CAMECA
SCIENCE & METROLOGY SOLUTIONS

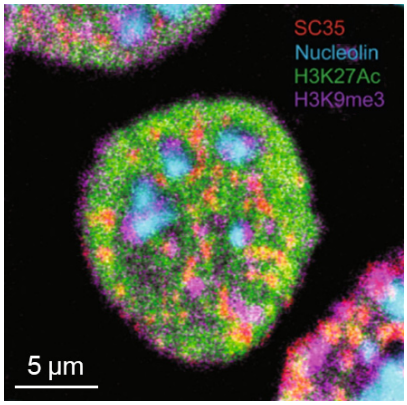
NanoSIMS 50L
Medical Biology Solutions

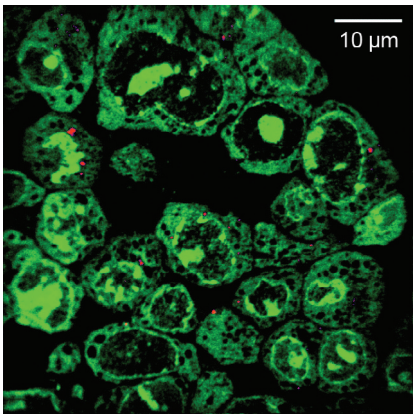
Sub-cellular structure

Sub-cellular localization of biomolecules and drug distribution: biomolecules of interest are stained with tagged antibodies carrying ^{19}F, ^{81}Br, ^{127}I or ^{197}Au.

NanoSIMS simultaneously detects the ^{9}F, ^{81}Br, ^{127}I or ^{197}Au to reveal the presence of the tagged biomolecules (here SC35, Nucleolin, H3K9me3, H3K27Ac molecules) with 50nm spatial resolution.

Xavier Rovira-Clavé et al., Nat Commun (2021)





Emerging therapeutics

Multi-Cellular Tumour Spheroids (MCTS) provide a complex 3D physiological environment filling the gap between in-vitro drug screening assays and in-vivo test in the drug development process. The kinetic and localization of 5 nm Si-bearing AGuIX-Cy5 nanoparticles within colorectal cancer cells (HCT-116) MCTS is unknown.

NanoSIMS reveals that the cytoplasm (visible with $^{31}P^-$ contrast in green) in HCT116 cells is loaded with Si-bearing AGuIX (as $^{28}Si^-$ in red).

Saba Goodarzi et al., Lab Chip (2021)

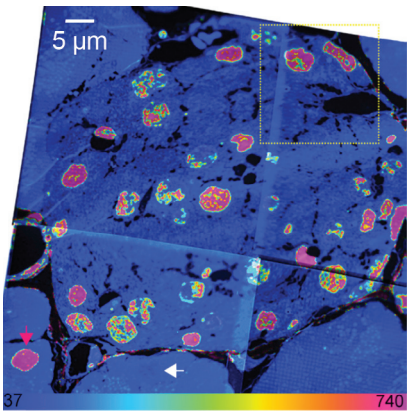
Cell ages

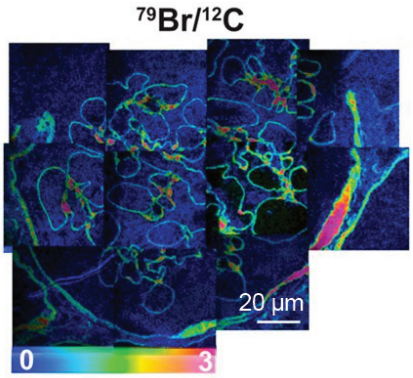
Adult mouse organs are mosaics of cells of different ages. ^{15}N-labelled feed mouse for days incorporated fresh ^{14}N (unlabeled) food.

NanoSIMS imaging reveals ^{15}N- rich old cells (pink arrow) and new ^{15}N-poor cells (white arrow) on the islets of Langerhans.

Pancreatic alpha, beta, and delta cells can be as old as the animal.

Rafael Arrojo e Drigo et al., Cell Metabolism (2019)



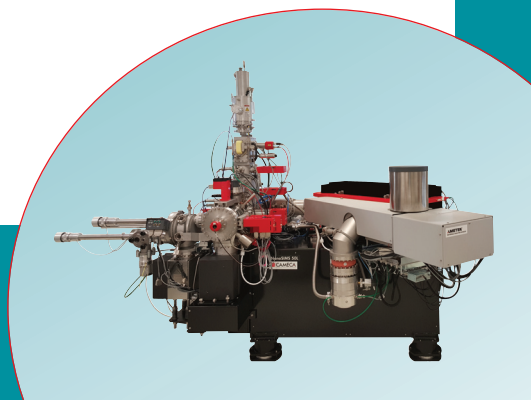


Cell membranes

Bromine and peroxidasin (an extracellular peroxidase) are essential for generating cross-links in collagen IV, a basement membrane protein.

NanoSIMS reveals Br is largely present in the basement membranes of normal human (figure) and mouse kidneys.

Cuiwen He et al., PNAS (2020)



AMETEK
MATERIALS ANALYSIS DIVISION

cameca.info@ametek.com
www.cameca.com