors
- Provide input on research ideas, innovative solutions, unmet pediatric needs and priorities
- Contribute to the design and implementation of clinical studies for children
- Serve as a critical voice for children and families in the medical, research and innovation process



Kids using their voice to advance medicine



ICAN

The International Children's Advisory Network (ICAN) is the umbrella organization for all KIDS groups in the U.S. and abroad, including Young Person Advisory Groups in the U.K. and Scotland, and the KIDScan group in Canada.

While the network has already begun to roll out, its official launch will be in June 2015 at the first annual ICAN Research Summit. This event will draw between 100-150 children, families, and team advisors from the United States, Canada, United Kingdom, Scotland, Australia, Spain, France, and elsewhere. KIDS Georgia will have 10 members and 2 adult advisors in attendance.



SERVICES

- Pediatric input on research projects during any stage of development by our KIDS Georgia panel
- Feedback request can be pushed out to other KIDS chapters and ICAN network
- Helps fulfill patient-centered outcome requirements many grant applications now request

HOW TO ACCESS

KIDS Georgia: www.kidsgeorgia.org
ICAN: www.icanresearch.org
Email: kidsgeorgia@emoryresearch.org



Adanya Otiomaka













Brushing by the
Academy of Sciences

ACADEMY OF SCIENCES

Erin Energy

Before Playing Brush Up

1. The toothbrush is clean and ready to use.

2. The toothbrush is used to brush the teeth.

3. The toothbrush is rinsed with water.

4. The toothbrush is stored in a clean container.

After Two Weeks of Play

1. The toothbrush is clean and ready to use.

2. The toothbrush is used to brush the teeth.

3. The toothbrush is rinsed with water.

4. The toothbrush is stored in a clean container.

One Year Later

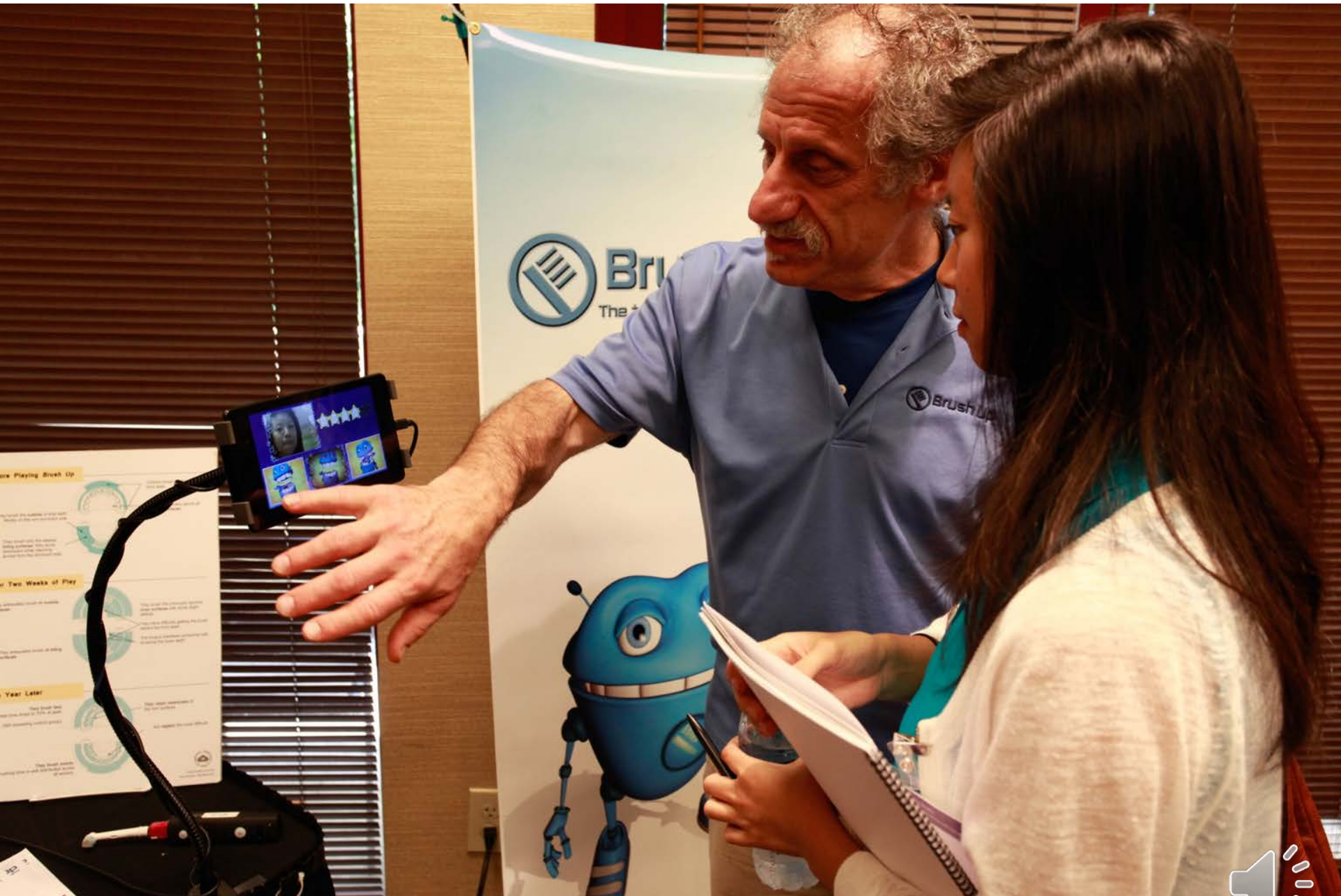
1. The toothbrush is clean and ready to use.

