Ion beams of various ion species and ion energy range have been successfully used for surface and interface analysis utilizing sputtering and scattering.

In this presentation, I will summarize our recent progresses in bio-SIMS and TOF-MEIS. A newly developed time-of-flight (TOF) medium energy ion scattering (MEIS)/Direct Recoil (DR) spectroscopy will be described with an introduction to MEIS. With TOF-MEIS, we report quantitative compositional profiling with single atomic layer resolution for 0.5~3 nm CdSe/ZnS conjugated QDs and ultra shallow junctions of As and B implanted Si.

In contrast to the great success of dynamic SIMS for semiconductor analysis, we are still waiting for the breakthrough to open successful application of bio-SIMS to various biomedical applications. Recent progresses in gas cluster ion source and the on-going bio-SIMS activity at DGIST will be summarized.

Complementary use of TOF-MEIS and SIMS in various nano& bio technology will be discussed.