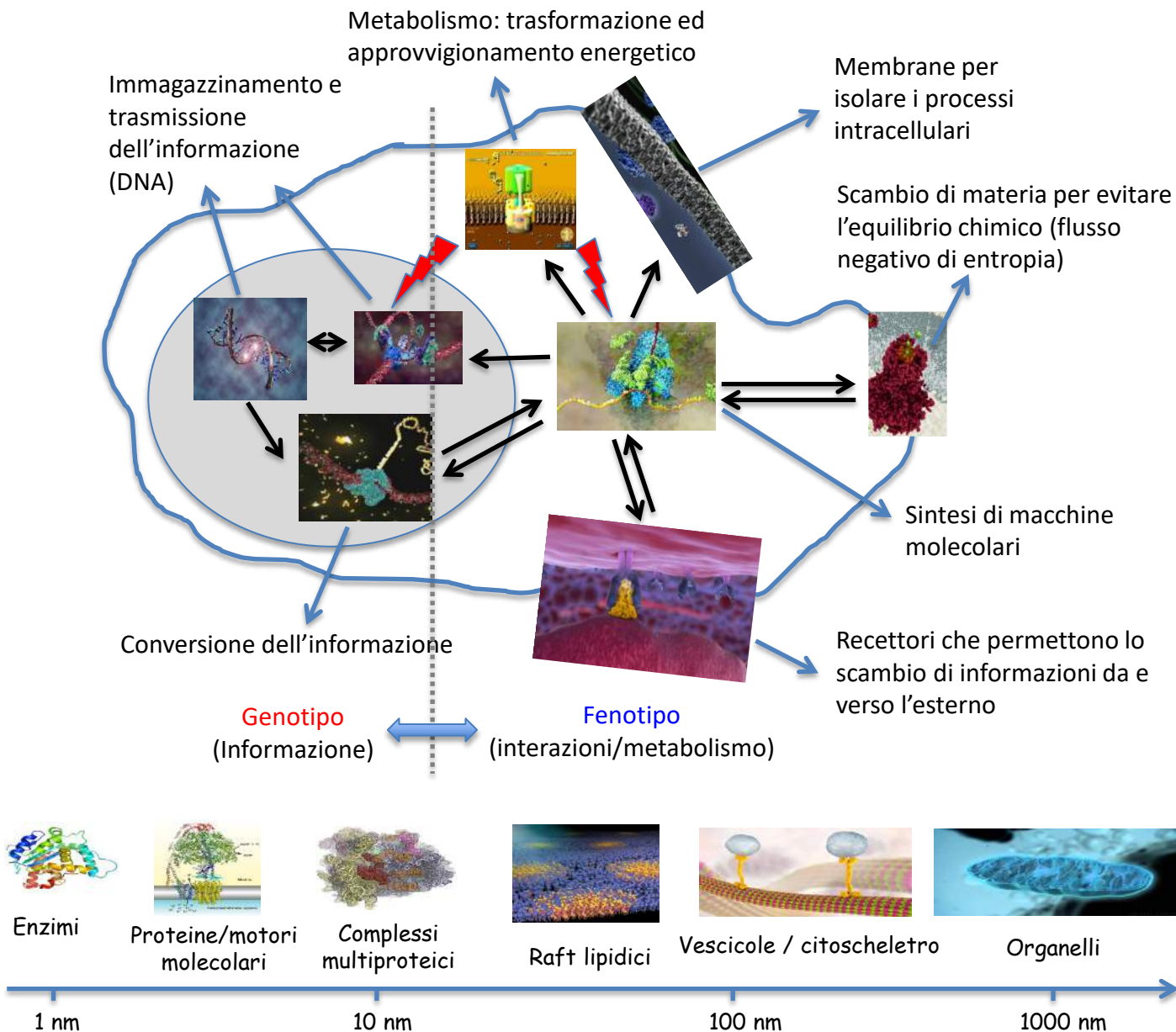




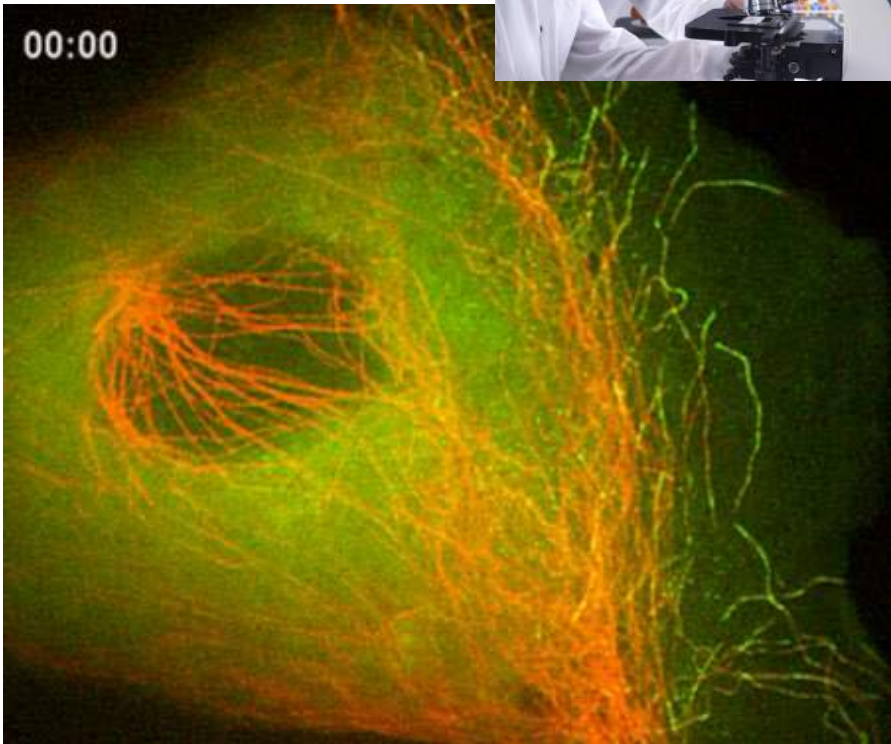
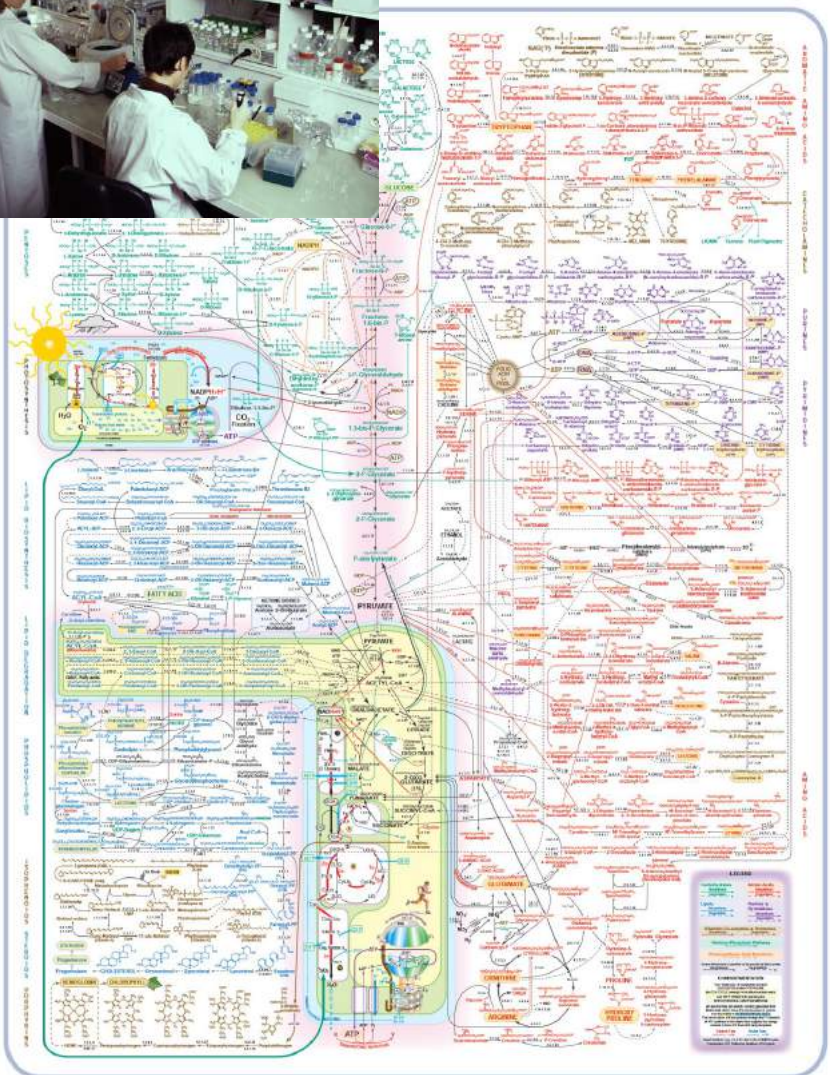
Zeiss 900 Airyscan

