

**HYDROCEPHALUS ASSOCIATION &
RUDI SCHULTE RESEARCH INSTITUTE**

RESEARCH WORKSHOP

Honoring the legacy of Dr. Michael Pollay

IDIOPATHIC NORMAL PRESSURE HYDROCEPHALUS (iNPH)

Tuesday, October 15, 2024

7:00 AM – 5:15 PM

Wednesday, October 16, 2024

7:00 AM – 2:30 PM

Falls Church Marriott Fairview Park

3111 Fairview Park Drive

Falls Church, VA 22042





WELCOME LETTER

From HA President and CEO, Diana Gray

Planning Committee

Sevil Yasar, MD, PhD

Chair
Johns Hopkins University

Mark G. Hamilton, MDCM

University of Calgary

Michael A. Williams, MD

University of Washington

Mark Johnson, MD, PhD

UMass Chan Medical School

Ville Leinonen, MD, PhD

University of Eastern Finland

James (Pat) McAllister, PhD

Virginia Commonwealth University

Abhay Moghekar, MD

Johns Hopkins University

Aruna Rao, MD

Johns Hopkins University

Welcome to the Hydrocephalus Association (HA) and Rudi Schulte Research Institute (RSRI) 2024 Research Workshop.

This workshop is dedicated to advancing our understanding and treatment of idiopathic normal pressure hydrocephalus (iNPH). We are excited to have you join us in Falls Church, VA, for this pivotal gathering of experts committed to advancing research and improving the lives of individuals affected by iNPH.

This workshop is a testament to the progress we have made in hydrocephalus research and treatment, building on the foundational work of the 2005 and 2012 NIH-sponsored workshops that established key research priorities for hydrocephalus. These historical milestones highlighted the need for improved diagnostics, better treatment options, and innovative interdisciplinary approaches, which continue to shape our research today.

This year's workshop features a comprehensive program addressing key areas crucial to advancing iNPH research, fueled by HA's patient-centered [Community Research Priorities](#):

- **Develop Non-Invasive and One-Time Therapies:** Sessions on biomarkers, CSF dynamics, and neuronal and glial mechanisms will explore potential drug targets and reversible processes, aiming to identify candidates for non-invasive treatments.
- **Reduce the Burden of Current Treatments:** Discussions on current diagnostic methods, surgical management, and the integration of AI and machine learning will focus on improving therapies and minimizing invasive procedures.
- **Improve the Screening and Diagnosis of Hydrocephalus:** Advances in diagnostic methods and the application of new technologies will be explored to enhance early detection and accurate diagnosis of iNPH.
- **Enhance Quality of Life and Access to Care:** Panels and sessions dedicated to patient and caregiver perspectives, funding opportunities, and advocacy will address the broader impacts of iNPH on quality of life and seek to improve access to comprehensive care.

As we engage in these discussions, it is crucial to envision the future of iNPH research and outcomes for the next two decades. The collaborative efforts and insights gained from this workshop, along with your expertise and dedication, will significantly advance HA's mission to improve the lives of those affected by hydrocephalus.

We are immensely grateful for the generous support of RSRI in making this event possible and we thank you all for being an integral part of this collaborative effort.

Sincerely,

Diana Gray, MA
President and Chief Executive Officer
Hydrocephalus Association

Research Workshop Agenda

Day 1, October 15

7:00 AM **Breakfast**

8:00 AM **Welcome and Introduction**

Diana Gray, MA

Hydrocephalus Association

J Gordon McComb, MD

Children's Hospital Los Angeles

Monica Chau, PhD

Hydrocephalus Association

SESSION 1: ADVANCES IN DIAGNOSIS

SESSION GOAL: Speakers will present updates on current diagnostic methods as well as applications of artificial intelligence (AI) and machine learning (ML) in iNPH. The session goal is to determine how we can potentially apply AI and ML to new and existing diagnostic methods to improve diagnosis and measuring treatment effect in iNPH.

MODERATOR:

Sevil Yasar, MD, PhD

Johns Hopkins University

CURRENT METHODS

8:30 AM **Michael A. Williams, MD**

University of Washington

Back to the Future

8:45 AM **Mats Tullberg, MD, PhD**

University of Gothenburg

iNPH Prevalence, Incidence, Natural History and Why We Should Consider Treating Early Disease (virtual presentation)

9:10 AM **Shigeki Yamada, PhD**

Nagoya City University

CSF Dynamics and Imaging Technologies for Improved Diagnosis

9:35 AM **Break**

LOOKING TO THE FUTURE WITH AI

9:50 AM **Ciprian Crainiceanu, PhD**

Johns Hopkins University

Objectively Measured Physical Activity in NHANES and UK Biobank

10:15 AM **Eric Oermann, MD**

NYU Langone Health

AI Driven Biomarkers for Neurological Disease

10:40 AM **Siavash Shirzadeh Barough, MD**

Johns Hopkins University

AI-enhanced Real-Time Video Analysis

Smartphone Application for Automated Gait Assessment

11:05 AM **Synthesis Discussion**

11:40 AM **Break**

SESSION 2: INCORPORATING THE PATIENT PERSPECTIVE

MODERATOR:

