

IDRM Research Facilities

An overview of the IDRM's facilities available for commercial use



Institute of
Developmental &
Regenerative
Medicine

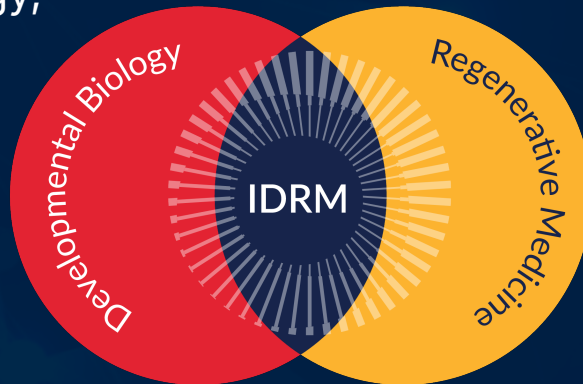


Institute of Developmental & Regenerative Medicine

Old Road Campus, University of Oxford

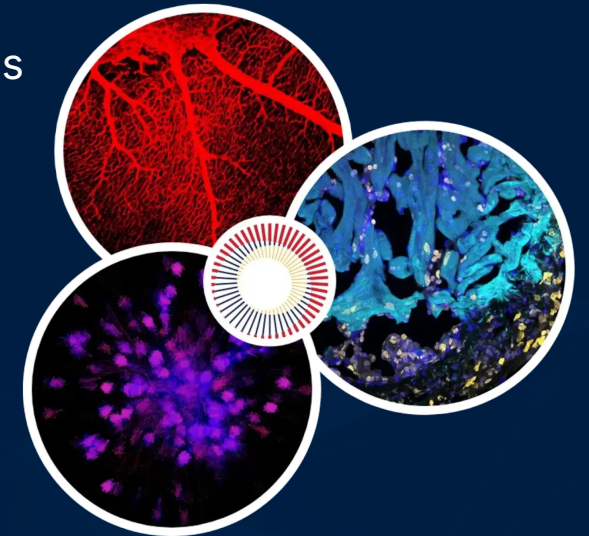
What we do

- Research into development, disease and tissue repair
- Focus on regeneration and repair of tissues and organs
- Integration of cardiology, neuroscience and immunology
- Close alignment with clinical research and patient-focused studies



Strengths of the Institute

- Interdisciplinary integration across cardiology, neuroscience and immunology
- Advanced imaging, -omics and computational biology platforms
- Part of two MRC Centres of Research Excellence (CoREs)
- Established industry collaborations and strong entrepreneurial track record



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Molecular analysis

AKTA HPLC

Protein purification system

- Separation and purification of proteins and biomolecules
- Enables isolation of high-quality material for downstream experiments
- Typically used in antibody, enzyme and biologics development



LC-MS

Liquid Chromatography–Mass Spectrometry

- Identification and quantification of molecules in complex samples
- Provides detailed information on composition and molecular structure
- Typically used for compound verification, biomarker analysis and metabolic profiling



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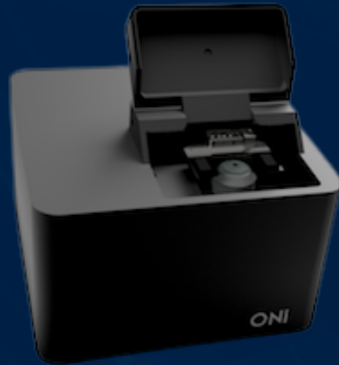


UNIVERSITY OF
OXFORD

Imaging and visualisation

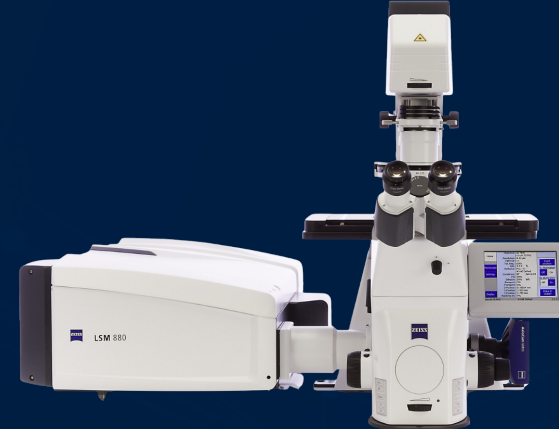
Oxford Nanoimager

- Super-resolution imaging at near-molecular scale
- Allows visualisation of individual molecules within cells
- Used to study molecular organisation and interactions