GIOVANNA BATONI, RANIERI BIZZARRI, SERENA DANTI,
MARIAGRAZIA DI LUCA, STEFANO FOGLI,
MASSIMO PASQUALETTI, VITTORIA RAFFA

CELL IS THE UNIT OF LIFE AND OPERATES AT MICRO/NANOSCALE



LIFE IS DYNAMIC: EX-VIVO AND IN-VIVO TECHNIQUES ARE SYNERGIC

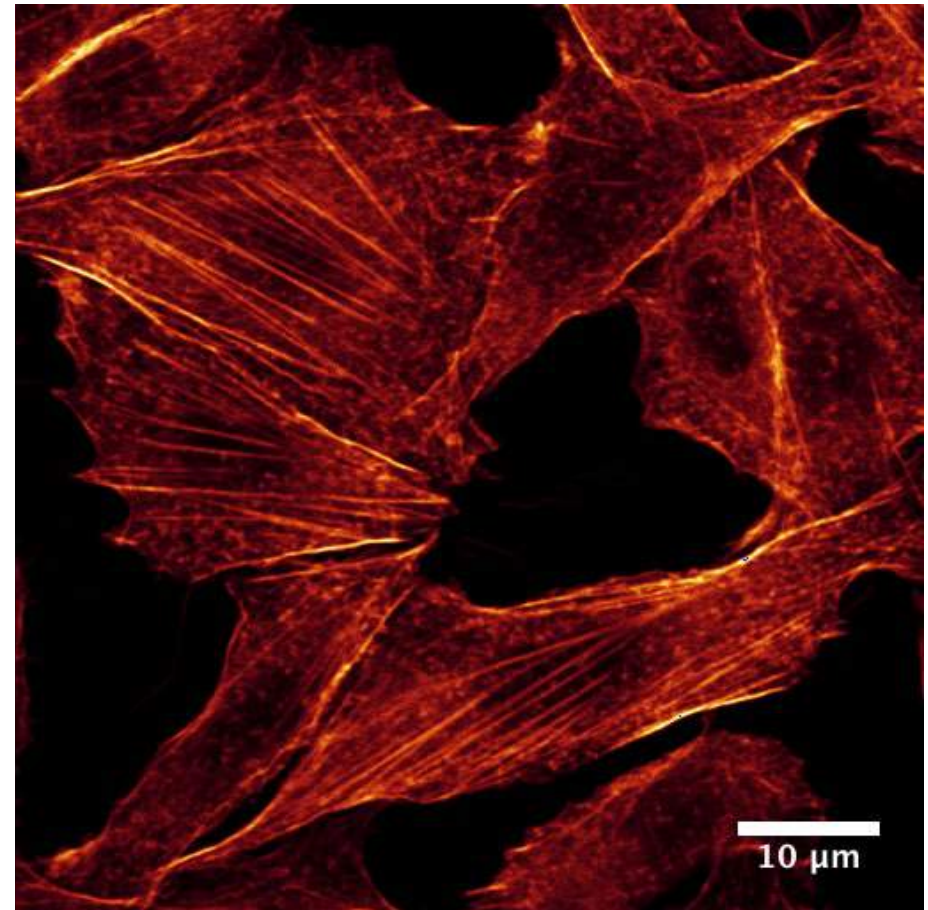
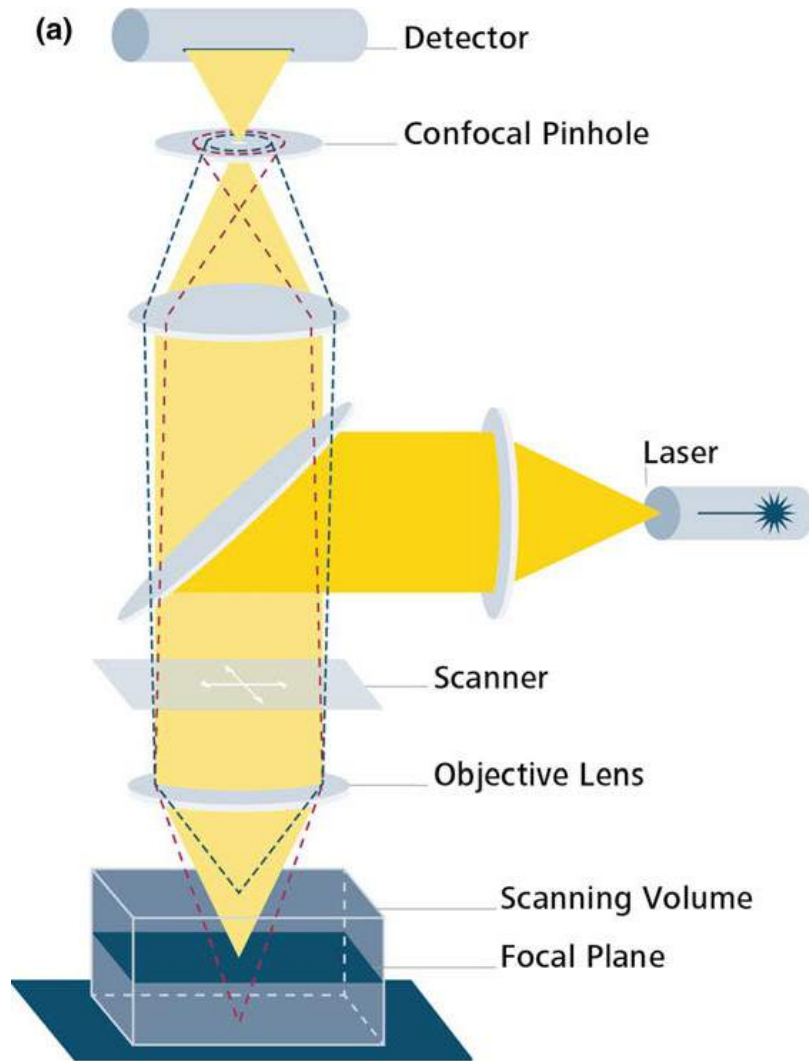


