TEMS

Temasek External Monthly Seminar

TEMASEK LIFESCIENCES LABORATORY

ALL ARE WELCOME

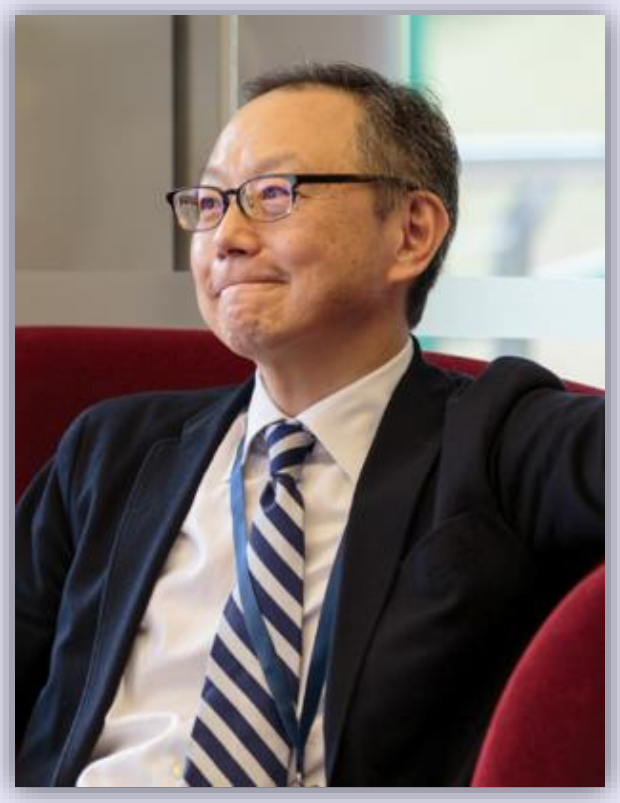
13 December 2017 (Wednesday), 3.00pm
The Auditorium (Level 1)

Hosted by: Dr Okamura Katsutomo

The nuclear Piwi-piRNA pathway in Drosophila

Professor Haruhiko Siomi
Keio University School of Medicine, Japan

PIWI-interacting RNAs (piRNAs) are germline-specific small RNAs which form the effector complexes with PIWI proteins to preserve the genome integrity by repressing transposable elements (TEs). In *Drosophila,* Piwi is known to transcriptionally silence their targets via heterochromatin formation. We have recently found that Piwi-piRNA complexes interact with chromatin components including linker histone H1 to promote chromatin compaction at target TE loci, thereby repressing them at transcriptional levels. Recent studies also showed that Panoramix (Panx; a.k.a. Silencio) interacts with Piwi-piRNA complexes to induce transcriptional repression of targets mediated by recruitment of H3K9me3 marks. To further elucidate the underlying mechanism of how Piwi-piRNA complexes repress TEs, we generated antibodies against Panx to immunopurify associated complexes. This confirmed the interaction between Panx and Piwi. Additionally, Nxf2 was detected in Panx complexes. Nxf2, one of the NXF family proteins, is specifically expressed in ovaries. We will further analyze the function of Panx-Nxf2 complex, and discuss its function in the Piwi-piRNA pathway.



Recent Publications:

1. Matsumoto N, Nishimasu H, Sakakibara K, Nishida KM, Hirano T, Ishitani R, **Siomi H**, Siomi MC, Nureki O. Crystal Structure of Silkworm PIWI-Clade Argonaute Siwi Bound to piRNA. *Cell*. 2016. 167:484–497.
2. Iwasaki YW, Murano K, Ishizu H, Shibuya A, Iyoda Y, Siomi MC, **Siomi H**, Saito K.Piwi Modulates Chromatin Accessibility by Regulating Multiple Factors Including Histone H1 to Repress Transposons. *Mol Cell*. 2016. 63:408–419.
3. Sato K, Iwasaki YW, Shibuya A, Carninci P, Tsuchizawa Y, Ishizu H, Siomi MC, **Siomi H**. Krimper Enforces an Antisense Bias on piRNA Pools by Binding AGO3 in the *Drosophila* Germline. *Mol Cell*. 2015. 59: 553–563

Professor Siomi obtained his Diploma degree (1982) and M.S. degree (1984) in Chemistry from Gifu University, and Ph. D. (1988) in Virology from Kyoto University. He was then an HHMI associate with Gideon Dreyfuss at the University of Pennsylvania School of Medicine, where he studied RNA-binding proteins, such as FMR1. He then joined the University of Tokushima faculty in 1999, where he started to work on RNAi/RNA silencing. In 2008, he moved to his current position at Keio University.