



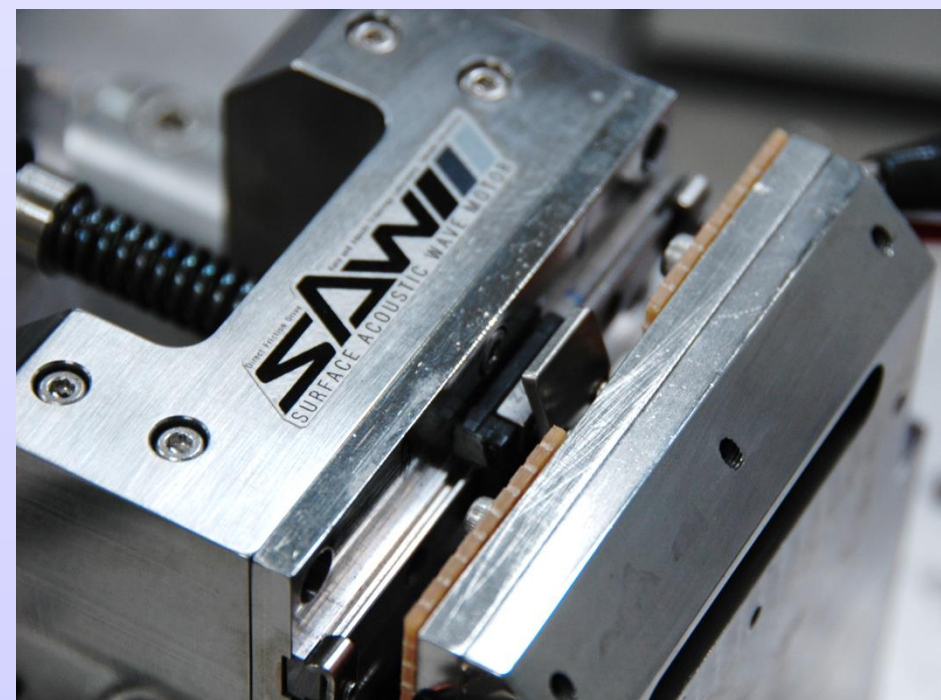
Koshi ADACHI Motoyuki MURASHIMA

Adachi/Murashima Laboratory

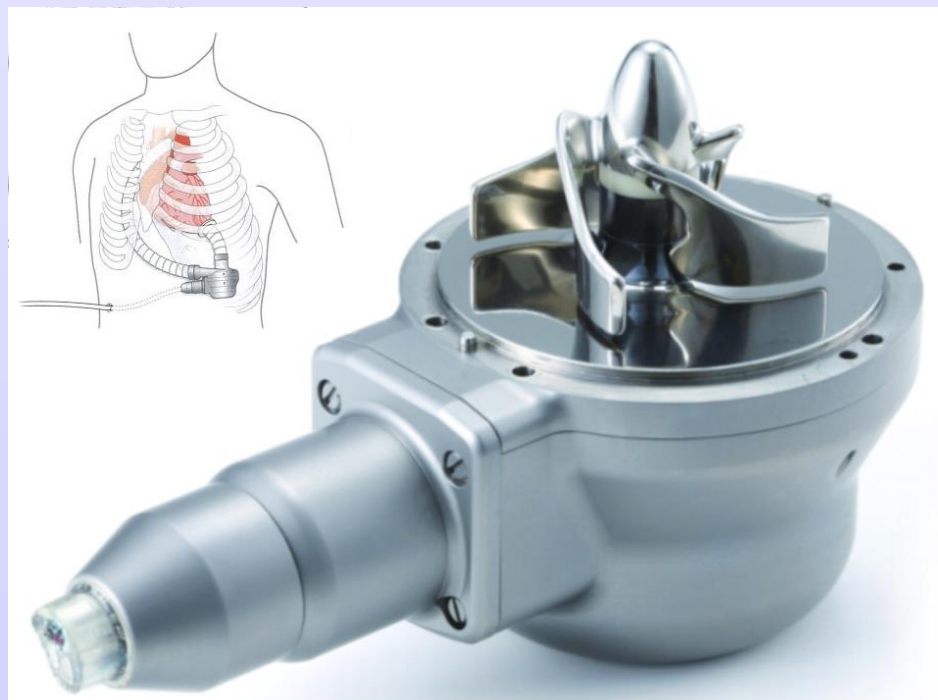
Laboratory of Tribology and Nanointerface Engineering
Department of Mechanical Systems Engineering
Graduate School of Engineering, Tohoku University
**Creation of Advanced Mechanical Systems
through Control of Nanointerface**