2. The toothbrush is used to brush the teeth.

3. The toothbrush is rinsed with water.

4. The toothbrush is stored in a clean container.

















SAPLING: PEDIATRIC SPINAL CAGE

a solution for children with cancer

ELIZABETH CARPENTER, TRACER IBRAHIM, RAJESH MURTHYKANNAN, KATHARINE HARRISON

PEDIATRIC SPINAL FUSIONS

INTRODUCING THE SAPLING CAGE

TARGETED PROGRESSION OF DEGRADATION

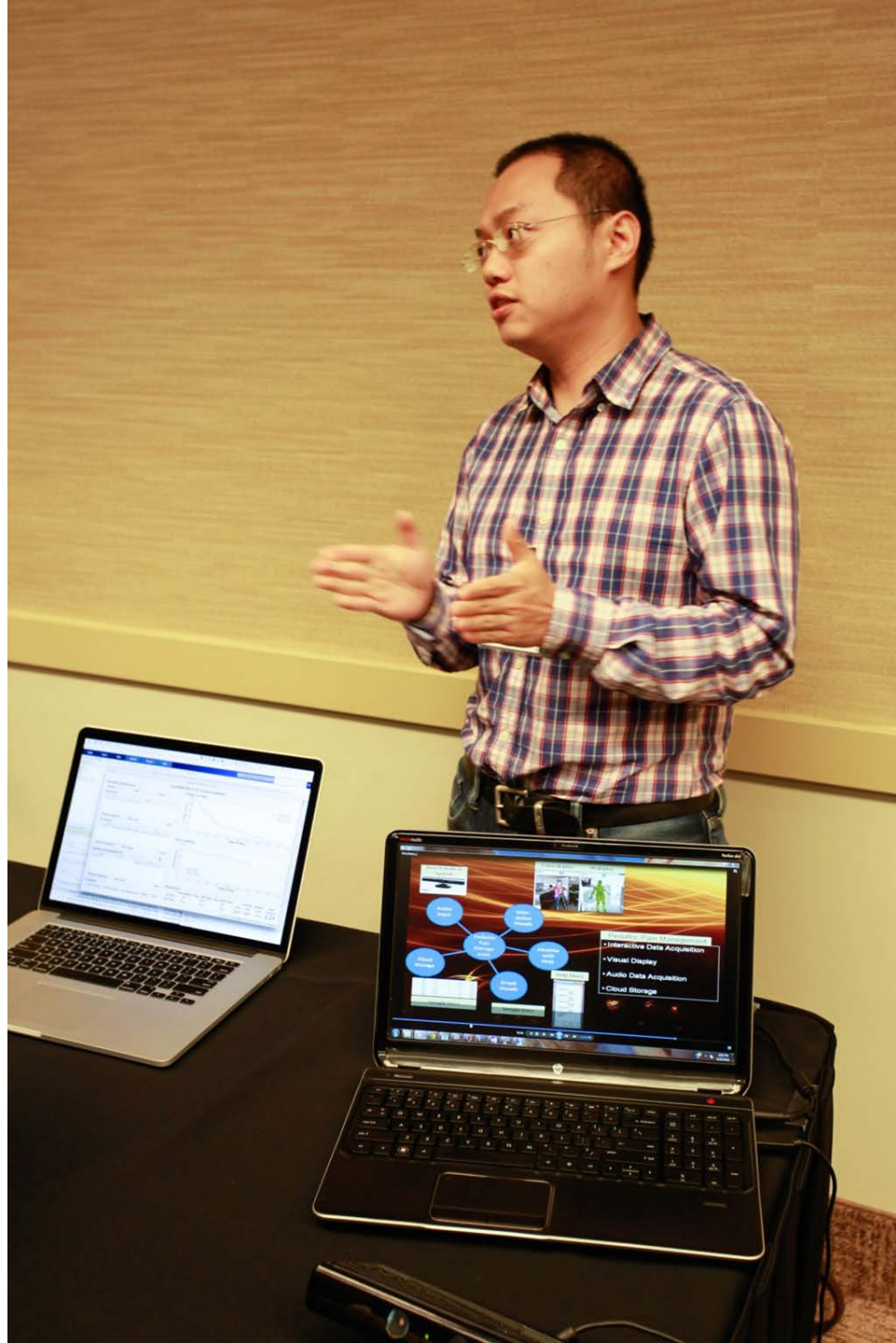
THE FUTURE OF FUSION

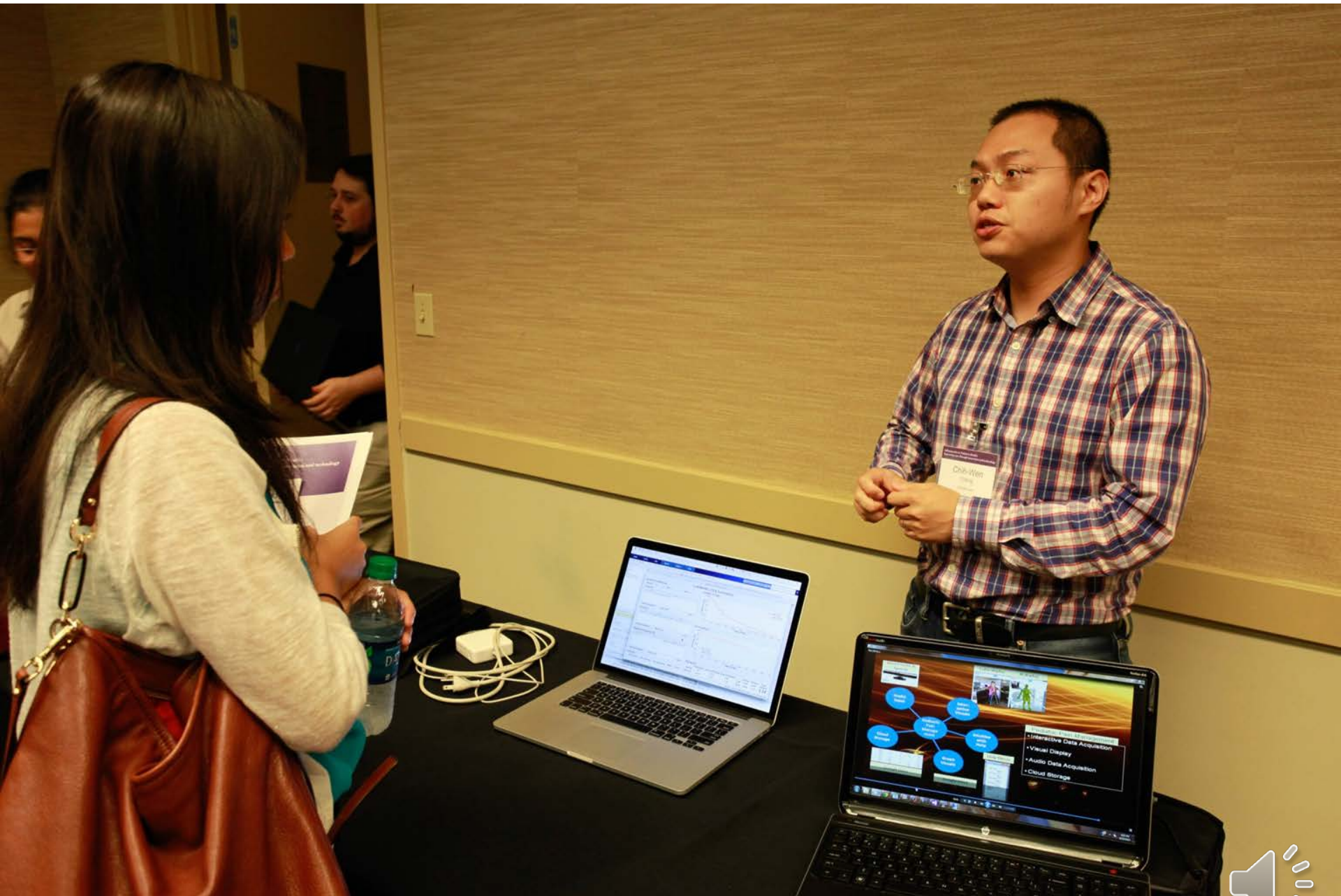
Comparison of fusion techniques: Traditional vs. Minimally Invasive vs. Hybrid vs. SAPLING.















