MIMS combines a new generation of Secondary-Ion Mass Spectrometry (SIMS) instrument with sophisticated ion optics, labeling with stable isotopes and quantitative image-analysis. Speakers will illustrate the use of MIMS to locate and measure the incorporation in subcellular domains of molecules labeled with stable isotopes: incorporation of $^{15}\text{N}$ l-leucine in cochlear structures; direct demonstration of nitrogen fixation, from gaseous $^{15}\text{N}$, in individual bacterial symbionts; transport of $^{13}\text{C}$-oleic acid within single lipid droplet in adipocytes.

**PERCENT $^{15}\text{N}$ INCORPORATION IN THE COCHLEA OF A MOUSE FED A DIET CONTAINING $^{15}\text{N}$ l-LEUCINE**