SOCIETY FOR IMAGE-GUIDED NEUROINTERVENTIONS (SIGN) AND CHILDREN’S BRAIN TUMOUR DRUG DELIVERY CONSORTIUM (CBTDCC)

DAY 1, June 10, 2019  Baltimore, MD

7:30 -- 8:00  Registration and continental breakfast

Mini Symposium 1 Advances in Device Navigation
Chair: Paul Bottomley (Johns Hopkins University, Baltimore, MD, USA)
Chengyan Chu (Johns Hopkins University, Baltimore, MD, USA)

8:00 -- 8:15  Invited: Zhengchu Tan, Imperial College London, UK

8:15 -- 8:30  Invited: Iulian Iordachita, Johns Hopkins University, Baltimore, MD, USA
Shape Sensing Based Navigation of Flexible Medical Devices

8:30 -- 8:45  Invited: Steve Hetts, University of California at San Francisco, CA, USA
Endovascular Interventional MRI: Catheter Development and Navigation

8:45 -- 9:00  Invited: Parag Karmarkar, Johns Hopkins University, Baltimore, MD, USA
Endovascular Devices for MRI Guided Interventions

9:00 -- 9:15  Coffee break and discussion

Mini Symposium 2 Artificial Intelligence and Virtual Reality
Chair: Piotr Dziedzic (Johns Hopkins University, Baltimore, MD, USA)
Rohit Srivastava (Johns Hopkins University, Baltimore, MD, USA)

9:15 -- 9:30  Invited: Brian Kim, Johns Hopkins University, Baltimore, MD, USA
Eye Surgery Automation Through Visual Servoing Based on Machine Learning by Demonstration

9:30 -- 9:45  Invited: Ciprian Ionita, University of Buffalo, NY, USA
Machine Learning to Guide Endovascular Treatment

9:45 -- 10:00  Invited: Meiyappan Solaiyappan, Johns Hopkins University, Baltimore, MD, USA
Stereoscopic 3D - A Game-changer in High Precision Visualization

10:00 -- 10:15  Coffee break and discussion
Opening Ceremony

10:15 -- 10:30  President of SIGN - Mirosław Janowski, Johns Hopkins University, Baltimore, MD, USA
10:30 -- 11:00  Keynote address: Prof. David Walker

David Walker is a Professor of Pediatric Oncology in the Division of Child Health Obstetrics and Gynaecology, Medical School, University of Nottingham and Director of the Children’s Brain Tumour Drug Delivery Consortium. He is a world-renowned expert in the treatment of pediatric brain tumors and who shares the mission of this conference, making him an ideal candidate to deliver the keynote address.

Live Webinar 1 Therapeutic Agent Delivery to the Brain: Clinical Perspectives

Chair: Monica Pearl (Johns Hopkins University, Baltimore, MD, USA)
   David Walker (University of Nottingham, UK)

11:00 -- 11:20  Invited: Graeme Woodworth, University of Maryland, Baltimore, MD, USA
   Sound Power: Using Focused Ultrasound to Unlock Barriers to Drug Delivery in the Brain

11:20 -- 11:40  Invited: Piotr Walczak, Johns Hopkins University, Baltimore, MD, USA
   Imaging Tools To Improve Precision and Reproducibility of Intra-Arterial Drug Delivery

11:40 -- 12:00  Invited: Steven Gil, North Bristol NHS Trust, UK
   A System for Intermittent Convection Enhanced Drug Delivery to the Brain

12:00 -- 13:00  Panel discussion with questions from the webinar audience

13:00 -- 14:00  Lunch time
   Lunch time presentation:
   Invited: Codrin Lungu
   Program Director, Division of Clinical Research,
   National Institute of Neurological Disorders and Stroke, NIH, Bethesda, USA
   Funding Mechanisms for Training and Early Career

