

クライオ電子顕微鏡法による *Mycoplasma mobile* 運動装置の構造解析

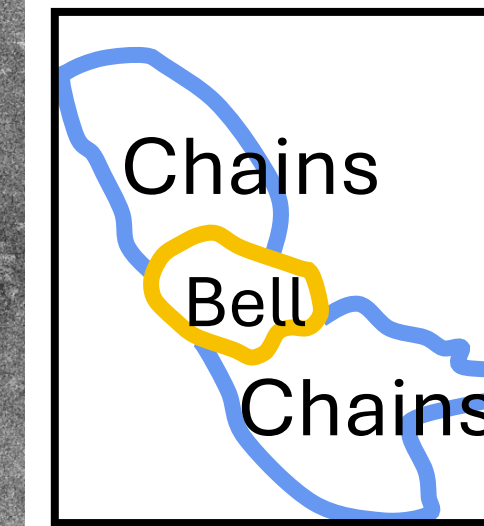
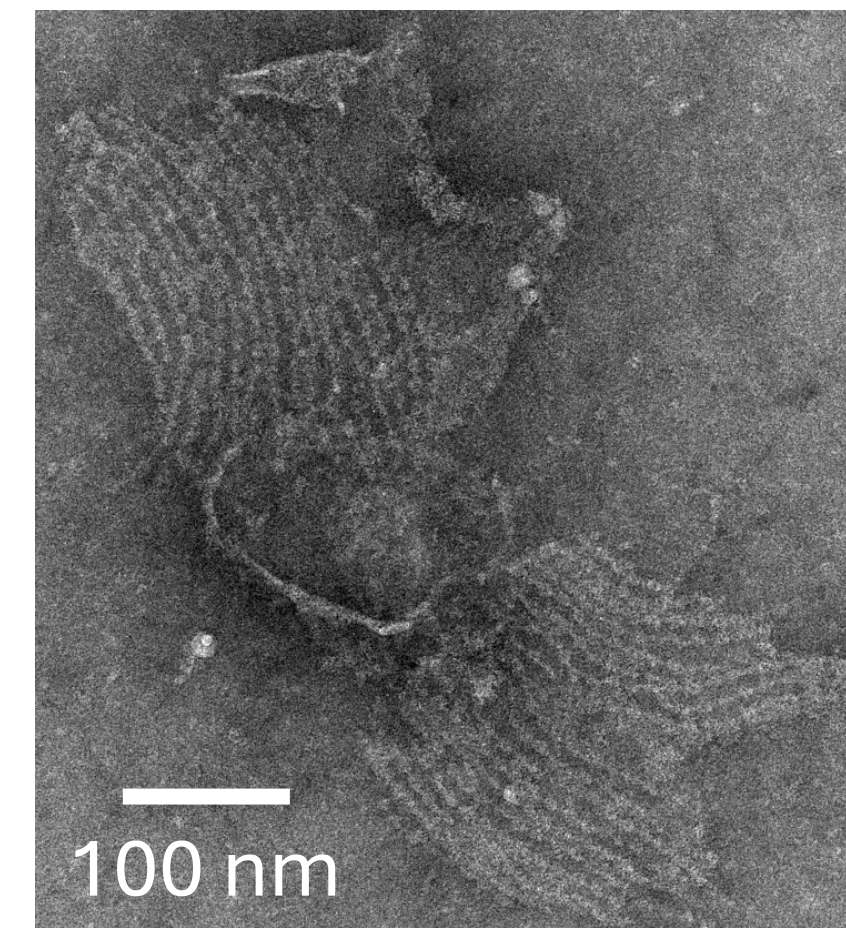
