分子細胞生物学研究所セミナー

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演題 **The SMC5/6 complex binds DNA through ATP-dependent electrostatic interactions and topological entrapment**

日時 **３月４日（金）15：00 ～ 16：30**

場所 **東京大学分子細胞生物学研究所**
生命科学総合研究所Ｂ棟 ３階 301会議室

主催 **東京大学分子細胞生物学研究所**
ゲノム情報解析研究分野（連絡先：20756）

The structural maintenance of chromosomes (SMC) protein complexes have central roles in genome stability, and influence replication, segregation, transcription and repair through their interaction with chromosomal DNA. To fully understand the mechanisms behind their many functions it is therefore essential to disclose the details of how SMC complexes bind DNA. I will present our investigation of the Smc5/6 complex (Smc5/6), which together with cohesin and condensin makes up the family of eukaryotic SMC complexes. While cohesin and condensin are known for their roles in sister chromatid cohesion and condensation, respectively, the function of Smc5/6 is largely unknown. The complex has however to be functional during late replication, and appears to facilitate resolution of sister chromatid linkages in preparation for anaphase. Our in-vitro analysis of Smc5/6 purified from Saccharomyces cerevisiae has shown that the complex binds DNA through electrostatic interactions and topological entrapment, similarly to cohesin and condensin. Both interaction-modes are regulated by ATP, and Smc5/6 is able to link two separate DNA molecules through topological entrapment. We also find that the complex associates to Top2, a topoisomerase that is required for resolution of sister chromatid entanglements. This suggest that the Smc5/6 complex and Top2 act together, and our

current analysis aims to decipher the functional relevance of their interaction.