ZEISS Confocal 880

- High-resolution imaging of cells and tissues, including 3D structures
- Allows localisation of proteins and cellular structures



Cell analysis & sorting



NanoFCM

Nanoflow Cytometry

- Detection and analysis of nanoscale particles such as extracellular vesicles and viruses
- Provides size distribution and molecular characterisation of nanoparticles
- Typically used in EV research, nanoparticle development and viral studies

Sony MA900 Cell Sorter

- Physical isolation of specific cell populations from mixed samples
- Enables recovery of viable cells for downstream applications
- Typically used in cell therapy workflows, functional assays and research studies
- 4 laser & 3 laser setups

Sony ID7000 Spectral Cytometer

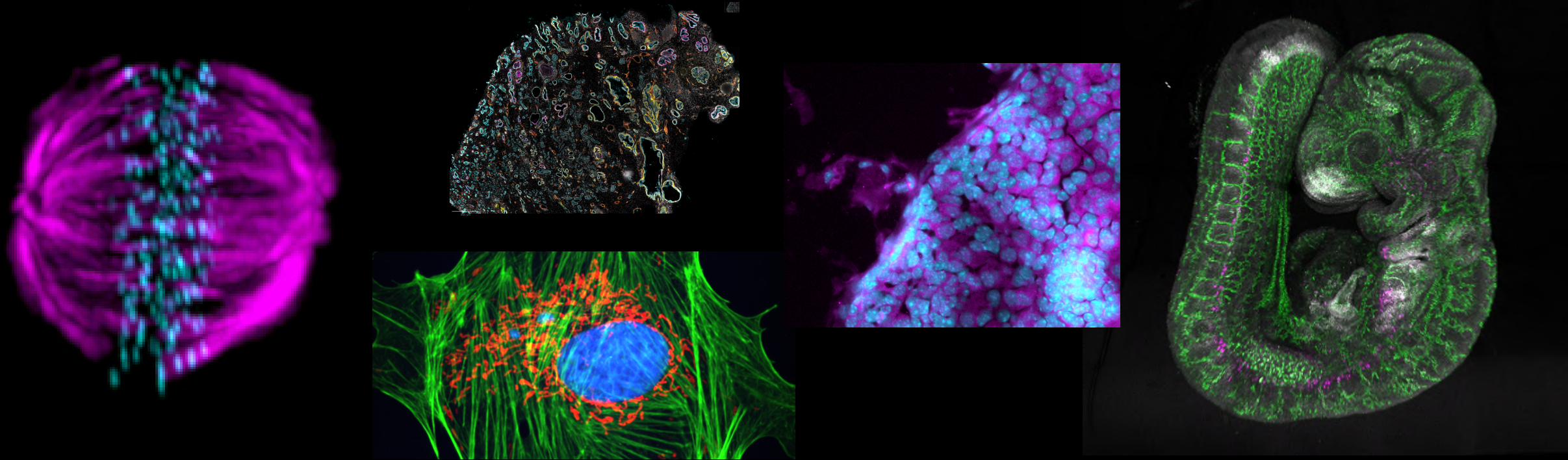
- High-dimensional analysis of cell populations using multiple markers simultaneously
- Enables detailed profiling of complex and heterogeneous cell samples
- Typically used in immunology, cell phenotyping and assay development



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Oxford ZEISS Centre of Excellence



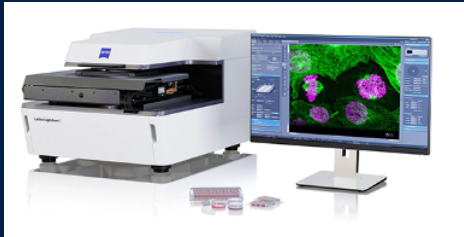
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Overview

