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Do Microbes Play a Leading Role in Our Health?



Patrick Seed, MD, PhD

Many of us think of microbes as tiny organisms that occupy our bodies and make us sick. For example, untreated bacterial infections in people can cause serious illness and even death.

Let's suppose that some microbes are our "friends". As scientists and non-scientists alike have come to understand, organisms form communities that are part of who we are. They reside in our gut (among other places in our bodies) and protect us against foreign invasions. Even though they are closely related to the microbes that cause serious diseases, they actually protect us. But how does this happen?

Patrick Seed, MD, PhD, has been studying the microbial community in mammals for over 20 years. He understands that interactions between microbes and the host (in this case, humans) are complicated. "We used to think of bacteria as causing specific infections – *Streptococcus pneumoniae* causes pneumococcal pneumonia, and *Bordetella pertussis* causes pertussis, or whooping cough. Now we know that these communities of bacteria, yeast, viruses, etc., play a significant role in human health. That's the focus of my lab," he says.

The term "microbiome" has been around for a few years. What does this mean? According to the National Institutes of Health, the microbiome is the "full collection of microbes (bacteria, fungi, virus, etc.) that naturally exist within a particular biological niche such as an organism,

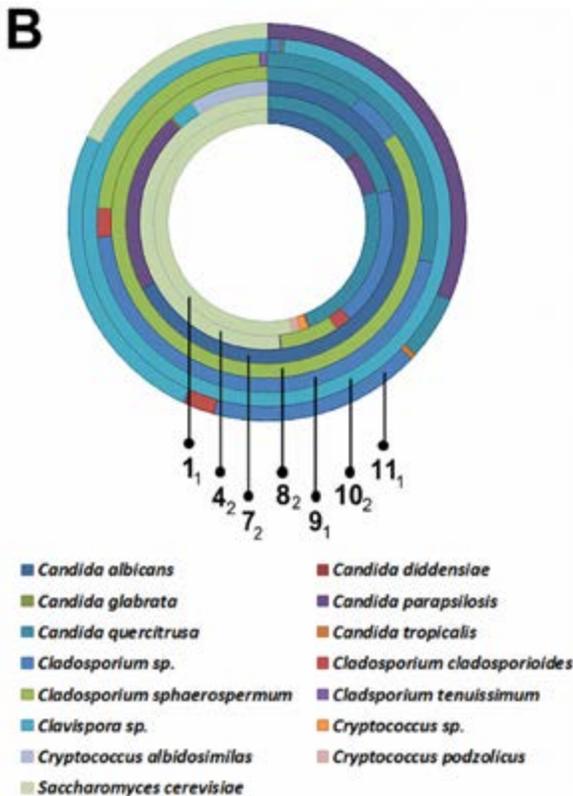


Image: Lower eukaryotic sequence abundance. Panel B: Predominant yeast genera and species. Best match genus-species estimates per infant's sample are shown. From: LaTuga MS1, Ellis JC, Cotton CM, Goldberg RN, Wynn JL, Jackson RB, Seed PC. Beyond bacteria: a study of the enteric microbial consortium in extremely low birth weight infants. *PLoS One*. 2011;6(12):e27858. doi: 10.1371/journal.pone.0027858. Epub 2011 Dec 8.

soil, a body of water, etc.” Research done by scientists around the world indicates that the microbiome is part of the human condition, contributing to our health but also playing important roles in illnesses that we develop. Seed uses an example drawn from his laboratory experiments. “Babies tend to get ear infections caused by *Haemophilus*. We think that those who get these infections early in life are more likely to develop asthma later on. So disruptions to the normal microbiome change our trajectory toward diseases that may affect us into and through adulthood.”

The Seed lab is working toward the goal of determining the “ideal” microbiome state. With that information, scientists can answer critical questions, including how infections proceed, how to design specific, effective antibiotics, and how to target the cause of infections without disrupting “the good guys” – beneficial microbes. “We hope to identify patterns of modifiable factors that encourage health. In mature individuals, the microbiome can be modified toward health,” he says.

“When we get right down to it,” Seed explains, “we are working out a novel way to predict, analyze and potentially prevent chronic disease. What if a young infant’s microbiome indicates that he will develop autism, or that she will become obese? Wouldn’t it be beneficial if we could change trajectories so that those individuals develop into healthy adults instead? These are the types of problems we are trying to address in the lab.”

