



EXPLORE WIDELY – COCREATE – DERISK

Multi-Modality Microscopy Engineering for Cell Observation and Management

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LAMBDA-X | HIGH
TECH

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Active since
1996

45+
employees
300+
developments

30 projects
each year

Certified
ISO 9001
EN 9100

Masters in Innovation **group**

50y

Pioneering
innovation

500+

Technology
building blocks

350+

Innovation
professionals

€45M

IR&D services
turnover

400+

Ventures
accelerated
& financed

8 innovation centers & hubs to facilitate co-development

Antwerp
Belgium

Kruibeke
Belgium

Ghent
Belgium

Kortrijk
Belgium

Westerlo
Belgium

Nivelles
Belgium

Utrecht
Netherlands

Aveiro
Portugal

Model & key markets

LAMBDA-X | HIGH-TECH INNOVATION



Space



Security



Life Sciences



Industry

Contract development and manufacturing services

LAMBDA-X | OPTHALMICS

World leader in wavefront metrology
Broad range of ophthalmic inspection instruments



NIMO TEMPO PMTF NIMO NIMO MULTILENS C-NIMO NIMO MATRIX NIMO EVO

Diffractive IOLs

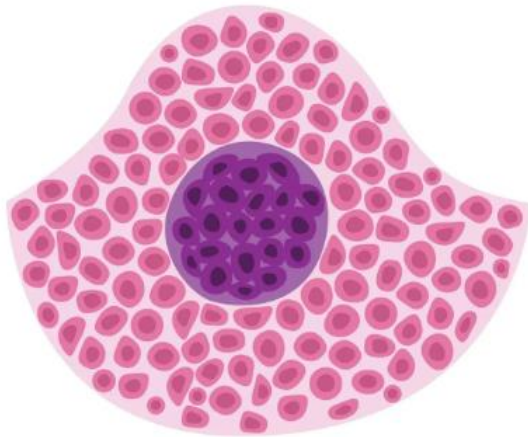
Refractive IOLs

Intraocular lenses

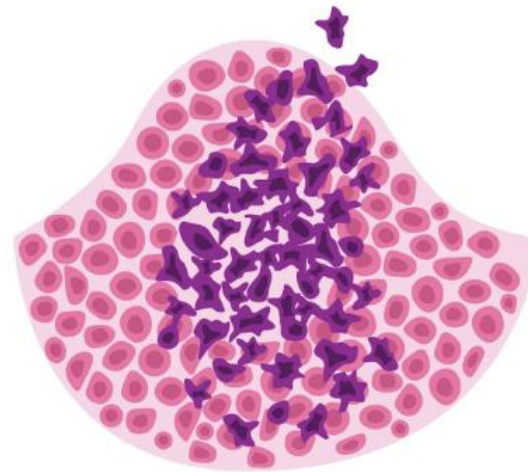
Contact lenses

OEM Microscopy and cancer research

1. For which type of samples?
2. What type of manipulations?
3. In which type of instruments?
4. How to develop it?



Benign Tumor

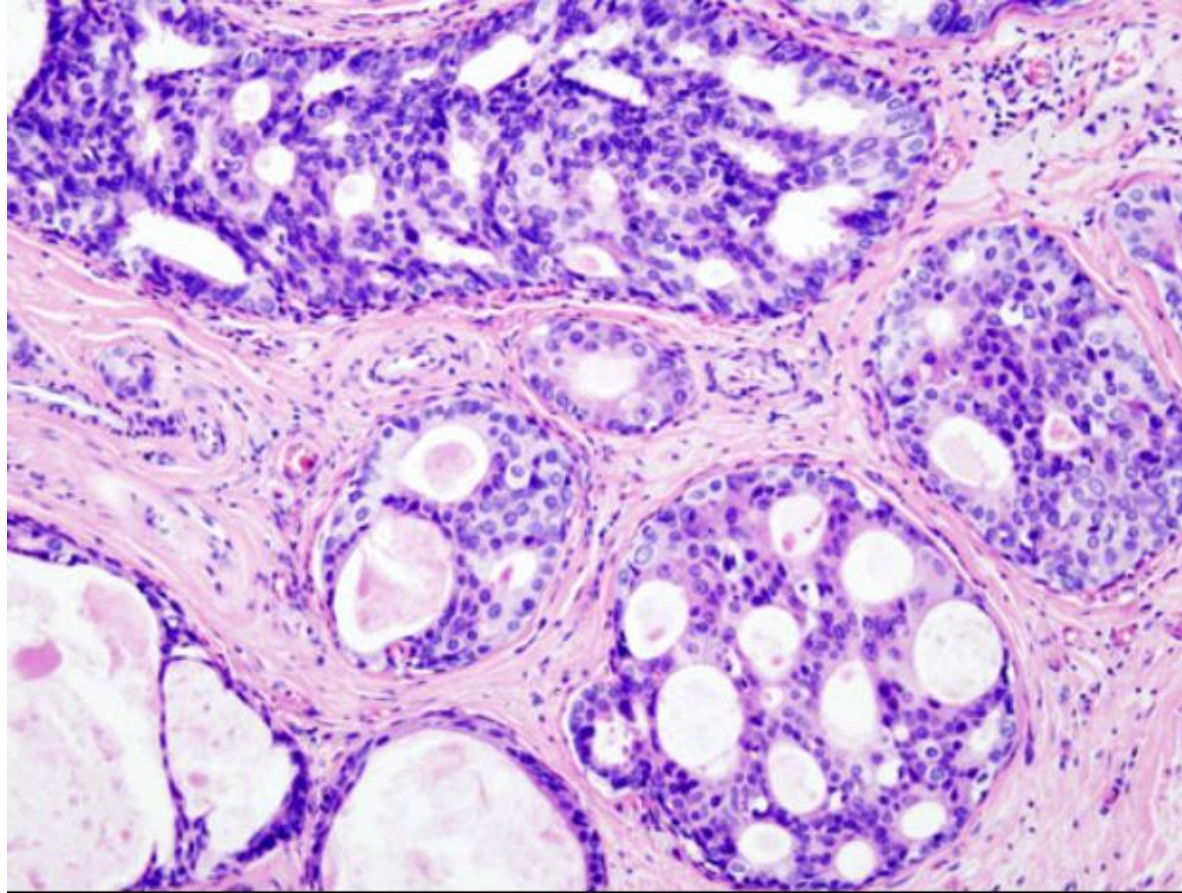


Malignant Tumor

Microscopy and cancer diagnosis

HE staining is the
reference in
Histopathology

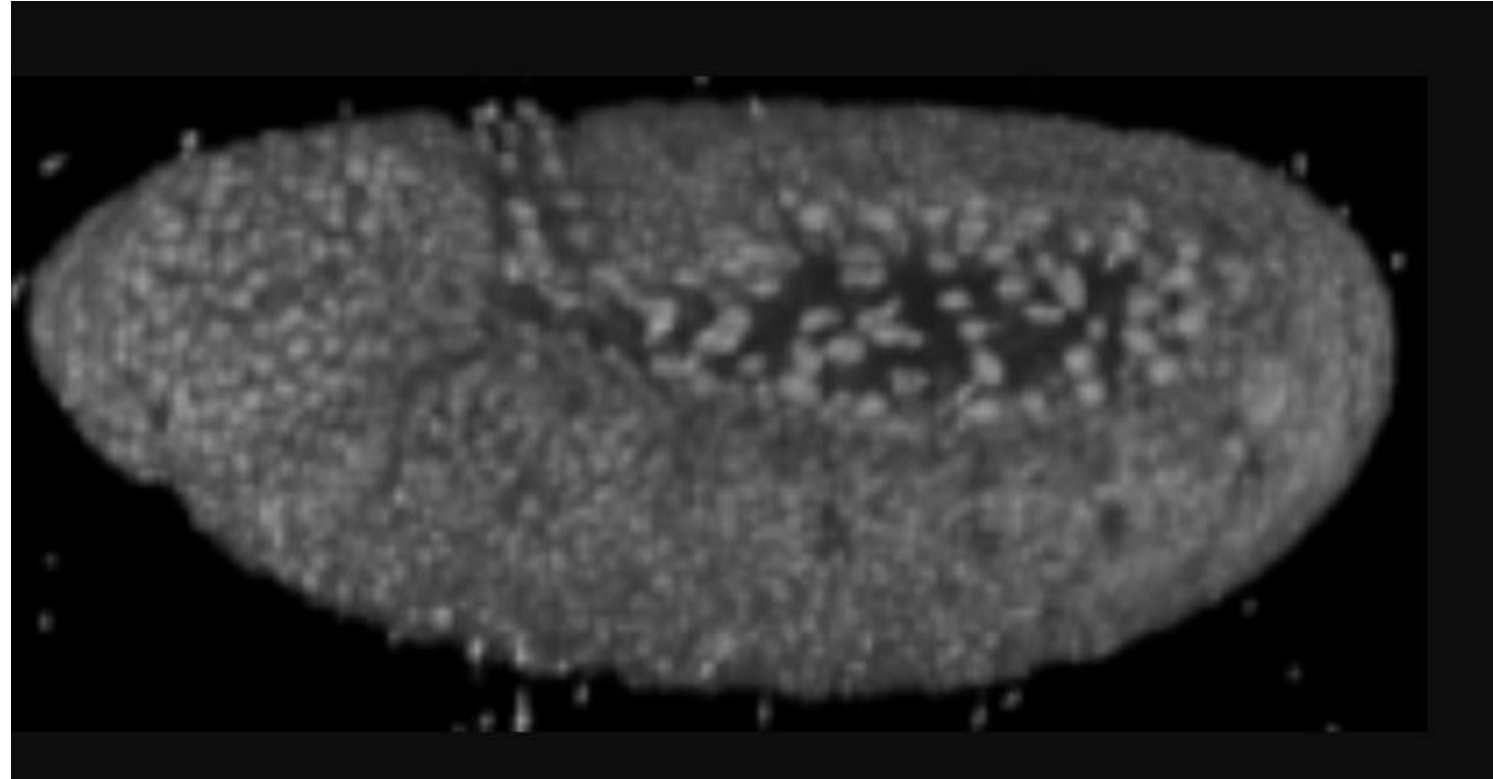
(1877)



Cancer research – living cell research

Cellular medium

1. *Adherent cells (petri dishes, well plates)*
2. *Suspension cells (bioreactors)*
3. *Cell encapsulation*
4. *Spheroids/Organoids*
5. *3D printed tissues*
6. *Tissue*
7. *Embryos*