   Invited: Chris H. Boshoff
   Program Director, Division of Translational Research,
   National Institute of Neurological Disorders and Stroke, NIH, Bethesda, USA
   Translational Research Funding for Biologics at NINDS
Mini Symposium 3 Intra-Arterial Approaches for Treatment of Stroke

Chair: Todd Abruzzo (Phoenix Children’s Hospital, AZ, USA)
Anna Jablonska (Johns Hopkins University, Baltimore, MD, USA)

14:00 -- 14:15 Invited: Ming Ren, Xuanwu Hospital, Beijing, China
Selective Intraarterial Hypothermia Treatment for Acute Schemia Stroke

14:15 -- 14:30 Invited: Dileep Yavagal, University of Miami, FL, USA
Imaging to Determine Dosing in Intra-arterial Cell Delivery for Stroke

14:30 -- 14:45 Invited: Michael E. Maniskas, University of Kentucky, Lexington, KY, USA
Instilling Healing: Intra-arterial Pharmacotherapy as an Adjunct to Thrombectomy in Ischemic Stroke

14:45 -- 15:00 Invited: Shen Li, Dalian Hospital, Dalian, China
Acute Ischemic Stroke in Dalian, China

15:00 -- 15:15 Invited: Paulo Henrique Rosado de Castro
Federal University of Rio de Janeiro, Brazil
Imaging of Intravascular Cell Therapies for Stroke

15:15 -- 15:30 Coffee break

Mini Symposium 4 Precise Delivery to the Brain Through Image-Guidance

Chair: Ali Fatemi (Kennedy Krieger Institute, Baltimore, MD, USA)
Anna Andrzejewska (Mossakowski Medical Research Centre, PAS, Warsaw, Poland)

15:30 -- 15:45 Invited: Monica Pearl, Johns Hopkins University, Baltimore, MD, USA
Intraarterial Chemotherapy for Brainstem Tumors

15:45 -- 16:00 Invited: Michal Zawadzki, CCHMI, Warsaw, Poland
First-in-Human MRI-Guided Neuroendovascular Interventions

16:00 -- 16:15 Invited: Elizabeth Vasconcellos, BrainLab, NY, USA
Multifaceted Approach to Optimizing Drug Delivery to the Brain

16:15 -- 16:30 Coffee break

16:30 -- 18:30 Early Stage Investigator Awards, rapid fire session and poster session.
More information in the next page

18:30 -- 19:00 SIGN business meeting

19:30 -- 23:00 Networking event
Sotto Sopra
Location: 405 N Charles St.
https://www.sottosoprainc.com
Early Stage Investigator Awards

Chair: Miroslaw Janowski (Johns Hopkins University, Baltimore, MD, USA)
Piotr Walczak (Johns Hopkins University, Baltimore, MD, USA)

First place Dominika Golubczyk, University of Warmia and Mazury, Olsztyn, Poland
Real-Time MRI-Guided Endovascular Model of Cerebral Ischemia in Swine

Second place Shreyas Kuddannaya, Johns Hopkins University, Baltimore, MD, USA
Tracking Post-Transplantation Survival of Hydrogel-Scaffolded Glial-Restricted Progenitors

Third place Raleigh Linville, Johns Hopkins University, Baltimore, MD, USA
Modeling Hyperosmotic and Peptide-Induced Blood-Brain Barrier Opening Within Tissue-Engineered in vitro Human Brain Microvessels

Rapid Fire Short Oral Presentations and Electronic Poster Session

Rohit K Srivastava, Johns Hopkins University, Baltimore, MD, USA
**Biodistribution of Transplanted Glial Progenitors in 3D Printed Model of Brain Ventricular System**

Kaja Kasarelo, Medical University of Warsaw, Poland
Antioxidant Mechanism of Action of Dimethyl Fumarate in Experimental Allergic Encephalomyelitis in Rats

Wei Zhu, Johns Hopkins University, Baltimore, MD, USA
**Monitoring the Degradation of Implanted Hydrogels in the Brain using CEST MRI**