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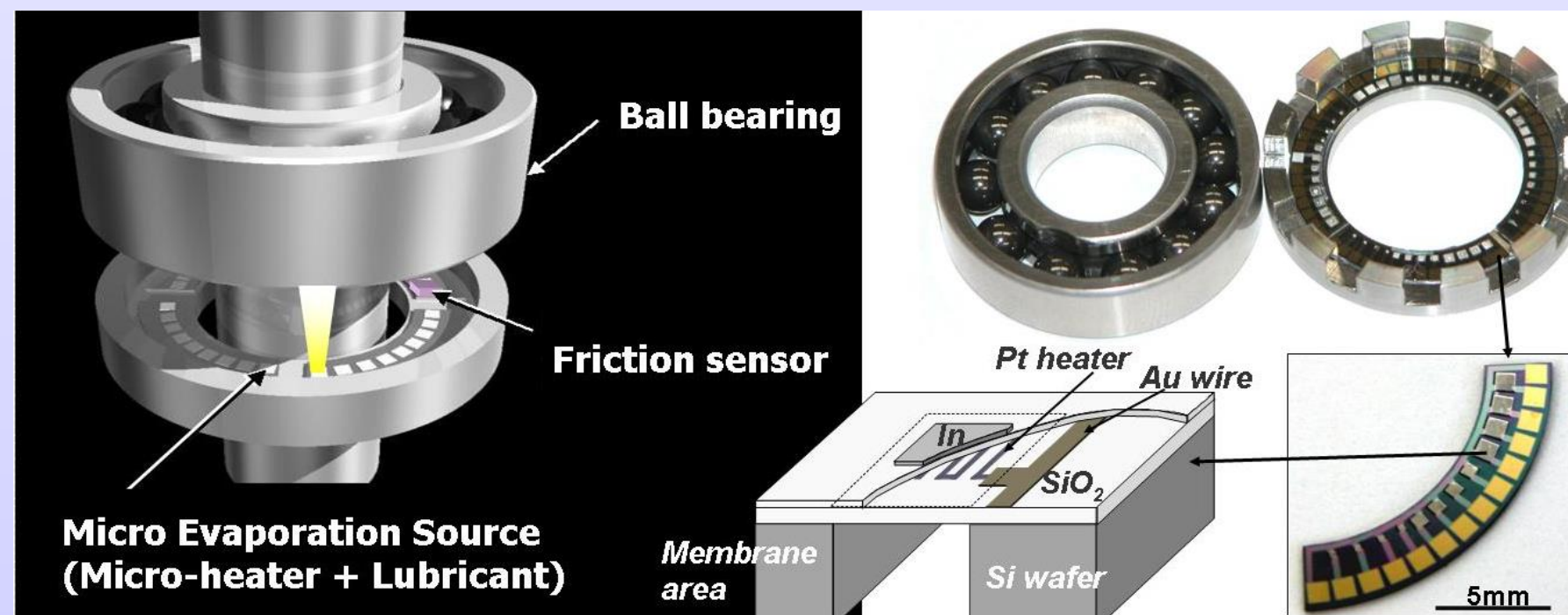
**High Speed, High Precision
Mechanical Systems**



