

Variable Pressure Scanning Electron Microscopy and dual Energy Dispersive X-Ray Spectroscopy VP-SEM-dEDS

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SAPIENZA
UNIVERSITÀ DI ROMA

**«Presentazione alla
Comunità Sapienza delle Grandi
Attrezzature di Ateneo»**
13 maggio 2019, Aula Magna del Rettorato



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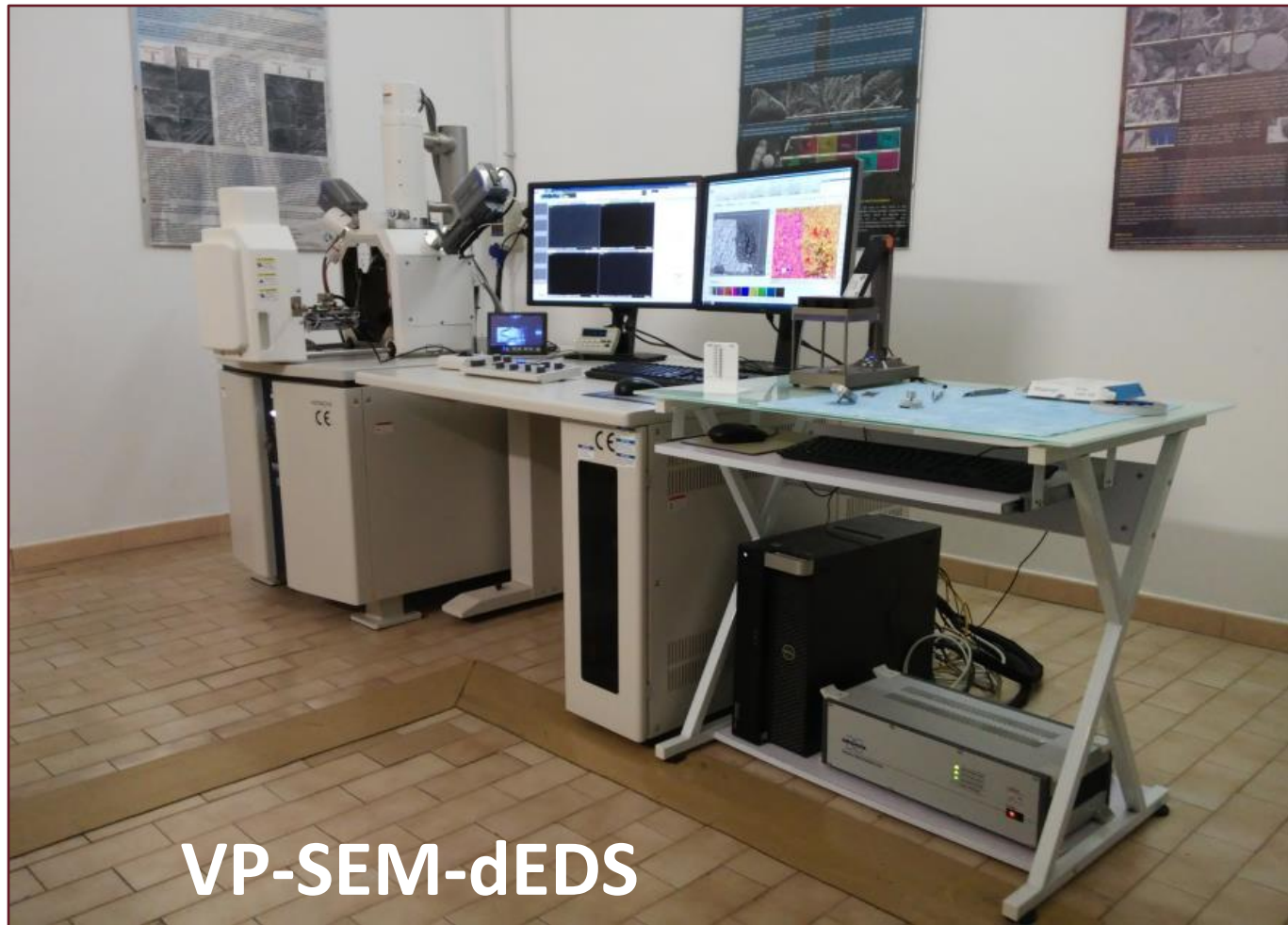
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**Variable Pressure Scanning Electron Microscopy
and dual Energy Dispersive X-Ray Spectroscopy
VP-SEM-dEDS**