**Inflammation in Pediatric Health:
Improving care through innovation and technology**

June 22, 2015
Emory Conference Center Hotel

Hosted by





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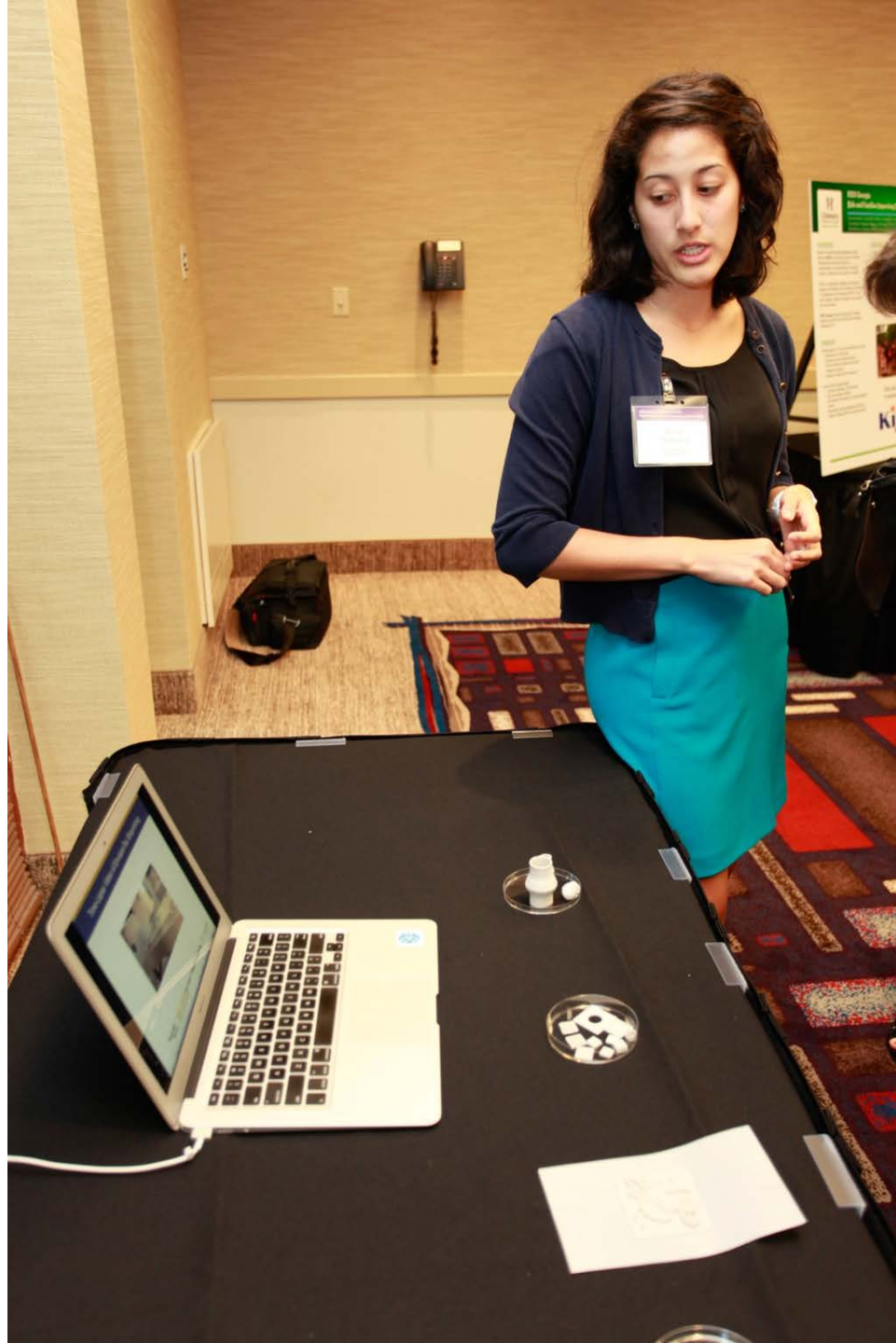


Inflammation in Pediatric Health: Improving care through innovation and technology

June 22, 2015
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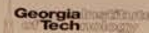






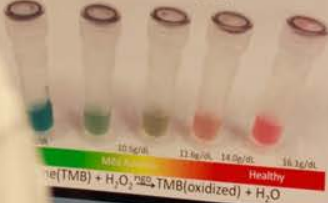
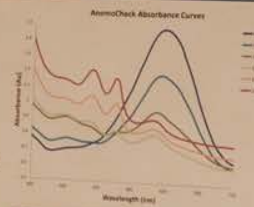


AnemoCheck: a point-of-care, patient-operated, standalone, inexpensive, & disposable diagnostic test for anemia



Caroline E. Hansen, BS, Erika A. Tyburski, BS & Wilbur A. Lam, MD, PhD, Emory University School of Medicine

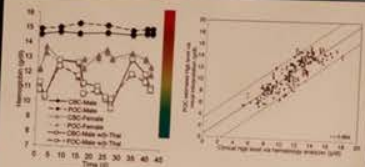
The Solution



Device and Smartphone App

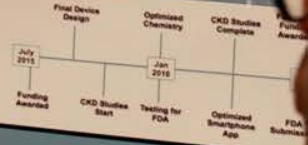


Clinical Testing



| Prevalence | Location | Site | Date of Enrollment |
|------------------------------|---------------------------------|------|--------------------|
| Control Blood Donors | ORCA & Winship Cancer Institute | 278 | 02/2013 to 03/2014 |
| Sickle Cell Anemia (SCA) | ORCA, Winship | 40 | 05/2013 to 05/2014 |
| Chronic Kidney Disease (CKD) | Emory, Winship | 60 | 09/2013 to 09/2014 |
| ICD | Midwest, South Africa | 200 | 02/2014 to 05/2015 |
| Palau | Mal, Africa | 400 | 07/2013 to 09/2013 |
| TOTAL | | 778 | |

