# FY 2025 Annual Report

***Unit Name***

Membranology Unit

Associate Professor Keiko Kono

**Students Supervised:**

- Jan Grasic (PhD Student)
- Yatzu Chiu (PhD Student)
- Kamila Krystyna Kozik (PhD Student)
- Yuta Yamazaki (PhD Student)
- Anna Gushiken (Research Intern)
- Natalia Aneta Malig (Research Intern)
- Kung Ting Ma (Research Intern)

## *Scholarly Contributions and Creative Productions (by Faculty)*

### *Journal Article*

1. Yamazaki, Y.; Kono, K.

   Large-Scale Identification of Plasma Membrane Repair Proteins Revealed Spatiotemporal Cellular Responses to Plasma Membrane Damage. eLife 2026, 14.
2. Chiu, Y.; Ishida, R.; Moriyama, Y.; Grašič, J.; Kono, K.

   Time-Resolved miRNA-mRNA Integrated Analysis Reveals the miRNA-mRNA Networks Underlying Plasma Membrane Damage-Dependent Senescence and DNA Damage Response-Dependent Senescence in WI-38 Normal Human Fibroblasts. RNA biology 2025, 22, 1–19.
3. Alghamdi, E.; Kono, K.

   Heterogeneity of Cellular Senescence: Subtype-Specific Mechanisms and the Emerging Role of Plasma Membrane Damage. Cancer science 2025, 116, 3274–3285.
4. Yamazaki, Y.; Omura, F.; Ono, E.; Kamada, N.; Kono, K.

   Time-Resolved Transcriptomics of S. Cerevisiae and S. Pastorianus in Response to Plasma Membrane Stresses. Scientific data 2025, 12, 1246.
5. Maipas, A.; Sato, A.; Moriyama, Y.; Yamamoto, T.; Kono, K.

   Knockdown of CNOT3, a Subunit of the CCR4-NOT Deadenylase Complex, Sensitizes A549 Human Non-Small Cell Lung Cancer Cells to Senescence-Inducing Stimuli. Biochemical and biophysical research communications 2025, 748, 151294.
6. Seike, T.; Takekata, H.; Kono, K.; Sakata, N.; Kotani, H.; Furusawa, C.; Matsuda, F.

   Discovery and Identification of a Novel Yeast Species, Sp. Nov., from Drosophila in Okinawa, Japan. International journal of systematic and evolutionary microbiology 2025, 75.

### *Presentation at Conference*

1. Kono, K.

Plasma Membrane Damage Triggers Cellular Senescence, Linking Mechanical Stress to Age-Related Pathologies. Emerging Concepts in Cell Division Cycles 2026: From Early Development to Cancer and Aging 2026.

2. Kono, K.

   Plasma Membrane Damage Triggers Cellular Senescence, Linking Mechanical Stress to Age-Related Pathologies. International Cell Senescence Institution (ICSA) 2025 2025.

3. Kono, K.

   細胞老化：Plasma Membrane Damage-dependent Senescence and Its Implications for Cancer Biology. The 84th Annual Meeting of the Japanese Cancer Association 2025.

4. Kono, K.

   Ca2+ Influx Induces Mitochondria-ER Contact Formation to Maintain Ca2+ Homeostasis and Cell Viability. The 98th Annual Meeting of the Japanese Biochemical Society 2026.

5. Kono, K.

   細胞膜の傷と老化 Plasma Membrane Damage Triggers Cellular Senescence, Linking Mechanical Stress to Age-Related Pathologies. JST Optical Control Research Area Meeting 2025.

6. Kono, K.

   細胞膜損傷による細胞老化におけるケミカルアトラス撹乱の役割 The Role of Chemical Atlas Perturbation in Plasma Membrane Damage-Dependent Senescence. The 48th Annual Meeting of the Molecular Biology Society of Japan 2025.

7. Kono, K.

   細胞膜損傷と老化. The Japanese Biochemical Society (JBS) Symposium, Kyushu Branch Meeting 2025.

8. Kono, K.

   Mitochondria Play a Key Role during Plasma Membrane Damage-Dependent Senescence. OsakaMito2025 2025.

9. Kono, K.

   Ca2 Influx Induces Mitochondria-ER Contact Formation by MTCH1 to Maintain Ca2 Homeostasis and Cell Viability. Joint meeting of Japan Society for Cell Biology 77th, JSDB 58th 2025.

10. Kono, K.

    細胞膜の傷と細胞分裂の停止. 第 4 回 細胞分裂研究会 2025.

11. Kono, K.

    Healthy Aging by Ameliorating Plasma Membrane Damage. Convergence: Fostering Interdisciplinary Collaboration for Solving Complex Problems 2025.

12. Kono, K.

    $Ca^{2+}$-Mediated ER Mitochondria Crosstalk during Plasma Membrane Damage-Dependent Senescence. A3 Meeting in Daejeon Korea 2025.