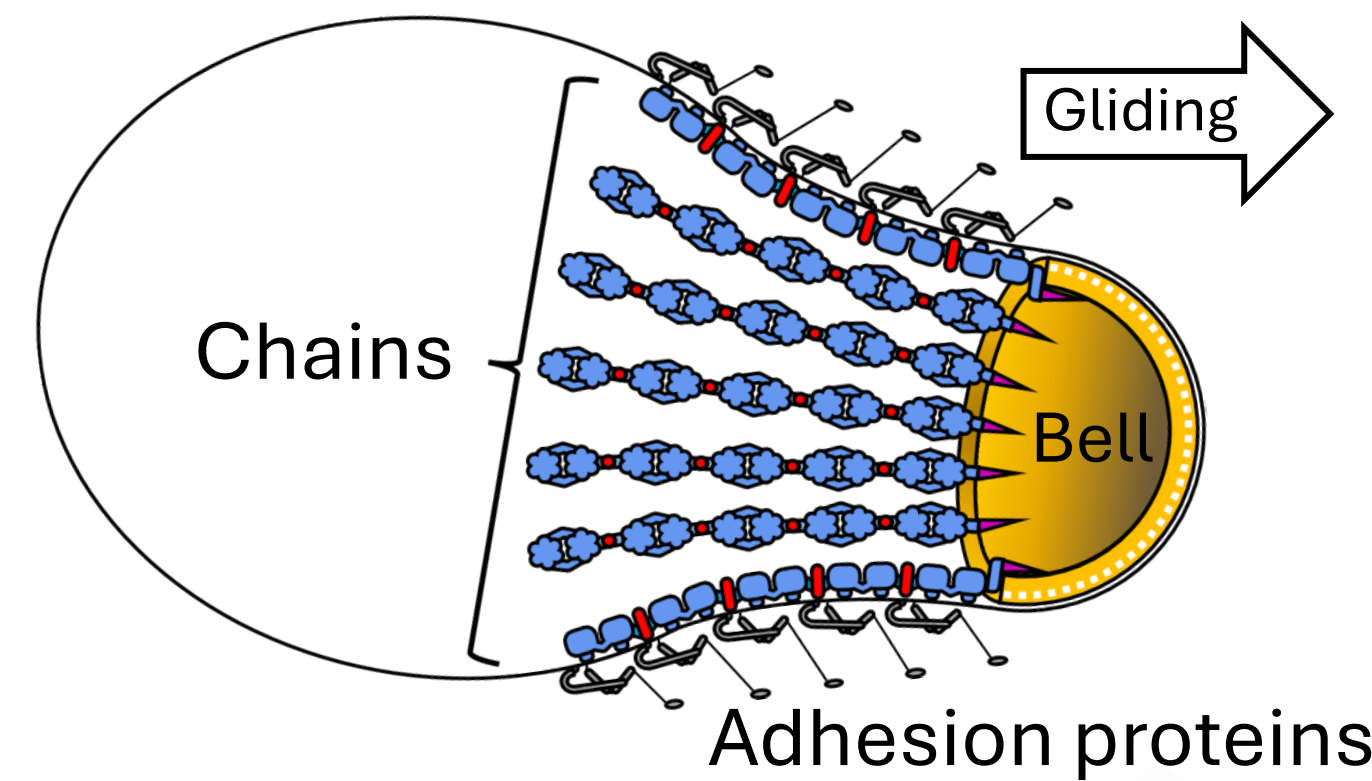
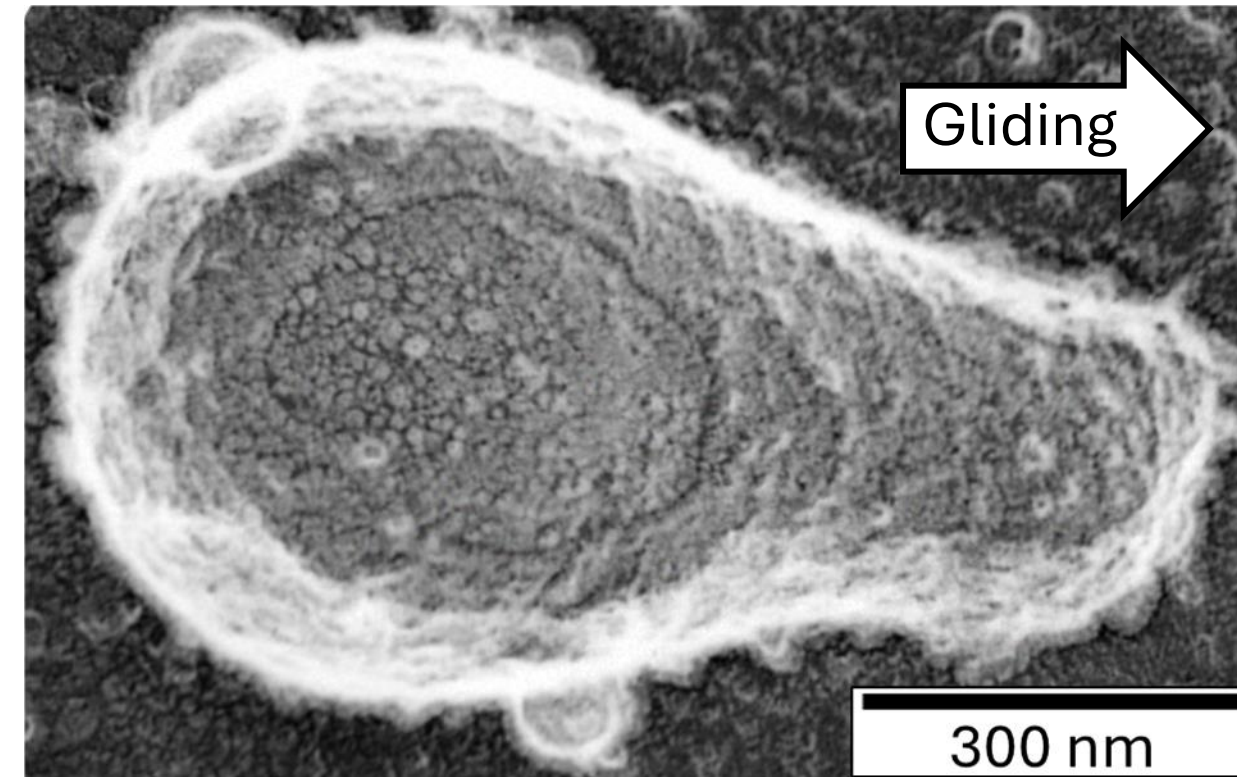
Gliding machinery of *Mycoplasma mobile* analyzed by cryo-electron microscopy