© 2003 International Union of Biochemistry and Molecular Biology - www.iubmb.org

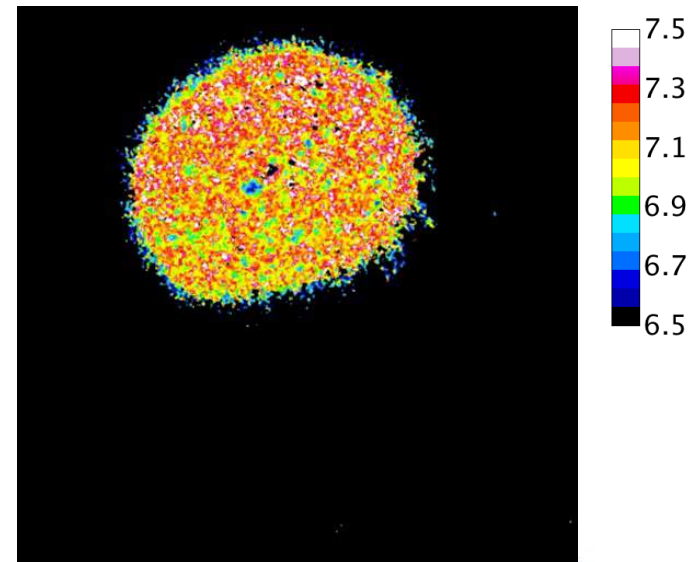
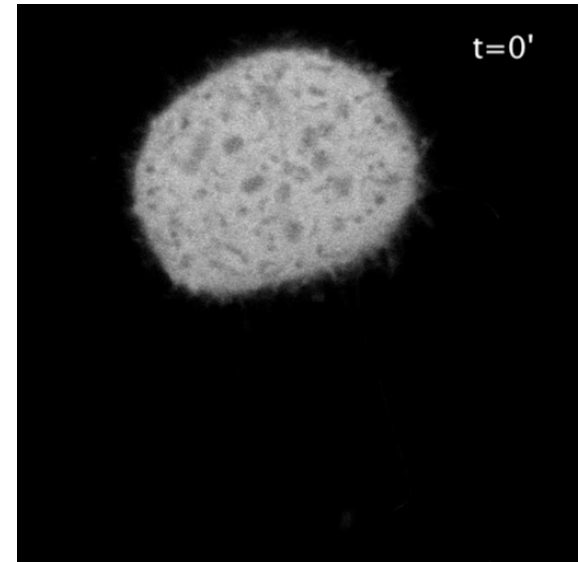
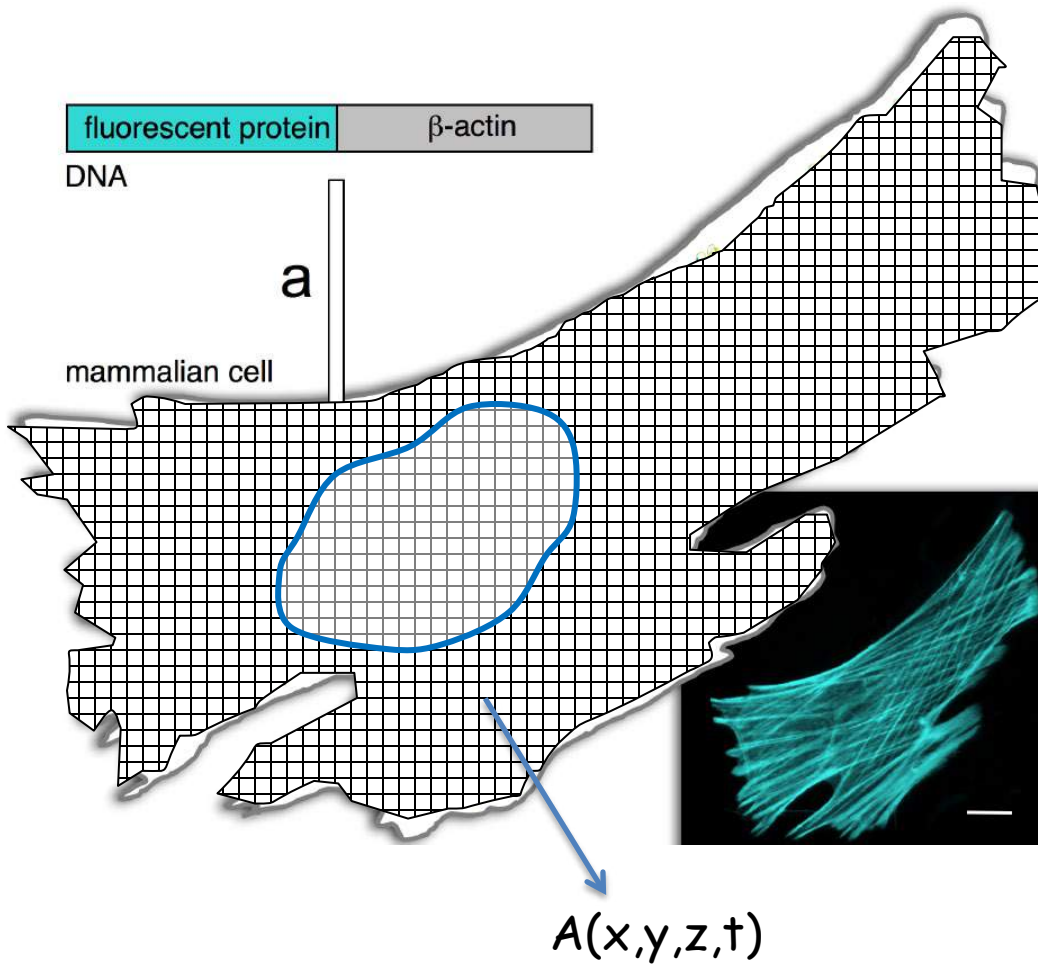
22nd Edition Designed by Donald E. Nicholson, D.Sc., The University of Leeds, England - and Sigma-Aldrich Cat. No. M3782



