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Top -level research and data

Highly accurate omics analysis across various organisms, from viruses and microorganisms to animal cells.

- Microbiome research based on single-cell genomics.
- · Identification of intracellular molecules by Raman imaging
- · Multi-omics analysis at the cellular level
- · Development of tools and algorithms for complex data

Deployment targets (sites, materials, etc.)

[Microbial cells, Viral particles]

Diverse environments including seawater, soil, gut, etc.

【 Eukaryotic cells 】

Cardiomyocytes, nerve cells, cancer cells, yeast, etc.

(Leading articles)

[1] Suwa S, Ando M, Nakashima T, Horii S, Anai T, Takeyama H., In Situ Raman Hyperspectral Analysis of Microbial Colonies for Secondary Metabolites Screening. Anal Chem. 2024 Sep 17:96(37):14909-14917.

doi: 10.1021/acs.analchem.4c02906.

[2] Nishikawa Y, Wagatsuma R, Tsukada Y, Chia-Ling L, Chijiiwa R, Hosokawa M, Takeyama H., Large-scale singlevirus genomics uncovers hidden diversity of river water viruses and diversified gene profiles. ISME J. 2024 Jan 8;18(1):wrae124.

doi: 10.1093/ismejo/wrae124.

[3] Matsunaga H, Arikawa K, Yamazaki M, Wagatsuma R, Ide K, Samuel AZ, Takamochi K, Suzuki K, Hayashi T, Hosokawa M, Kambara H, Takeyama H, Reproducible and Sensitive Micro-Tissue RNA Sequencing from Formalin-Fixed Paraffin-Embedded Tissues for Spatial Gene Expression Analysis, Scientific Reports, 12 (2022), 1-12

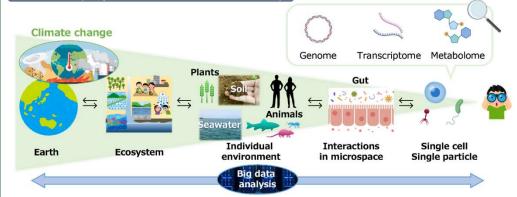
doi: 10.1038/s41598-022-23651-6





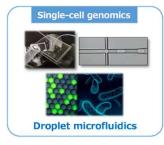


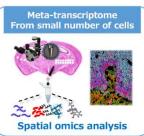
Features (implementation means, etc.)

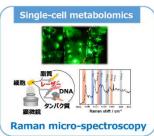


Keyword

- Single-cell analysis
- Multi-omics analysis
- Genetic engineering
- Molecular biology
- Microbial engineering
- Biomass energy
- Biometrics
- Raman micro-spectroscopy
- Microfluidics
- Bioinformatics









- Analysis of cellular and viral genome information, which are components of the environment.
- Multi-omics analysis that can capture various biological components from multiple perspectives

Related projects

- · Construction of Agri-soil microbe atlas for diagnosis of healthy soils Moonshot R&D Program, The cabinet office
- Development of LC-Raman system through industry-academia collaboration
- Development of the Centre for Spatial Omics Analysis Research (CECOAR) Basis for supporting INnovative Drug discovery and life Science research

Assumed outlets / applications

- · Elucidation of disease mechanisms towards personalized medicine
- Development of new drugs using microorganisms
- Environmental biomonitoring

Associated SDGs