In addition to directing a laboratory, Seed is the Associate Chief Research Officer for Basic Science Research at Stanley Manne Children’s Research Institute at Ann & Robert H. Lurie Children’s Hospital of Chicago. He sees major changes coming to the research institute in the next two years. “With the opening of the Simpson Querrey Biomedical Research Center on the Northwestern University medical campus in 2019, all of our operations will be moving. This move will catalyze change in what we do and how we do things,” he says. “The opportunity to collaborate with colleagues both at Northwestern University and at Lurie Children’s will be fantastic for our basic scientists. This is an important cultural shift,” he continues.

Seed points out that these changes will focus everybody involved on the institutional mission and the best ways to accomplish institutional goals. His ideas: “Innovation, education and advocacy are the three pillars of our mission. All of these will be strengthened in the coming years as we incentivize collaborations among scientists and clinicians, teach skills to trainees that lead to fulfilling careers, and engage with our community.”

When asked about real life examples, Seed is brimming with ideas. “How about a science café that gives teams of clinicians and scientists medical mysteries to solve? The clinician on the team may have insight about what’s going on in the patient while the basic scientist lends understanding to the underlying mechanisms. Trainees have the capacity to bring people together. They are naïve enough to ask big questions that encourage professionals from different fields to interact. Lastly, there is the advocacy pillar. We can serve scientists of the future by inviting Chicago high school students to learn about laboratory work. Or we can bring members of the public to Lurie Children’s for seminars. The possibilities are many,” he says.

Patrick C. Seed, MD, PhD, is Professor of Pediatrics – Infectious Diseases at Northwestern University Feinberg School of Medicine and a faculty member in the Division of Infectious Diseases at Lurie Children’s.



(from left) Children's Research Fund 2016 Ball Co-Chairs John and Ann Amboian, Ashley Hemphill Netzky and Pam Netzky.

Children's Ball celebrates 25 years of giving

More than 1,100 guests celebrated the successful conclusion of the Children's Research Fund's year-long fundraising campaign, as well as the group's 25th year of affiliation with Lurie Children's, on December 3 at the Hilton Chicago with a gala evening of cocktails, hors d'oeuvres, dinner and dancing. The paddle-raise and auction of a luxury experience raised almost \$400,000 toward the Children's Research Fund's current commitment to Precision Medicine. Co-chairs Ashley and Pam Netzky and Ann and John Amboian announced the annual campaign's gross fundraising total of more than \$2.5 million late in the evening.

Legacy Video Project

To celebrate 25 years of philanthropy for pediatric research, the Children's Research Fund commissioned a series of videos to show the impact of their giving on patient lives and in contributions to science. Four videos are being produced featuring the doctors and patients, of which three are now available for viewing on the Children's

Research Fund homepage:

- The first video, on neuromuscular disorders, features Christine DiDonato, PhD, Nancy Kuntz, MD, and a young patient benefiting from research on Duchenne muscular dystrophy.
- The second video, on Precision Medicine, premiered at the Children's Ball, and features two patients treated for brain tumors 15 years apart. The patients, Stephanie and Aliko, made an appearance at the Children's Ball with Stewart Goldman, MD, the physician who treated them with therapies supported in part by the Children's Research Fund.
- The third video, shown at the Children's Research Fund Annual Meeting, focuses on the Clinical & Translational Research Program, which had early support from the Children's Research Fund. Because of this program, new treatments were developed for cystic fibrosis, muscular dystrophy, severe food allergy and many other conditions, including epilepsy, which affects a 5-year-old patient featured in the video who now benefits from a clinical trial of a new treatment.
- The fourth video, on the promise of Predictive Analytics, will debut this spring.

About the Children's Research Fund

The Children's Research Fund has firmly established itself as one of Chicago's leading philanthropic organizations dedicated to funding basic and clinical medical research. Over the years, Children's Research Fund support has led to advanced investigation in cancer, heart disease, genetics, microbiology and neonatology. Since its affiliation with Ann & Robert H. Lurie Children's Hospital of Chicago in 1991, the Children's Research Fund has contributed more than \$70 million in support of research conducted at the Manne Research Institute. To get the latest information on Children's Research Fund events and fundraising campaigns, please visit www.childrensresearchfund.org.

New Children's Research Fund Chair: Donna Drescher

Donna Drescher's path to the position of Children's Research Fund Chair is the result of profound gratitude. She identifies herself as a "grateful parent" because of her son's successful treatment for acute lymphocytic leukemia at Lurie Children's many years ago. Keenly aware that decades of philanthropy provided the funding for decades of research that resulted in the protocol for his treatment, she is committed to making a difference for other children affected by childhood disease.