CONFOCAL MICROSCOPE: AXIAL SECTIONING & 200-NM RESOLUTION



FUNCTIONAL (MOLECULAR) CONFOCAL MICROSCOPY



- Biochemical processes in real-time

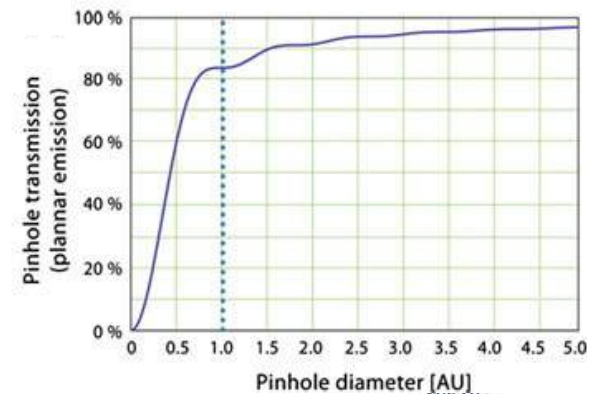
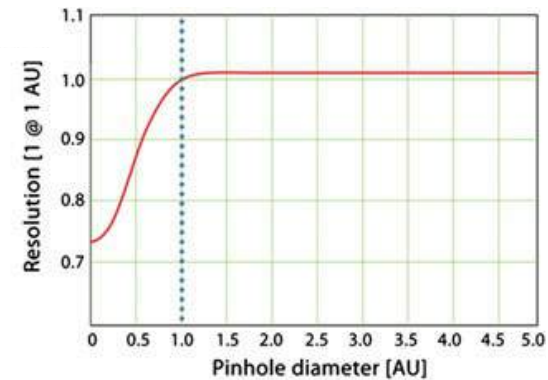
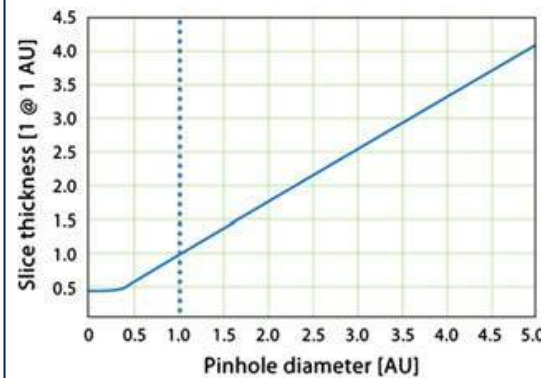
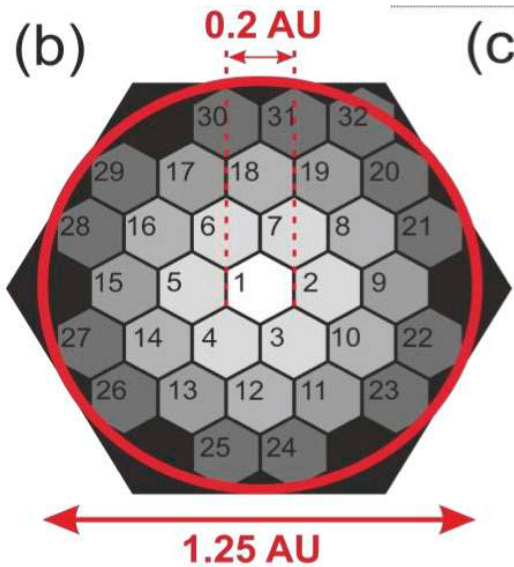
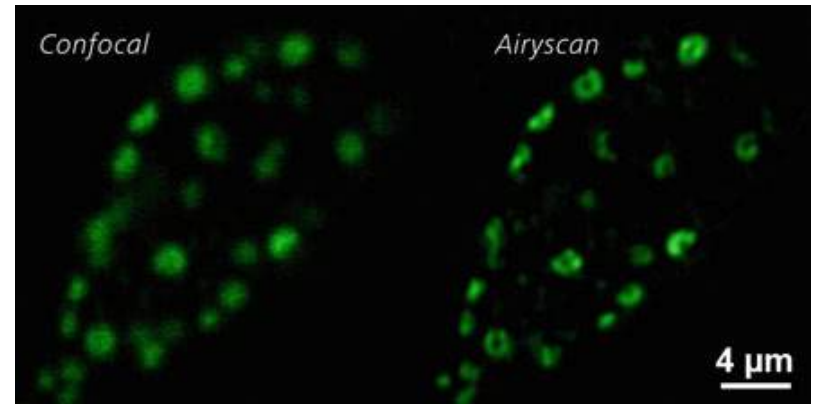
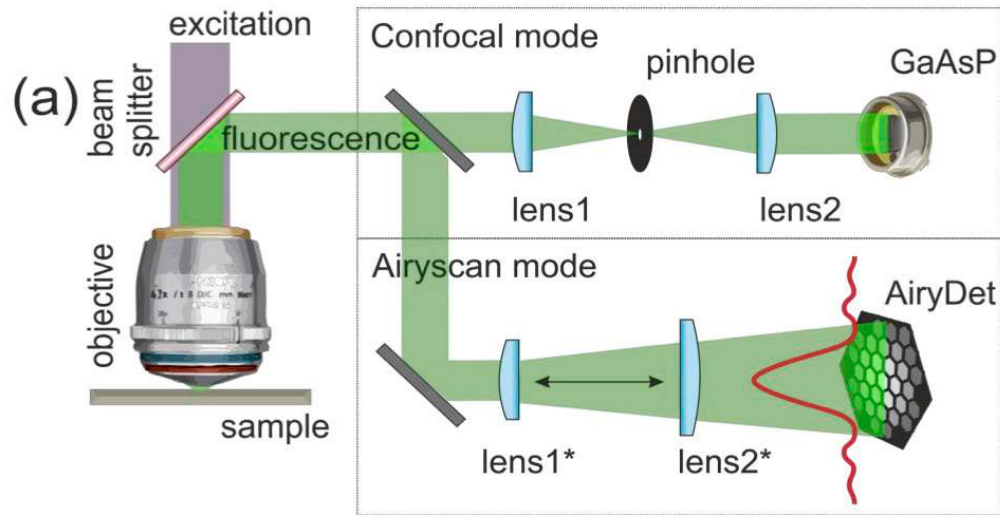
NESSUN SISTEMA PER MICROSCOPIA
FUNZIONALE (MOLECOLARE) SU CAMPIONI
VITALI È DISPONIBILE @UNIFI

