SMC proteins
Chromosomal organizers from bacteria to human

June 13-16, 2017
Nanyo city, Yamagata, Japan

Venue:
Nanyo City Cultural Hall
430-2 Mitsumadori, Nanyo city, Yamagata, 999-2232, JAPAN

Organizers:
Tatsuya Hirano (RIKEN)
Tomoko Nishiyama (Nagoya Univ.)
Katsuhiko Shirahige (The Univ. Tokyo)
Yuri Nakagawa (The Univ. Tokyo)[administrative]

Sponsors
Grant-in-Aid Scientific Research on Innovative Areas
The Molecular Biology Society of Japan
RIKEN Centennial
RIKEN Symposium Series
The Uehara Memorial Foundation
Nanyo City
Meeting Program

Tuesday, June 13

13:00-14:20   Arrival & registration
14:20-14:30   Welcome address

KEYNOTE SESSION
(Chair: Tatsuya Hirano)

14:30-15:15   William C. Earnshaw (Univ. of Edinburgh, UK)
              Condensin – from non-histone scaffold to chromosomal nano-machine

SESSION I: Prokaryotic SMC (I)
(Chair: Tatsuya Hirano)

15:15-15:40   David Z. Rudner (Harvard Medical School, USA)
              Bacillus subtilis SMC complexes juxtapose chromosome arms as they travel from origin to terminus
15:40-16:05   Byung-Ha Oh (KAIST, Korea)
              Structure and conformational change of full-length Smc
16:05-16:30   Stephan Gruber (Univ. of Lausanne, Switzerland)
              DNA chambers in Smc-ScpAB

16:30-17:00   Afternoon coffee/tea
SESSION II:
Chromosome biophysics and modeling
(Chair: Christian Haering)

17:00-17:25  Leonid Mirny (MIT, USA)  T05
Chromosome folding by loop extrusion

17:25-17:50  Kerry Bloom (Univ. of North Carolina, USA)  T06
Partitioning nuclear sub-domains

17:50-18:05  Yuji Sakai (RIKEN, Japan)  T07
Modeling the functions of condensin in chromosome shaping and segregation

18:05-18:30  John F. Marko (Northwestern Univ., USA)  T08
Condensin in eukaryote mitotic chromosomes and on single DNA molecules

18:30-18:45  Je-Kyung Ryu (TU Delft, The Netherlands)  T09
High-speed atomic force microscopy imaging on condensin

19:30-21:00 Dinner (served at Takinami for all participants)
Wednesday, June 14

7:00- Breakfast (served at each inn)
7:45- The first shuttle leaves for the Cultural Hall

SESSION III:
Sister chromatid cohesion (I)
(Chair: Jan-Michael Peters)

8:30-8:55 Douglas Koshland (UC Berkeley, USA)  
Novel functions for the coiled coils of cohesin

8:55-9:20 Mitsuhiro Yanagida (OIST, Japan)  
Cohesion clip model

9:20-9:35 Madhusudhan Srinivasan (Univ. of Oxford, UK)  
The topology of cohesion’s association with chromosomes and its regulation by HAWKs

9:35-10:00 Yasuto Murayama (Tokyo Inst. of Tech., Japan)  
Cohesion mediates DNA-DNA tethering in vitro

10:00-10:30 Morning coffee/tea

SESSION IV:
Condensin
(Chair: John Marko)

10:30-10:55 Christian H. Haering (EMBL, Germany)  
Structural basis for a safety-belt mechanism that anchors condensin complexes to chromosomes

10:55-11:20 Frank Uhlmann (The Francis Crick Institute, UK)  
Condensin-mediated remodeling of the mitotic chromatin landscape

11:20-11:45 Toru Hirota (JFCR, Japan)  
Cooperative acts of condensins and topoisomerases in
shaping mitotic chromosomes

11:45-12:10  **Giovanni Bosco** (Geisel Sch. Med., Dartmouth, USA)  
Human condensin II subunit NCAPH2 associates with shelterin protein TRF1 and is required for telomere stability

**Poster Session 1 (Odd Number)**

**SESSION V:**  
Sister chromatid cohesion (II)  
*(Chair: Frank Uhlmann)*

15:30-15:55  **Hongtao Yu** (Univ. of Texas, USA)  
Structural and mechanistic insight into cohesin loading and release

15:55-16:10  **Benjamin D. Rowland** (NKI, The Netherlands)  
The cohesin release factor WAPL restricts chromatin loop extension

16:10-16:35  **Dale Dorsett** (Saint Louis Univ., USA)  
Roles of Pds5, Wapl and Brca2 in cohesin localization and sister chromatid cohesion

16:35-16:50  **Tomoko Nishiyama** (Nagoya Univ., Japan)  
Cohesin dynamics on single DNA in *Xenopus* egg extracts

16:50-17:15  **Jan-Michael Peters** (IMP, Austria)  
How cohesin is positioned in mammalian genomes to control chromatin architecture