Her election to the chair took place at the Children's Research Fund's annual meeting, and her term will last two years. She hopes to be able to focus on strong fundraising results and on engaging board members thoughtfully during her term as chair.

"As a grateful parent, I feel I have a debt I can never fully repay," Donna says. "What better gift can we provide for our children and grandchildren than the finest healthcare available? With advances in research, the possibilities are endless."

Faculty Profile

Jenifer Cartland, PhD



Jenifer Cartland, PhD, is senior director of Data Analytics and Reporting at Lurie Children's, a member of the Mary Ann & J. Milburn Smith Child Health Research Program at the Manne Research Institute, and Research Associate Professor of Pediatrics at the Feinberg School.

Michael Kelleher, MD, is the Chief Medical Officer and holds the Crown Family Professorship in Pediatrics at Lurie Children's, and is Associate Professor of Pediatrics at the Feinberg School. He is also an attending physician in the Division of Critical Care at Lurie Children's.

Mark Wainwright, MD, PhD, is an attending physician in the Division of Neurology, medical director of the Davee Pediatric Neurocritical Care Program, medical director for DAR and Founders' Board Chair in Neurocritical Care at Lurie Children's, director of the Neurobiology Program at the Manne Research Institute, and Professor of Pediatrics, Neurology and Pharmacology at the Feinberg School.

Michael Miller, MD, is director of Clinical Services and an attending physician in the Division of Rheumatology at Lurie Children's, director of Research Informatics at the Manne Research Institute, and Professor of Pediatrics at the Feinberg School.

Who is Jenifer Cartland, and WHY does she write a blog about data analytics?

Jenifer Cartland, PhD, is the senior director of Data Analytics and Reporting (DAR) at Lurie Children's. A long-time member of the faculty at Northwestern University and director of the Child Health Data Lab (CHDL) at the Manne Research Institute, Cartland was asked in 2010 by Patrick Magoon, the hospital's President and CEO, to analyze Illinois Medicaid claims data. Although analysts around the State of Illinois were struggling with these data, Cartland and Tracie Smith, MPH, then assistant director of the CHDL, were able to gain

important insight from the data on behalf of the hospital.

Hospital leaders recognized the value of these types of insights, and responded by forming a centralized data analytics resource. Thus, DAR was born, and with it Cartland was offered a challenging new job – overseeing the hospital's operational reporting, clinical and population health analytics, data warehouse and data governance. "I had a lot to learn," she readily admits. "With a background as a social scientist, I am trained to be strong quantitatively and to crystalize key insights from data. So that was on my side. But I was being asked to build an entirely new infrastructure, and to populate it with staff who were well equipped to carry out our mandate."

Cartland and her team tackled these challenges by creating an analytic roadmap and steadily working their way through it. She explains, "DAR offers a lot of different services now. As we have always done, we can pull data into spreadsheets for physicians and staff around the organization. But now we can also use interactive dashboards that are intuitive for individuals who don't have analytics backgrounds, offer a full range of statistical supports, and are now

developing the data science capacity for the hospital."

DAR is staffed with epidemiologists, statisticians, data architects and report writers who are ready to assist clinicians, researchers and staff members with their data needs. "I think my 'aha' moment came sometime after I started putting the analytic roadmap in place. We had assumed that we simply needed to give data to the people who asked for it. What we found is that people weren't using the data with confidence. We surveyed the faculty and leaders, and discovered that they needed training in data analytics. Basically, if you can't work with data confidently, you are not going to be able to turn it into insights," she explains.

How the blog came to be.

The Why Axis is a blog for Lurie Children's staff intended to be "a helpful guide through the world of analytics and data," as stated on its site. Cartland created it because she wanted to have an engaging, informative and interactive way to teach analytics to leaders and staff who may have no special training in quantitative methods. The feedback from the blog's readers helps her figure out "the training needs of folks around the hospital," she says. DAR will be launching more training based on what they are learning from the blog. "I want people to feel comfortable around analytic thinking and methods."

Apparently Cartland is having some success. "A while back I posted a quiz to the blog, and asked people to solve a difficult analytic problem. One of the first correct responses was from a night nurse. I was pretty excited about that," she says. "Good analytic thinkers are everywhere. We want to find them and give them more tools and knowledge," she continues.

