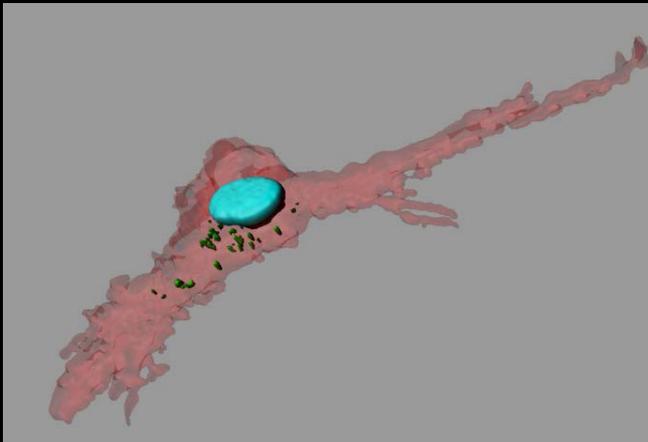




Innovative Nanomaterialen - Risiken und Anwendungen

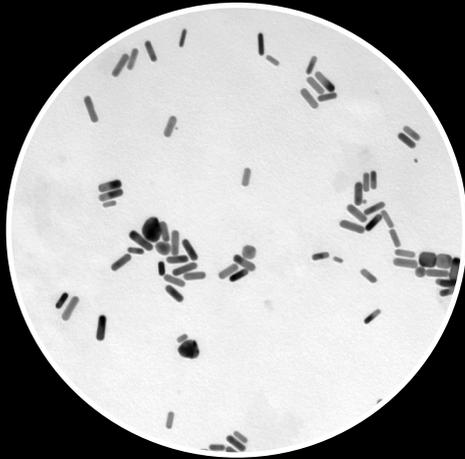


Barbara Rothen-Rutishauser

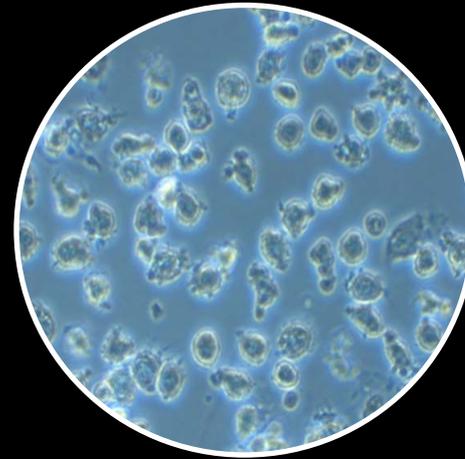
Chair Bio-Nanomaterials
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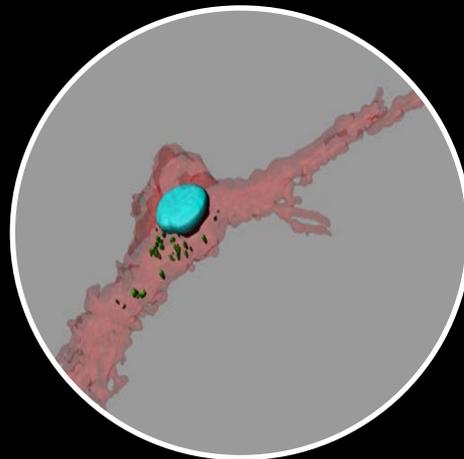
Bio-Nanomaterials: Research topics