Variable Pressure Scanning Electron Microscopy (Hitachi SU3500) and dual Energy Dispersive X-Ray Spectroscopy (Bruker XFlash® 6|60)



Variable Pressure Scanning Electron Microscopy
and dual Energy Dispersive X-Ray Spectroscopy
VP-SEM-dEDS



46 Participants in this proposal belonging to the following Departments of :

- ☐ Anatomical, Histological, Forensic Medicine and Orthopedics Sciences
- ☐ Biochemical Sciences "Alessandro Rossi Fanelli"
- ☐ Chemical Engineering Materials Environment
- ☐ Chemistry and Technology of Drugs
- ☐ Classics
- ☐ Clinical Medicine
- ☐ Clinical and Molecular Medicine
- ☐ Earth Sciences
- ☐ Experimental Medicine
- ☐ Gynecological and Obstetric Sciences and Urological Sciences
- ☐ Internal Medicine and Medical Specialties
- ☐ Medico-Surgical Sciences and Biotechnologies
- ☐ Public Health and Infectious Diseases
- ☐ Oral and Maxillo-Facial Sciences
- ☐ Radiological Sciences, Oncology and Anatomical Pathology
- ☐ Surgical Sciences
- ☐ Surgery "Pietro Valdoni"



Grande Attrezzatura, Hitachi SU3500:

Source: Pre-centered tungsten filament

Variable Pressure: 6-650 Pa

High Vacuum Detectors: SE, BSE and Topographic BSE

Variable Pressure Detectors: UVD, BSE and Topographic BSE

Large Chamber with 10 ports: Maximum specimen size 20 cm

EDS Detectors: Bruker XFlash[®] 6|60, Large active area 60 mm²

Coolstage: Deben ULTRA -45° to +50° C



Hydrated biological and/or cells samples prepared in any Lab can be *directly imaged in their native state* on any type of supports (i.e. glass slide) by VP-SEM.

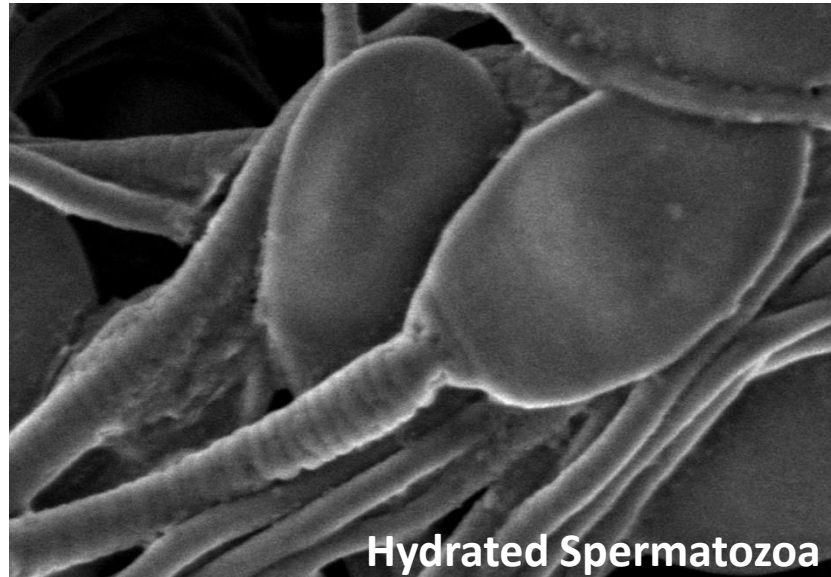
VP-SEM can solve challenges in visualization of *in situ* conditions using *correlative imaging* with optical, fluorescence, confocal, Raman and atomic force microscopy