**Next Generation
Medical Devices**



**High Reliability, High Durability Mechanical Systems
(Next Generation Self-Repairing Systems)**

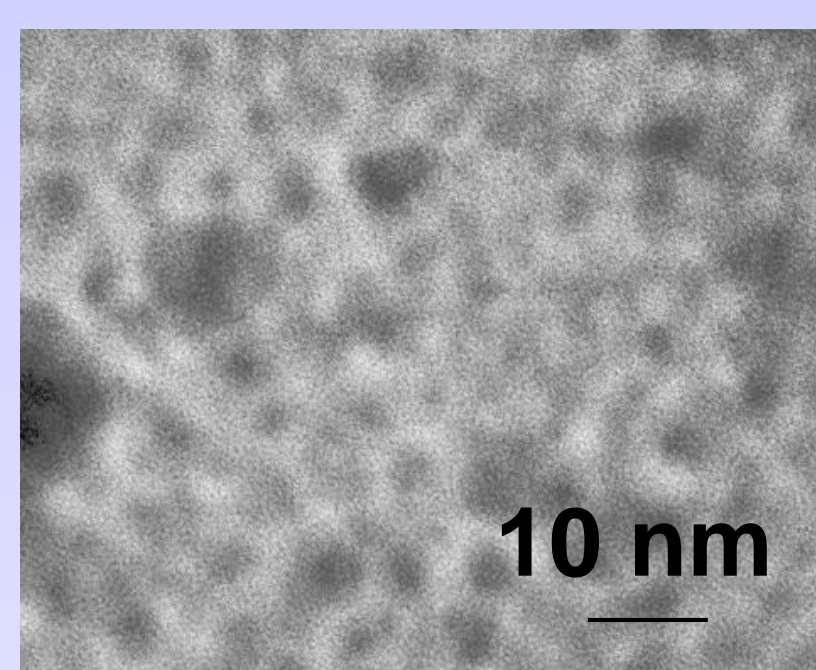


**Ultra Low Friction
Mechanical Systems**

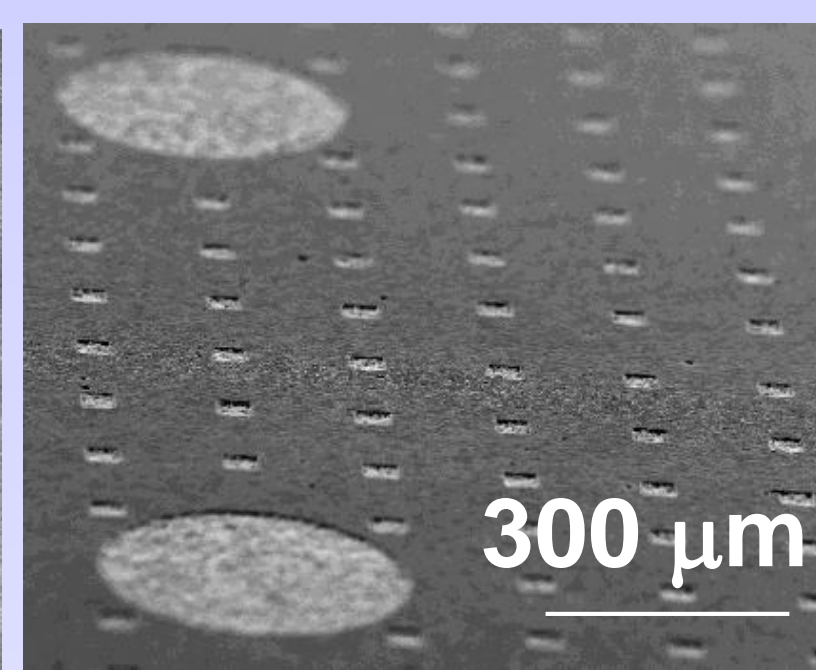


**Optimization Technology of Nanointerface (Highly-functionalized Surface/Interface)
and Tribologically-based Machine Design**

