Institute for Bioengineering of Catalonia

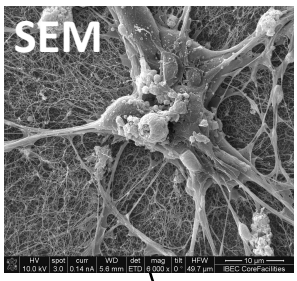
Microscopy

Core Facilities

Biological samples preparation for SEM

Aligned with our service of SEM, in the Microscopy Characterization Facility, we can pre-treat biological and insulating samples, for ultra high resolution inspection under electron microscopy.

Biological samples, with a defined mechanical structure in liquid environment, need to be processed before SEM, to preserve their integrity under the high vacuum conditions of electron microscopy inspection.



Chemical fixation service:
Process in which a fixing agent (Glutaraldehyde, Formaldehyde, etc.) penetrates into tissue/cells and combines covalently with their major biochemical constituents (lipids, proteins, carbohydrates, etc.), fixing them into place. This process also increases the mechanical strength and stability of the sample for next inspection.

Dehydration service:
Water removal from samples is necessary prior SEM studies. However, air drying results into the collapse of the biological structure, being necessary to substitute it by an organic solvent (generally ethanol or acetone), compatible with further drying processes.

Critical Point Drying service:
Process of evaporating the liquids of a biological sample by crossing the thermodynamical critical point of the liquid. In these conditions, the surface tension of the liquid is minimum, and removal of the liquid can be done preserving the mechanical structure of the sample. In this process ethanol or acetone are substituted by liquid CO_2, which is taken to its critical point to be eliminated from the sample in gaseous state.

Gold coating service:
A thin conductive film (gold at the Microscopy Characterization Facility) is sputtered on surfaces with poor conductivity, allowing imaging at ultra high resolution.

www.ibecbarcelona.eu/corefacilities microscopy@ibecbarcelona.eu

Aquest equip ha estat cofinançat en un 50% pel Fons europeu de desenvolupament regional en el marc del Programa operatiu FEDER de Catalunya 2014-2020

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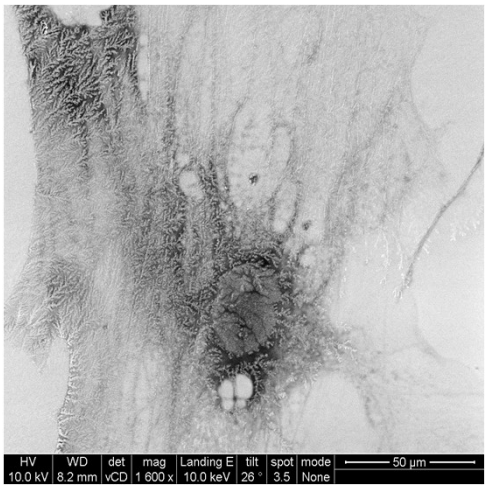
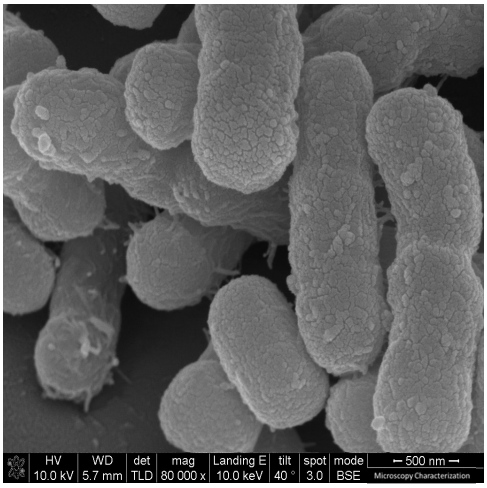
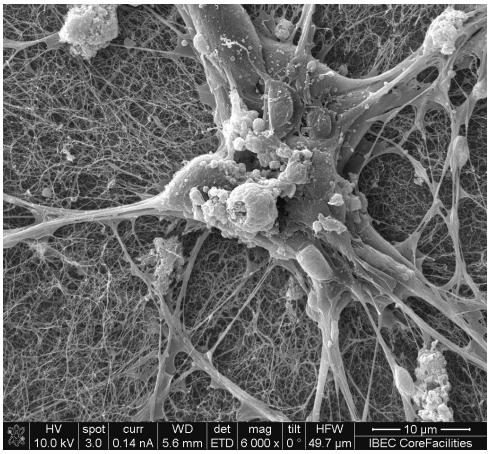


Cell chemically fixed and dehydrated on glass. Low vacuum SEM analysis.

Bacteria chemically fixed on surface, dehydrated and finally covered by a 10 nm thick layer of gold. High vacuum SEM analysis (ultra high resolution).





Human neuron cell on hydrogel, dehydrated, dried by critical point method and finally covered with a thin layer of gold (10 nm).
Sample provided by Dr. Zaida Álvarez, leader of the Biomaterials for Neuronal Regeneration group of IBEC

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