

**Tuesday, January 24 (Day 1): Symmetry breaking in vertebrates**

09:00-09:30 Registration

09:30-09:35 Welcoming remarks by Hiroshi Hamada

**Opening and Keynote Talk 1**

Chair: Hiroshi Hamada

09:35-10:20 **KT1-1**  
**From Molecular Motor KIF3 to Left-Right Determination and Recent Advancement**  
Nobutaka Hirokawa (The University of Tokyo, Japan)

**Session 1**

Chair: Marnie Halpern

10:20-10:55 **S1-1**  
**Imaging cilia at high resolution in the embryo**  
Julien Vermot (Imperial College London, UK)

10:55-11:30 **S1-2**  
**Fluid extraction from the left-right organizer uncovers mechanical properties needed for symmetry breaking**  
Susana Lopes (NOVA Medical School, Portugal)

---

11:30-11:45 *Coffee Break*

---

11:45-12:10 **S1-3\***  
**Mouse nodal immotile cilia sense bending direction for left-right determination: Mechanical regulation in initiation of symmetry breaking**  
Takanobu Katoh (RIKEN Center for Biosystems Dynamics Research, Japan)

12:10-12:45 **S1-4**  
**Matrix metalloproteinase-21 (Mmp21) acts like a fluid-flow transported morphogen**  
Tim Ott (University of Hohenheim, Germany)

Program

---

12:45-13:45     *Group Photo & Lunch*

---

13:45-14:30     **Poster Session 1**  
Presenters of Odd-numbered posters

---

**Session 2**

Chair: Natasza A. Kurpios

14:30-15:05     **S2-1**  
**The importance of timing in Left-Right determination**  
Dominic Norris

15:05-15:35     **S2-2**  
**A network of cilia genes establishes left-right asymmetry in mouse and human**  
Martina Brueckner (Yale School of Medicine, USA)

15:35-16:00     **S2-3**  
**Cilia function as calcium-mediated mechanosensors that instruct cardiac left-right asymmetry**  
Shiaulou Yuan (Massachusetts General Hospital and Harvard Medical School, USA)

---

16:00-16:20     *Coffee Break*

---

**Session 3**

Chair: Cecilia Lo

16:20-16:55     **S3-1**  
**Flow-dependent and flow-independent functions of unconventional type 1 Myosins in zebrafish Left-Right Asymmetry**  
Maximilian Fürthauer (Institut de Biologie Valrose, France)

16:55-17:20     **S3-2**  
**Generating left-right asymmetry through RNA regulation in zebrafish Kupffer's Vesicle**  
Rebecca D. Burdine (Princeton University, USA)

Program

17:20-17:55     **S3-3**  
**De novo Mutations in FOXJ1 result in a motile ciliopathy with hydrocephalus and randomization of left/right body asymmetry**  
Heymut Omran (University Hospital Muenster, Muenster, Germany)

---

18:00-20:00     Banquet at BDR Lounge (with a mini-concert)

---

**Wednesday, January 25 (Day 2): Signaling and Organogenesis in vertebrates**

**Keynote Talk 2**

Chair: Hiroshi Hamada

9:00-9:45      **KT2-1**  
**Origin and left-right asymmetric morphogenesis of the syrinx**  
Cliff Tabin (Harvard Medical School, USA)

**Session 4**

Chair: Dominic Norris

9:45-10:20      **S4-1**  
**TBA**  
Cecilia Lo (University of Pittsburgh, USA)

10:20-10:40      **S4-2\***  
**Molecular mechanics governed by the genetic left-right asymmetry programme underlying cardiac outflow tract morphogenesis**  
Kenta Yashiro (Kyoto Prefectural University of Medicine, Japan)

10:40-11:15      **S4-3**  
**Left-right asymmetry of the heart**  
Sigolène Meilhac (*Imagine* - Institut Pasteur, INSERM, France)

---

11:15-11:30      *Coffee Break*

---

11:30-11:50      **S4-4\***  
**Extracellular behavior of Nodal and Dand5 proteins in zebrafish embryos during left-right asymmetry formation**  
Takafumi Ikeda (The University of Tokyo, Japan)

11:50-12:25      **S4-5**  
**Adventures in laterality: new twists on how Pitx2 governs left-right organ asymmetry**  
Natasza A. Kurpios (Cornell University, USA)

12:25-12:45      **S4-6\***  
**Spatial transcriptome profiling uncovers metabolic regulation in left-right patterning**  
Hisato Yagi (University of Pittsburgh School of Medicine, USA)

Program

---

12:45-13:45 Lunch

---

13:45-14:30 **Poster Session 2**  
Presenters of Even-numbered posters

---

**Session 5**

Chair: Susana Lopes

14:30-15:05 **S5-1**  
**Mapping asymmetric connections in the zebrafish brain**  
Marnie E. Halpern (Geisel School of Medicine at Dartmouth, USA)

15:05-15:25 **S5-2\***  
**Investigating the role of *tbx2b* on left-right epithalamic asymmetry establishment**  
Taimu Masaki (RIKEN Center for Brain Sciences, Japan)

15:25-16:00 **S5-3**  
**Regulation of Social Fighting Behavior by Zebrafish and Left-Right Brain Asymmetry**  
Hitoshi Okamoto (RIKEN Center for Brain Science, Japan)