Cartland is grateful to Michael Kelleher, MD, Mark Wainwright, MD, PhD – who serves as the medical director for DAR – and Michael Miller, MD, who have been instrumental in ensuring the success of DAR's efforts.

Although accessible to Lurie Children's staff only, The Why Axis posts can be shared. Contact Peggy Murphy for more information.

Awards & Honors



Sigita Plioplys, MD

Sigita Plioplys, MD, was named a Distinguished Fellow by the American Academy of Child and Adolescent Psychiatry (AACAP).

Plioplys also received an Abramson Grant from the AACAP for the Pathways in Clinical Care (PaCC) project. Plioplys is head of the Pediatric Neuropsychiatry Program in the Department of Child and Adolescent Psychiatry at Lurie Children's, and Associate Professor of Psychiatry and Behavioral Sciences at the Feinberg School.



Larry Kociolek, MD

Lurie Children's infectious disease expert Larry Kociolek, MD, was selected by the Society for Pediatric Research (SPR) as one of its featured New Members of the Month in 2017. SPR recognizes new members who have contributed to high quality science and demonstrate the promise of continued contributions in pediatric research. Kociolek's research focuses on *Clostridium difficile* infection, which causes intestinal problems. He is working to develop more reliable diagnostic strategies and delineate the immune response to this bacteria in infants. He also is using a tool known as whole genome sequencing to better define how

different strains of *C. difficile* are transmitted among patients. Kociolek is an attending physician in the Division of Infectious Diseases at Lurie Children's and Assistant Professor of Pediatrics at the Feinberg School.

The Heart Center at Lurie Children's has been awarded a 3-star rating by the Society of Thoracic Surgeons in the most recent Fall 2016 harvest of surgical and anesthesia data for the period July 2012 through June 2016. Only 1 of 11 centers nationally is given a 3-star rating (out of 103 rated).

Sandra Sanguino, MD, MPH, an attending physician in the Division of Academic General Pediatrics and

Primary Care at Lurie Children's, Associate Professor of Pediatrics and Associate Dean for Student Affairs at the Feinberg School, was selected as a 2017 recipient of the Exceptional Mentor Award. The award, presented by the American Medical Women's Association (AMWA), celebrates those who have made an impact on the lives of students in medicine.

Amy Paller, MD, will receive the Stephen Rothman Memorial Award at the Society for Investigative Dermatology annual meeting in April 2017. The Rothman Award is presented annually for distinguished service to investigative cutaneous medicine. The recipient of this award has made major scientific achievements and excelled as a teacher and recruiter of outstanding dermatologists. The recipient is an individual who has distinctly altered the course and image of dermatology or its allied fields. It is the Society's highest award. Paller is an attending physician in the Division of Dermatology at Lurie Children's, Professor of Dermatology and Pediatrics, chair of the Department of Dermatology, director of the Northwestern University Skin Disease Research Center, and Walter J. Hamlin Professor of Dermatology at the Feinberg School.



Amy Paller, MD

Patient navigators can serve crucial roles in hospitals

by Kelly Michelson, featured in STAT, December 14, 2016

As Jane's 7-year-old daughter, Kelsey, lay in the intensive care unit, shaking from seizures, Jane needed people to listen to her and trust her. Jane — not a textbook — knew which of the five different seizure medicines worked best for Kelsey, and which had little effect. But the doctors weren't paying much attention to "just a mom." With help from her patient navigator, Jane convinced the doctors to stop treating Kelsey like a seizure disorder and start treating her like Kelsey.

Navigators guide patients and their families as they move through the health care system. While interactions with navigators have traditionally happened outside of hospitals, particularly for cancer patients, their services are also needed for people in the hospital and their families.

In pediatric intensive care units, where I have worked for 15 years, parents and members of the health care team describe the importance of having a "point person" who can guide parents facing life-changing decisions for their child. To fill that need, I have partnered with parents, physicians, social workers, chaplains, and other health care professionals to develop a program called PICU Supports. It uses a navigator to provide emotional, decision-making, and communication support to parents of critically ill children. A study supported by the Patient-Centered Outcomes Research Institute to test the impact of the program is underway.



and David Uihlein Professor of Bioethics and Medical Humanities at the Feinberg School. [Read more.](#)

Study offers clues to risk of Zika birth defects in the U.S.