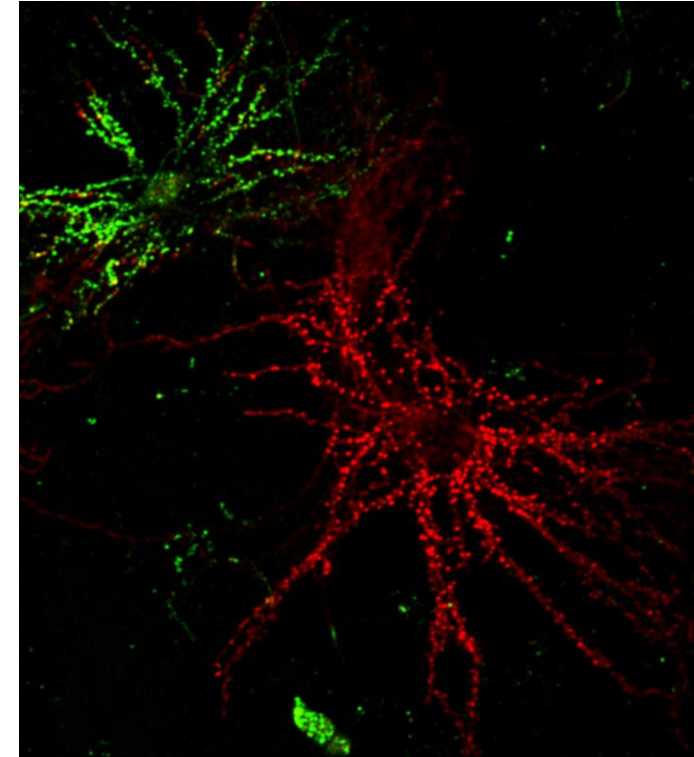
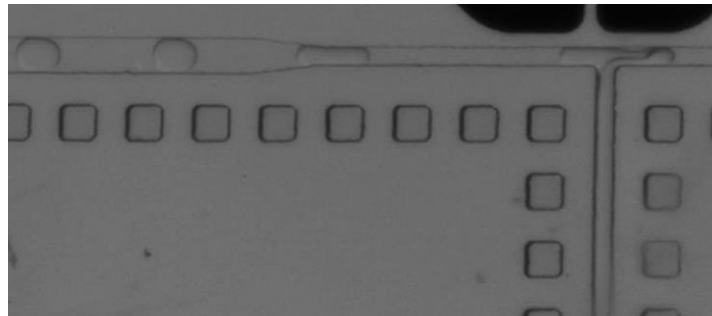


Cell imaging technology is peculiar for many types of cell culture environment

Cancer research – living cell research

Cell management

1. *Sorting (FACS / μ -fluidic)*
2. *Moving (tweezer)*
3. *Modifying (transfecting)*
4. ...



Cell imaging technology is coupled with cell manipulations

Cell inspection tool : Microscope inside

1. Morphology Imaging (e.g. viability)
2. Fluorescence label detection
3. Time-evolutions
4. Cell function detection (e.g. protein expression)
5. Drug propagation (e.g. CARS)
6. ...



Cell incubation monitoring



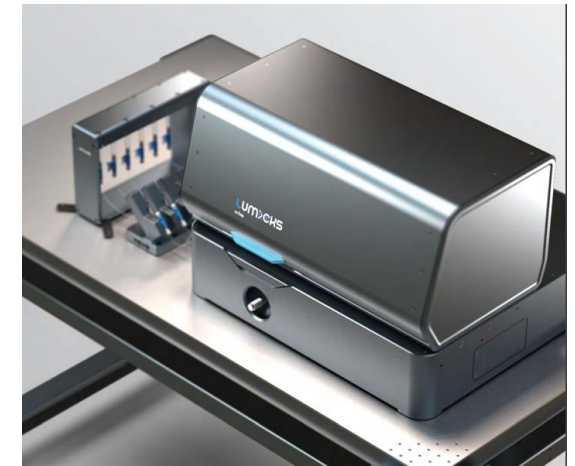
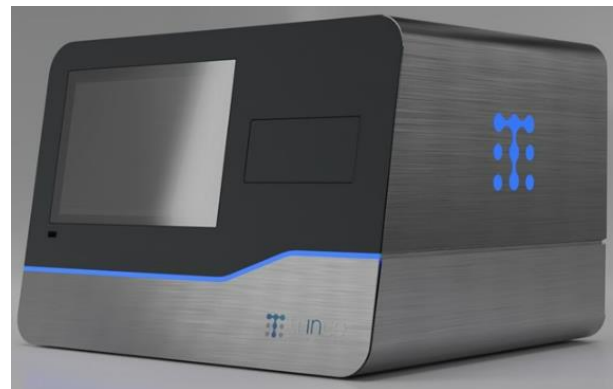
Histopathology