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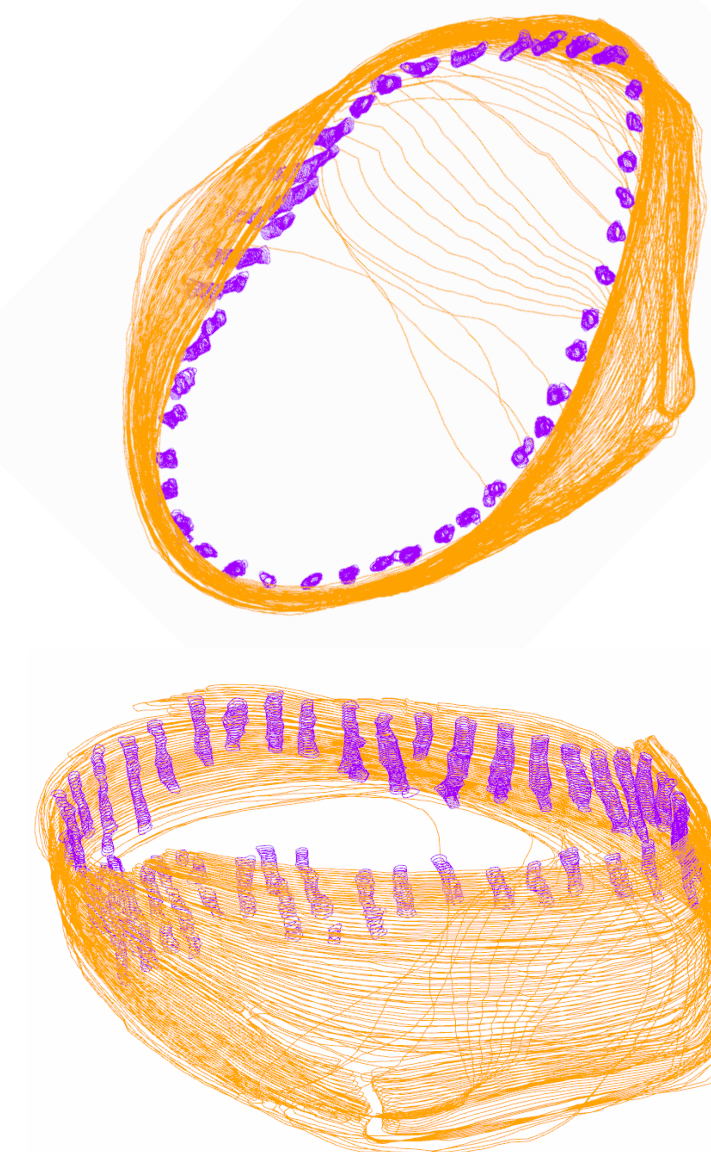