ZEISS AIRYSCAN SYSTEM (BORN 2014)



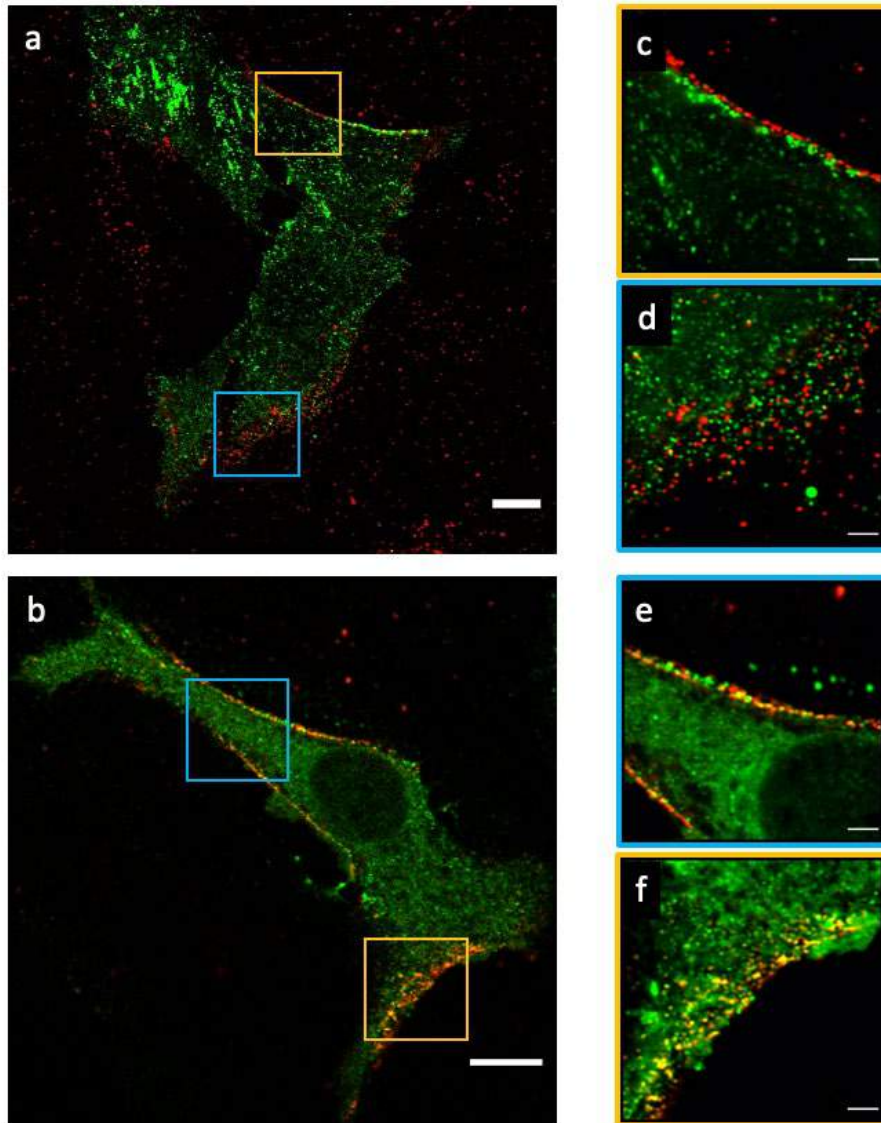
- Airyscan synergizes the properties of a confocal microscope **with super-resolution (SR) detection down to 120 nm**
- Airyscan 2 allows for fast imaging (ms time scale) also in super-resolution mode
- Contrast (= S/N) 4-8x with respect to a confocal system
- Living specimens can be used
- 4 excitation lines and 3 spectral detectors to address most fluorochromes in use
- 5-years full coverage of everything by Zeiss
- Cost: 295 k€ + IVA