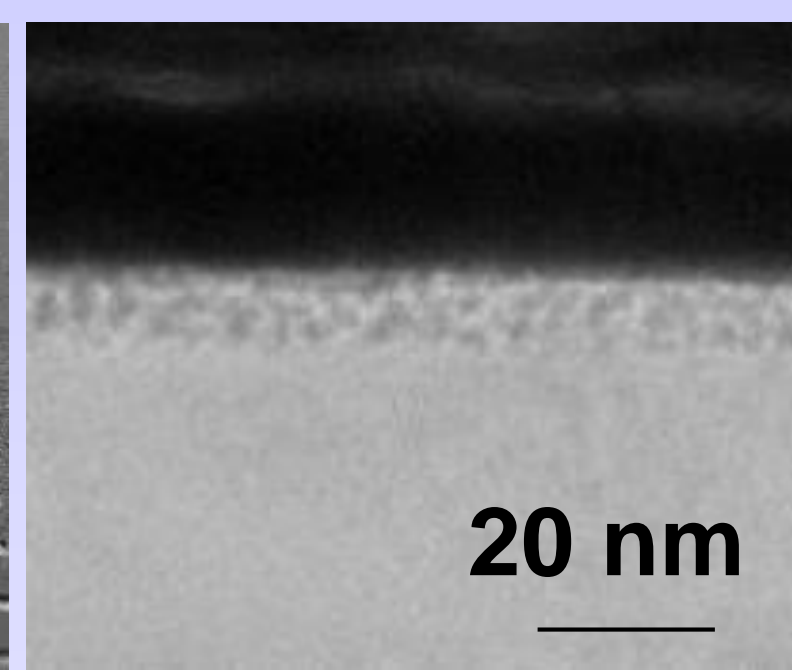
for Creation of Highly Functionalized, Environmentally Friendly Mechanical Systems