Xiaoyan Lan, Johns Hopkins University, Baltimore, MD, USA
**Feasibility Study of Ultra-High Dose Fractionated Radiation Therapy for Glioblastoma**

Chengyan Chu, Johns Hopkins University, Baltimore, MD, USA
Optimization of Osmotic Blood-Brain Barrier Opening to Enable Intravital Microscopy Studies on Drug Delivery in a Mouse Cerebral Cortex

Anna Jablonska, Johns Hopkins University, Baltimore, MD, USA
Fluorine Nanoemulsion for Magnetic Resonance Imaging of Injectable Tissue Composites to Repair Intervertebral Discs

Joanna Kwiatkowska, University of Warmia and Mazury, Olsztyn, Poland
Histological Assessment of Neuroinflammation after Ischemic Brain Injury in Swine Endovascular Stroke Model

Lukasz Kalkowski, University of Warmia and Mazury, Olsztyn, Poland
**Intraarterial Cell Delivery with MRI Guidance as a Platform for Stem Cell Therapy in Large Animal Model**

Bela Turk, Kennedy Krieger Institute, Baltimore, MD, USA
Magnetization Transfer Imaging in the Adrenomyeloneuropathy Spinal Cord Shows Longitudinal Suitability as a Potential Biomarker for Clinical Trial

Mitsuyoshi Watanabe, University of Miami, FL, USA
**Maximum Tolerated Dose of Exosomes Derived from Mesenchymal Stem Cells via Intra-arterial Dosing in a Rat Stroke Model**

Anna Andrzejewska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Superparamagnetic Iron Oxide Nanoparticles as Optimal Label for Genetically Engineered Mesenchymal Stem Cell in Term of Their Visualisation and Homing Assessment After Transplantation**

Sylwia Dabrowska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Imaging of Extracellular Vesicles Derived from Human Bone Marrow Mesenchymal Stem Cells Using Fluorescent and Magnetic Labels: in vitro and in vivo Studies**

Larissa Jank, University of Hamburg-Eppendorf, Germany
**Gellan Gum (GG) Based Hydrogels as Potential Scaffolds for Intrathecal Stem Cell Delivery in Demyelination Models of Mice**

Piotr Rogujski, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Alginate-Based hydrogels Used as Potential Scaffolds for Mesenchymal Stem Cells Delivery in Shiverer Mice Therapy**

Anna Andrzejewska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Fluorine Nanoemulsion for Magnetic Resonance Imaging of Injectable Tissue Composites to Repair Intervertebral Discs**

Joanna Kwiatkowska, University of Warmia and Mazury, Olsztyn, Poland
**Histological Assessment of Neuroinflammation after Ischemic Brain Injury in Swine Endovascular Stroke Model**

Lukasz Kalkowski, University of Warmia and Mazury, Olsztyn, Poland
**Intraarterial Cell Delivery with MRI Guidance as a Platform for Stem Cell Therapy in Large Animal Model**

Bela Turk, Kennedy Krieger Institute, Baltimore, MD, USA
Magnetization Transfer Imaging in the Adrenomyeloneuropathy Spinal Cord Shows Longitudinal Suitability as a Potential Biomarker for Clinical Trial

Mitsuyoshi Watanabe, University of Miami, FL, USA
**Maximum Tolerated Dose of Exosomes Derived from Mesenchymal Stem Cells via Intra-arterial Dosing in a Rat Stroke Model**

Anna Andrzejewska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Superparamagnetic Iron Oxide Nanoparticles as Optimal Label for Genetically Engineered Mesenchymal Stem Cell in Term of Their Visualisation and Homing Assessment After Transplantation**

Sylwia Dabrowska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Imaging of Extracellular Vesicles Derived from Human Bone Marrow Mesenchymal Stem Cells Using Fluorescent and Magnetic Labels: in vitro and in vivo Studies**

Larissa Jank, University of Hamburg-Eppendorf, Germany
**Gellan Gum (GG) Based Hydrogels as Potential Scaffolds for Intrathecal Stem Cell Delivery in Demyelination Models of Mice**