THE AIRYSCAN PRINCIPLE



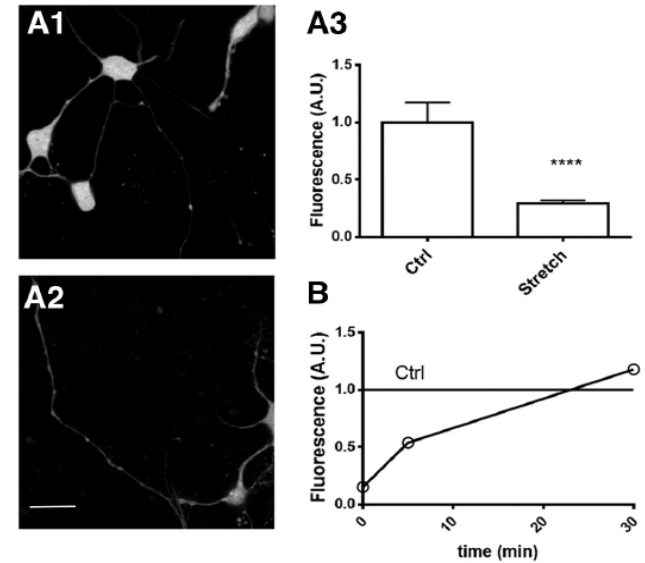
MULTIDISCIPLINARY PLATFORM (MEDICAL/BIOLOGICAL/MAT.SCI)

Imaging Sars-CoV-2 Entry (SR)



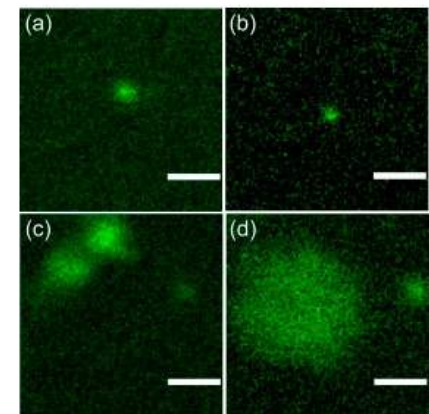
B. Storti et al. **2021** bioRxiv 2021.03.31.437907

Calcium Imaging in stimulated Neurons



S. De Vincentiis et al. **2020** *J. Neurosci.*, 40, 4997

Imaging nanospheres in hydrogel



A. Fabiano et al. **2019** *Pharmaceutics*. **2020**, 12, 623

FAST-GROWING TECHNOLOGY AND RESOLUTION BRIDGE



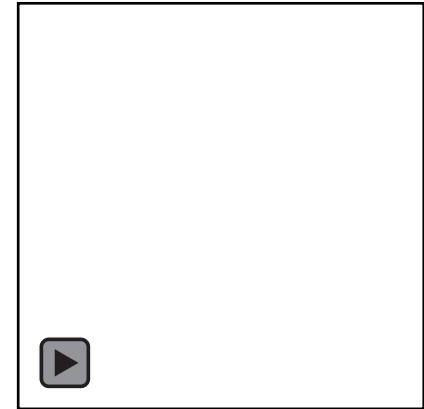
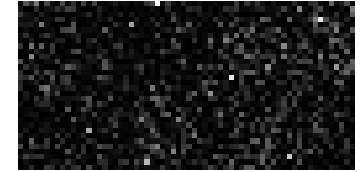
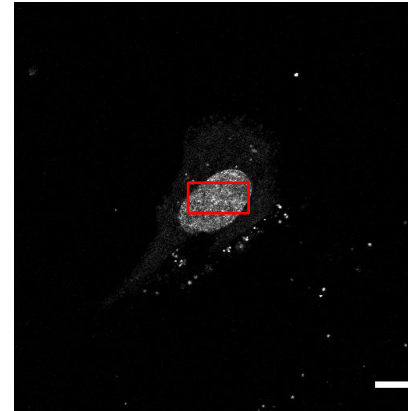
ARTICLE

DOI: 10.1038/ncomms14667-018-07513-2

OPEN

Comprehensive correlation analysis for super-resolution dynamic fingerprinting of cellular compartments using the Zeiss Airyscan detector

