

## **Unit Name**

**Molecular Cryo-Electron Microscopy Unit**  
**Professor Matthias Wolf**

## **Collaborations**

Prof. Mihnea Bostina, University of Otago, New Zealand, on the structures of bacteriophages  
Prof. Satoshi Shibata, Tottori University, Japan, on the structure of the bacterial pilus MFA1  
Prof. Koji Nakayama, Nagasaki University, Japan, on the structure of the bacterial pilus MFA1  
Prof. Mikhail Pyatibratov, RAS Pushchino, Russia, on the structure of a halophilic archaeum  
Prof. Shinichi Aizawa, Hiroshima University, Japan, on the polymorphism of the *salmonella* filament  
Prof. Makoto Fujita, The University of Tokyo, Japan, on the structure of organometallic cages  
Prof. Hiroshi Matsuo, NIH, USA, on the the structure of APOBEC3H  
Prof. Andrew Fisher and Prof. Peter Beal, UC Davis, USA, on the structure of ADAR2  
Prof. Vincent Laudet and Dr. S. Toledo-Patino, OIST, on volume imaging of nematocysts and symbionts  
Prof. Takeshi Noda, Osaka University, Japan, on the structure of the ebolavirus VLP  
Prof. Yoshihiro Kawaoka, Univ of Tokyo IMSUT, Japan, on the structure of the ebolavirus VLP  
Prof. Yagai, Chiba University, Japan, on the structure of organic nanotubes  
Prof. Tomohiro Mochizuki, Osaka-Ohtani, Japan, on the structure of archaeal viruses  
Prof. Hanna Oksanen, Helsinki University, Finland, on the structure of the archaeal virus His1  
Dr. Haejon Park, SNU, Korea, on the structures of bacteriophage tail spikes in complex with lipopolysaccharides

## **Research Personnel**

Rika Yoshizawa, Research Unit Administrator  
Hideyuki Matsunami, Staff Scientist  
Rafael Ayala Hernandez, Staff Scientist  
Vladimir Meshcheryakov, Staff Scientist  
Tzung Yang Hsieh, Staff Scientist  
Tae Gyun Kim, Staff Scientist  
Matej Horvath, Postdoctoral Scholar  
Laura Burga, Staff Scientist  
Keon Young Kim, PhD Student  
Ting-Hua Chen, PhD Student  
Daniel Gutierrez Del, PhD Student  
Maya Ann Street, PhD Student  
Monika Leigh Eggenberger, PhD Student  
Michael Siler, PhD Student  
Kiara Mary Kawatsure, Research Intern

En Watanabe, Research Intern

James Mark William Hodgkinson-Bean, Visiting Research Student

Miho Maezono, Visiting Research Student

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

#### ***Book Chapter***

1. Hyun, J.; Hsieh, L. T. H.; Ayala, R.; Chang, W.; Wolf, M.  
Methods to Study Poxvirus Structures by Cryo-EM Imaging Modalities; Humana Press Inc., 2025.

#### ***Journal Articles***

1. Skorupka, K. A.; Matsuoka, K.; Hassan, B.; Ghirlando, R.; Balachandran, V.; Chen, T. H.; Walters, K. J.; Schiffer, C. A.; Wolf, M.; Iwatani, Y.; Matsuo, H.  
HIV-1 Vif Mediates Ubiquitination of the Proximal Protomer in the APOBEC3H Dimer to Induce Degradation. *Nature Communications* 2025, 16.
2. Hodgkinson-Bean, J.; Ayala, R.; McJarrow-Keller, K.; Cassin, L.; Rutter, G. L.; Crowe, A. J. M.; Wolf, M.; Bostina, M.  
Cryo-EM Structure of Bacteriophage Bas63 Reveals Structural Conservation and Diversity in the Felixovirus Genus. *Science advances* 2025, 11, eadx0790.
3. Ayala, R.; Moiseenko, A. V.; Chen, T. H.; Kulikov, E. E.; Golomidova, A. K.; Orekhov, P. S.; Street, M. A.; Sokolova, O. S.; Letarov, A. V.; Wolf, M.  
Reply to: About Proteins of a Siphophage Tail Tip Complex Reverting to Their Pre-Ejection Fold after DNA Ejection. *Nature Communications* 2025, 16, Article number: 2860 (2025).
4. Kumaran, R.; Jayawardena, N.; Chen, K. L.; Eruera, A. R.; Hodgkinson-Bean, J.; Burga, L. N.; Wolf, M.; Bostina, M.  
Cryo-EM Structure of the Seneca Valley Virus A-Particle and Related Structural States. *Journal of Virology* 2025, 99.
5. Matthews, M. M.; Kim, T. G.; Kim, K. Y.; Obata, F.; Shibata, S.; Shibata, N.; Iha, H. A.; Meshcheryakov, V.; Hsieh, T.-Y.; Collins, M.; Tamai, M.; Sasaki, D.; Fujii, J.; Ishikawa, H.; Wolf, M.  
Antigen Clustering Effect on Immunogenicity in Prefusion-Stabilized Spike-Based COVID-19 Vaccines. *Research Square* 2024.
6. Tokoro Schreiber, M.; Cassidy, C.; Saidani, M.; Wolf, M.  
Electromagnetic Lensing Using the Aharonov-Bohm Effect. *New Journal of Physics* 2024, 26.
7. Wolf, M.; Kim, T. G.; Matthews, M. M.  
SARS-CoV-2 IgG Seroprevalence in the Okinawa Main Island and Remote Islands in Okinawa, Japan, 2020–2021. *Japanese Journal of Infectious Diseases* 2025, 2025 Volume 78, Pages 8–18.  
[https://www.jstage.jst.go.jp/article/yoken/78/1/78\\_JJID.2023.255/article](https://www.jstage.jst.go.jp/article/yoken/78/1/78_JJID.2023.255/article)
8. Wolf, M.; Gutierrez-Del-Rio, D.; Ayala, R.; Oksanen, H.  
Cryo-EM Characterization of Extremophile Viruses with Dynamic Structures. 13th Asia Pacific Microscopy Congress 2025 (APMC13) 2025, e316.
9. Wolf, M.; Street, M.  
Structure of a T4-like Myophage in Two States by Cryo-EM. 13th Asia Pacific Microscopy Congress 2025 (APMC13) 2025, e223.