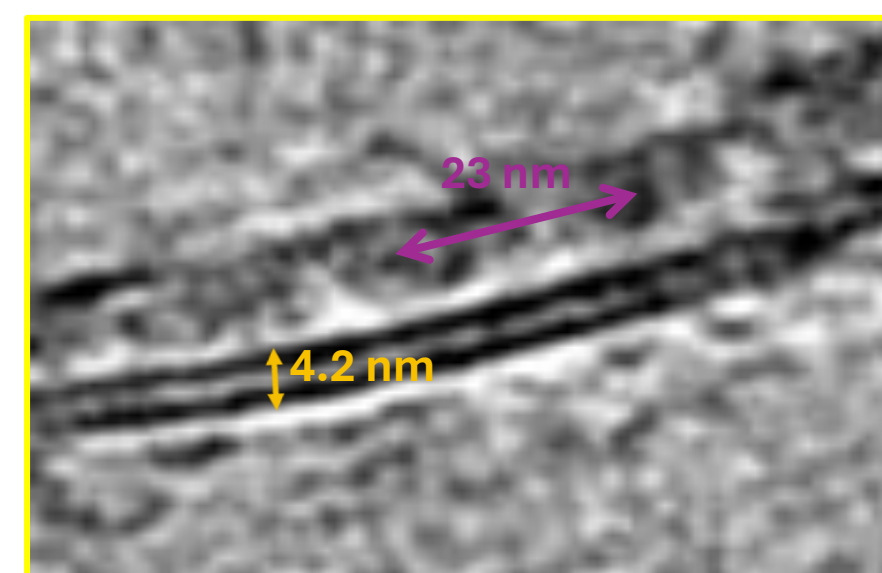
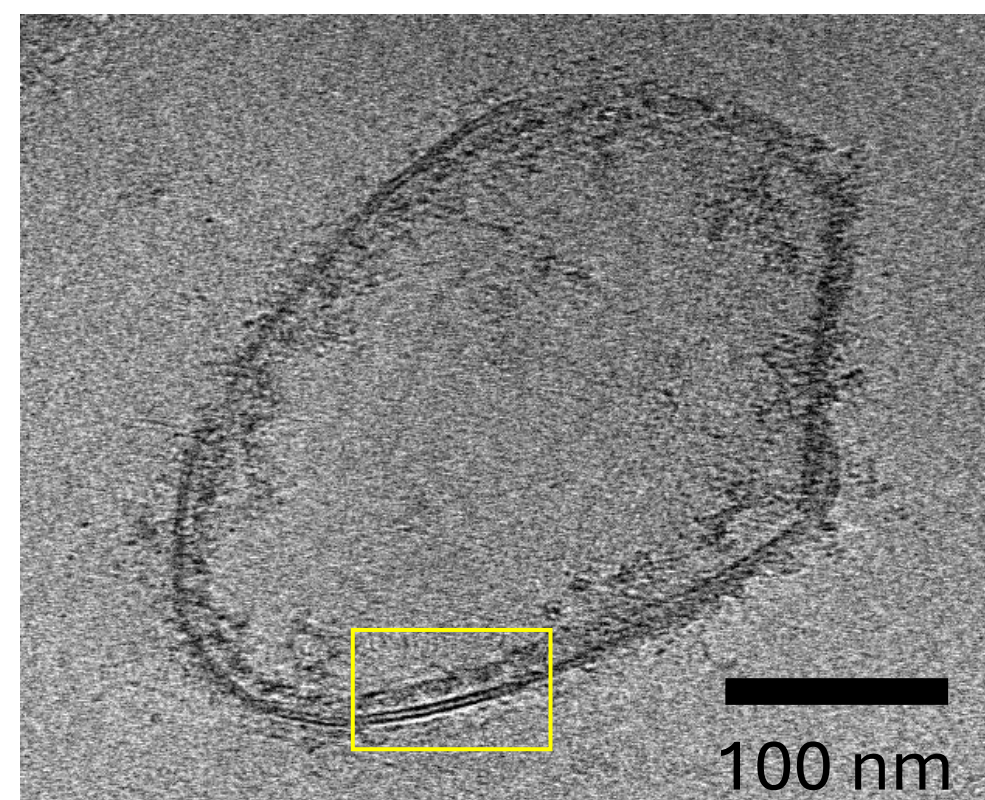
Introduction

