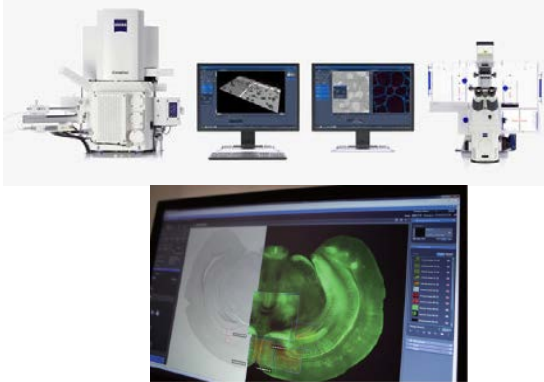


KBRI-ZEISS Joint Correlative Microscopy Workshop

- Correlative Microscopy between FE-SEM and LSM Introduction -

Correlative Microscopy



동일한 샘플 영역을 장비간 연동하여 분석하는 연구법으로, 광학 현미경과 전자 현미경, 나아가 X-ray 현미경과의 연동이 모두 가능합니다. 데이터를 상호 연관하여 선택한 관심영역(ROI)을 빠르고 쉽게 재배치하며 여러 현미경의 이미지 모드를 비교해 폭 깊은 샘플 정보를 획득합니다.

Workflow & Application



Sample Preparation

- Fixation
- Embedding
- Labeling



Mounting into Correlative Holder



Light Microscopy

- Widefield
- LSM, Superresolution



Sample Transfer



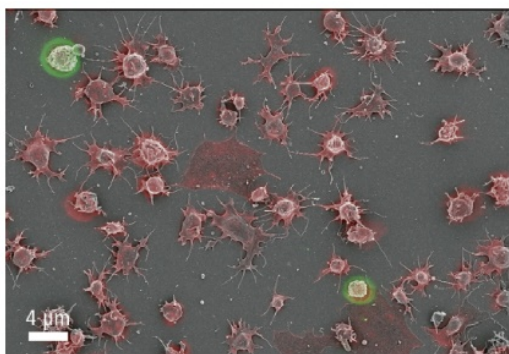
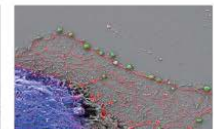
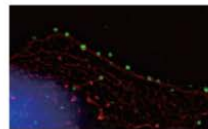
Electron Microscopy

- SEM
- FIB-SEM

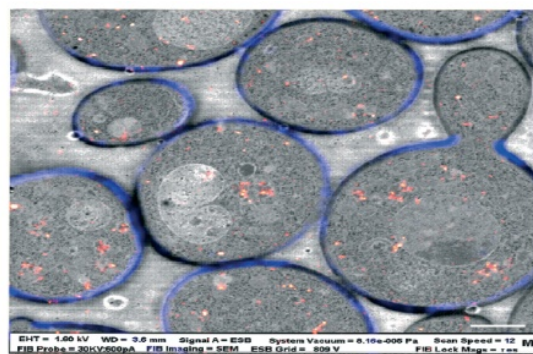


Evaluation & Analysis

- Correlation
- Image Processing



Platelets stained with AF647 (cellular platelet protein, green) and AF555 (Phalloidin, red). Shuttle & Find (LSM, GeminiSEM)



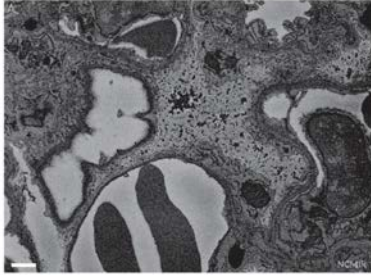
Yeast cells labeled at Calcofluor (blue) and G protein coupled receptor (red). Scale bar: 1 μm, Shuttle & Find (Elyra, Sigma)

ZEISS FE-SEM: GeminiSEM

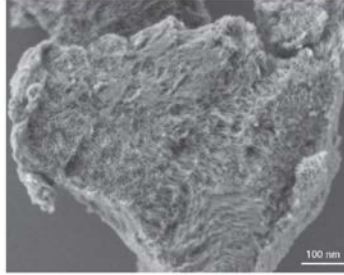


샘플의 Bias를 걸어주지 않아도 저전압에서 고해상도 이미지 구현이 가능한 GeminiSEM 모델은 기존 GEMINI 칼럼의 In-lens SE 보다 20배 높은 검출 기능을 보유하고 있습니다. 향상된 VP 기능으로 고진공 분석과 같은 결과를 냅니다.

