

分子細胞生物学ゲノム生物学 (横森 馨子) Molecular Cell and Genome Biology (YOKOMORI Kyoko)



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ゲノム損傷に対する細胞生存メカニズム； クロマチンエピジェネティクス異常による疾患のメカニズムの解析

我々の遺伝情報はクロマチンという核酸たんぱく複合体の形で細胞核内に保全されています。そのクロマチンが何らかのダメージを受けた時に、細胞がどのように反応して、ダメージを修復し遺伝情報を守り、代謝を変えて生存を図るのかをレーザーと様々な蛍光ダイナミクス的手法を用いて、リアルタイムで計測します。また、クロマチンの構造あるいは修飾異常がどのように人の疾患につながるのかを、コルネリアデランゲ症候群 (CdLS) と顔面肩甲上腕型筋ジストロフィー (FSHD) の二つの疾患に着目して次世代シーケンス、さらにシングルセル解析を用いてゲノムワイドに研究しています。

Mechanism of cell survival in response to DNA damage; Molecular mechanism of epigenetic abnormality disorders Cornelia de Lange syndrome and facioscapulohumeral muscular dystrophy

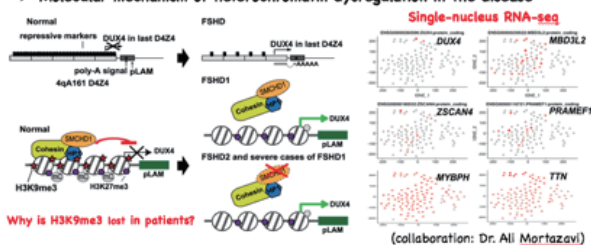
The Yokomori laboratory studies the mechanisms of higher-order chromatin structural organization and how they influence genome integrity and functions, such as DNA repair and gene transcription, with special focus on chromatin structural organizers cohesins and condensins, and human epigenetic abnormality disorders, Cornelia de Lange syndrome and FSHD muscular dystrophy, using genome-wide pooled and single cell/nucleus sequencing analyses. In addition, the role of PARP signaling in epigenetic DNA damage response and its relationship to cellular metabolism are being investigated using laser microirradiation and realtime fluorescence dynamics techniques.

Epigenetic regulation of gene expression and DNA damage response in human disorders

Dysregulation of heterochromatin in human disorder

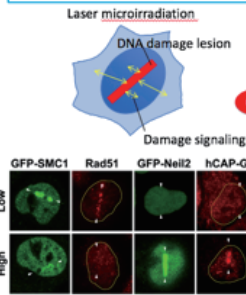
Facioscapulohumeral muscular dystrophy (FSHD)

- > Single nucleus-seq analyses to identify and characterize the disease-driving cells.
- > CRISPR-Cas9 or dCas9 to create the disease modeling human muscle cells.
- > Molecular mechanism of heterochromatin dysregulation in the disease



Epigenetic and metabolic DNA damage signaling in cancer

In vivo tools to study real time DDR



Multifaceted roles of PARP1 signaling in DNA repair, metabolism, and cell survival