Control
synthesis
Shape/ Surface



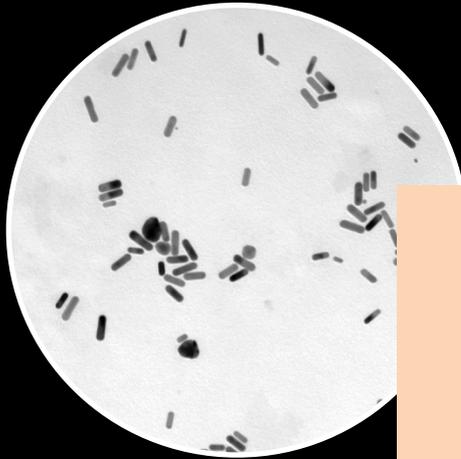
Defined
biological
systems



Nanomaterial-
cell interactions
- realistic
conditions



Bio-Nanomaterials: Research topics



Control



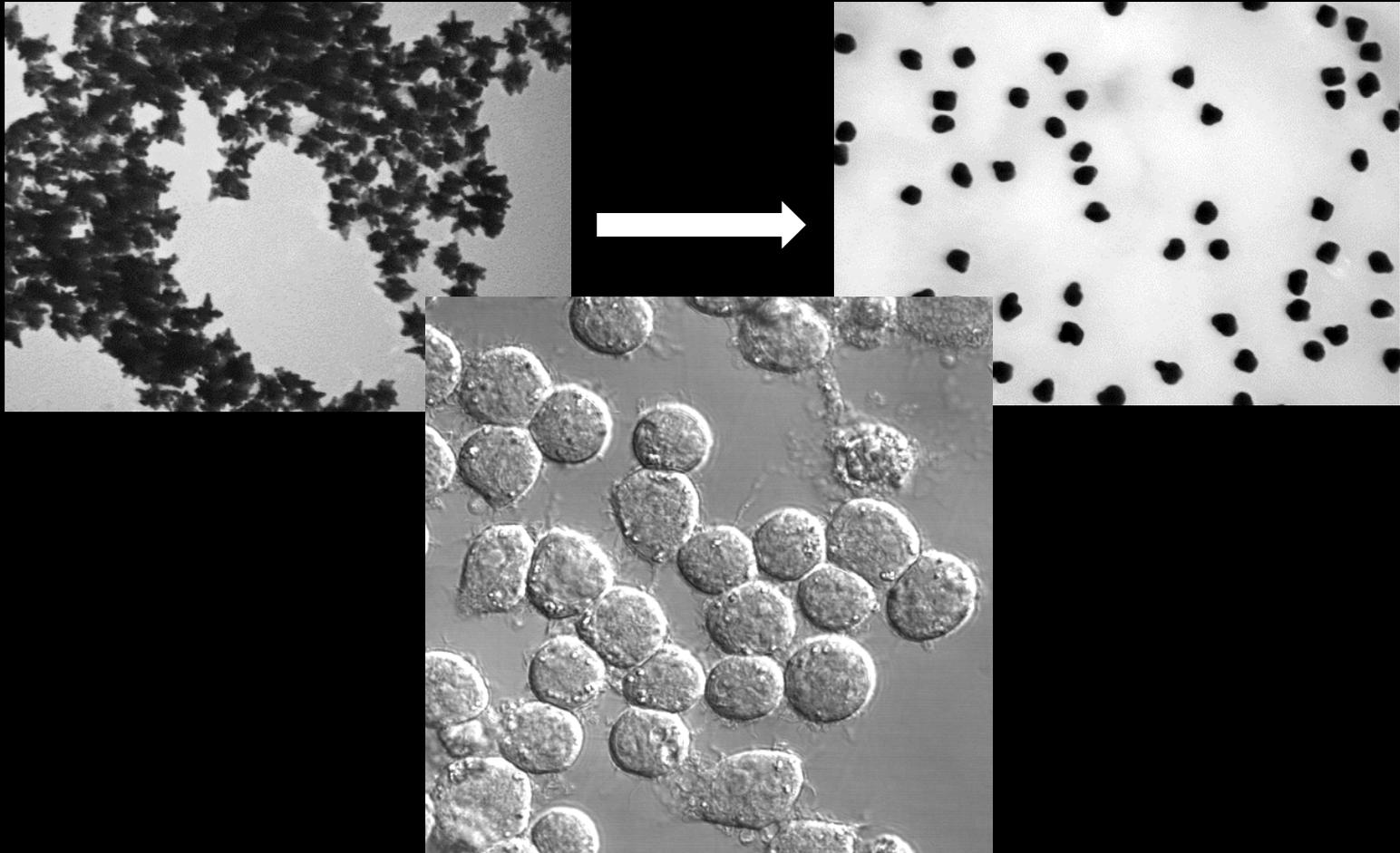
Defined
biological
systems

- Basic research
- Risk assessment
- Study of diseases
- Drug development

Material-
reactions
stochastic
conditions



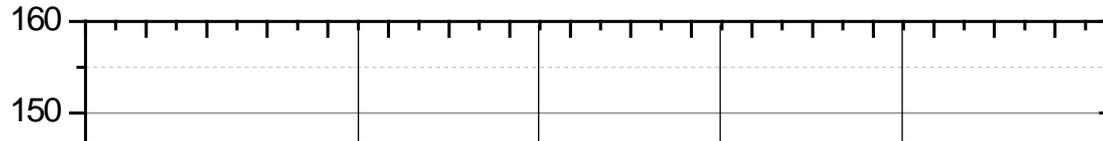
Basic research – shape / surface effects