A study published in the *Journal of the American Medical Association (JAMA)* indicates that birth defects and other problems related to the Zika virus are not just limited to Brazil. William Muller, MD, PhD, Associate Professor of Pediatrics at the Feinberg School and an attending physician in the Division of Infectious Diseases at Lurie Children's, wrote an editorial accompanying the study in *JAMA*. Muller is quoted in a National Public Radio story.

Prevent peanut allergies: Give kids peanuts

by Kristen Thometz, WTTW-Chicago Tonight, January 6, 2017

Infants as young as 4 months old should be introduced to peanut-containing foods to prevent the development of peanut allergies, according to new guidelines from the National Institute of Allergy and Infectious Diseases. "It's an important issue for lots of parents. They don't want their kids developing a food allergy," said Ruchi Gupta, MD, MPH, who helped develop the guidelines and specializes in asthma, food allergies and eczema. Gupta is an attending physician in the Division of Academic General Pediatrics and Primary Care at Lurie Children's, director of the Pediatric Allergy Research Consortium (PARC) at the Smith Child Health Research Program, Associate Professor of Pediatrics and Medicine, director of the Program for Maternal and Child Healthcare at the Center for Healthcare Studies, and director of the Food Allergy Outcomes Program at the Center for Community Health at the Feinberg School. [Read more.](#)



Kelly Michelson, MD, MPH, is an attending physician in the Division of Critical Care at Lurie Children's, Associate Professor of Pediatrics, director of the Center for Bioethics and Medical Humanities, and Julia

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Santhanam Suresh, MD

New concerns about anesthesia for young children

Repeated or lengthy use of general anesthesia may harm children’s brain development, the FDA warns

by Sumathi Reddy, [The Wall Street Journal](#), Dec. 19, 2016

Santhanam Suresh, MD, chair of the Department of Anesthesiology at Lurie Children’s, and co-chairman of SmartTots, a nonprofit group formed by the FDA and the International Anesthesia Research Society

to promote research on the effect of general anesthesia on young children, was part of this story on the effects of anesthesiology in children. Suresh holds the Arthur C. King Professorship in Anesthesiology at Lurie Children’s and is Professor of Anesthesiology and Pediatrics at the Feinberg School. [Read more.](#)

an almost four-fold increase in program use among families, according to the findings published in the *American Journal of Preventive Medicine*.

Matthew M. Davis, MD, MAPP, was a co-author on the publication. He is the Associate Chief Research Officer for Health Services Research and Policy and director of the Smith Child Health Research Program at the Manne Research Institute. He also is the division head of Academic General Pediatrics and Primary Care at Lurie Children’s, and Professor of Pediatrics and Medical Social Sciences at the Feinberg School. [Read more.](#)

Innovative test uses sound to detect concussions

by Dina Bair and Katharin Czink, [WGN-TV](#), December 23, 2016

A novel diagnostic tool is helping scientists reliably see and hear the effects of a hit to the head. This is the first objective test to detect concussions in children using sound. Cynthia LaBella, MD, principal investigator and medical director of the Institute for Sports Medicine at Lurie Children’s, collaborated with Northwestern University scientists on this study, which was published in the December 2016 issue of *Scientific Reports*. LaBella is Associate Professor of Pediatrics at the Feinberg School. [Read more.](#)

Heavy kids fare worse in one way after surgery

by Randy Dotinga, [HealthDay](#), January 13, 2017

Here’s yet another reason to watch your child’s weight: Overweight and obese kids seem to be more likely than others to develop a wound infection after surgery, a new study suggests. Researchers have already documented this connection in adults. But, “research on this topic among children and adolescents is scarce,” said study co-author Catherine Hunter, MD. The results were published in the journal *Surgical Infections*. Hunter is an attending physician in the Division of General Pediatric Surgery at Lurie Children’s and Assistant Professor of Surgery and Pediatrics at the Feinberg School. [Read more.](#)



Fruits & Vegetables infographic American Heart Association

5-minute chats in waiting room may prompt families to eat more fruits and vegetables

by Beata Mostafavi, [Michigan Health Lab](#), January 18, 2017

Low-income families were more likely to use their federal food assistance on nutritious food after learning that their dollars can be doubled for more fruits and vegetables, a new study finds. To educate eligible participants, a University of Michigan-led team conducted five-minute conversations in the waiting room of a health clinic. They explained a program called Double Up Food Bucks that matches food assistance dollars spent on fruits and vegetables. This brief interaction prompted increased fruit and vegetable consumption and led to



Pediatricians frequently prescribe antibiotics; finding the most effective antibiotics that resolve infections while avoiding antibiotic resistance can be guided by consulting antibiograms. These are summary reports of antimicrobial susceptibility testing data from patients (State of Hawaii, Department of Health).