L. Scipioni¹, L. Lanza², A. Diaspro^{2,3} & E. Gratton¹

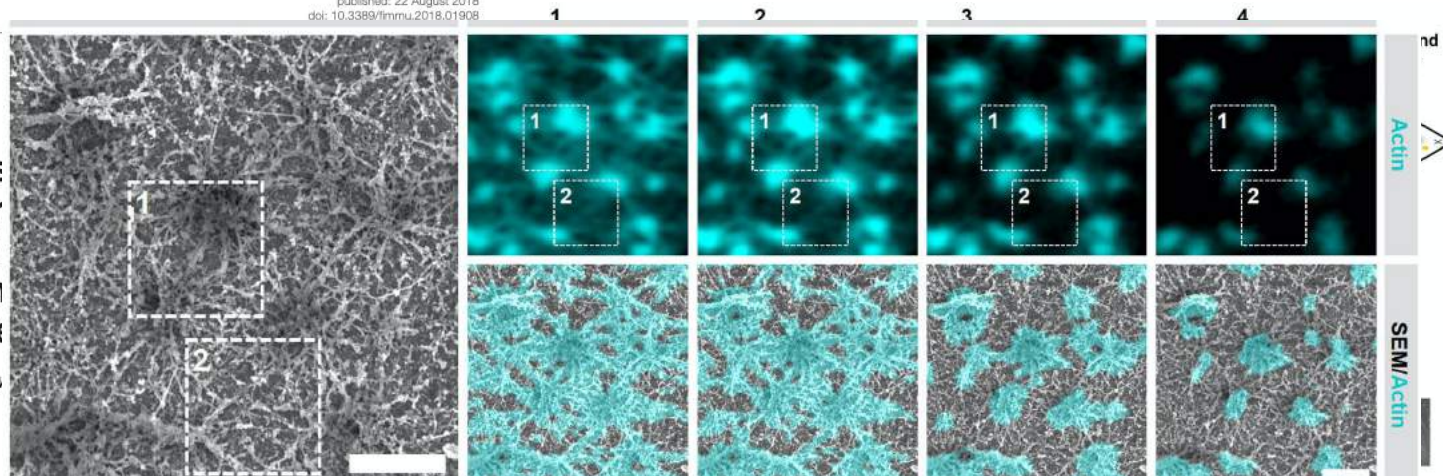


frontiers
in Immunology

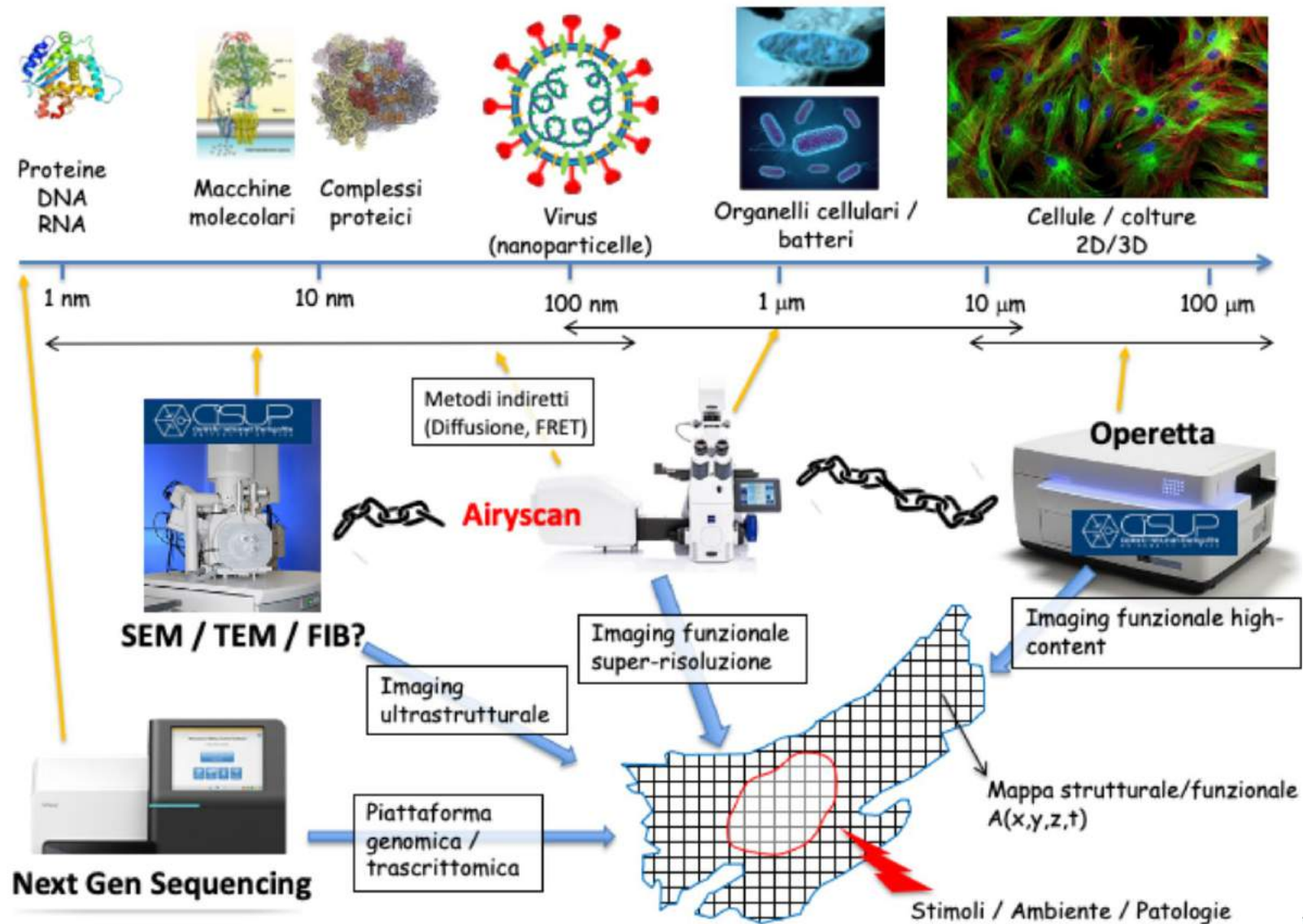
Super-Resolution and Electrophysiology Reveals New Insights Into Podosome Dynamics