Mycoplasma mobile

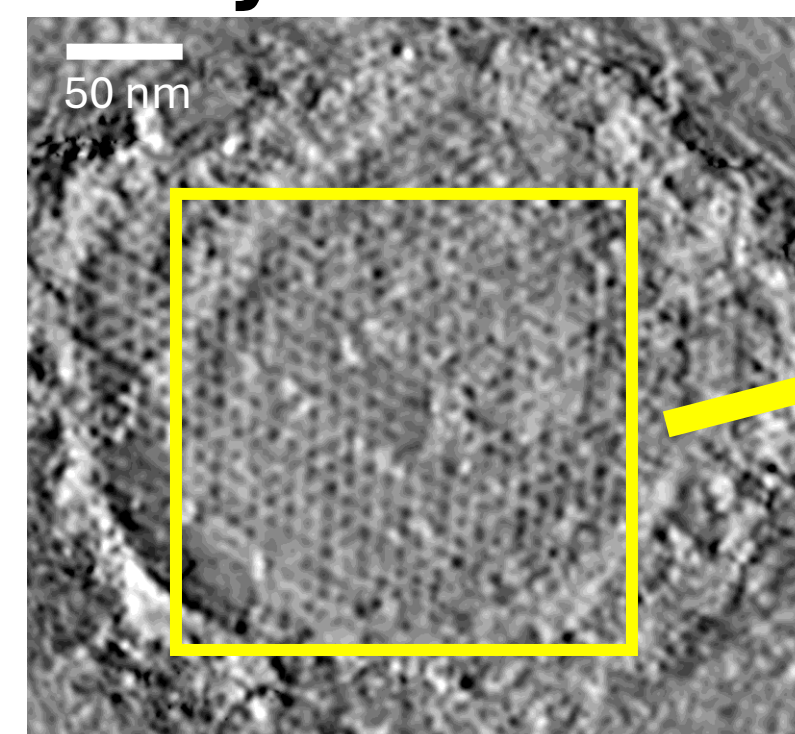


- Parasitic bacterium
- Expand the infectious range through gliding motility
- Has a unique machinery for gliding
- Gliding machinery consists of a bell, chains of gliding motors and surface proteins