Abhay Moghekar, MBBS, MD

Johns Hopkins University

11:55 AM **Patient and caregiver panel**

Trish Bogucki, Richard Norman, and Denise Berman

Session Topics:

- *Delayed care and navigating healthcare*
- *How can we better help caregivers?*
- *Research priorities for iNPH patients and caregivers*

12:30 PM **Lunch**

Research Workshop Agenda (cont.)

SESSION 3: BIOMARKERS IN INPH

SESSION GOAL: Understanding iNPH biomarkers to provide insight into the possible causes of iNPH and identify potential drug target candidates to treat iNPH. The session goal is to define the next steps and identify candidate targets for a non-invasive treatment.

MODERATOR:

Bonnie Blazer Yost, PhD

IU Indianapolis

- 1:15 PM **Ville Leinonen, MD, PhD**
University of Eastern Finland
FinnGen iNPH GWAS and Brain Biopsy as a Prognostic Indicator in iNPH (virtual presentation)
- 1:40 PM **Mark Johnson, MD, PhD**
UMass Memorial Health
The Genetics and Pathophysiology of NPH: Clues from Animal Models
- 2:05 PM **Kristopher Kahle, MD, PhD**
Massachusetts General Brigham
Towards a Molecular Understanding of NPH: Consequences for Patient Care (virtual presentation)
- 2:30 PM **Abhay Moghekar, MBBS, MD**
Johns Hopkins University
Molecular Signatures of Normal Pressure Hydrocephalus: A Large-scale Proteomic Analysis of Cerebrospinal Fluid
- 2:55 PM **Synthesis Discussion**
- 3:30 PM **Break**

SESSION 4: FINDING BETTER THERAPIES

SESSION GOAL: Speakers will summarize the outcome measures related to surgical management of iNPH and how to advocate and implement practices for improvement of outcomes. The session goal is to be discussion-intensive and strategize on how to improve current therapies and adverse outcomes and develop better therapies.

MODERATOR:

Mark G. Hamilton, MDCM, FRCS

University of Calgary

- 3:45 PM **Mark G. Hamilton, MDCM, FRCS**
University of Calgary
Treatment for Adult Hydrocephalus: an Evolution of Thought and Practice
- 4:10 PM **Sara Qvarlander, PhD**
Umeå University
Shunts, ICP Dynamics and the Risk of Overdrainage
- 4:35 PM **Synthesis Discussion**
- 5:05 PM **Closing Remarks**
- 5:15 PM **End of Workshop Program**
- 6-8:00 PM **Reception**
Ellipse Room at the Hotel

Day 2, October 16

7:00 AM **Breakfast**

7:50 AM **Opening Remarks**

SESSION 5: NEURONAL AND GLIAL REVERSIBLE MECHANISMS IN INPH

SESSION GOAL: Learn from other diseases to translate mechanisms to iNPH (e.g. hypoxia).

MODERATOR:

Mark Johnson, MD, PhD

UMass Memorial Health

8:00 AM **Pat McAllister, PhD**

Virginia Commonwealth University

Reversibility of CNS-wide Mechanisms in iNPH

8:25 AM **Richard Keep, PhD**

University of Michigan

Reversibility in Oligodendrocyte and Endothelial Cell Injury

8:50 AM **Synthesis Discussion**

9:20 AM **Break**

SESSION 6: FUNDING AND ADVOCACY

SESSION GOAL: Advocate for NPH to funding agencies and learn about funding opportunities.

MODERATOR:

Mark Luciano, MD, PhD

Johns Hopkins University

9:35 AM **Jill Morris, PhD**

National Institutes of Health (NIH); National Institute of Neurological Disorders and Stroke (NINDS)

NINDS Funding Opportunities for NPH Research

10:00 AM **Kathryn Argue, PhD**

Department of Defense (DoD) Congressionally Directed Medical Research Programs (CDMRP)

Department of Defense, Congressionally Directed Medical Research Programs and Support for Clinical Trials (virtual presentation)

10:25 AM **Erin Darbouze, MPH**

Senior Director of Policy & Advocacy at Research!America

The Power of Advocacy: How Scientists and Physicians Can Make an Impact

SESSION 7: CSF CIRCULATION, LYMPHATICS, GLYMPHATICS

SESSION GOAL: Speakers will describe the current understanding of the association between glymphatics, lymphatics and CSF circulation, and how this relates to future translational hydrocephalus research.