Light-Sheet

ZEISS Lattice Lightsheet 7



- Fast
- Gentle

Perfect for long term,
rapid, live imaging

Confocal

ZEISS LSM 980 w/ Airyscan
2 and Picoquant FLIM



- Extended resolution
- Multiplex Airyscan

Perfect for range of
magnifications and
adaptive multi-immersion

Widefield

Leica DMI8

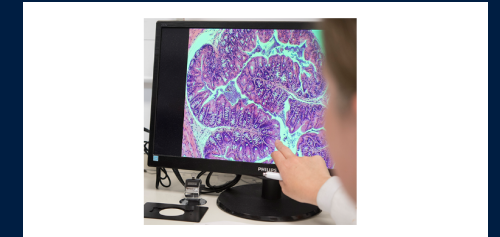


- Simple
- Fast

Perfect for tiling of thin
tissue sections and stain
optimisation

Workstations

ZEN, arivis, Imaris



- Processing
- Analysis

Perfect for segmentation,
tracking and scoring

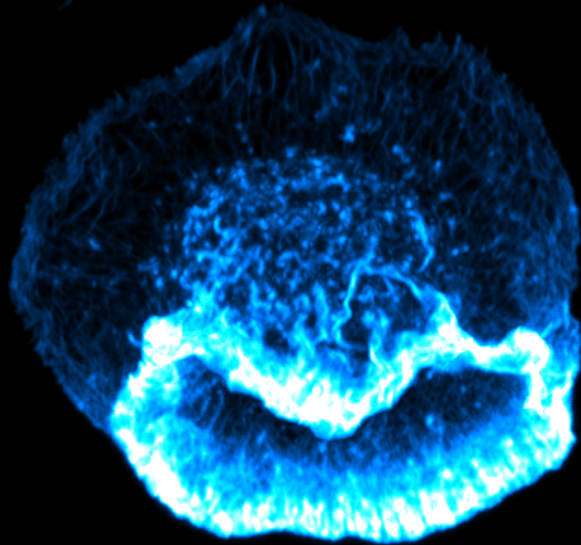


ZEISS 980 with Airyscan 2

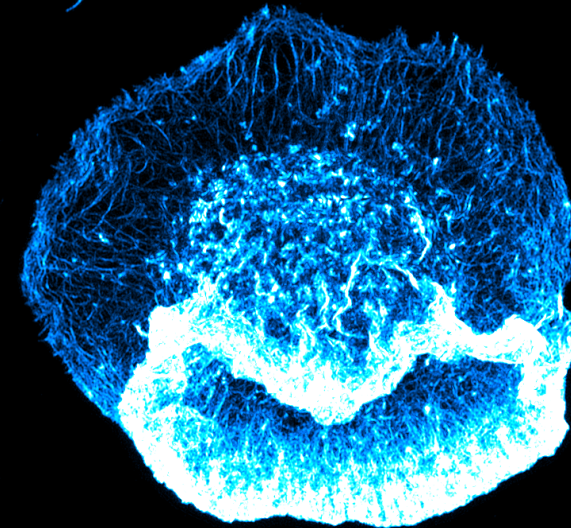
- Conventional inverted confocal with spectral detection
- 7 excitation laser lines (405, 445, 488, 514, 561, 594, & 639 nm)
- Airyscan confocal for enhanced-resolution mode
- Airyscan multiplexing for high speed
- Tile scanning for large field of view
- FLIM, FRAP, FCS