A survey conducted by members of the Division of Infectious Diseases and the Pharmacy at Lurie Children's, and the University of Illinois at Chicago, sought to delineate the availability, characteristics, and perceptions of antibiograms among pediatricians, and the availability of other infectious diseases (ID)-related educational resources, the perceived need for additional resources, and general educational preferences.

Using the Research Electronic Data Capture (REDCap) tool, an anonymous electronic survey was sent to members of the Illinois Chapter of the American Academy of Pediatrics. 58 percent of respondents had access to an antibiogram and 25 percent had access to a pediatric-specific antibiogram. Respondents with subspecialty training and practice location in Chicago were more likely to have access to a pediatric-specific antibiogram. Those with access to antibiograms perceived that they were informed about resistance patterns at the national and local levels. Nearly all respondents would use a single antibiogram that compiled antibiotic resistance data from children with common infections throughout the region. More than 75 percent identified both the American Academy of Pediatrics Red Book and online medical resources among the top useful and frequently accessed educational resources. In addition, 91 percent of respondents utilized smartphones/tablets.

These data, published in *Infection and Drug Resistance*, suggest that there is an unmet need for additional educational resources to guide antibiotic prescribing among Illinois pediatricians. Moreover, an electronic regional antibiogram would be well received, potentially improving knowledge of antibiotic resistance and empiric antibiotic use.



Senior author Larry Kociulek, MD, and co-author Sameer Patel, MD, MPH, are attending physicians in the Division of Infectious Diseases at Lurie Children's and Assistant Professors of Pediatrics at the Feinberg School.

Community areas in the City of Chicago. Those areas highlighted in color were targeted by SCY based on high rates of crime compared to other areas in the region. Author: Kelli Day, Operations Manager for SCY.

Smith Child Health Research Program news

Over the past three years, the Alliance for Research in Chicagoland Communities (ARCC) has been partnering with Strengthening Chicago's Youth (SCY), Lurie Children's violence prevention collaborative, on the NIH-funded project, Community-Academic Collaboration to Prevent Violence in Chicago (CACPVC). This project enhances connections between academic, philanthropic and community partners to build capacity to develop, implement and evaluate strategies to reduce health disparities related to violence in Chicago.

SCY and ARCC Faculty-Community Research Liaison Maryann Mason, PhD, recently gave an invited session on the project and the principles of community-engaged research at the Midwest Injury Prevention Alliance 2016 Summit in Wisconsin.

Mason is co-director of the Center on Obesity Management and Prevention (COMP), Community and Evaluation Research Director for the Consortium to Lower Obesity in Chicago Children (CLOCC) and principal investigator of the Illinois Violent Death Reporting System (IVDRS), all part of the Smith Child

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Health Research Program at the Manne Research Institute. She is also Research Assistant Professor of [Pediatrics](#) and [Preventive Medicine](#) at the Feinberg School.



Juvenile Justice Collaborative model (click on image to view in greater detail).

In December 2016, SCY began a demonstration project to connect at-risk youth who have been arrested to mental health and other services they need. In this program, called the [Juvenile Justice Collaborative](#), the Cook County Juvenile Probation Department and others can refer young people to a Centralized Intake and Referral Home, which will assess needs and risk level, and then place them with the appropriate community-based provider for care coordination and other services. The goal is to decrease youth in detention and ensure they get the services they need to succeed. SCY is working with 10 community-based youth services providers in this program. The demonstration project will continue for the first six months of 2017. If the Juvenile Justice Collaborative can demonstrate better connection of youth to needed services, it will be expanded.

In 2017, [CLOCC](#) marks 15 years since being founded in 2002. In that span, thousands of organizations and passionate health advocates have focused on creating healthy children, families and communities in our Chicago communities. While child obesity rates remain high (and may still be increasing in lower income communities of color and at the highest extremes of the BMI continuum) we have seen significant improvements in environments where children live, learn and play. Over the year CLOCC and its partners will be curating a virtual “Childhood Obesity Prevention Hall of Fame” and also building lists of 15 obesity prevention commitments for the future. CLOCC eagerly anticipates

sharing these creative approaches to obesity prevention and to recognizing the important milestones that we have achieved. To learn more, visit [CLOCC’s 15th Anniversary web page](#).