Going Forward



The Team





EMORY **AnemoCheck**: a point-of-care, patient-operated, standalone, inexpensive, & disposable diagnostic test for anemia. **Georgia Tech**

Stella O. Fagbami, BS, Caroline E. Hansen, BS, Erika A. Tyburski, BS & Wilbur A. Lam, MD, PhD, Emory University School of Medicine

The Problem

Anemia = low hemoglobin in red blood cells.
Hemoglobin = O_2 , CO_2

8.5% over 18 years old
Pregnant Women
Sickle Cell Disease
Children

2 BILLION

The Solution

AnemoCheck Workflow

- Step 1: Perform finger stick
- Step 2: Collect blood in tube
- Step 3: Insert tube, mix well & wait 1 minute

Color Scale: Green (Severe Anemia) to Red (Healthy)

Sulfamethoxazole (SM) + H_2O_2 (SMboxidized) + H_2O

Clinical Testing

Graphs showing Hemoglobin (g/dL) vs. Time (min) and Hemoglobin (g/dL) vs. Hemoglobin (g/dL).

| Parameter | Location |
|------------|--------------------------|
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |
| Hemoglobin | EMory School of Medicine |

The Competition

Hematology Analyzer for Complete Blood Count (CBC)

- Portable
- Simple Blood Draw
- High Cost
- High Error
- High Price: \$K-\$10K for easy

World Health Organization Hemoglobin Color Scale

The Device and Smartphone App

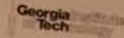
- Step 1: Center the filled tube in the carrying window and lock the lid.
- Step 2: Hit trigger will convert pink and white.
- Step 3: High light (the carrying window) will glow blue and the light sensor will detect. The test will be ready to be photographed.





AnemoCheck: a point-of-care, patient-operated, standalone, inexpensive, & disposable diagnostic test for anemia

Stella O. Fagbemi, BS, Caroline E. Hansen, BS, Erika A. Tyburski, BS & Wilbur A. Lam, MD, PhD, Emory University School of Medicine



The Problem

Anemia = low hemoglobin in red blood cells.
 Hemoglobin = O₂ CO₂



The Solution



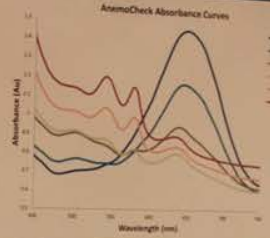
Step 1: Perform finger stick



Step 2: Collect blood in tube

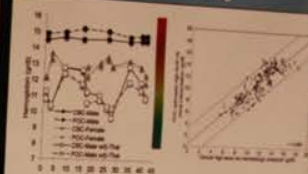


Step 3: Insert tube, mix well & wait 1 minute



Tetramethylbenzidine(TMB) + H₂O₂ → TMB(oxidized) + H₂O

Clinical Testing



| Population | Location | Size | Year of Publication |
|-----------------------|-----------------------|------|---------------------|
| Asian Blood Donors | USA & Thailand Center | 100 | 2014 |
| Adult US Blood Donors | USA, Blood Bank | 100 | 2014 |
| Chinese Blood Donors | China, Blood Bank | 100 | 2014 |
| US | Public Health Office | 100 | 2014 |
| India | India, Blood Bank | 100 | 2014 |
| USA | USA, Blood Bank | 100 | 2014 |

The Competition



Hematology Analyzer for Complete Blood Count (CBC)

- Hospital Visit
- Venous Blood Draw
- Wait Time
- High Costs: US \$20 Co-pay

HemoCue Spectrophotometer

- US \$1,000 Machine Cost
- US \$1-2 Cuvette Cost Per Test



World Health Organization Hemoglobin Color Scale



- Subjective
- Inaccurate

The Device and Smartphone App



Step 1: Center the filled tube in the viewing window and capture the image.