ZEISS 980 with Airyscan 2: resolution improvement



Confocal

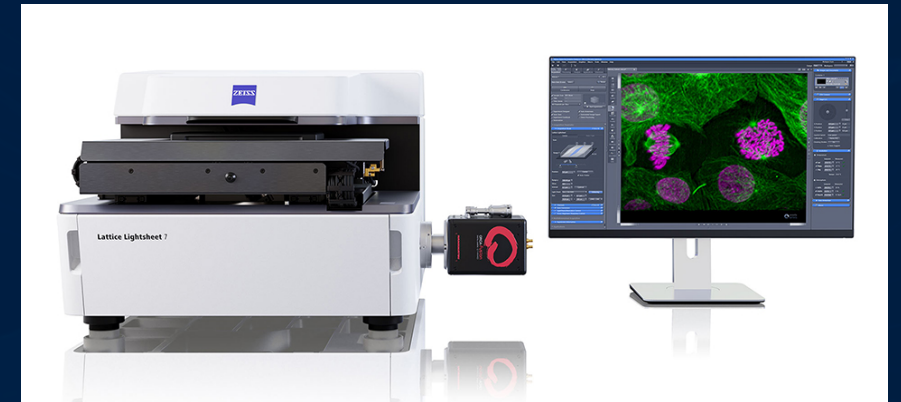


Airyscan SR

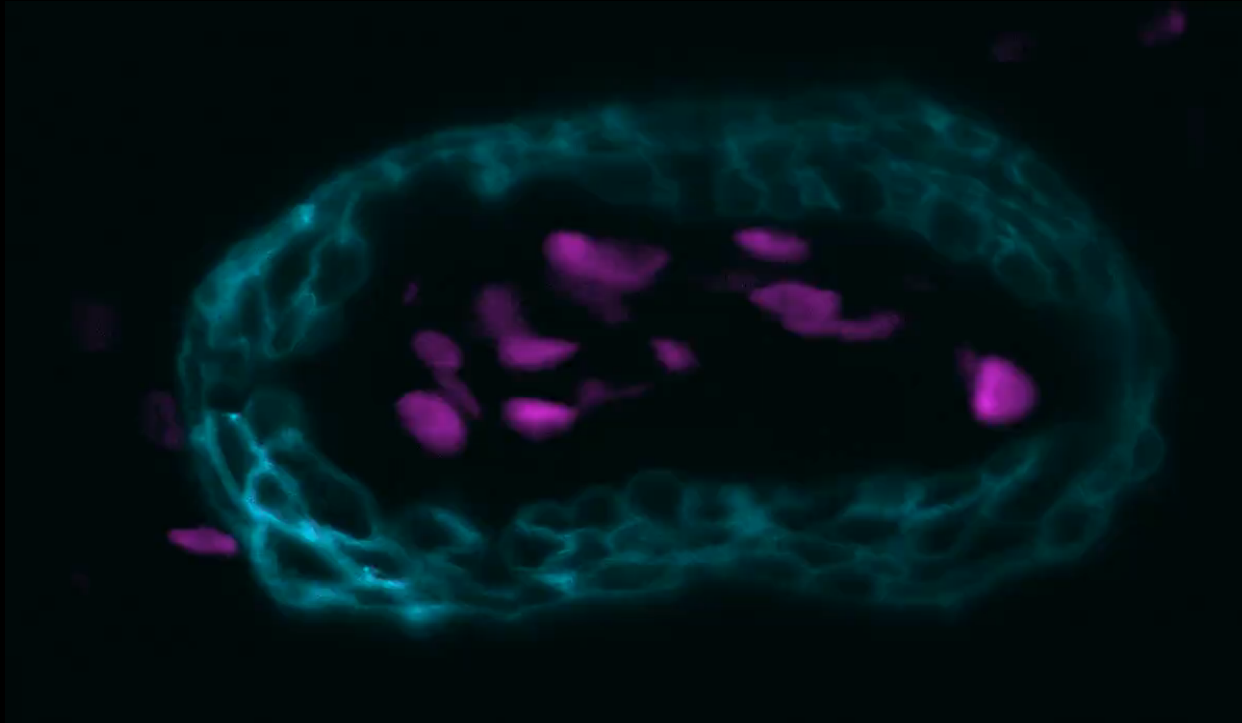
Life-act citrine (phalloidin enhanced) RBL cell. Credit: Kseniya Korobchevskaya

ZEISS Lattice Lightsheet 7

- Inverted design Bessel beam light-sheet for fast gentle acquisition of live samples
- 488, 561, 642 nm illumination
- Fast acquisition up to 1 ms per frame (0.5s per cell sized volume)
- Low phototoxicity
- Dual camera for simultaneous two-colour imaging
- Diffraction limited resolution