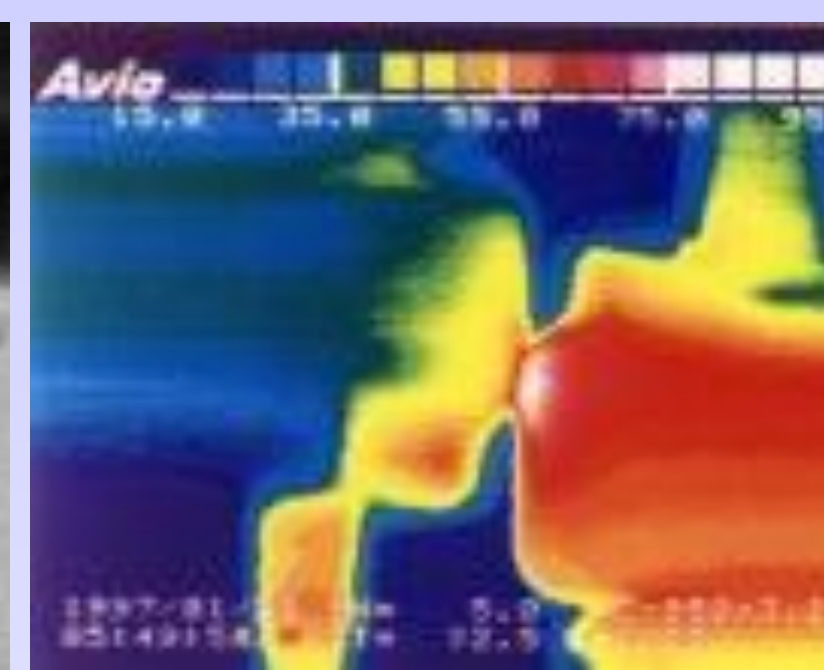
**Control of
Nano-structure**



**Control of
Surface Texture**



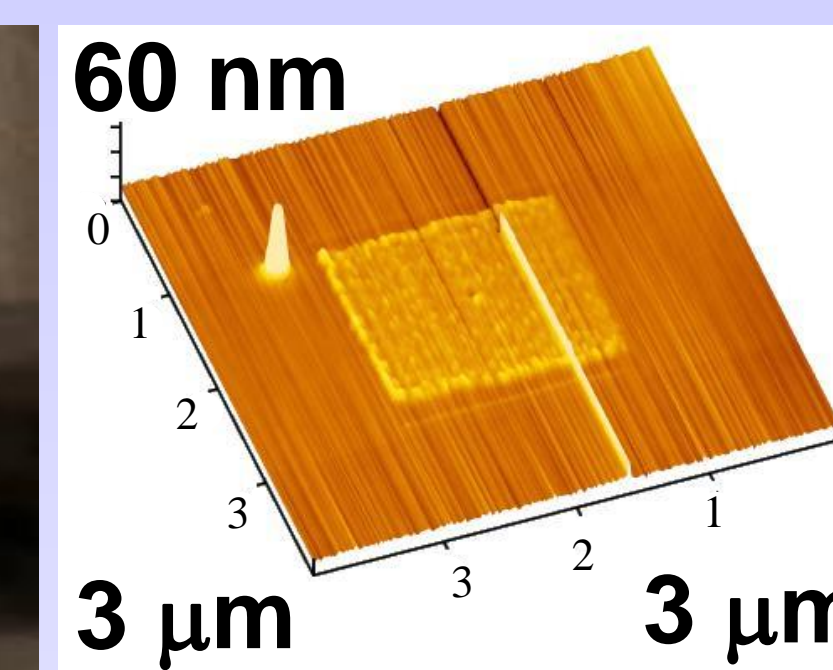
**Control of Frictional
Chemical Reactions**