MODERATOR:

Michael A. Williams, MD

University of Washington

10:55 AM **Andreas Linninger, PhD**

University of Illinois at Chicago

A General Overview of CSF Hydrodynamics

11:20 AM **Nanna MacAulay, PhD**

University of Copenhagen

Pharmacological Modulation of CSF Secretion to Reduce ICP – starting with rats, but aiming for the clinic

11:45 AM **Lunch**

12:30 PM **Benjamin Plog, MD, PhD**

Washington University in St. Louis

Leptomeningeal Arterial-Venous Overlaps Facilitate Direct Cerebrospinal Fluid Shunting

12:55 PM **Young-Kwon Hong, PhD**

University of Southern California

Activation of Meningeal Lymphatics to Promote CSF outflow in Hydrocephalus

1:20 PM **Charalampos Georgiopoulos, MD, PhD**

Skåne University Hospital & Lund University

Understanding the Glymphatic System and its MRI Assessment

1:45 PM **Synthesis Discussion**

2:20 PM **Closing Remarks**

2:30 PM **End of Workshop Program**

Workshop Attendees

Naomi Abel, MD

University of South Florida
nabel@usf.edu

🔊 Kathryn Argue, PhD

The Congressionally Directed Medical
Research Programs Peer Reviewed
Medical Research Program
kathryn.j.argue.civ@health.mil

David Audu, PhD

Indiana University
audud@iu.edu

Scott Badesch, MA

Senior Brain Health Policy Advisor for
Congressman Smith (NJ-04)
Scott.Badesch@mail.house.gov

Harrison Bai, MD

Johns Hopkins University
hbai7@jh.edu

🔊 Denise Berman, MS

Retired
denisedsk2@aol.com

Bonnie Blazer-Yost, PhD

Indiana University, Indianapolis
bblazer@iu.edu

🔊 Trish Bogucki, MA

Retired (from KPMG)
trish.bogucki@hydroassoc.org

Matthew Borzage, PhD

Children's Hospital Los Angeles
Borzage@usc.edu

Christopher Carswell, PhD

Imperial College London
c.carswell@imperial.ac.uk

🔊 Monica Chau, PhD

Hydrocephalus Association
Research@hydroassoc.org

Christine Cliatt Brown, MD

University of Utah
Christine.CliattBrown@hsc.utah.edu

🔊 Ciprian Crainiceanu, PhD

Johns Hopkins University
ccraini1@jh.edu

Sarah Daniel, PhD

In Scripto, LLC
sarahdaniel@inscriptoscience.com

🔊 Erin Darbouze, MPH

Research!America
edarbouze@researchamerica.org

Sarah Edwards, MD

University of Calgary
Sarah.edwards1@ucalgary.ca

Amanda Garzon, MA

Hydrocephalus Association
amanda@hydroassoc.org

Keith George, MD

UT Southwestern
Keith.george@utsouthwestern.edu

🔊 Charalampos "Harris"

Georgiopoulos, MD, PhD
Lund University
Charalampos.Georgiopoulos@med.
lu.se

June Goto, PhD

Cincinnati Children's Hospital
Medical Center
june.goto@cchmc.org

Ramesh Grandhi, MD

University of Utah
ramesh.grandhi@hsc.utah.edu

🔊 Diana Gray, MA

Hydrocephalus Association
diana@hydroassoc.org

Maria Guglielmo, MD

Brown University School of Medicine
mguglielmo1@lifespan.org

**Nayeem Ullah Farrukh Hameed,
MD, PhD**

UT Southwestern
hameed.farrukh7@gmail.com

🔊 Mark G. Hamilton, MDCM

University of Calgary
mgHamilton.hydro@gmail.com

Carolyn Harris, PhD

Wayne State University
caharris@wayne.edu

Lakisha Harris, MS

Hydrocephalus Association
lakisha@hydroassoc.org

Tim Heck, MD

Johns Hopkins University School of
Medicine
theck3@jh.edu

Hawley Helmbrecht, PhD

Johns Hopkins University
hhelmb1@jh.edu

Alexandra Hochstetler, PhD

Boston Children's Hospital
Alexandra.Hochstetler@childrens.
harvard.edu

🔊 Young-Kwon Hong, PhD

University of Southern California
young.hong@usc.edu

Jun Hua, PhD

Johns Hopkins University
jhua1@jh.edu

Katie Hua

The Scintillon Research Institute
katiehua1@gmail.com

Workshop Attendees (cont.)