#### ***Presentations at Conferences***

1. Wolf, M.  
Cryo-EM Structure of the Ebolavirus Virus-like Particle (VLP). EID Seminar Series (EIDSS), NUS Singapore, March 3, 2026.

[https://www.duke-nus.edu.sg/eid/events/detail/index/eid-seminar-series---cryo-em-structure-of-the-ebolavirus-virus-like-particle-\(vlp\)](https://www.duke-nus.edu.sg/eid/events/detail/index/eid-seminar-series---cryo-em-structure-of-the-ebolavirus-virus-like-particle-(vlp))

2. Wolf, M.  
OIST's New JEOL cryoARM300-II Cryo-TEM with Narrow-Gap Optics. 2026 Cryo-Electron Microscopy Course 2026.
3. Wolf, M.  
Architecture and Contractile Transformation of Myophages Bas63 and  $\phi$ TE. OIST-Keio Showcase Talk Series Vol. 9 - Proteins in Focus: Cryo-EM and Structural Frontiers 2026.
4. Wolf, M.  
Challenges in Working with Recombinant Ebola Virus in Japan. The 24th Annual Meeting of the Japanese Biological Safety Association 2025.
5. Wolf, M.  
Cryo-EM in Enzymology and Dynamics: Cryo-EM Structure of the Ebola Virus Virus-like Particle. The International Chemical Congress of Pacific Basin Societies 2025 (PACIFICHEM2025) 2025.
6. Wolf, M.  
Architectures of Two Contractile Bacteriophages Bas63 and  $\phi$ TE. Frontiers of Cryo-Electron Microscopy and Tomography. NIPS CryoEM workshop 2025. Oct. 18, 2025.
7. Wolf, M.  
The Dynamic Structure of the Tailed Bacteriophage  $\phi$ TE. SKKU, Seoul, May 19, 2025.
8. Wolf, M.  
The Dynamic Structure of the Tailed Bacteriophage  $\phi$ TE. 31st FAOBMB Conference 2025, May 20, 2025.
9. Wolf, M.  
Global Structural Survey of Pectobacterium Phage  $\phi$ TE. AMED BINDS Workshop, OIST, opening lecture 2025.
10. Wolf, M.  
The Dynamic Structure of the Tailed Bacteriophage  $\phi$ TE. CMCB Dresden, Germany, April 10, 2025.
11. Wolf, M.  
Opening Lecture. 2025 AMED BINDS Cryo-Electron Microscopy Course, OIST, April 22, 2025.

### ***Seminars (invited speaker)***

1. Wolf, M.  
Lecture: Image Formation, Fourier Analysis and CTF Theory. Hokkaido Summer School, Oct 4, 2025.
2. Wolf, M.  
Seminar: The Dynamic Bacterial Flagellum. Univ. of the Ryukyus, May 27, 2025.

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

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Rafael Ayala Hernandez	Journal Article	Gintegrator: Enhancing biological sequences data integration with real-time identifier translation	SoftwareX	Elsevier	2025-02-01
Tzung Yang Hsieh	Journal Article	Engineered protein subunit COVID19 vaccine is as immunogenic as nanoparticles in mouse and hamster models	Scientific Reports	Nature	01-10-2024

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Maya Ann Street	Poster Presentation at Conference	Structure of a T4-like Myophage in Two States by Cryo-EM	Conference: 13th Asia Pacific Microscopy Congress 2025 (APMC13)		2025-1/21
Daniel Gutierrez-Del-Rio	Poster Presentation at Conference	Cryo-EM Characterization of Extremophile Viruses with Dynamic Structures	Conference: 13th Asia Pacific Microscopy Congress 2025 (APMC13)		2025-1/21
Hideyuki Matsunami	Presentation at Conference	Structure and Function of Bacterial Surface Appendages: Flagella and Fimbriae	Special lecture of the state-of-the-art drug development, Hokkaido Summer Institute, Hokkaido University		2025-08-05

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

Title	Location	Co-Organizers	Date
2026 Cryo-Electron Microscopy Course	OIST seminar rooms C210, C700 and EM facility	Toshiaki Mochizuki, Oleg Sitsel	2026-01-28