

IMEG Seminar Series

The road to global science



Dr. Madhav Jagannathan

**Professor,
Institute of Biochemistry, ETH Zürich, Switzerland**

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Network-like condensation of satellite DNA into chromocenters stabilizes nuclear mechanics

This seminar series is open to all students and researchers in Kumamoto University.

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The pericentromeric heterochromatin of eukaryotic chromosomes is primarily comprised of abundant non-coding tandem repeats known as satellite DNA. While previously considered ‘junk DNA’, we have recently shown that satellite DNA clustering by sequence-specific DNA binding proteins into membrane-less nuclear condensates known as chromocenters is crucial for genome encapsulation. Despite the important and conserved role for chromocenters, the mechanisms underlying their formation and function remain incompletely understood. In this presentation, we will focus on the *Drosophila* satellite DNA-binding protein, D1, which is required for chromocenter formation in the *Drosophila* testis. We will present data suggesting that network-like satellite DNA condensation into chromocenters safeguards nuclear integrity under physically challenging conditions. We propose that adjusting network properties of chromocenters is an effective mechanism to control the mechanical robustness of nuclei and may be especially relevant in cell populations such as macrophages and myocytes, which function in the face of significant external forces.