第7回 RcMcD 融合研究セミナー
（5研究科共同セミナー）

演　題：Global distribution of chromosome territories and nuclear architecture

講演者：田辺 秀之先生（総合研究大学院大学 先導科学研究科，准教授）

日　時：平成２７年7月17日（金）１６：２０～１７：５０

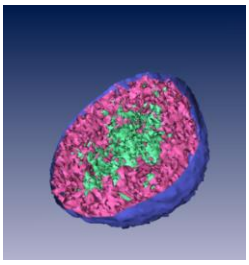
場　所：広島大学理学部Ｅ００２講義室

【Abstract】

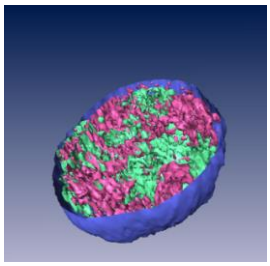
Chromosomes are discretely, highly compartmentalized within the cell nucleus in eukaryotes forming so-called “chromosome territories (CTs)”. It has been studied for nearly two decades mainly by utilizing 3D-FISH techniques. How do CTs occupy the cell nucleus? What kind of regulations can be applied to arrange their positioning? It has been revealed that the radial positioning of CTs from center to nuclear rim has the following characteristics.

1) It depends on the physical size and gene density of each CT; larger gene-poor CTs are located toward periphery and smaller gene-dense CTs are located into interior of the nucleus.
2) Evolutionarily syntenic regions of CTs are inclined to localize the same radial positioning.
3) Lamin Associated Domains (LADs) might be affected; LADs are located near the nuclear rim, which are tethering mainly gene-poor chromosomal regions corresponding to G/C-bands roughly consisting of heterochromatin.
4) Actin related protein 6 (Arp6), which is one of the ubiquitous components of chromatin remodeling complexes, has affected to global nuclear radial distribution of CTs. Arp6-knock out chicken DT40 cells have shown disturbed global nuclear architecture.
5) Cancer cells have shown specific several characteristics, especially glioblastoma cells have been disturbed intensely.

In summary, spatial radial distribution of CTs could be affected strongly with physical properties whereas less affected with the status of gene expression or epigenetic factors. Organization of nuclear architecture from evolutionary views will be discussed.



chicken DT40 cell



DT40 Arp6-KO cell

References

1) Ohfuchi-Maruyama E, Hori T, Tanabe H, *et al.*: ***J Cell Science***, 125: 3739-3743 (2012)
2) Kawamura R, Tanabe H, Wada T, *et al.*: ***Chromosome Research***, 20: 659-672 (2012)
3) Amano T, Sagai T, Tanabe H, *et al.*: ***Developmental Cell*** 16: 47-57 (2009)

お問い合わせ先：クロマチン動態数理研究拠点事務局
082-424-7898（内線 7898）　E-mail：rcmcd@hiroshima-u.ac.jp