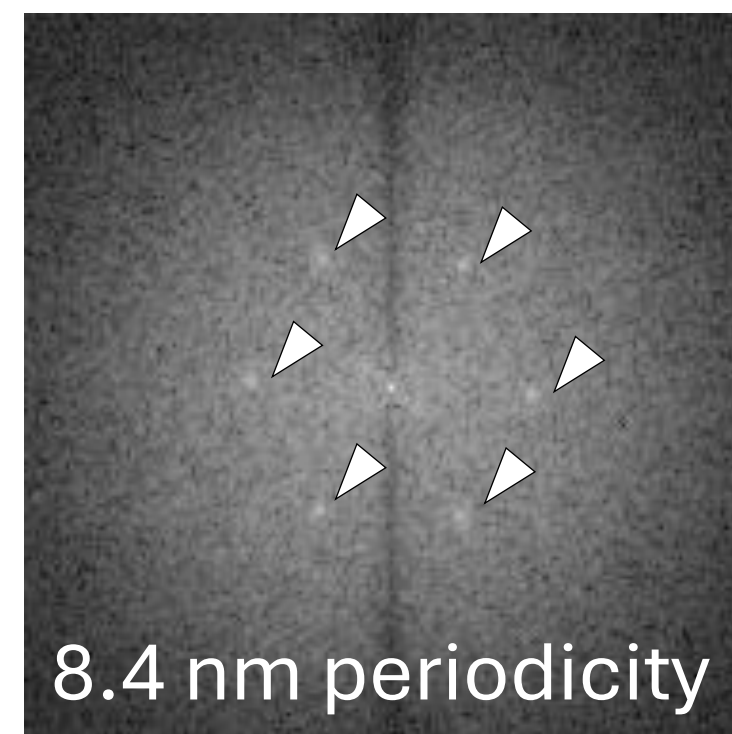
Bell: bowl-shaped structure



Honeycomb structure of bell surface



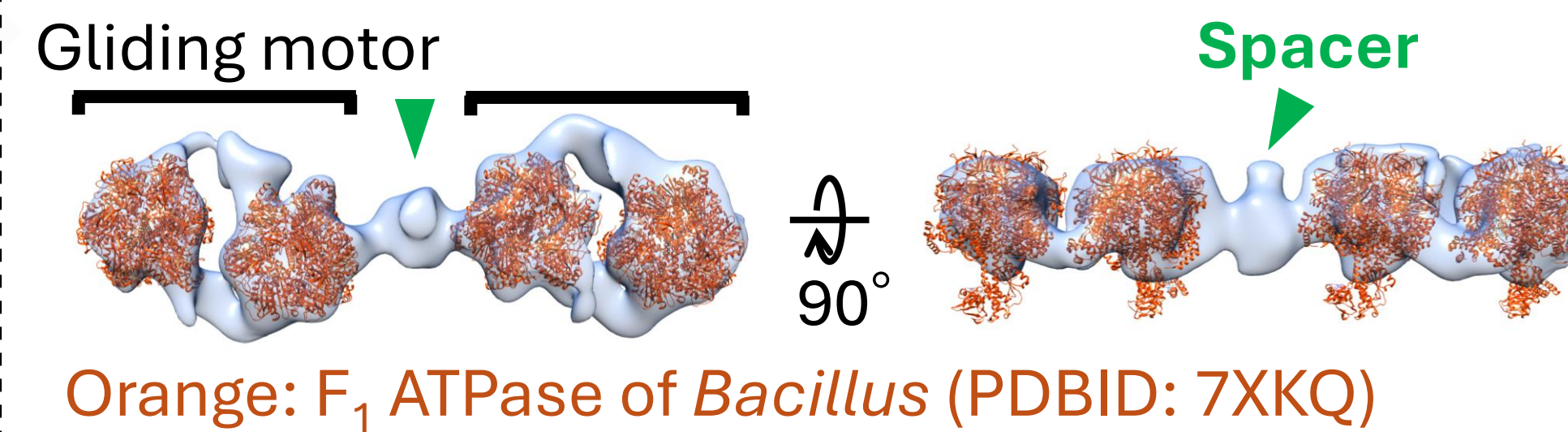
FFT



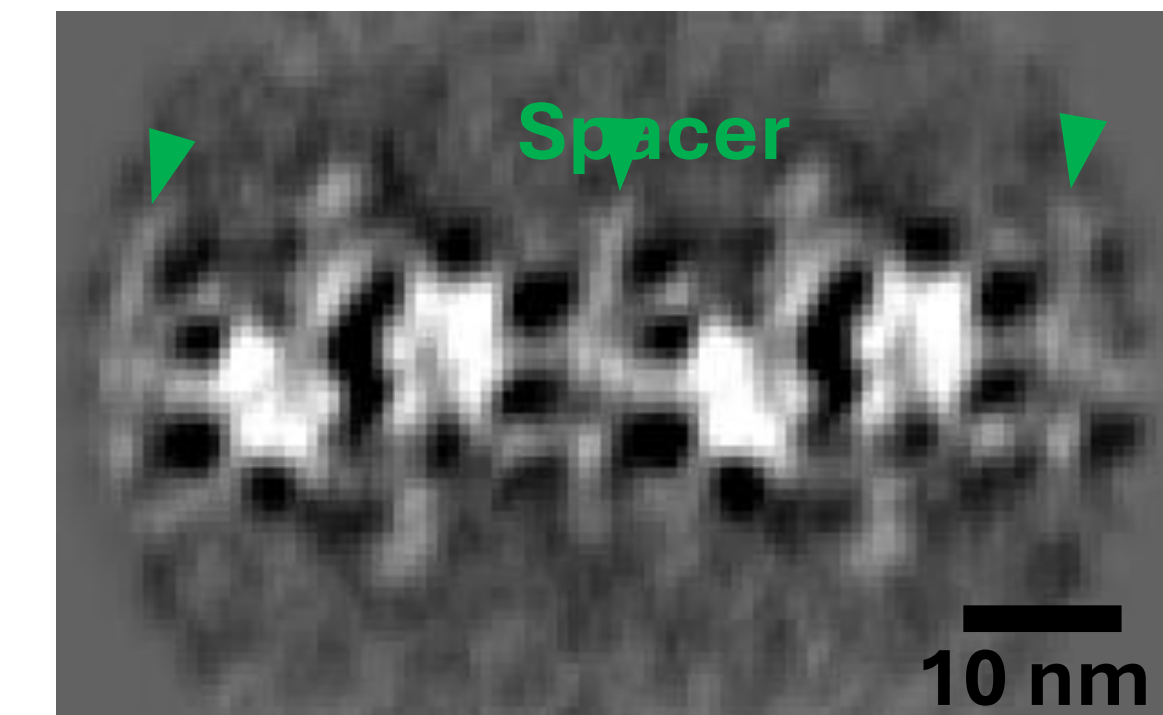
Wedge structures (purple) connects the bell and chains