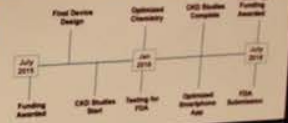
Step 2: The image will convert to black and white.



Step 3: Highlight the viewing window with your finger and the Hgb value will appear. The data can be saved or sent to physician for review.

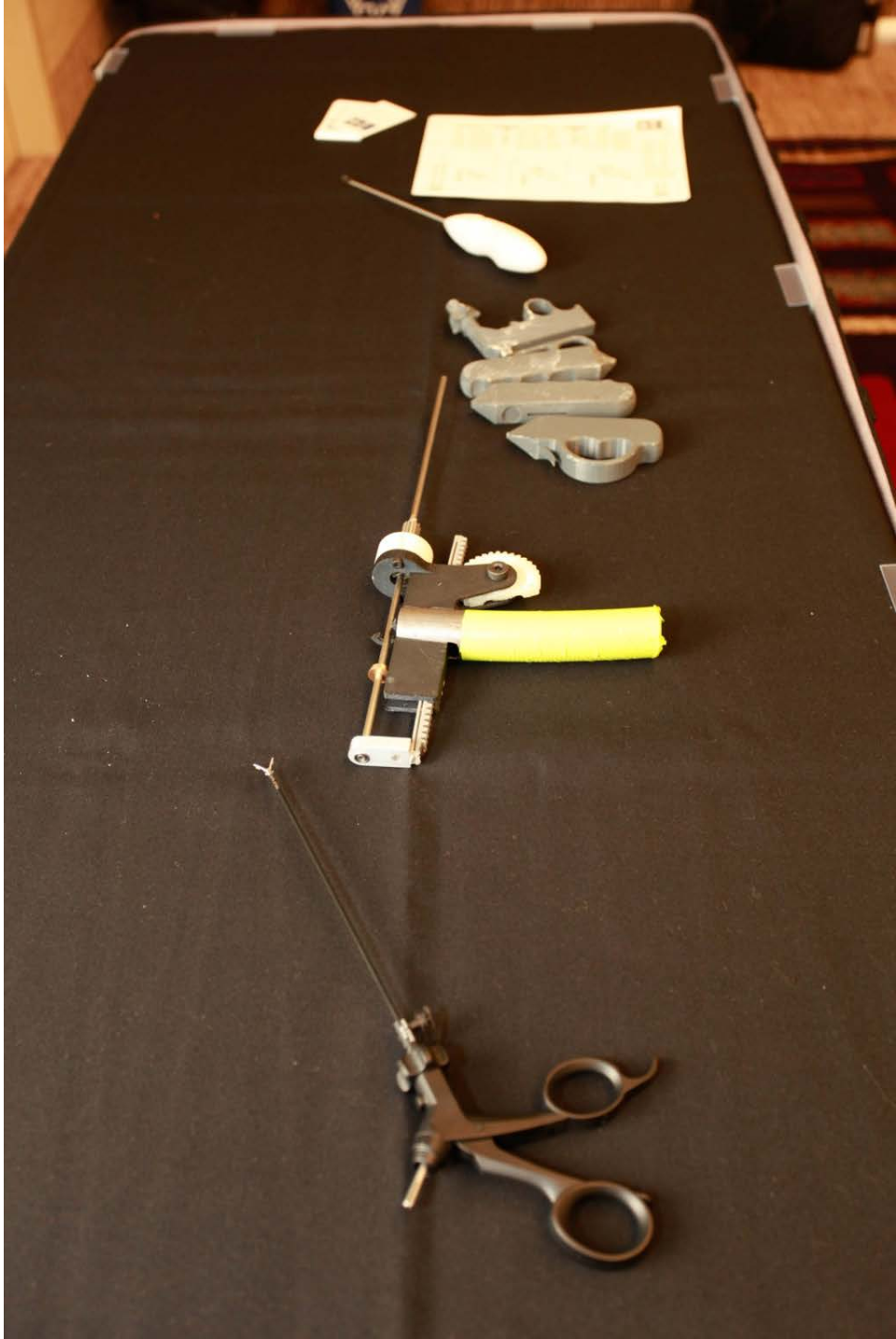


Going Forward



The Team













PEDIATRIC SPINAL FUSIONS

with cancer

ELIZABETH CARPENTER, NASER IBRAHIM, KAVYA MUDDUKUMAR, KARTHIK NATHAN

Department of Biomedical Engineering

COALESCE

ING CAGE

FLEXIBLE IMAGING

BETTER FUSION

DEMANDS DRIVEN

UNDEGRADED FUSION

THE FUTURE OF FUSION

supporting the solution

ELIZABETH CARPENTER, NASER IBRAHIM, KAVYA MUDDUKUMAR, KARTHIK NATHAN

Georgia Tech Department of Biomedical Engineering

COALESCE

VIABILITY

Suggests biocompatibility

| Group | Viability (Proliferation) |
|---------|---------------------------|
| Control | ~0.8 |
| DDM | ~0.7 |

Significant increase in proliferation of cells when exposed to DDM

DIFFERENTIATION

Suggests osteoinductive properties

| Group | Differentiation (Alkaline Phosphatase Activity) |
|---------|---|
| Control | ~0.1 |
| DDM | ~0.4 |

Significant increase in differentiation of cells when exposed to DDM

MIGRATION

Suggests increased support of fusion

| Group | Migration (Proliferation) |
|---------|---------------------------|
| Control | ~0.3 |
| DDM | ~0.5 |

Significant increase in migration when cells are exposed to DDM

CONCLUSION

The Sapping cage creates an environment for further fusion by being more osteoinductive, with key material to decrease interference with imaging in pediatric cancer patients.