### *Seminars*

1. Kono, K.

   Cell Membrane Damage and Aging. The Provost Lecture Series 21, Office of the Provost, OIST 2026.

2. Kono, K.

   細胞膜損傷を起点とする細胞膜老化. ATAGO Respiratory Expert Seminar, Tokyo 2025.

3. Kono, K.

   細胞膜損傷を起点とする細胞老化. 第 33 回東北生活習慣病研究会、宮城 2025.

4. Kono, K.

   細胞膜の傷と老化 Plasma Membrane Damage and Aging. PROS PriME, Ehime 2025.

5. Kono, K.

   Cracks That Change Us: The Hidden Power of Cell Damage. Converge, OIST 2025.

### *Scholarly Contributions (by Unit Members)*

| Name of Unit Member | Type | Title | Outlet | Publisher | Year Pub |
|---|---|---|---|---|---|
| Nurhanani binti Razali | Journal Article | Proteomic analysis reveals phage-driven metabolic shifts and biofilm disruption in methicillin-resistant Staphylococcus aureus (MRSA) | World Journal of Microbiology and Biotechnology | Springer Nature | |
| Nurhanani binti Razali | Other Scholarly Work | Atom, Molecules and Chemical Bonds | Team teaching invitation for CLIL-based Biochemistry subject with Assoc. Prof. Barry Kavanagh | Institute for Excellence and Higher Education, Tohoku University | |
| Mirai Tanigawa | Other Scholarly Work | シンポジウム「TOR をトリまく栄養応答の最前線」オーガナイザー | The 48th Annual Meeting of the Molecular Biology Society of Japan | | |
| Nurhanani binti Razali | Other Scholarly Work | Chair for Symposium 21: Involvement of cellular senescence in toxicity | The 52nd Annual Meeting of the Japanese Society of Toxicology | | |
| Jan Grasic | Poster Presentation at Conference | Protein biomarkers of plasma membrane damage-dependent senescence | A3 Meeting in Daejeon Korea | | |
| Nurhanani binti Razali | Poster Presentation at Conference | Resveratrol ameliorates oxidative stress and senescence in estradiol-induced thymic involution | Geromedicine Conference | | |
| Kamila Kozik | Poster Presentation at Conference | PAK1-mediated macropinocytosis in senescent cells | Suntory Sip and Connect Meeting OIST | | |
| Kamila Kozik | Poster Presentation at Conference | PAK-1 Dependent Macropinocytosis is Upregulated in Senescent Cells | Research Appreciation Month, OIST | | |
| Kamila Kozik | Poster Presentation at Conference | PAK1-Dependent Upregulated Macropinocytosis Is a Hallmark of Senescent Cells | Stem cells across the lifespan: embryogenesis, aging, therapy Hangzhou China | | |
| Kamila Kozik | Poster Presentation at Conference | PAK1 Shapes Inflammatory SASP via TGFβ Signaling | A3 Foresight Meeting, OIST | | |
| Jan Grasic | Poster Presentation at Conference | Protein biomarkers of plasma membrane damage-dependent senescence | Suntory Sip and Connect | | |
| Enaam Alghamdi | Poster Presentation at Conference | Ca2+ influx induces mitochondria-ER contact formation by MTCH1 to maintain Ca2+ homeostasis and cell viability | Suntory Sip and Connect meeting | | |
| Kamila Kozik | Presentation at Conference | Constitutive Macropinocytosis Is a Hallmark of Senescent Cells and Is Regulated by PAK1 | ICSA2025 Rome Italy | | |
| Kamila Kozik | Presentation at Conference | PAK1 Regulates Vacuole Formation and Macropinocytosis in Cellular Senescence | A3 Meeting in Daejeon Korea | | |

| Name of Unit Member | Type | Title | Outlet | Publisher | Year Pub |
|---|---|---|---|---|---|
| Mirai Tanigawa | Presentation at Conference | ミトコンドリアには、液胞に局在する TORC1 とは異なる制御を受ける TORC1 プールがある | The 48th Annual Meeting of the Molecular Biology Soceity of Japan | | |
| Mirai Tanigawa | Presentation at Conference | Mitochondria has a TORC1 pool that is regulated independently of vacuole-localized TORC1 | 32nd International Conference on Yeast Genetics and Molecular Biology | | |
| Nurhanani binti Razali | Presentation at Conference | Time-resolved transcriptomic profiling of senescence-associated secretory phenotype (SASP) in multiple senescent cell subtypes | A3 Meeting in Daejeon Korea | | |
| Kojiro Suda | Presentation at Conference | 細胞膜損傷による細胞老化の分子メカニズムと疾患形成への影響 Molecular mechanisms of plasma membrane damage-dependent senescence and its implications for disease | The 48th Annual Meeting of the Molecular Biology Society of Japan | | |
| Nurhanani binti Razali | Presentation at Conference | Senescence-associated secretory phenotype (SASPs) regulation in estradiol-induced thymic involution | The 52nd Annual Meeting of the Japanese Society of Toxicology | | |
| Nurhanani binti Razali | Presentation at Conference | Transcriptomic profiling of senescence-associated secretory phenotype (SASP): from in vitro to in vivo analyses | young International Cell Senescence Association (yICSA) Symposium, Karolinska Institute, Sweden | | |
| Nurhanani binti Razali | Seminars | From Migration to Senescence: My Research Journey | young International Cell Senescence Association (yICSA) Webinar Series | | |
| Kamila Kozik | Seminars | Constitutive macropinocytosis is a hallmark of senescent cells and is regulated by PAK1 | Seoul National University , Prof. Chanhee Kang's Lab , Korea | | |
| Yohsuke Moriyama | Seminars | 細胞老化のメカニズムと機能性サプリメントの可能性 | 日本栄養食糧学会 2025 九州・沖縄支部大会 | | |
| Yohsuke Moriyama | Seminars | 細胞膜の傷と老化 | 日本抗加齢医学会 研修講習会 抗加齢ゲノム医学編 | | |

