

Unit Name

Nucleic Acid Chemistry and Engineering Unit

Collaborations

Jiro Kondo, Sophia University, Japan, Structural characterization of RNA aptamers (through AMED BINDS program)

Confidential, Confidential (U.S. pharmaceutical company F), U.S.A., Riboswitch applications for gene therapy

Confidential, Confidential (U.S. pharmaceutical company R), U.S.A., Riboswitch applications for gene therapy

Paola Laurino, OIST, Japan, Riboswitch applications for enzyme engineering

Junichi Haruta, Osaka University, Japan, Lead exploration of aptamer ligands (through AMED BINDS program)

Keisuke Fukunaga, Institute of Science Tokyo, Tokyo, Japan, Applications of engineered RNA binding proteins

Tomoaki Matsuura, Institute of Science Tokyo, Tokyo, Japan, Applications of engineered RNA binding proteins

Mieko Arisawa, Kyushu University, Japan, AMED Bridge project "Lead exploration of small molecule regulators of riboswitches for gene therapy"

Research Personnel

Elvira Vitu, Staff Scientist

Rosa Márquez-Costa, Postdoctoral Scholar

Thao Le, Staff Scientist

Narae Kim, Staff Scientist

Harikrishnan K S, Postdoctoral Scholar

Bochen Zhu, Postdoctoral Scholar

Lara Sellés Vidal, Postdoctoral Scholar

Haifeng Zhang, Research Unit Technician

Nao Miyahira, Research Unit Technician

Yayoi Maehara, Research Unit Technician

Yoko Nomura, Science and Technology Associate

Noma Tomoya, PhD Student

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Kim, N.; Yokobayashi, Y.

Scalable Control of Stem Cell Fate by Riboswitch-Regulated RNA Viral Vector without Genomic Integration. *Molecular therapy : the journal of the American Society of Gene Therapy* 2025.

- Sellés Vidal, L.; Noma, T.; Yokobayashi, Y.
Accurate, Comprehensive Database of Group I Introns and Their Homing Endonucleases. *Bioinformatics advances* 2025, 5, vbaf020.
- Nomura, Y.; Kim, N.; Zhu, B.; Hamzah, M.; Zhang, H.; Yokobayashi, Y.
Optimization of Exon-Skipping Riboswitches and Their Applications to Control Mammalian Cell Fate. *ACS synthetic biology* 2024, 13, 3246–3255.
- Ishii, Y.; Fukunaga, K.; Cooney, A.; Yokobayashi, Y.; Matsuura, T.
Switchable and Orthogonal Gene Expression Control inside Artificial Cells by Synthetic Riboswitches. *Chemical communications (Cambridge, England)* 2024, 60, 5972–5975.

Patent and Intellectual Property

- Yokobayashi, Y.; Venugopal, D.; Fukunaga, K.; Miyahira, N.; Jiro, F.; Ishikawa, S.; Oosumi, Y.
An RNA Aptamer That Binds to asp7967 or an Analogue Thereof. WO2024075841A1, 2024.

Presentation at Conference

- Yokobayashi, Y.
Controlling RNA Function in Mammalian Cells by Small Molecules. XXV International Round Table on Nucleosides, Nucleotides and Nucleic Acids (IS3NA), The Japan Society of Nucleic Acids Chemistry 2024.
- Yokobayashi, Y.
Chemical Regulation of Transgene Expression by Synthetic Riboswitches. The 30th Annual Meeting of Japan Society of Gene and Cell Therapy 2024.

Seminars

- Yokobayashi, Y.
Riboswitch Technology for Regulating Gene Expression: Basic Principles and Biomedical Applications. 2024.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Narae Kim	Poster Presentation at Conference	RIBOSWITCH-EQUIPPED RNA VIRAL VECTOR CONTROLS NANOG EXPRESSION FOR PLURIPOTENCY MAINTENANCE IN MOUSE EMBRYONIC STEM CELLS	ISSCR 2024 (International Society for Stem Cell Research)		2024
Tomoya Noma	Poster Presentation at Conference	Lentivirus-Based Screening Accelerates Mamamlia RNA Gene Switches Development	SynBYSS2024 (The SynBio Young Speaker Series Conference)	J. Craig Venter Institute	2024
Keisuke Fukunaga	Poster Presentation at Conference	Development of small molecule- and protein-responsive cell-free riboswitches	XV International Round Table on Nucleosides, Nucleotides and Nucleic Acids (IRT2024)		2024
Keisuke Fukunaga	Poster Presentation at Conference	Development of cell-free riboswitches	The 3rd Interntaional Symposium on Biofunctional Chemistry (ISBC2024)		2024

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Keisuke Fukunaga	Presentation at Conference	合成リボスイッチの開発と無細胞合成生物学への応用	第 18 回バイオ関連化学シンポジウム		2024
Keisuke Fukunaga	Presentation at Conference	セルフリーシステムを用いた合成リボスイッチのプロトタイピング	第 76 回日本生物工学会大会		2024

External Service

2025	Peer reviewer, Nucleic Acids Research
2024	Peer reviewer, Molecular Therapy
2024	Peer reviewer, ACS Synthetic Biology
2024	Peer reviewer, ACS Synthetic Biology
2024	Peer reviewer, ACS Synthetic Biology
2024	Peer reviewer, Nucleic Acids Research
2024	Peer reviewer, Journal of Biochemistry
2024	Peer reviewer, ACS Synthetic Biology
2024	Session Leader (Chair) at The 3rd International Symposium on Biofunctional Chemistry 2024, ISBC, Conference session chair
2024	Peer reviewer, ACS Nano
2024	Peer reviewer, Nucleic Acids Research

Outreach Activities (For Unit Members Only)

2024	Harikrishnan K S, Support Staff at OIST Science Festival 2025, OIST
2024	Tomoya Noma, OIST Net Café (Talk and Q&A session), OIST
2024	Tomoya Noma, Career talk, hands-on activity, and lab tour for Salesio Gakuin High School students (2025-07-11), OIST
2024	Tomoya Noma, Career talk, hands-on activity, and lab tour for Seishin Gakuen High School students (2025-06-13), OIST

Workshops and Seminars (Organized and Hosted by Faculty/Units)

Speaker Name(s)	Title	Location	Date
Jonathan T. Sczepanski	Mirror Image Oligonucleotides: New Opportunities in Biotechnology	OIST	2025
Maxim Berezovski	Cancer Diagnostics and Therapy with DNA Aptamer Nanotechnology	OIST	2024-11-25