Introduction of MeV-SIMS

Nuclear stopping process
- Incident Energy (MeV)
- Nuclear Collision
- MeV Beam
- Desorption
- Electronic Excitation

Electronic stopping process
- MeV Beam
- Fragmentation
- Secondary ion yield

Conventional SIMS
- keV Beam
- Electronic Stopping
- MeV Beam
- Nuclear Stopping

MeV-SIMS Imaging System at Kyoto University

MeV-SIMS Imaging of Rat Cerebellum

MeV-SIMS allows to distinguish and separate different amino acids and fat components, and provide their precise position and composition within the sample, in very good agreement with the optical image.

Ion Yield Requirement for Molecular Imaging of µm level lateral resolution

Summary

- High secondary ion yields of molecules are realized with swift heavy ions. (>10^3 times)
- High mass resolution (M/ΔM>6000) is realized.
- Molecular imaging of lipids with µm spatial resolution is demonstrated by using swift heavy ion.