Piotr Rogujski, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Alginate-Based hydrogels Used as Potential Scaffolds for Mesenchymal Stem Cells Delivery in Shiverer Mice Therapy**

Anna Andrzejewska, Mossakowski Medical Research Centre, PAS, Warsaw, Poland
**Fluorine Nanoemulsion for Magnetic Resonance Imaging of Injectable Tissue Composites to Repair Intervertebral Discs**
DAY 2, June 11, 2019   Baltimore, MD

7:30 -- 8:15   Registration and continental breakfast

Mini Symposium 5 Advances in Neuroimaging
Chair: Peter van Zijl (Kennedy Krieger Institute, Baltimore, MD, USA)
Bela Turk (Kennedy Krieger Institute, Baltimore, MD, USA)

8:00 -- 8:15   Invited: Peter Ludewig, University of Hamburg-Eppendorff, Germany
Magnetic Particle Imaging for Neurological Applications

8:15 -- 8:30   Invited: Michael McMahon, Kennedy Krieger Institute, Baltimore, MD, USA
Organic Theranostic Agents for Interventional MRI

8:30 -- 8:45   Invited: Marcel Daadi, Texas Biomedical Research Institute, San Antonio, TX, USA
Interventional Magnetic Resonance Imaging-Guided Transplantation of Neural Stem Cell Progeny Into the Brain

8:45 -- 9:00   Invited: Wojciech Lesniak, Johns Hopkins University, Baltimore, MD, USA
Radiolabeling of Therapeutic Agents and PET Imaging for Precision Medicine

9:00 -- 9:15   Invited: Qin Qin, Johns Hopkins University, Baltimore, MD, USA
Novel Techniques for Non-Contrast Cerebral MR Angiography

9:15 -- 9:30   Coffee break

Mini Symposium 6 Preclinical Research on Animal Models
Chair: Jeff W. Bulte (Johns Hopkins University, Baltimore, MD, USA)
Larissa Jank (University of Hamburg-Eppendorf, Germany)

9:30 -- 9:45   Invited: Johannes Boltze, University of Warwick, UK
Stroke Modelling and Neuroimaging in Sheep

9:45 -- 10:00   Invited: Rebecca Krimins, Johns Hopkins University, Baltimore, MD, USA
Learning from Brain Cancer in Pets
10:00 -- 10:15 Invited: Kevin (Yajie) Liang, Janelia Research Campus, HHMI, Ashburn, VA, USA  
_Intravital Two-Photon Microscopy: State-Of-The-Art and Prospects for Clinical Applications_

10:15 -- 10:30 Coffee break

10:30 -- 11:00 **Keynote address: Prof. Sean Savitz, University of Texas, Houston, TX, USA**  
_Neurolmaging: Transforming Personalized Medicine for Neurological Disorders_

Sean Savitz is a Professor of Neurology and Director of Stroke Institute at University of Texas. He is a world-renowned expert in the treatment of neurological disorders. He focuses on stroke, a medical field which has greatly benefitted recently from advanced imaging to optimally select patients for neurointerventions; therefore, he is well suited to provide a perspective on clinical needs to further advance image guided neurointerventions.

**Live Webinar 2 Technological Advances**  
Chair: Miroslaw Janowski (Johns Hopkins University, Baltimore, MD, USA)  
Jaroslaw Maciaczyk (University of Otago, Dunedin, New Zealand)

11:00 -- 11:20 Invited: Edward A. Neuwelt, Oregon Health and Science University, Portland, USA  
_The Blood-Brain Barrier in Brain Tumor Therapy: Intra-Arterial Chemotherapy_

1:20 -- 11:40 Invited: Henry Brem, Johns Hopkins University, Baltimore, MD, USA  
_Novel Approaches to Therapeutic Brain Delivery_

