

Unit Name

Nucleic Acid Chemistry and Engineering Unit
Professor Yohei Yokobayashi

Collaborations

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

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

Matthias Wolf, OIST, Japan, Imaging analysis of AAV particles produced using a riboswitch

Matthias Wolf, OIST, Japan, Cryo-EM analysis of small RNA nanostructures

Research Personnel

Thao Le, Staff Scientist

Elvira Vitu, Staff Scientist

Rosa Márquez-Costa, Postdoctoral Scholar

Narae Kim, Staff Scientist

Harikrishnan K S, Postdoctoral Scholar

Bochen Zhu, Postdoctoral Scholar

Kenji Arakaki, Research Assistant

Lara Sellés Vidal, Postdoctoral Scholar

Haifeng Zhang, Research Unit Technician

Yayoi Maehara, Research Unit Technician

Nao Miyahira, Research Unit Technician

Yoko Nomura, Science and Technology Associate

Tomoya Noma, PhD Student

Chi Zhang, Research Intern

Hannah Claire Connor, Research Intern

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Hauf, S.; Nakamura, R.; Cellini, B.; Yokobayashi, Y.; Dindo, M.
Emergent Chemical Reactivity and Complexity of RNA Condensates. *Angewandte Chemie (International ed. in English)* 2025, 64, e11332.
2. 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.
3. Sellés Vidal, L.; Noma, T.; Yokobayashi, Y.

Accurate, Comprehensive Database of Group I Introns and Their Homing Endonucleases. *Bioinformatics advances* 2025, 5, vbaf020.

- Fukunaga, K.; Teramoto, T.; Nakashima, M.; Ohtani, T.; Katsuki, R.; Matsuura, T.; Yokobayashi, Y.; Kakuta, Y.

Structural Insights into Lab-Coevolved RNA-RBP Pairs and Applications of Synthetic Riboswitches in Cell-Free System. *Nucleic acids research* 2025, 53.

Poster Presentation at Conference

- Yokobayashi, Y.; Zhu, B.; Nomura, Y.
Optimization of Synthetic Riboswitches That Function in Mammalian Cells. The 31st Annual Meeting of Japan Society for Gene and Cell Therapy 2025.
- Yokobayashi, Y.; Zhu, B.; Nomura, Y.
Optimization of Synthetic Riboswitches That Function in Mammalian Cells. JAACT 2025 2025.

Seminars

- Yokobayashi, Y.
Large-Scale Experimental Analysis of RNA Sequence-Function Relationships and Synthetic Biology Applications (RNA 配列—機能関連の大規模実験解析と合成生物学的応用) 6th Kimura Motoo Memorial Evolutionary Biology Seminar, 2025.
- Yokobayashi, Y.
Engineering RNA Devices: From Chemistry to Synthetic Biology. Cold Spring Harbor Asia, Synthetic Biology Course, 2025.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Year Pub
Tomoya Noma	Poster Presentation at Conference	High-Throughput Screening of RNA Switches for Next-Generation Gene Therapy	ISNAC 2025 (The 52nd International Symposium on Nucleic Acids Chemistry 2025)	2025
Tomoya Noma	Poster Presentation at Conference	A Massively Parallel Discovery Platform for ligand Sensitive RNA Devices for Gene Therapy	15th European Biophysics Congress (EBSA2025)	
Rosa Marquez-Costa	Poster Presentation at Conference	Structure-Switching Aptamers for Triggered Cargo Release	ISNAC 2025 (The 52nd International Symposium on Nucleic Acids Chemistry 2025)	2025
Bochen Zhu	Poster Presentation at Conference	Chemical Optimization of Small Molecules for Controlling Mammalian Synthetic Riboswitch	ISNAC 2025 (The 52nd International Symposium on Nucleic Acids Chemistry 2025)	2025
Kaloor Surendran Harikrishnan	Poster Presentation at Conference	Engineering Ordered Macroscopic Architectures via Valance and Direction Controlled Self-assembly of DNA-decorated Hydrogels	ISNAC 2025 (The 52nd International Symposium on Nucleic Acids Chemistry 2025)	2025

External Service

Term 2 2026 - Term 1 2026 Local Organizing Committee Chair for ISNAC 2026, Local Organizing Committee Chair for ISNAC 2026 to be held in Okinawa, Japan From Nov 18-20, 2026. [Fiscal Year: 2025]

Term 2 2026 - Term 2 2026	Peer reviewer, [Fiscal Year: 2025]
Term 1 2025 - Term 1 2025	Local Organizing Committee Member for ISNAC 2025, Local Organizing Committee member for ISNAC 2025 held in Toyama, Japan From Nov 12-14, 2025. [Fiscal Year: 2025]
Term 3 2025 - Term 3 2025	Peer reviewer, [Fiscal Year: 2025]
Term 3 2025 - Term 3 2025	Peer reviewer, [Fiscal Year: 2025]
Term 2 2025 - Term 2 2025	Peer reviewer, [Fiscal Year: 2024]
Term 2 2025 - Term 2 2025	Peer reviewer, [Fiscal Year: 2024]
Term 2 2025 - Term 2 2025	Peer reviewer, [Fiscal Year: 2025]

Other Institutional Service

Term 1 2024 - Term 1 2025	Dean of Faculty Affairs Search Committee, (University) [Fiscal Year: 2024]
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Outreach Activities [For Unit Members Only]

Term 2 2025	Tomoya Noma, Visit and career talk at Kaiho High School, OIST [Fiscal Year: 2025-07-28]
Term 2 2025	Tomoya Noma, OIST SEED program (Career talk, hands-on activity and lab tour for Odawara High School students), OIST [Fiscal Year: 2025-10-08]
Term 2 2025	Harikrishnan K S, Support Staff at OIST Science Festival 2025, OIST [Fiscal Year: 2024]

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