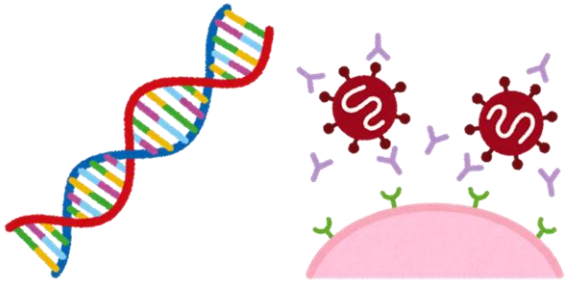
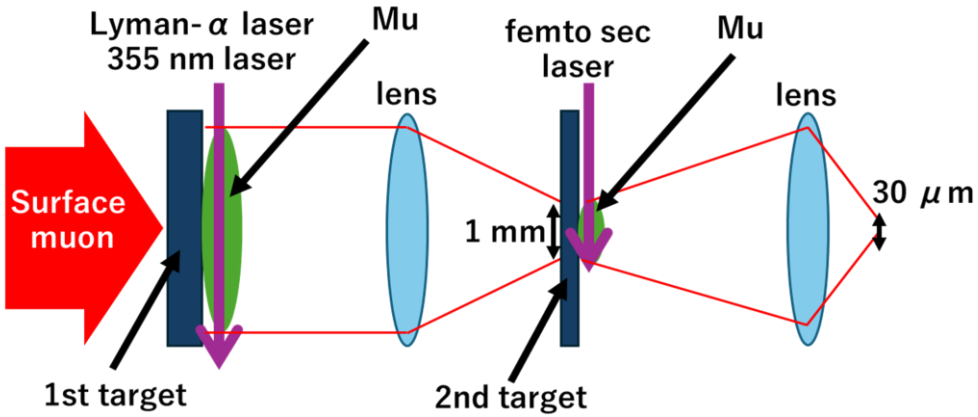
Development of the 2-stage Ultra-slow muon generation toward transmission Muon microscopes

Chikahiro Oobe Ibaraki Univ



TEM : viruses, DNA
(100 nm – μm scale)

TμM: cells, power devices
(10μm～cm)



2-stage generation of ultra-slow muon

Why

- TμM aims to observe cells & power devices
- Muons: 200× heavier than electrons → penetrate thick samples
- 1-stage USM generation: insufficient beam focus

Method

- 2-stage USM generation: Muon → Muonium → Ionization → USM → Re-injection
- Micro-hole aerogel + femtosecond laser

Goal

- Beam shrink: 1 mm → 30 μm
- Meet cyclotron injection

Outlook

- Preparing Femtosecond ionization
- Toward 2-stage genaration, smaller beams