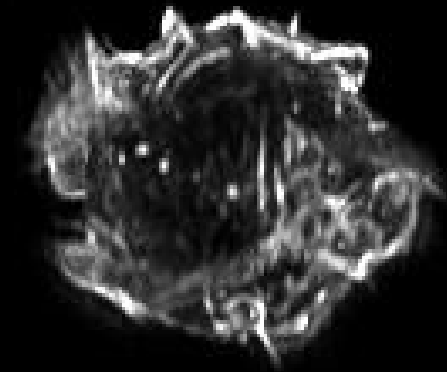
ZEISS Lattice Lightsheet 7



Zebra fish heartbeat, magenta are red blood cells

Credit: Toby Andrews and Helena Coker

0 sec



10 μ m

Life-act citrine jurkat T cell

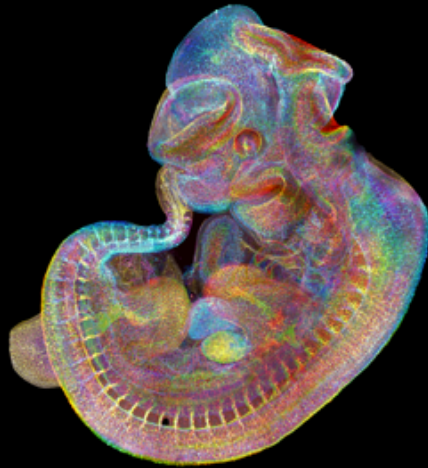
Credit: Helena Coker



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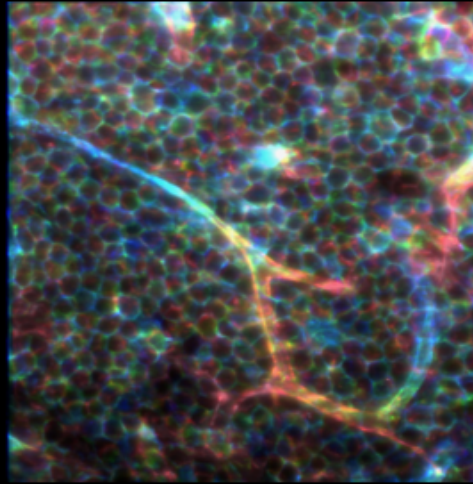