Children born with heart defects at increased risk for epilepsy

by Anna Williams, [Northwestern News Center](#), January 13, 2017

Children with congenital heart disease have a higher risk of the seizure disorder epilepsy through adulthood, according to a [study](#) published in the journal *Circulation*. Bradley Marino, MD, MPP, MSCE, an attending physician in the [Division of Cardiology](#) at Lurie Children’s and Professor of [Pediatrics](#) and [Medical Social Sciences](#) at the Feinberg School, was a co-author of the paper. Marino is co-director of the Neo-Heart Developmental Support Program at Lurie Children’s and director of the Center for Cardiovascular Innovation at the Manne Research Institute. He also is the director of the [Cardiovascular Bridge Program](#) at Lurie Children’s and Northwestern Memorial Hospital. [Read more](#).

The role of alcohol in homicide: 2015

In December 2016 IVDRS, which is part of the [National Violent Death Reporting System \(NVDRS\)](#), released a [data brief](#) that examines how the presence of alcohol varies by demographics, weapon type and circumstances in victims of homicide who were ages 20 to 54 years in Cook, DuPage, Kane, Lake, McHenry and Peoria Counties in 2015. These six counties comprise 79.3 percent of all homicides that occurred in Illinois during that time ([Illinois Department of Public Health](#)). Of the findings, these were noted by the authors of the study:

- Homicide victims were significantly more likely to test positive for alcohol if they were Hispanic, if the weapon was a sharp instrument and/or if the homicide occurred on a Saturday or Sunday.

Research News (continued from page 10)

- Homicide victims were significantly less likely to test positive for alcohol if they were killed by a firearm and/or if the homicide occurred on a Tuesday or Friday.

IVDRS is a center of the [Smith Child Health Research Program](#) and is headed by Maryann Mason, PhD. [Read more.](#)



Lurie Children's in new NIH Consortium on Child Health

by Vita Lerman, [Lurie Children's News & Events](#), October 17, 2016

Researchers from Lurie Children's will play leadership roles in the new [Environmental Influences on Child Health Outcomes \(ECHO\)](#) Program, as part of a grant awarded to Northwestern University by the National Institutes of Health (NIH). The seven-year national study will explore the impact of exposures on children that range from air pollution, to societal factors, to individual behaviors like sleep and diet.

Northwestern is in charge of the program's Patient Reported Outcomes Core, which will capture the voices and experiences of more than 50,000 children and family members participating in research at more than two dozen study sites. Patient reported outcomes involve answers to questions about the physical, mental and social aspects of the child's environment – rather than data from physical tests or blood work. Experts on the Patient Reported Outcomes Core team will design the survey methodology and tools, shape the questions used and participate in the comprehensive data analysis.

[Matthew Davis, MD, MAPP](#), will lead the Social

Functioning domain team within the Patient Reported Outcomes Core. [Bradley S. Marino, MD, MPP, MSCE](#), will lead the Physical Functioning domain team within the Patient Reported Outcomes Core. [Read more.](#)

Halting lethal childhood leukemia

by Marla Paul, [Northwestern News Center](#), January 5, 2017

Northwestern Medicine scientists have discovered the genetic driver of a rare and lethal childhood leukemia and identified a targeted molecular therapy that halts the proliferation of leukemic cells. The finding also has implications for treating other types of cancer. The lead investigator is [Ali Shilatifard, PhD](#), Robert Francis Furchgott Professor and Chair of the [Department of Biochemistry and Molecular Genetics](#) at the Feinberg School. Shilatifard is also Professor of [Pediatrics](#) and a member of the [Robert H. Lurie Comprehensive Cancer Center of Northwestern University](#).

The [laboratory of John Crispino, PhD](#), Robert I. Lurie, MD, and Lora S. Lurie Professor of Medicine in the Department of Medicine, [Division of Hematology/Oncology](#), and the Department of Biochemistry and Molecular Genetics at the Feinberg School, and his fellow Andrew Volk contributed to the study, which was [published](#) in *Cell*. Crispino is also a member of the Lurie Cancer Center at Northwestern University and the [Cancer Biology and Epigenomics Program](#) at the Manne Research Institute. Shilatifard's graduate student Kevin Liang was first author on the publication. [Read more.](#)



Matthew Davis, MD, MAPP (top) and Bradley Marino, MD, MPP, MSCE, will lead domain teams in the NIH Consortium on Child Health.