Dual Energy Dispersive X-Ray Spectroscopy allows to identify the composition and spatial distribution of the chemical elements using two detectors with a large active area of 60 mm² in parallel configuration offering some advantages:

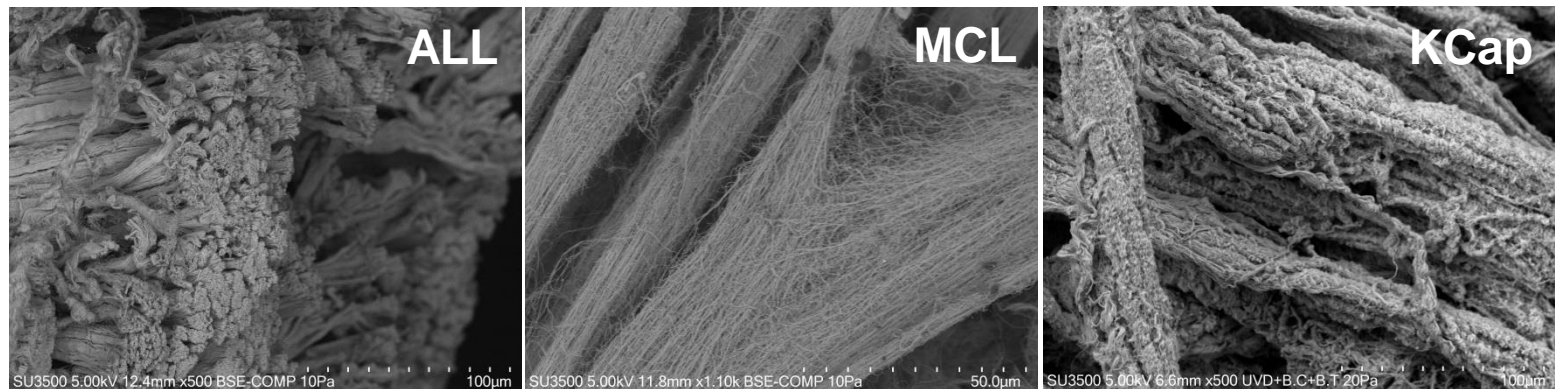
- ❖ Shorter acquisition times essential for surface-sensitive materials to the primary beam energy.
- ❖ Acquisition spectra with high count rates useful for resolving overlapping peaks and background corrections.
- ❖ Absence of Shadow effect needful for analysing samples with highly rough surface.