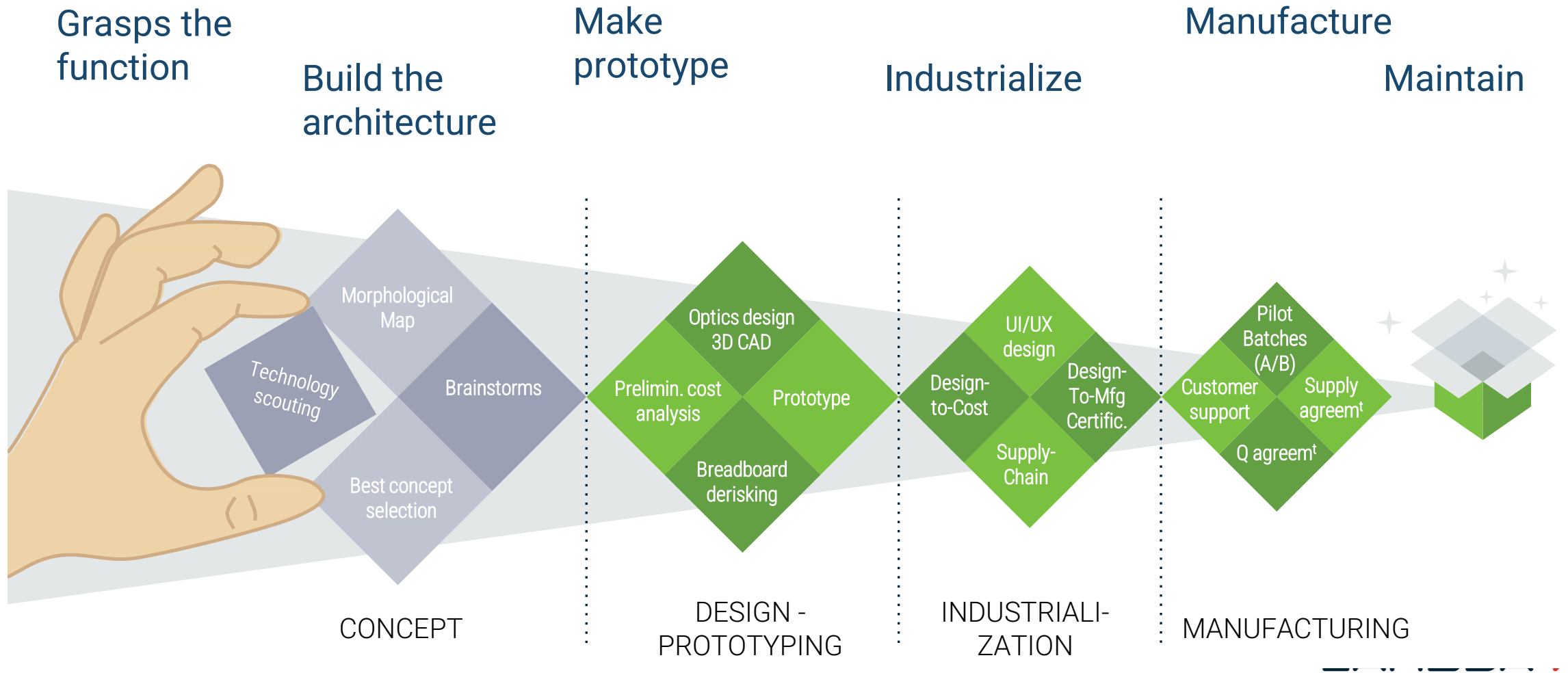
Bioreactor cell monitoring

Cell manipulation tool: Microscope inside

1. Transport (tweezers)
