Genome Biology

Principal Investigator Masafumi Muratani
E-mail.address muratani@md.tsukuba.ac.jp
URL http://www.md.tsukuba.ac.jp/basic-med/genome/

Major Scientific Interests of the Group

The main research interests in our group is genomics and epigenomics in space life science and clinical research, with particular focus on development of technologies for limited sample analysis. We also collaborate with clinicians and industry partners to implement our methods to personalized medicine and automated laboratory testing using AI and robotics.

Projects for Regular Students in Doctoral or Master's Programs

1) Clinical sample analysis using chromatin immunoprecipitation combined with 2nd generation sequencing (ChIPseq) and RNAseq, data analysis and validation of potential disease biomarkers.
2) Genomics and epigenomics analysis in space research projects

Study Programs for Short Stay Students (one week – one trimester)

1) Access to genomics databases, integrative analysis of regulatory regions, gene expression and genetic variations.
2) Genomics and epigenomics assays, chromatin immunoprecipitation, RNA assays and genotyping.

Selected Publications

1) Husna N, Aiba T, Fujita SI, Saito Y, Shiba D, Kudo T, Takahashi S, Furukawa S, Muratani M. Release of CD36-associated cell-free mitochondrial DNA and RNA as a hallmark of space environment response. ***Nat Commun.*** 2024 Jun 11;15(1):4814.
2) Ong Q, Sakashita S, Hanawa E, Kaneko N, Noguchi M, Muratani M. Integrative RNA-Seq and H3 Trimethylation ChIP-Seq Analysis of Human Lung Cancer Cells Isolated by Laser-Microdissection. ***Cancers*** (Basel). 2021 Apr 5;13(7):1719.
3) Rutter L, Barker R, Bezdan D, Cope H, Costes SV, Degoricija L, Fisch KM, Gabitto MI, Gebre S, Giacomello S, Gilroy S, Green SJ, Mason CE, Reinsch SS, Szewczyk NJ, Taylor DM, Galazka JM, Herranz R, Muratani M. A New Era for Space Life Science: International Standards for Space Omics Processing. ***Patterns*** (N Y). 2020 Nov 25;1(9):100148.
4) Fujita SI, Rutter L, Ong Q, Muratani M. Integrated RNA-seq Analysis Indicates Asynchrony in Clock Genes between Tissues under Spaceflight. ***Life*** (Basel). 2020 Sep 11;10(9):196.