Gliding motor chain is a repetitive structure

Negative staining EM

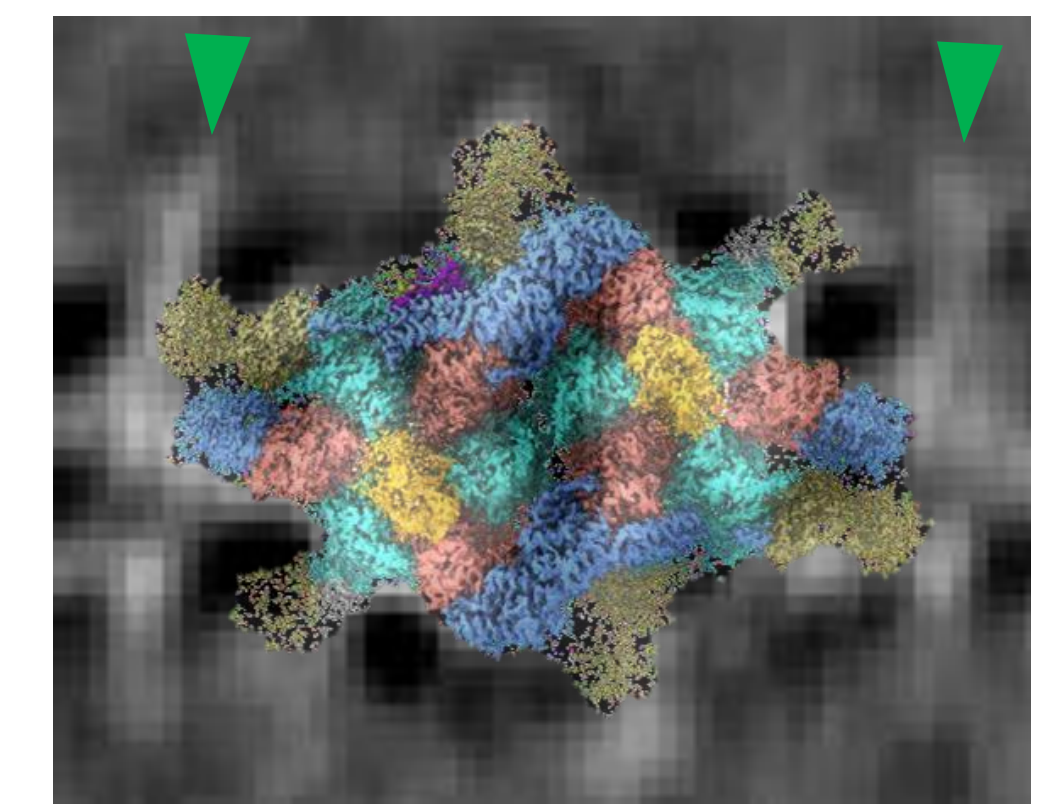
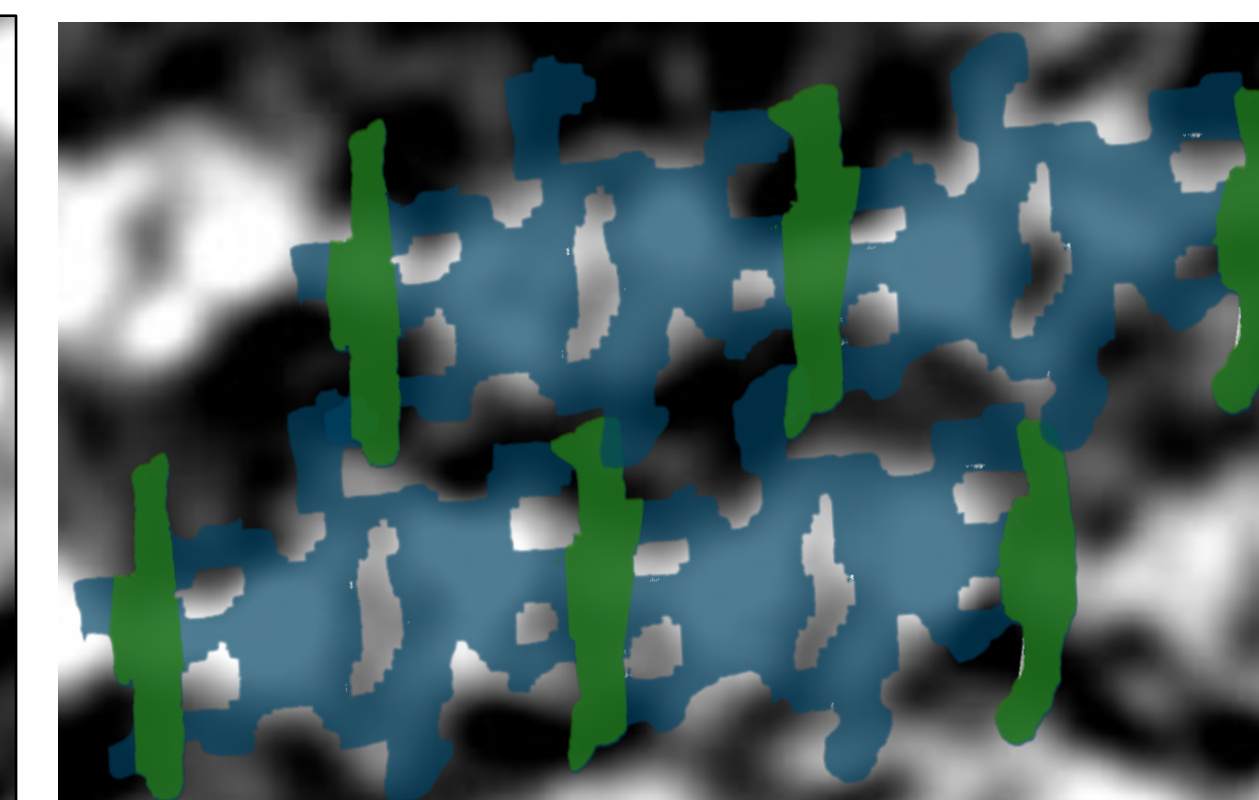