Albert Isaacs, MD, PhD

Nationwide Children's Hospital
Albert.Isaacs@nationwidechildrens.org

Lauren Jantzie, PhD

Johns Hopkins University
ljantzie@jhmi.edu

👉 **Mark Johnson, MD, PhD**

UMass Neurosurgery
kelly.head2@umassmemorial.org

Davis Kaderli, MPP

Hydrocephalus Association
davis@hydroassoc.org

👉 **Kristopher Kahle, MD, PhD**

Massachusetts General Brigham
kahle.kristopher@mgh.harvard.edu

Aida Kamalian, MD

Johns Hopkins University
akamali4@jh.edu

👉 **Richard Keep, PhD**

University of Michigan
rkeep@umich.edu

Samantha Lanjewar, PhD

Hydrocephalus Association
samantha@hydroassoc.org

Darrin Lee, MD, PhD

University of Southern California
darrin.lee@med.usc.edu

Ryan Lee, MD

Vanderbilt University
ryanlee53@gmail.com

👉 **Ville Leinonen, MD, PhD**

University of Eastern Finland
ville.leinonen@kuh.fi

James Liao, MD, PhD

Cleveland Clinic Foundation
liao2@ccf.org

👉 **Andreas Linninger, PhD**

University of Illinois at Chicago
linninge@uic.edu

Mark Luciano, MD, PhD

Johns Hopkins University
Markluciano@jh.edu

👉 **Nanna MacAulay, PhD**

University of Copenhagen
Macaulay@sund.ku.dk

Gowthami Mahendran, PhD

Indiana University, Indianapolis
gmahendr@iu.edu

👉 **Pat McAllister, PhD**

Virginia Commonwealth University
james.mcallister@vcuhealth.org

👉 **J Gordon McComb, MD**

Children's Hospital Los Angeles;
USC Keck SOM
gmccomb@chla.usc.edu

Guy McKhann, MD

Columbia University
gm317@cumc.columbia.edu

👉 **Abhay Moghekar, MD**

Johns Hopkins University
am@jhmi.edu

👉 **Jill Morris, PhD**

NINDS
jill.morris@nih.gov

Sean Nagel, MD

Cleveland Clinic
nagels@ccf.org

Takahisa Nakamura, PhD

Cincinnati Children's Hospital
takahisa.nakamura@cchmc.org

👉 **Richard Norman, BS**

cmtpres@gmail.com

Padraig O'Suilleabhain, MD

University of Texas Southwestern
Medical Center Padraig
osuilleabhain@utsouthwestern.edu

👉 **Eric Oermann, MD**

NYU Langone Health
eric.oermann@nyulangone.org

Julia Ottewell, BS

The Scintillon Research Institute
jottewell@scintillon.org

👉 **Benjamin Plog, MD, PhD**

Washington University in St. Louis
bplog@wustl.edu

Neha Prakash, MBBS

UConn Health
prakash@uchc.edu

👉 **Sara Qvarlander, PhD**

Umeå University
sara.qvarlander@umu.se

Kent Richter, MD

Geisinger Health System
krichter@geisinger.edu

Veronika Ross, BA

Hydrocephalus Association
veronika@hydroassoc.org

Maria Grazia Ruocco, PhD

Adelle Diagnostics, Inc.
Maria_grazia_ruocco@brown.edu

Eric Schmidt, MD, PhD

Neurosurgery University Hospital
Toulouse
schmidt.e@chu-toulouse.fr

👉 **Siavash Shirzadeh Barough, MD**

Johns Hopkins University
sshirza1@jhmi.edu

Workshop Attendees (cont.)

Michael Siegel, PhD

Pediatric Dermatology Research Alliance
cgul72@gmail.com

Marina Thompson

Hydrocephalus Association
Marina@hydroassoc.org

👉 **Mats Tullberg, MD**

Sahlgrenska Academy, University of Gothenburg
Mats.tullberg@neuro.gu.se

Tessa van der Willigen, MPhil, MAPP

Georgetown University
tessavanderwilligen@gmail.com

Qiuting Wen, PhD

Indiana University School of Medicine
wenq@iu.edu

Jonathan White, MD

UT Southwestern Medical Center
Jonathan.white@utsouthwestern.edu

👉 **Michael A. Williams, MD**

University of Washington
Maw99@uw.edu

Gwen Williams, MS

Wayne State University
hq4570@wayne.ed

Jessica Wollett

Johns Hopkins University School of Medicine
jwollet1@jh.edu

👉 **Shigeki Yamada, PhD**

Nagoya City University Graduate School of Medical Science
shigekiyamada393@gmail.com

Sevil Yasar, MD, PhD

Johns Hopkins University
syasar1@jhmi.edu

Jinsuh Yu, MS, PharmD

University of Southern California
jinsuhyu@usc.edu

Yun Yung, PhD

The Scintillon Research Institute
yyung@scintillon.org

Sally Jo Zuspan, MSN

University of Utah
sally.zuspan@hsc.utah.edu



HYDROCEPHALUS ASSOCIATION

(888) 598-3789 | www.hydroassoc.org | info@hydroassoc.org

[f](#) [t](#) [i](#) [i](#) [v](#) @hydroassoc