**Control of
Frictional Heating**



**Control of
Micro-Plasma**

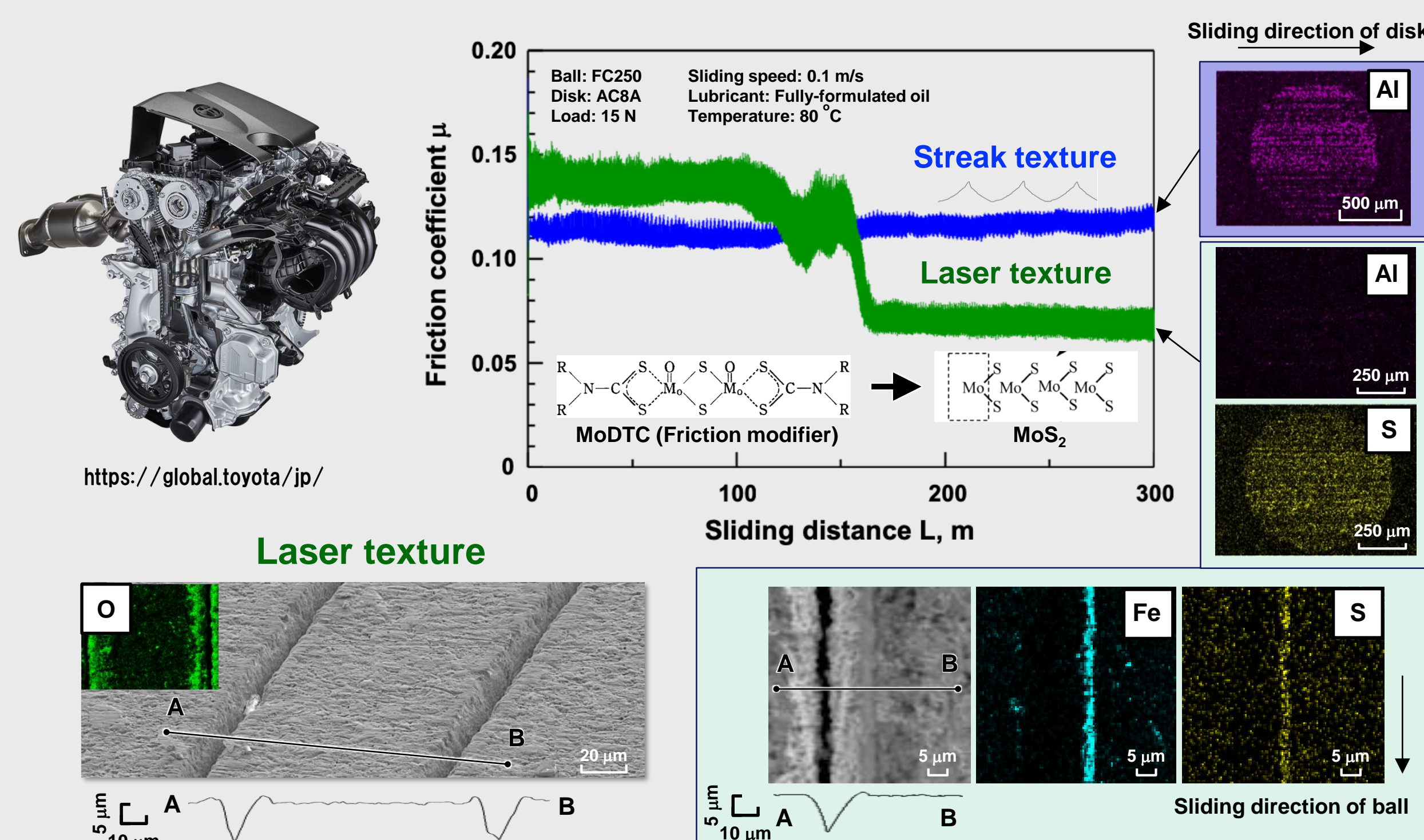


**Control of
Additive Molecules**

**Self-healing Low Frictional Technology
for Environmentally-friendly Engine Systems**

-Design for Highly-Efficient and Reliable Mechanical System-

Surface texture for running-in control realizes reliable and low friction system

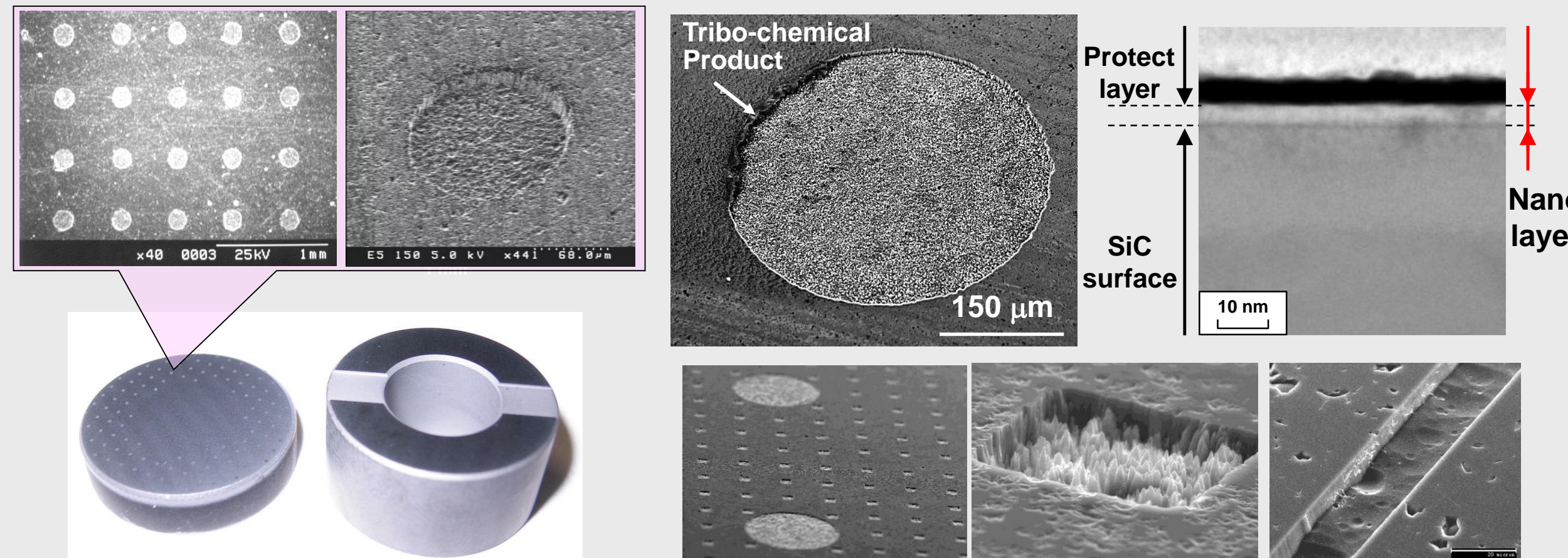