2. Transfections
3. Cell sorting
4. 3D print
5. ...

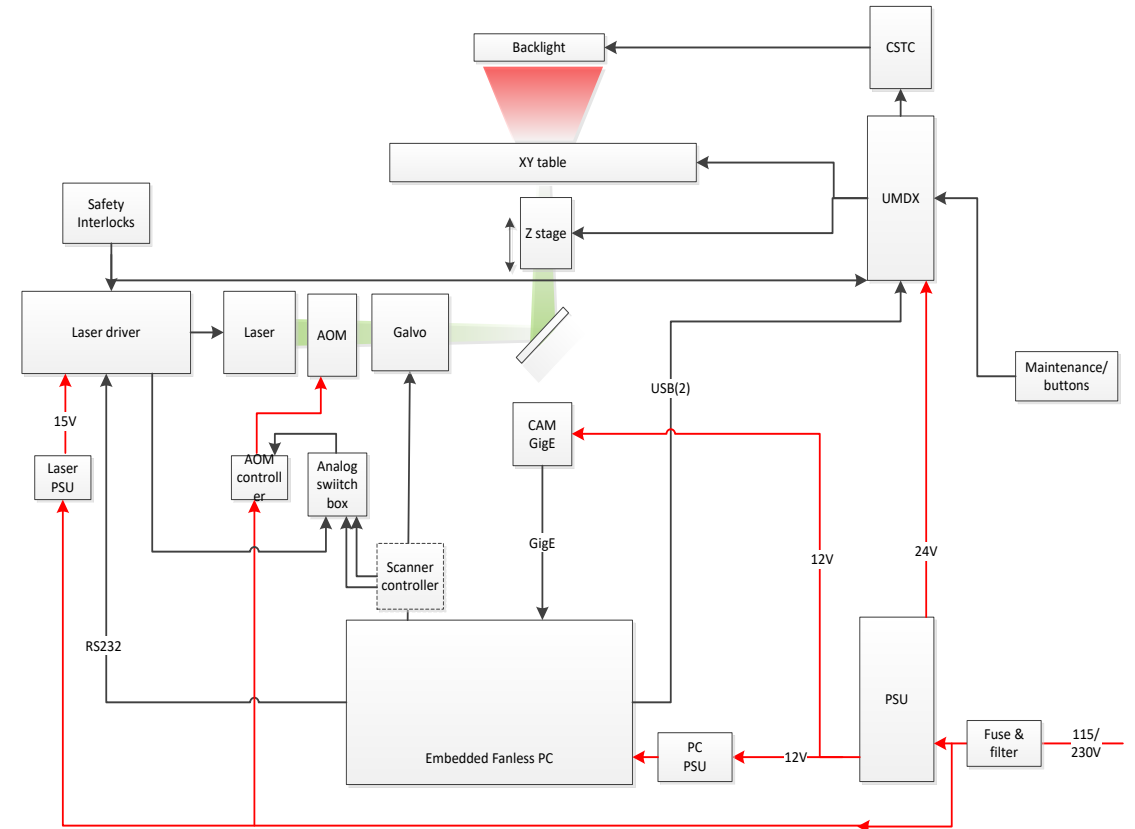
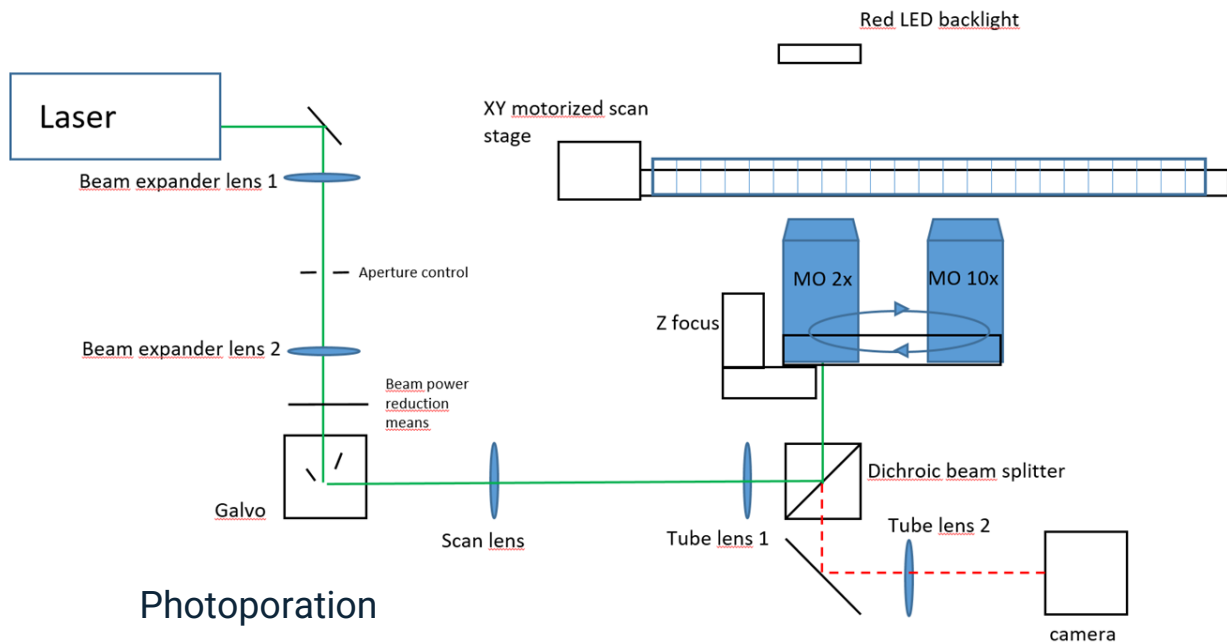


