Contribution ID: **117** Type: **Talk**

【934】A nuclear jamming transition in embryonic tissues

Thursday 12 September 2024 15:15 (30 minutes)

Tissue physical states and rigidity transitions are known to be controlled by various cellular properties but the impact of sub-cellular organelles on tissue states remains unexplored. By combining theoretical modeling with in-vivo experiments, we uncover a novel nuclear jamming transition. Introducing nuclei as soft particles in the model, we investigate how nuclei affect tissue states. Tissue dynamics gradually decelerate and tissue structure becomes more ordered as nuclear volume fraction increases. Structural and mechanical measurements within retinal tissues of zebrafish embryos reveals a nuclear jamming transition during embryonic development. Our findings highlight a novel rigidity transition governed by nuclei, potentially serving as a crucial mechanism in embryonic tissues.

Author: KIM, Sangwoo (EPFL)

Co-authors: Dr BOUTILLON, Arthur (TU Dresden); DENIZ, Ilker Ali (TU Dresden); Prof. CAMP\‘AS, Otger (TU Dresden); Dr POSPISIL, Petr (TU Dresden); Dr AMINI, Rana (TU Dresden); Dr YEN, Shuo-Ting (TU Dresden)

Presenter: KIM, Sangwoo (EPFL)

Session Classification: Biophysics and Soft Matter

Track Classification: Biophysics and Soft Matter