FUTURE DIRECTIONS

- ODM Testing
- Reduce sample size
- Test in vivo
- Perform additional biocompatibility tests
- Polymers
- Test biocompatibility with neuronal cells
- Explore degradation rates of Kevlar
- Mechanical Testing
- Perform tensile and shear testing
- Conduct compression testing of PEEK leads
- Test using CFR-PEEK and PLA
- Optimize holes and thickness of cage
- Imaging Artifact Testing
- Conduct mechanical imaging interference tests
- Improve MyoGrowth
- Explore porous treatment of CFR-PEEK

MECHANICAL TESTING

COMPRESSION → Ultimate compression strength increased with function

TENSION → Compression strength increased with function

TORSION → Ultimate torsional strength increased with function

FINITE ELEMENTAL ANALYSIS: TARGETED DEGRADATION

Targeted degradation of a cage structure

Ultimate compression testing of Sapping

Change rate of Sapping under 24h iterations of compression

Finite Element Analysis of Sapping with more mechanical strength

ACKNOWLEDGEMENTS

Sanjiva Karthikyan, Professor James Wang, PhD Student
 Dr. Sarah Boehrer, Dr. Eshwar Ramaswami, Dr. Thomas Beckner, Emily Bennett, Olivia Barnard, Dr. Saeed Alsharif, Michael Fisher, Matt Callaway, Michael Glatzer, Big Jay, Marty Lee Allen, Michael Khoshdelmanesh, Dr. Jie Tang, Dr. Ben MacDonnell, Erica Mann, Gabriel Pezzullo, Dr. Laura O'Keefe, Dr. Rajakrishna Pillai, Dr. Mark Pritzman, Dr. Jonathan Shroy, Caroline Smith, Dr. Daniel Smith, Howard Swartz, Dr. Johnnie Tomasiello, Samuel Yoon, Suihua Zhang

REFERENCES