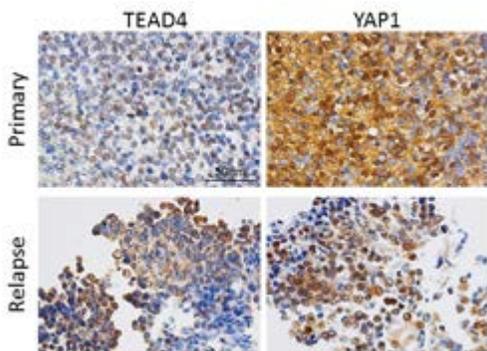


Image: Immunohistochemistry for TEAD4 and Yap1 reveals expression of both markers in primary and relapsed tumors (image: Mario Suzuki, MD).

Atypical teratoid/rhabdoid tumor (AT/RT) is a highly aggressive brain tumor that occurs mainly in early childhood. The prognosis for many patients with AT/RT is poor, and the biological basis of its tumorigenesis and aggressiveness is still unknown.

The laboratory of Simone Treiger Sredni, MD, PhD, published an article in *Pediatric Blood and Cancer* that identified a gene that had not been previously implicated in AT/RT. This discovery helps to clarify the aggressiveness of this tumor. The team developed primary cell lines generated from a patient's tumors. They analyzed the cell lines to identify genes involved in AT/RT biology. The expression of one of these genes – TEA domain family member 4 (TEAD4) – was validated in AT/RT patient samples.

TEAD4 functions as part of a signaling pathway that, when properly regulated, plays an important role in tumor suppression. The team investigated the function of TEAD4 in rhabdoid tumor cells, including amplification and overexpression – which may lead to cell proliferation and cancer aggressiveness. TEAD4 amplification was detected in the primary cell lines and its overexpression was confirmed at mRNA and protein levels in an independent cohort of AT/RT samples. TEAD4's co-activator, YAP1, and two downstream targets, were also found to be upregulated in AT/RT when compared to a closely related type of tumor that shows better outcomes for patients, medulloblastoma. Cell proliferation and migration were significantly

reduced in TEAD4 cells that had been mutated.

Overall, the results from this study suggest that TEAD4 plays a role in the pathophysiology of AT/RT, which represents a new insight into the biology of this aggressive tumor. Research scholar Mario Suzuki, MD, was first author. Sredni is a member of the Cancer Biology and Epigenomics Program of the Manne Research Institute and Research Associate Professor of Neurological Surgery at the Feinberg School.

Pediatric acute liver failure (ALF) patients may suffer neurologic complications; these complications are a major determinant of outcome. However, early recognition of neurologic compromise in young children and infants can be difficult. An area of concern for critical care specialists is hepatic encephalopathy (HE), which is devastating in this population.

A team led by Mark Wainwright, MD, PhD, sought to determine if spectral electroencephalogram (sEEG) can be used in very young patients to determine presence and level of HE. They found that sEEG is able to quantify and categorize the grade of HE in children with ALF. This is of significant benefit to younger children for which neurological examination and thus clinical determination of HE is challenging. The article was published in *Pediatric Critical Care Medicine*.

First author Craig Press, MD, PhD, completed a fellowship in the Ruth D. & Ken M. Davee Pediatric Neurocritical Care Program at Lurie Children's.

Rui Yang, a graduate student in the laboratory of Ann Harris, PhD, defended his thesis on November 30, 2016. The title of his presentation was "Exploring the Roles of cis- and trans-Factors in Modulating Higher Order Chromatin Structure and Gene Expression." Harris is Professor and Vice Chair of Research for the Department of Genetics and Genome Science at Case Western Reserve University.

Discovery

RESEARCH
at Stanley Manne Children's Research Institute

Published by Stanley Manne Children's Research Institute

Winter 2017

Volume 13: Issue 4

luriechildrens.org/research

Research at Ann & Robert H. Lurie Children's Hospital of Chicago is conducted through the Stanley Manne Children's Research Institute. The Manne Research Institute is focused on improving child health, transforming pediatric medicine and ensuring healthier futures through the relentless pursuit of knowledge. The research institute is a virtual center for pediatric research at Northwestern University Feinberg School of Medicine. Founded in 1989, the research enterprise has grown to include more than 200 investigators and over \$30 million in external funding for research, two-thirds from the NIH and other federal agencies.

Please send questions and comments to Peggy Murphy: pemurphy@luriechildrens.org
773.755.7485
225 E. Chicago Ave., M/C 205
Chicago, Illinois 60611