**Surface texture enhances formation of tribochemical products
by suppression of aluminum adhesion**

**Creation of Surface and Interface for Low Friction
-Design of Environmental-Friendly Mechanical System-**

Water or Nitrogen Gas Realizes Oil Free Mechanical System

Formed surface texture



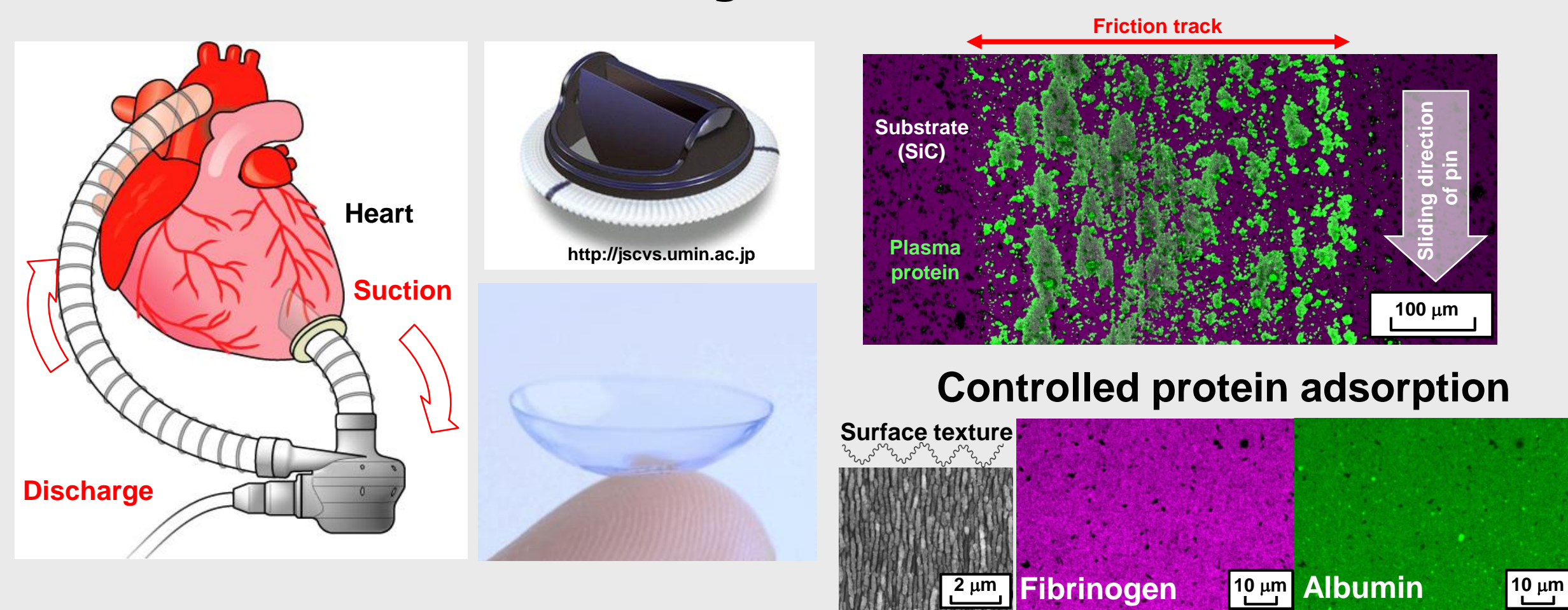
**Low friction ($\mu=0.0002$) is realized in water lubrication
under contract pressure of 20 MPa
by combined surface texture on SiC**