**Afternoon coffee/tea**
<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:45-18:10</td>
<td><strong>David Sherratt</strong> (Univ. of Oxford, UK)</td>
<td>How does MukBEF work?</td>
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<tr>
<td>18:10-18:35</td>
<td><strong>Hironori Niki</strong> (NIG, Japan)</td>
<td>Multiple cis-acting rDNAs near replication origin are contributed for nucleoid separation as loading sites for the Smc-ScpAB complex</td>
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<td>18:35-18:50</td>
<td><strong>Jan Palecek</strong> (Masaryk Univ., Czech Republic)</td>
<td>KITE proteins: new insights to evolution and dynamics of SMC complexes</td>
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<tr>
<td>19:30-21:00</td>
<td>Dinner</td>
<td>Dinner <em>(BBQ at Hygeia Park for all participants)</em></td>
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Thursday, June 15

7:00- Breakfast (served at each inn)
7:45- The first shuttle leaves for the Cultural Hall

SESSION VII:  
Chromosome organization in meiosis/zygotes  
(Chair: Kei-ichiro Ishiguro)

8:30-8:55  Franz Klein (MFPL, Austria)  
The meiotic DSB machinery takes the Rec8-bus to work  

8:55-9:10  Stefan Galander (Univ. of Edinburgh, UK)  
Spo13 establishes meiosis I-specific chromosome  
segregation by regulating cohesin protection and  
mono-orientation  

9:10-9:35  Yasushi Hiraoka (Osaka Univ., Japan)  
A cohesin-based platform of the chromosome for  
homologous chromosome pairing in fission yeast meiosis  

9:35-10:00  Tomoya Kitajima (RIKEN CDB, Japan)  
The causes of chromosome segregation errors in oocytes  

10:00-10:25  Kikuë Tachibana-Konwalski (IMBA, Austria)  
Single-nucleus Hi-C reveals unique chromatin  
reorganization during the oocyte-to-zygote transition  

10:25-12:55  Poster Session 2  (Even Number)  

12:55-17:30  Lunch and excursion
SESSION VIII:  
SMC and genome stability  
*(Chair: Lena Ström)*

17:30-17:55  **Luis Aragón** (Imperial College London, UK)  
A phosphorylation-code at separase sites regulates cohesin cleavage during DNA damage

17:55-18:20  **Camilla Sjögren** (Karolinska Institute, Sweden)  
The Smc5/6 complex - connecting DNA supercoiling and sister chromatid entanglement?

18:20-18:35  **Johanne M. Murray** (Univ. of Sussex, UK)  
The Smc5/6 complex and replication stress

19:30-21:00  *Dinner (served at Takinami for all participants)*
Friday, June 16

7:00- Breakfast (served at each inn)
7:45- The first shuttle leaves for the Cultural Hall

SESSION IX:  
SMC and gene regulation  
(Chair: Katsuhiko Shirahige)

8:30-8:45 Clémence Hocquet (CNRS, LBMC ENS de Lyon, France)  
Role of condensin in the regulation of gene expression  
In fission yeast

8:45-9:10 Barbara J. Meyer (UC-Berkeley, USA)  
Dynamic control of X-chromosome conformation and repression by condensin

Condensin II is anchored by TFIIC and H3K4me3 in the mammalian genome and supports expression of active dense gene clusters

9:35-10:00 Matthias Merkenschlager (MRC London Inst. Med. Sci., UK)  
Cohesin regulates inducible and developmental genes

10:00-10:25 Ana Losada (CNIO, Spain)  
Distinct contributions of cohesin-SA1 and cohesin-SA2 to genome architecture and gene regulation

10:25-10:55 Morning coffee/tea
SESSION X:
SMC and disease
(Chair: Kerstin Wendt)

10:55-11:20  Andrew Wood (Univ. of Edinburgh, UK)  T39
T cell lymphoma and tissue-specific chromosomal instability in \textit{Caph2}^{nes/nes} mutant mice

11:20-11:35  Julia Horsfield (Univ. of Otago, New Zealand)  T40
Cohesin mutations in myeloid leukaemia: the search for mechanism

11:35-12:00  Ayana Kon (Kyoto Univ., Japan)  T41
The genetic and biological characterization of pathway mutations of cohesin complex in myeloid neoplasms

12:00-12:25  Matt Deardorff (Children's Hospital of Philadelphia, USA)  T42
\textit{SMC1A} mutations cause mechanistically separable allelic disorders: Atypical Cornelia de Lange Syndrome and a Rett-like Epileptic Encephalopathy

12:25-12:30  Closing remarks

12:30-13:30  \textit{Lunch and departure}
phone number of the hotel
1: Ikikaerinoyado Takinami  0238-43-6111
2: Masugataya    0238-43-2301
3: Gotenmori     0238-40-2611
4: Daimonjiya    0238-43-3070
5: Yamatoya      0238-43-2257
6: Tansen Hotel  0238-43-3030
7: Tanbakan      0238-43-3000
8: Mutsumisou    0238-43-3035
9: Morinoyu      0238-43-2057
10: Business Hotel Tansen  0238-440-2474