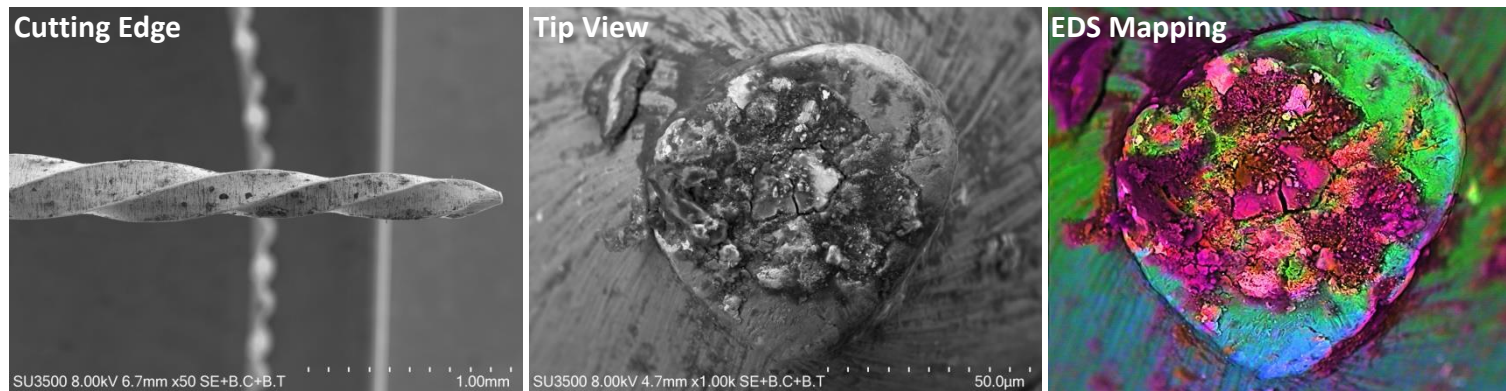


Morphological Characteristics of Hydrated Spermatozoa



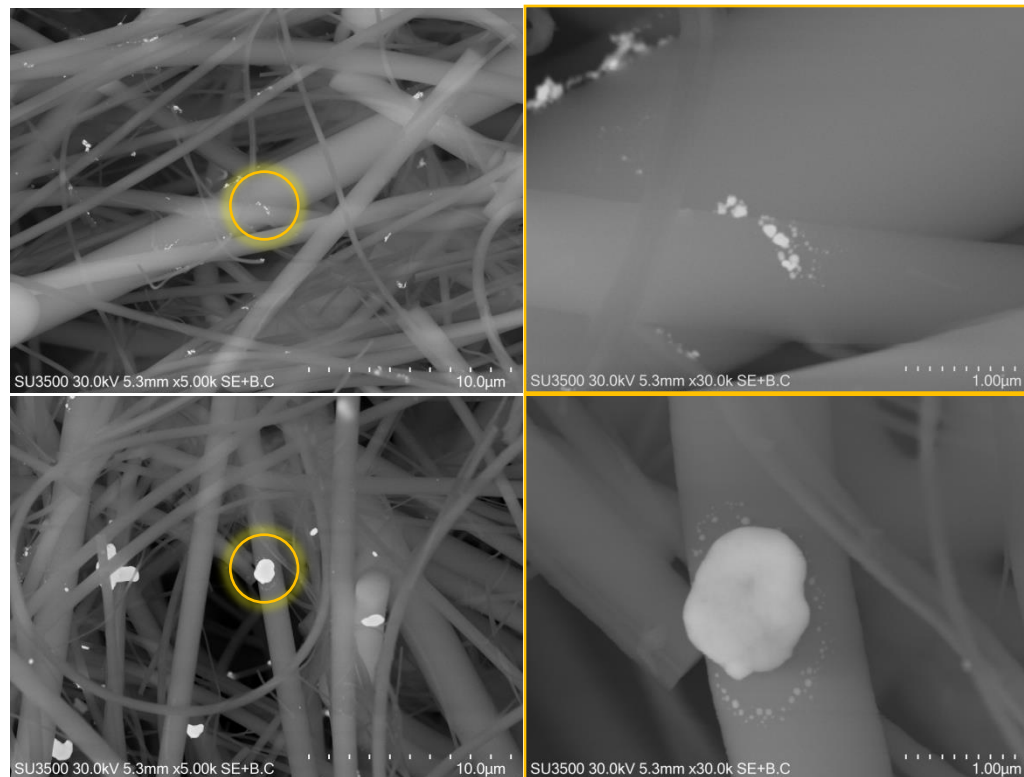
Human ligaments were dehydrated and digested in NaOH at room temperature for 3-10 days **without** metallic or conductive coating





Endodontic rotary alloy instruments for root canal configuration.





Sensing properties depend on the morphology, crystallinity and chemical composition of the functionalized Gold Nanoparticles deposited onto quartz fibers able to reveal very low concentrations of gaseous mercury



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