Biology across scales



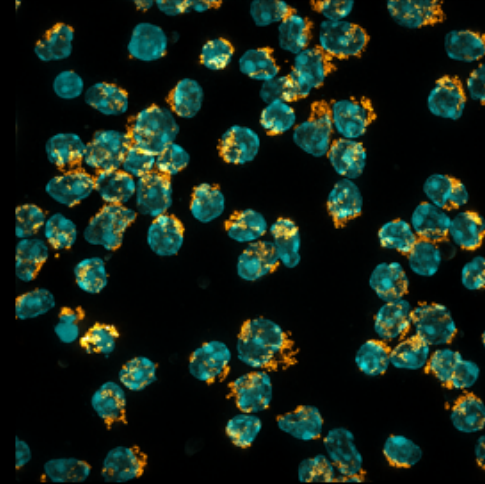
David Grainger LSM980

Organisms



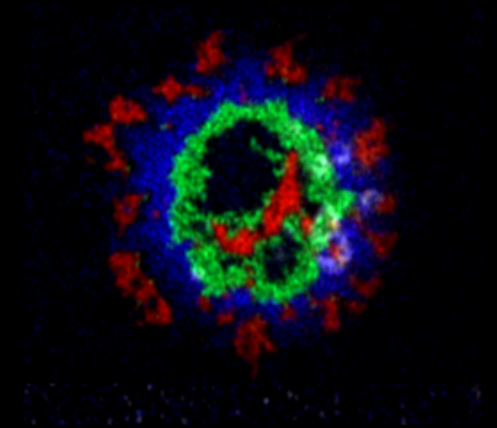
Anna Schepers LLS7

Tissue



Robert Mitchell Elyra 7

Cells



Salvo Valvo TIRF-SIM

Molecules

Size

meters

millimeters

microns

nanometers

Time

days

hours

minutes

seconds

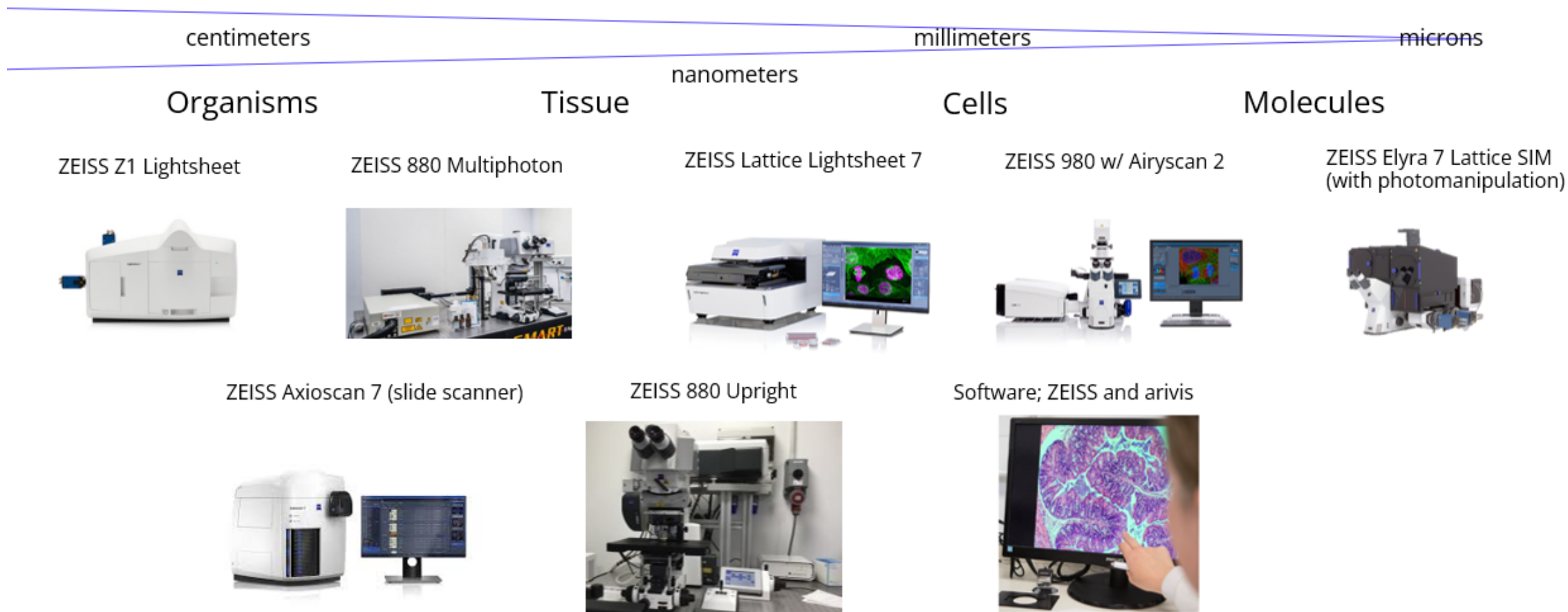
microseconds



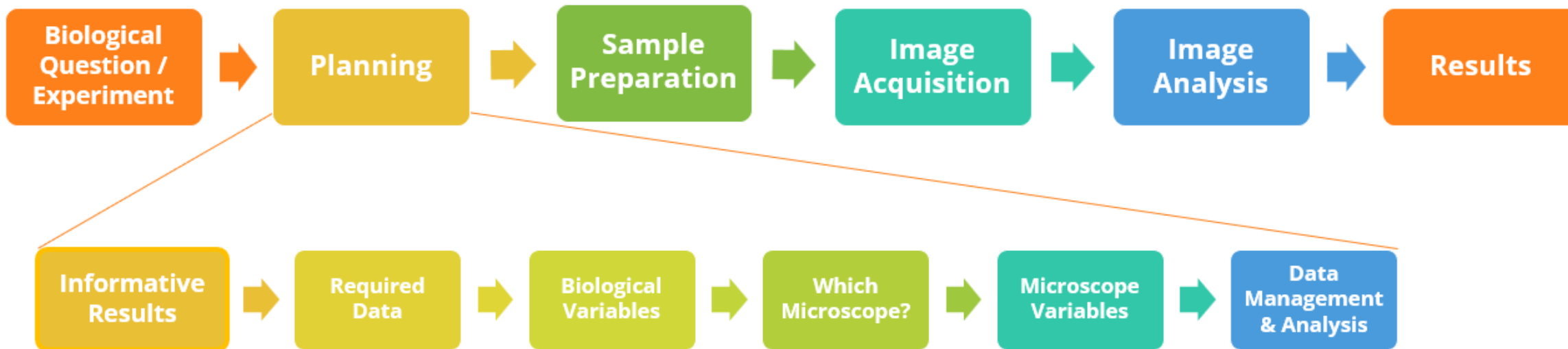
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Instrumentation across scales



Support we provide



- Costing
- Booking System, Building and Facility Access
- Training

- Analysis
- Ongoing support
- Methods reporting

Adapted from Wait *et. al.*, 2020.



Expertise



Helena Coker, PhD
Advanced Microscopy
Facility Manager

Expert Skills:
Lattice Light Sheet,
Light Sheet



Kseniya Korobchevskaya, PhD
Advanced Microscopy
Facility Manager

Expert Skills:
Super-resolution microscopy,
SIM, Advanced Confocal



Christoffer Lagerholm, PhD
Senior Advanced
Microscopy Specialist

Expert Skills:
Super-resolution microscopy,
SIM, STED, Confocal
FCS, FLIM



Jacky Ka Long Ko, PhD
Advanced Image Analyst

Expert Skills:
3D cell analysis,
Volume tracking
Machine learning