11:40 -- 12:00 Invited: Mark Souweidane, Weill Cornell, New York, NY, USA  
_Strategies to Overcome Barriers of Convection Enhanced Delivery (CED) for CNS tumors_

12:00 -- 13:00 Panel discussion

13:00 -- 14:00 Lunch time

**Mini Symposium 7 Biomaterials and Nanotechnologies**  
Chair: Jordan J. Green (Johns Hopkins University, Baltimore, MD, USA)  
Xiaoyan Lan (Johns Hopkins University, Baltimore, MD, USA)

14:00 -- 14:15 Invited: Marcin Kortylewski, Beckman Research Institute at City of Hope, Duarte, CA, USA  
_Optimizing TLR9-Targeted STAT3 Inhibitors for Glioma Immunotherapy_

14:15 -- 14:30 Invited: Michel Modo, University of Pittsburgh, PA, USA  
_Magnetic Resonance Imaging-Based Guidance and Monitoring of Biomaterial Implantation Into the Stroke-Damaged Brain_
### Mini Symposium 8 Focused Ultrasound

**Chair:** Peter Searson (Johns Hopkins University, Baltimore, MD, USA)
Wei Zhu (Johns Hopkins University, Baltimore, MD, USA)

<table>
<thead>
<tr>
<th>Time</th>
<th>Invited Speaker</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>15:45 -- 16:00</td>
<td>Victor Frenkel, University of Maryland, Baltimore, MD, USA</td>
<td>The Paradox of Ultrasound Effects on the Extracellular Space: How Expanding These Regions Can Enhance Both Local and Systemic Delivery</td>
</tr>
<tr>
<td>16:00 -- 16:15</td>
<td>Hong Chen, Washington University, St. Louis, MO, USA</td>
<td>Image-Guided Focused Ultrasound-Mediated Brain Drug Delivery</td>
</tr>
<tr>
<td>16:15 -- 16:30</td>
<td>Raag Airan, Stanford University, CA, USA</td>
<td>Targeted Drug Delivery to the Nervous System With Ultrasonic Drug Uncaging</td>
</tr>
<tr>
<td>16:30 -- 16:45</td>
<td>Costas Arvanitis, Georgia Institute of Technology, Atlanta, GA, USA</td>
<td>Controlled Drug Delivery and Release to Brain Tumors With Focused Ultrasound</td>
</tr>
<tr>
<td>16:45 -- 17:00</td>
<td>Rao Gulapalli, University of Maryland, Baltimore, MD, USA</td>
<td>Exploring Strategies to Improve Workflow Associated with MRgFUS</td>
</tr>
</tbody>
</table>

### Closing Ceremony

<table>
<thead>
<tr>
<th>Time</th>
<th>Invited Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:00 -- 17:15</td>
<td>President of SIGN - Miroslaw Janowski, Johns Hopkins University, Baltimore, MD, USA Chairman of CBTDDC - David Walker, University of Nottingham, UK</td>
</tr>
</tbody>
</table>
We Thank Our 2019 Sponsors

Media Partners

The 2019 Conference Organizing Committee

Miroslaw Janowski, MD, PhD, Johns Hopkins University/ SIGN, USA  
Piotr Walczak, MD, PhD, Johns Hopkins University/ SIGN, USA  
Monica Pearl, MD, Johns Hopkins University/ SIGN, USA  
Michal Zawadzki, MD, PhD, CCHMI, Warsaw/ SIGN, Poland  
Jeff Bulte, PhD, Johns Hopkins University, USA  
Anna Jablonska, PhD, Johns Hopkins University, USA  
Graeme Woodworth, MD, University of Maryland, USA  
Victor Frenkel, PhD, University of Maryland, USA  
David Walker, MD, University of Nottingham/ CBTDDC, UK  
Ruman Rahman, PhD, University of Nottingham/ CBTDDC, UK  
Emma Campbell, PhD, University of Nottingham/ CBTDDC, UK  
I-Hsun Wu, MA, CMI, Johns Hopkins University, USA