

# **Soft X-ray transmission and emission microscopy with the TwinMic station at Elettra**

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The TwinMic soft X-ray transmission and emission spectromicroscope is multipurpose instrument synergizing several imaging modes including full-field imaging and scanning microscopy with contrast modalities as bright-field, differential phase and interference contrast. Most recent achievements demonstrating the capabilities of the TwinMic soft X - ray spectromicroscope at the Elettra synchrotron radiation facility in tissue, cellular or subcellular analysis are based on imaging with low - energy X - ray fluorescence spectroscopy and micro - spot X - ray absorption spectroscopy. Selected results will represent research fields including biotechnology, biomaterials, food science and nanotoxicology, neuroscience and clinical medicine. They will illustrate new insights into the morphology and compositional enrichment, distribution and correlation of the elements resulting from growth of plants under altered environmental or toxic conditions, concentration dependence of penetration of engineered nanoparticles in different cell organelles and changes in the nanoparticle chemistry inside the cells, chemical reaction of lung tissue in the presence of inhaled asbestos species, among others.