Product development process



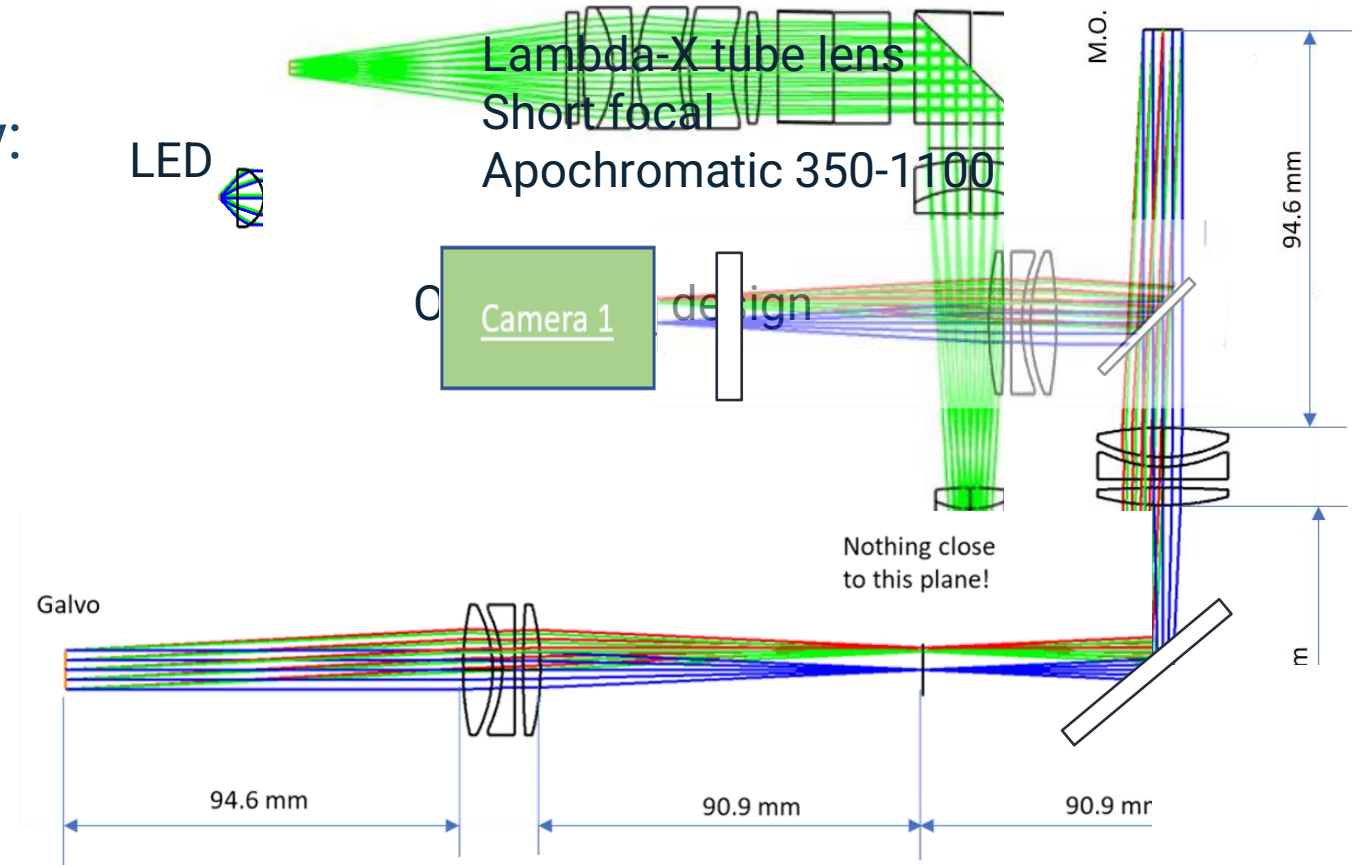
Microscope architectures

1. Optical architecture
2. Electronics architecture
3. SW architecture



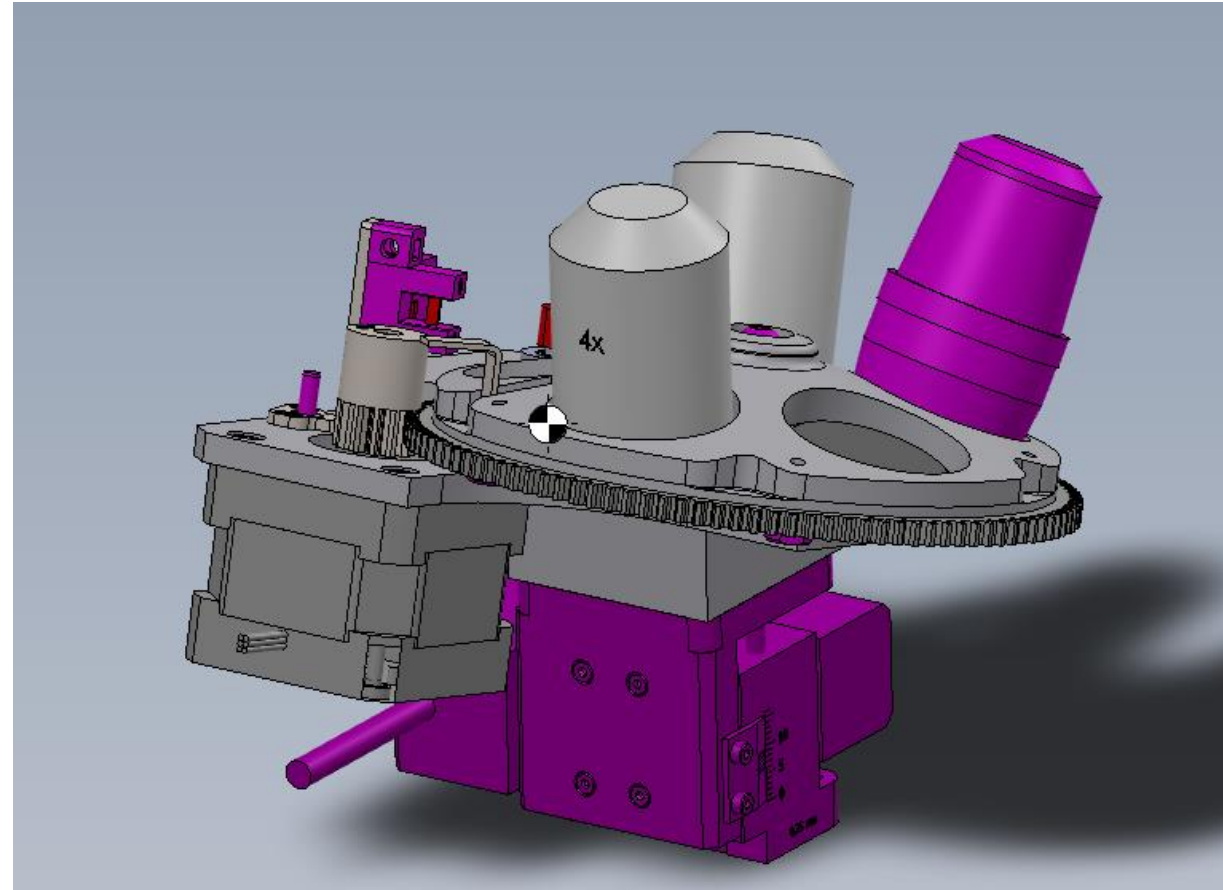
Microscope optical design

1. OEM optics when needed?
2. Classical needs in microscopy: reference designs



OEM microscopy: building blocks

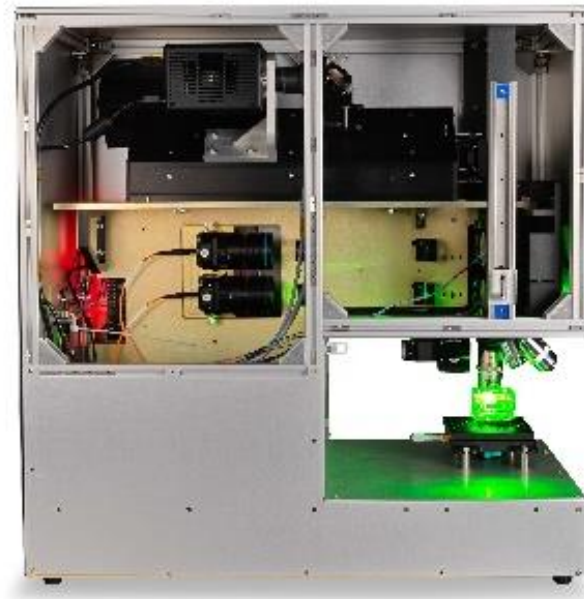
1. MO and tube lens, camera
2. Scanner and relay lenses