### *Honors, Awards & Fellowships*

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| Term 3 2025 - Term 3 2025 | Faculty Excellence in Mentoring Award, -, 2025, OIST [Fiscal Year: 2025-04-11] |

### *Honors, Awards & Fellowships [By Unit Members Only]*

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| Term 2 2026 - Term 2 2026 | Nurhanani binti Razali, Poster award at the Geromedicine: Unlock Healthy Longevity Conference, Singapore, -, 2026, Natinal University of Singapore (NUS), - [Fiscal Year: 2026-02-26] |

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| Term 1 2025 - Term 1 2025 | Yuta Yamazaki, Peter Gruss Doctoral Dissertation Excellence Award, -, 2025, OIST, - [Fiscal Year: 2025] |
| Term 1 2025 - Term 1 2025 | Nurhanani binti Razali, Oral presentation award, -, 2025, Young ICSA symposium in Karolinska Institute, - [Fiscal Year: 2025] |
| Term 3 2025 - Term 3 2025 | Nurhanani binti Razali, Oral presentation award, n/a, 2025, young International Cell Senescence Association (yICSA), n/a [Fiscal Year: 2025-05-06] |
| Term 2 2025 - Term 2 2025 | Jan Grasic, Best Poster Award, A3 Foresight Meeting, -, 2025, Yonsei University & DGIST, South Korea, - [Fiscal Year: 2025-03-09] |

### *Other Institutional Service*

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|---|---|
| Term 2 2025 - Term 2 2025 | Keizai Douyukai X OIST Joint Symposium 2025, (University) [Fiscal Year: 2024] |
| Term 1 2024 - Ongoing | Cell Membrane Damage and Aging, (University) [Fiscal Year: 2024] |

### *Outreach Activities [For Unit Members Only]*

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| Term 2 2026 | Yohsuke Moriyama, TINY, TINY WORLD!, Okinawa AMICUS International [Fiscal Year: 2026-02-27] |
| Term 1 2025 | Kamila Kozik, WI-38 senescent cell imaged on a confocal microscope Zeiss LSM 900 , ibidi Calendar 2026 [Fiscal Year: 2025] |
| Term 1 2025 | Jan Grasic, OIST SEED Program, OIST [Fiscal Year: 2025-10-08] |
| Term 1 2025 | Yohsuke Moriyama, Carrier Talk to Nanbu Commercial High School Student at OIST, OIST x Nanbu Commercial High School [Fiscal Year: 2025-12-23] |
| Term 3 2025 | Mirai Tanigawa, Onna × OIST Children's School of Science, OIST, Onna-son [Fiscal Year: 2025-08-05] |
| Term 3 2025 | Yohsuke Moriyama, Onna × OIST Children's School of Science, OIST, Onna-son [Fiscal Year: 2025-08-05] |
| Term 2 2025 | Kamila Kozik, Human senescent cells to study human aging, Ibidi Calendar 2025 [Fiscal Year: 2025-01-01] |
| Term 2 2025 | Jan Grasic, OIST Science Festival 2025, OIST [Fiscal Year: 2025-02-01] |
| Term 2 2025 | Yohsuke Moriyama, OIST visit by Onna Elementary School (field trip)_Research introduction, Onna Elementary School [Fiscal Year: 2025-04-28] |

### *Workshops and Seminars [Organized and Hosted by Faculty/Units]*

| Title | Location | Co-Organizers | Date |
|---|---|---|---|
| Emerging Concepts in Cell Division Cycles 2026: From Early Development to Cancer and Aging | Sydney Branner Hall at OIST | Kiyomitsu U, Meitinger U, Ohta G | 2026-03-02 |
| A3 Foresight Meeting | OIST Conference Center | Cancer Institute Hospital of JFCR | 2026-01-23 |