**Thin hard coating and controlled environment realizes
low friction
($\mu=0.004$) under dry lubrication**

**Self-formation of Low Frictional Protein Film
for Next-generation Assistant Heart**

-Design for Improvement of QOL-

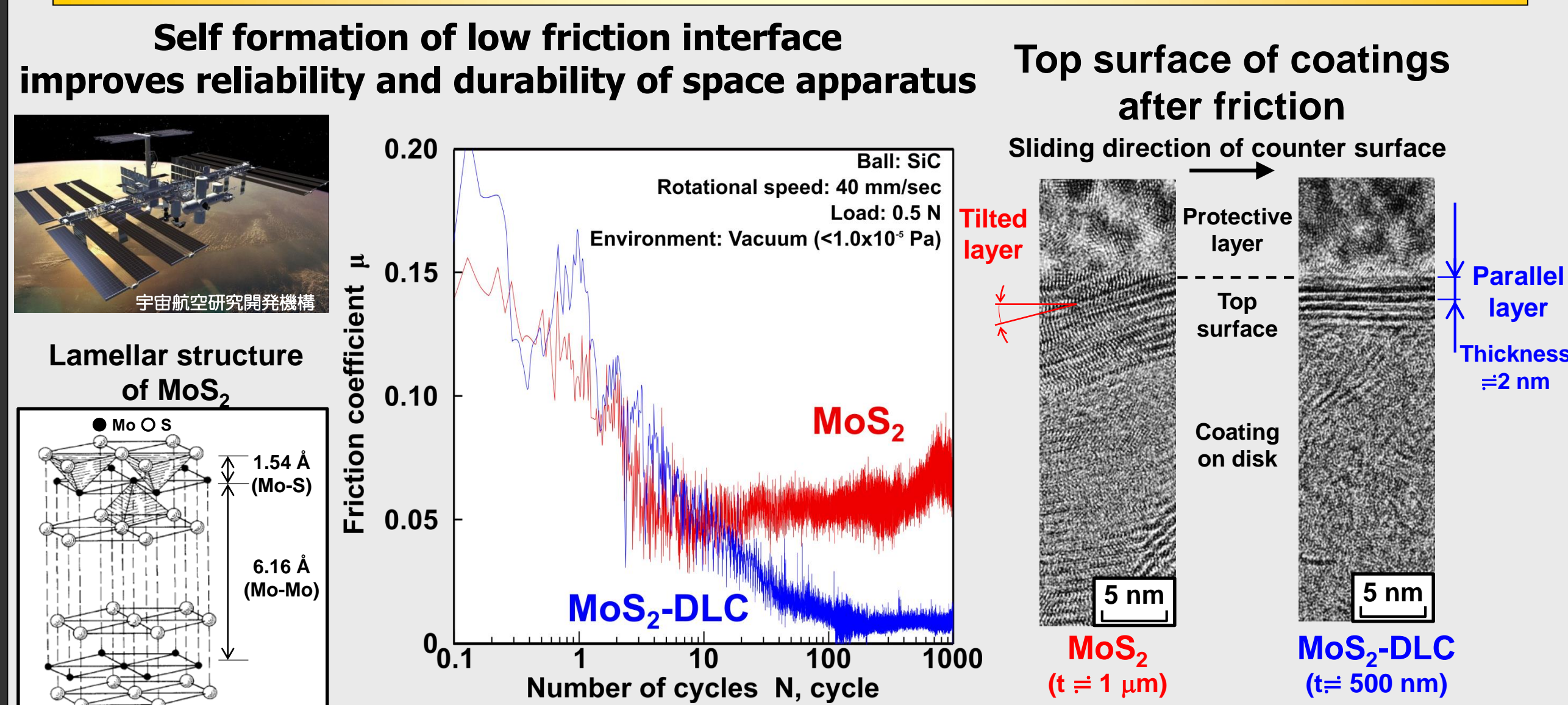
Controlled protein adsorption realizes highly-functionalized
and reliable next-generation medical device



**Design of interface based on protein adsorption control
realizes low and stable friction in blood environment**

**Development of Ultra-low Frictional Coating in Vacuum
for Highly-reliable Space Mechanisms**

-Design of Self Healing Low Friction System-



**Dispersed soft metal in carbon hard coating realizes
low friction coefficient (<0.05) in vacuum condition**

For details about these or other themes, please visit our website. <http://www.tribo.mech.tohoku.ac.jp>