---

16:00-16:20 *Coffee Break*

---

**Session 6**

Chair: Heymut Omran

16:20-16:55 **S6-1**  
**Left-right asymmetries in brain and behavior: A comparative perspective**  
Sebastian Ocklenburg (Ruhr University Bochum, Germany)

16:55-17:15 **S6-2\***  
**Explain human handedness: combining kin selection, sex, parental and parent-of-origin effects**  
Bing Dong (University of St Andrews, UK)

\*Selected Talk

Program

17:15-17:40

**S6-3**

**Large-scale genetic studies reveal clues to the developmental origins of human brain asymmetry**

Clyde Francks (Max Planck Institute & Radboud University Medical Center, Nijmegen, Netherlands)

**Thursday, January 26 (Day 3): Diversity of L-R asymmetry in among organisms**

**Session 7**

Chair: Sigolène Meilhac

- 9:00-9:35      **S7-1**  
**Cavefish as a model system for the evolution of left-right visceral asymmetry**  
William R. Jeffery (University of Maryland, USA)
- 9:35-9:55      **S7-2\***  
**Left-right asymmetry in calvarial mineralization by osteoblasts**  
Koichi Matsuo (Keio University School of Medicine, Japan)
- 9:55-10:30     **S7-3**  
**Mechanical insights into plant chiral growth through twisted mutant analysis**  
Masayoshi Nakamura (Nagoya University, Japan)
- 
- 10:30-10:45    *Coffee Break*
- 
- 10:45-11:05    **S7-4\***  
**Evolution of left-right patterning and the Nodal cascade in veiled chameleon (*Chamaeleo calyptratus*)**  
Natalia A. Shylo (Stowers Institute for Medical Research, USA)
- 11:05-11:25    **S7-5\***  
**Diverge to converge: Left-right symmetry breaking and left-right organizer in the chick in context**  
Nokolo Tsikolia (University Medicine Goettingen, Germany)
- 11:25-11:45    **S7-6\***  
**Vertebrate genome evolution featured by non-conserved gene repertoires regulating early embryogenesis**  
Shigehiro Kuraku (RIKEN Center for Biosystems Dynamics Research & National Institute of Genetics, Japan)
- 
- 11:45-13:45    Lunch & **Poster Session 3**  
All posters, Free Discussion
-

Program

**Session 8**

Chair: Julien Vermot

- 13:45-14:20      Presentation by Zoom  
**S8-1**  
**Establishment of left-right asymmetry in amphioxus**  
Guang Li (Xiamen University, China)
- 14:20-14:55      **S8-2**  
**Neurula rotation and left-right asymmetry in ascidian embryos:  
Ciliary movements and the vitelline membrane signal**  
Hiroki Nishida (Osaka University, Japan)
- 14:55-15:30      **S8-3**  
**Left-right body plan of freshwater snails is determined by a single  
gene in very early embryogenesis**  
Reiko Kuroda (Chubu University, Japan)
- 

15:30-15:50      *Coffee Break*

---

**Session 9**

Chair: Leo Q. Wan

- 15:50-16:25      **S9-1**  
**Class I myosins link between molecular and cellular chirality**  
Kenji Matsuno (Osaka University, Japan)
- 16:25-17:00      **S9-2**  
**Genetic control of brain laterality in *Drosophila***  
Stéphane Noselli (Institut de Biologie Valrose, France)
- 17:00-17:35      **S9-3**  
**Molecular and Functional Analysis of myosin with chiral activity**  
Kohji Ito (Chiba University, Japan)
- 17:35-17:55      **S9-4\***  
**Temperature and Chirality Effects on Primitive Polyester Synthesis  
and the Origin of Homochiral Macromolecular Polymers**  
Tony Z. Jia (Tokyo Institute of Technology, Japan)

(Invited speakers move to Restaurant)



**Friday, January 27 (Day 4): Origin of Chirality**

**Session 10**

Chair: Kenji Matsuno

- 9:00-9:35      **S10-1**  
**Emergence of cell chirality from the spatial organization of actin and myosin cytoskeleton**  
Tatsuo Shibata (RIKEN Center for Biosystems Dynamics Research, Japan)
- 9:35-9:55      **S10-2\***  
**Three-dimensional simulation of epithelial tube revealed a distinctive chiral cellular behavior, cell twisting, that may account for the left-right asymmetric tissue rotation**  
Mikiko Inaki (Osaka University, Japan)
- 9:55-10:30     **S10-3**  
**Cellular left-right asymmetry in cardiovascular development and disease**  
Leo Q. Wan (Rensselaer Polytechnic Institute, USA)
- 
- 10:30-10:45    *Coffee Break (15 min)*
- 
- 10:45-11:20    **S10-4**  
**Chiral self-organization of actin filament-based structures**  
Alexander D. Bershadsky (National University of Singapore, Singapore and Weizmann Institute of Science, Israel)
- 11:20-11:40    **S10-5\***  
**Cell chirality induces collective rotation *via* the left-right asymmetric formation of lamellipodia and focal adhesions**  
Tomoki Ishibashi (RIKEN Center for Biosystems Dynamics Research, Japan)
- 11:40-12:15    **S10-6**  
**Left-right asymmetry of amino acids modulates mammalian physiology**  
Junpei Sasabe (Keio University School of Medicine, Japan)
- 12:15-12:25    Closing remarks by Hiroshi Hamada