3. Illumination block
4. Alpha prototypes architecture
5. Laser modules
6. Real time controller
7. Autofocus
8. Filter bloc
9. Z stage
10. XY stage
11. Motorized turret



Alpha prototypes



Cell Photoporation

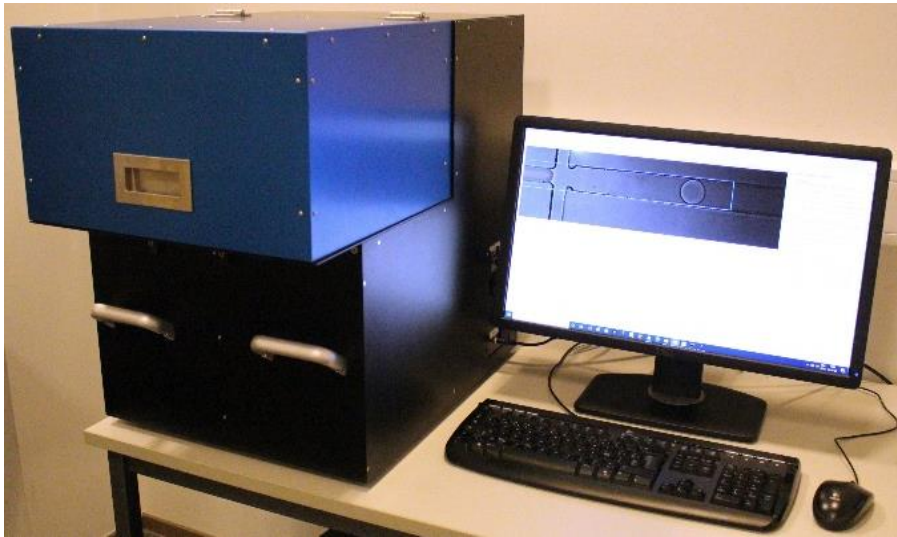


Raman full field imaging



Fluorescence immuno assay
diagnosis

Alpha prototypes



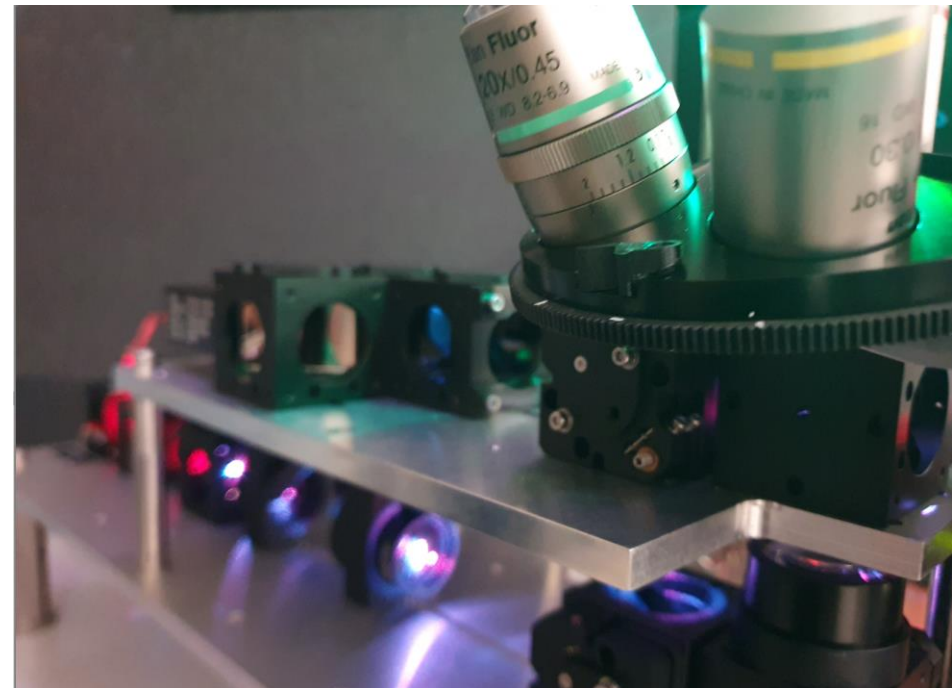
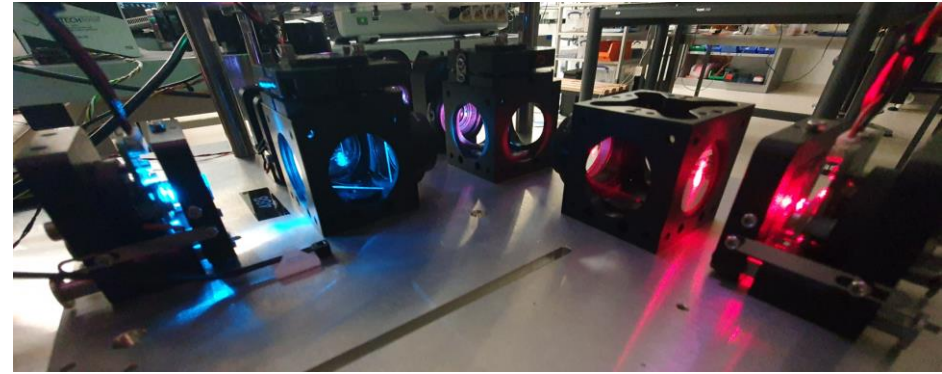
Fluorescence Activated Droplet Sorting