C. Kinnear, L. Rodriguez-Lorenzo, D. Vanhecke



Basic research – shape / surface effects



- Control synthesis – surface/shape – uptake and cell responses
- Surface ligand is the key parameter

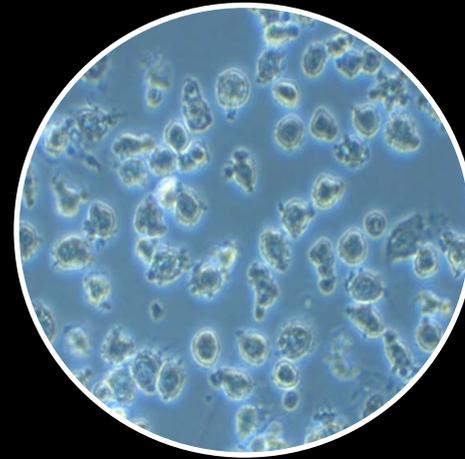




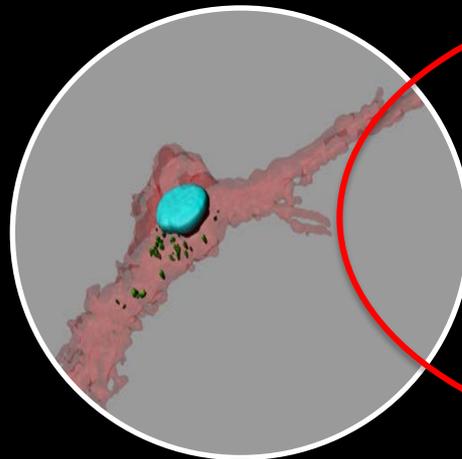
Bio-Nanomaterials: Research topics



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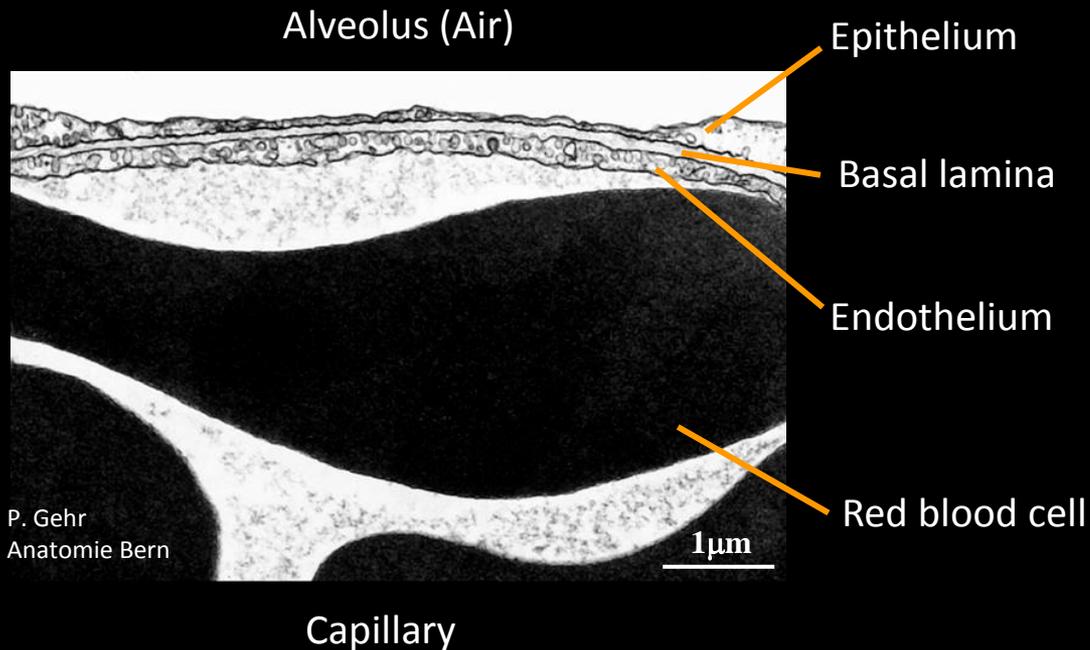