Ben Joosten¹, Marieke van den Dries^{1*}, Koen van den Dries^{1*}

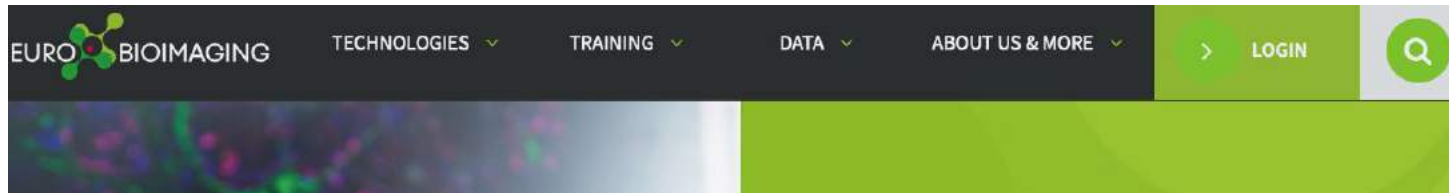
ORIGINAL RESEARCH
published: 22 August 2018
doi: 10.3389/fimmu.2018.01908



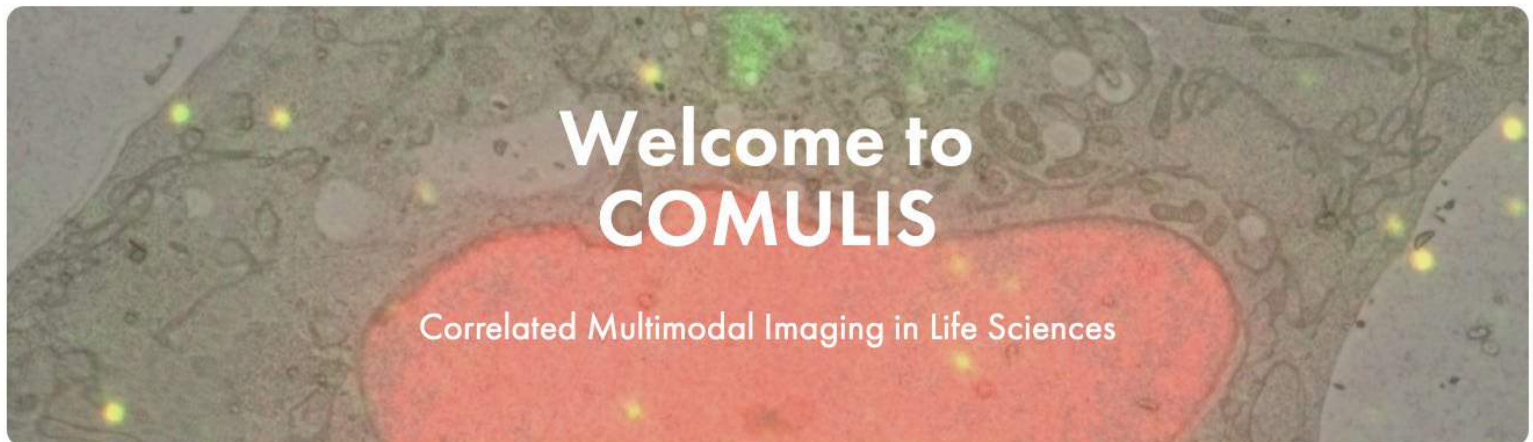
PIATTAFORMA INTEGRATA MOLECOLARE-CORRELATIVA



ACCESSO A RETI INTERNAZIONALI



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Con la presente, espi
Airyscan oggetto della propost
Pisa (CISUP). Tale tecnologia è
ambiti di applicazione in spett
Diaspro, A. , Gratton E., Com
compartments using the Zeiss A
2). Inoltre, la tecnologia Airysc
piattaforma integrata con siste
che la strumentazione, se acqui
(integrata anche nella piattafor
oltre che a rappresentare una
desiderano avvalersi di imagi
convenzionale analisi confocale
scientifica che in termini di utilizzo dello strumento come utenti secondo le condizioni e i protocolli che verranno
implementati, sia in termini economici che logistici.

Alberto Diaspro

Genova, 11 Aprile 2021

- Ground state depletion microscopy (GSD) @ Genoa, Milan
- Photo activated localization microscopy (PALM) @ Genoa, Milan
- Stimulated emission depletion microscopy (STED) @ Naples, Genoa, Padua
- Stochastic optical reconstruction microscopy (STORM) @ Genoa, Florence, Milan
- Expansion Microscopy (ExM) @ Genoa
- Optical Tweezers @ Florence

◦ **Airyscan (correlative) imaging**



PROPOSAL DETAILS: PEOPLE



Parola chiave "Airyscan" su WOS, anno 2014-2021: 56 prodotti, 424 citazioni, h=12.

Settori ERC: PE 20%, LS 80%

- Firme di 37 colleghi appartenenti a:
 - 5 dipartimenti (Biologia, DICl, Pat. Chir., Ric. Trasl., Med. Clin.)
 - 15 SSD
- Interessi molteplici
 - da Materials Science a Cell Biology, da Microbiology a Molecular Oncology
- Gruppo proponente
 - Rappresenta tutti e 5 i dipartimenti presenti
- Ecosistema pisano/nazionale
 - SSSUP – Istituto di Biorobotica
 - Nanobiophysics – IIT Genova
 - CNR Pisa – IFC, ITB
 - SIBPA – elenco strumentazioni interesse biofisico
 - Laboratorio Bioacustica, Dipartimento Neuroscienze, UniPd

PROPOSAL DETAILS: LOCATION AND ACCESS RULES

➤ Location:

- Dipartimento di Biologia, Edificio D37, lab.8
- Room already dedicated to microscopy
- Minor room upgrade (window opening system, CO₂ external line, aluminium plate to distribute weight, c.a. 10,000 E)

➤ No safety issues

➤ **Close to all living specimen manipulation facilities!!!!**



➤ Access:

- 8:30-17:30 Mon-Fri, 1h slots
- Training 1/w, 2-4h
- Maintenance: 2-3 d/y

➤ Costs:

- CISUP 8 €/h
- Academic: 12 €/h
- Non-academic (with operator): 40 €/h

➤ Assistance

- Training and operators: **1 technician** (Dr. D'Alessandro, Pat. Chir.) + 2 proponents
- Assistance always available during workhours

➤ Budget plan:

- Years 1-5, at least 1/3 of slots will be covered and about 1,000 €/y costs
- Years >5: remodulation of fees to sustain about 12k €/y