Blood analysis

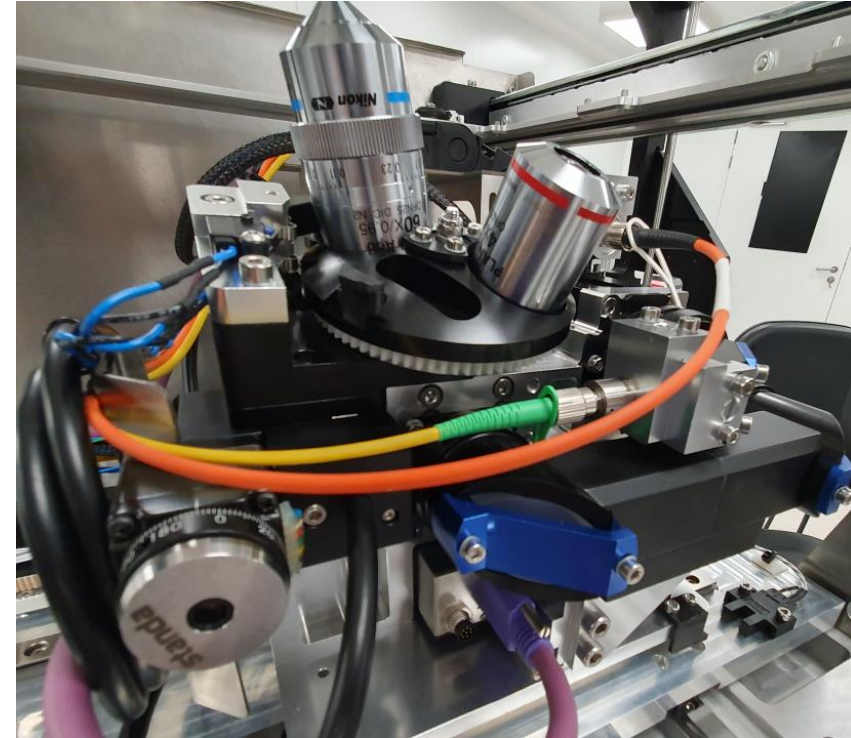
OEM microscopy modalities : Multimodal

1. Transmission
2. Wide field fluorescence
3. Confocal
4. Lifetime imaging
5. Light sheet
6. Raman
7. SRS/CARS/TPF/SHG...
8. ...



OEM microscopy: hidden inside

1. Sample at fixed position
2. Fast xy scanning (piezo)
3. Compact
4. Mobile microscope xyz



Products including OEM microscope



Cell monitoring



Enzymatic detection



Diffractive lenses measurement

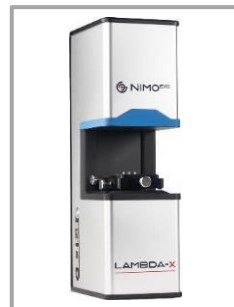
Be fast to market

Industrialization and Contract manufacturing

- 10~10k units/year
- Clean Room (650m² ISO7 & ISO5)
- Product evolutions
(Reliability-Up, Cost-Down, ...)
- Product industrialization
(DFM, DFA) & certification (CE, UL, GMP...)
- EN 9100, ISO 9001 & ISO 13485 quality system



>1k units in
3 yrs



600 units in
14 yrs



200 units in 3 yrs



20 units
in 1.5 yr



360 units in 10
yrs



22 units in 1yr



Key takeaways

Product Complexity and Diversity:

Cell environment -> peculiar microscope constraints

Product application -> so many with microscopy inside

Product development -> phase-based process

-> OEM building blocks fasten product development



Excellence in Execution:

Master design process.

Expertise in industrialization

Supply chain management

Contract manufacturing and 20 years experience in production

Conclusions – the EPIC question

What we can do for you:

- Design & Manufacture products for Life Science applications ...and beyond
- OEM microscopes or modules for your applications
- Innovative ideas to solve your challenges in imaging and medical research

• What you can do for us:

- Your expertise in Life Science and challenges in imaging drive innovations
- R&D projects to develop innovative systems together (electronics, opto-mechanics)
- Bring technologies to integrate into our customers' projects

Looking for talents



Experienced System Engineer

Human Resources intern

Business Development Manager

Quality Assurance Manager

Human Resources Manager

Project Manager – optical
instrumentation

Open application

<https://hightech.lambda-x.com/jobs/>

Thank you for your attention!

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