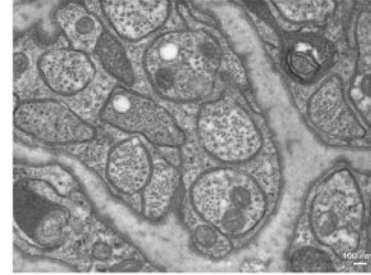
Application



Block face images of mouse lung tissue with Focal Charge Compensation. Scale bar: 1 μm



Mesoporous Silica, at 500V, Inlens SE detector, imaged with GeminiSEM 500



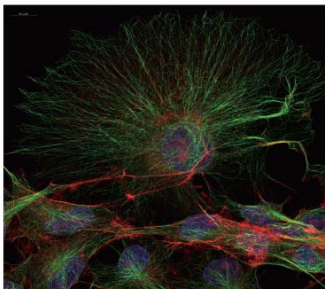
Mouse brain tissue, ultrathin section, STEM, brightfield, at 10kV

ZEISS LSM 900 with Airyscan 2

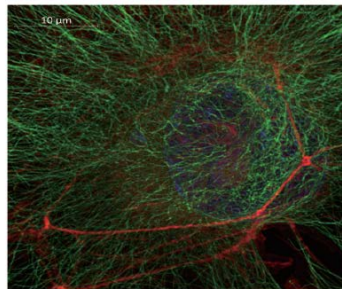


ZEISS 특허인 초고해상도 Airyscan 2 mode를 체험해 보세요. 큰 스케일 이미지도 Multiplex mode를 사용하여 매우 빠르게(초당 19 frame) 촬영이 가능합니다. 신호가 약한 샘플도 선명한 관찰이 가능하며 (Signal to Noise 비율 매우 우수) 초고감도 GaAsP detector(최대 3개)를 통해 샘플의 bleaching 및 photo damage를 최소화합니다.

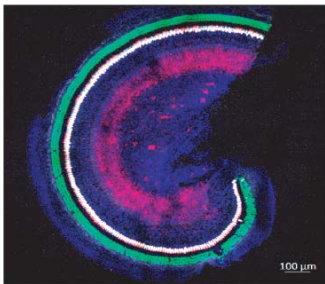
Application



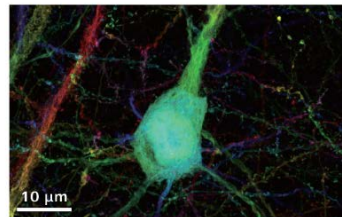
같은 시간동안 Multiplex 모드로 찍은 이미지(왼쪽)가 SR 모드로 찍은 이미지(오른쪽)보다 약 5배 빠른 속도로 초고해상도 이미지 촬영. 동일시간내 촬영되는 이미지의 양이 Multiplex 모드가 훨씬 많기 때문에 기존에 어려웠던 크기가 큰 샘플도 초고해상도 이미징 가능. COS7 cells with labelled microtubules (alpha-tubulin 488, green) and actin (phalloidin 568, red)



Section of a Thy1-YFP mouse brain. Thy-1(green) is involved in the communication of cells in their nervous. Image show a single neuron.



Large volume image: Mouse cochlea. Outer Hair Cells are green, Inner Hair Cells are red and grey



- 초고해상도 Large volume Imaging: 3D cells, Organoids, Tissue Section, Cleared sample, Model Organisms, Plant roots
- 초고해상도 Live-cell Imaging: Whole living embryo, Multi-labeled living cells, FRET, FRAP, bleaching experiment