cryoEM

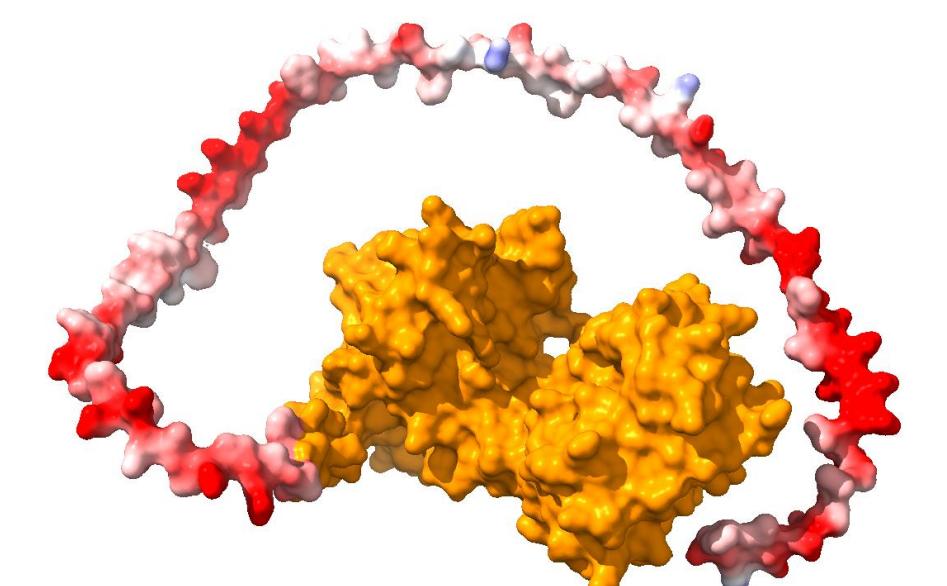


Spacer involved in forming sheet structure

Flexible linkers (blue arrowheads) and spacer (green) connect and form sheet structure



Red: Negatively charged residue
Blue: Positively charged residue



MMOB4530 (phosphoglycerate kinase)
predicted by AlphaFold3

References

1. Kobayashi K, Koder N, Kasai T, Tahara YO, Toyonaga T, Mizutani M, Fujiwara I, Ando T, Miyata M. Movements of *Mycoplasma mobile* Gliding Machinery Detected by High-Speed Atomic Force Microscopy. *mBio*. 2021, Vol. 12, e00040-21.
2. Fukushima M, Toyonaga T, Tahara YO, Nakane D, Miyata M. Internal structure of *Mycoplasma mobile* gliding machinery analyzed by negative staining electron tomography. *Biophys Physicobiol*. 2024, Vol. 21, e210015
3. Toyonaga T, Kato T, Kawamoto A, Miyata T, Kawakami K, Fujita J, Hamaguchi T, Namba K, Miyata M. Dimeric assembly of F1-like ATPase for *Mycoplasma* gliding motility. *bioRxiv*. 2024, 2024.06.11.597861