Nanomaterial-
cell interactions
-realistic
conditions



Bio-printing platform to manufacture lung tissue

The air-blood tissue barrier





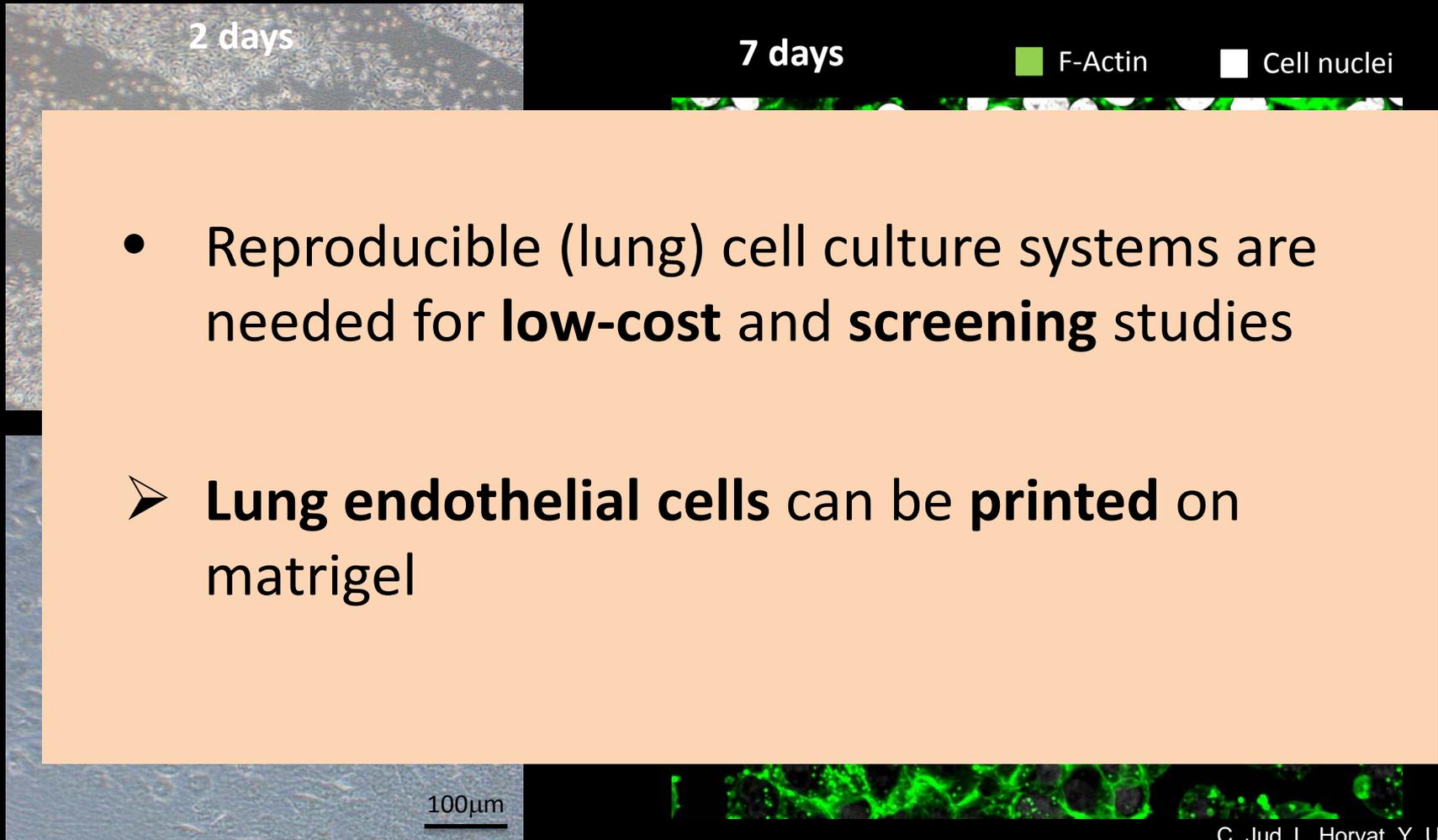
Our 3D printer: BioFactory®



Pictures provided by regenHU

C. Jud, L. Horvat, Y. Umehara

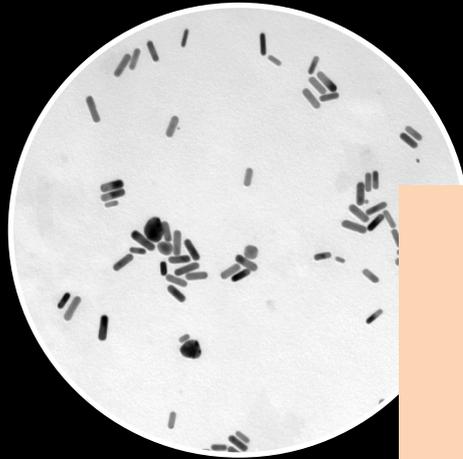
Endothelial cells (EA.hy926) printed on Matrigel



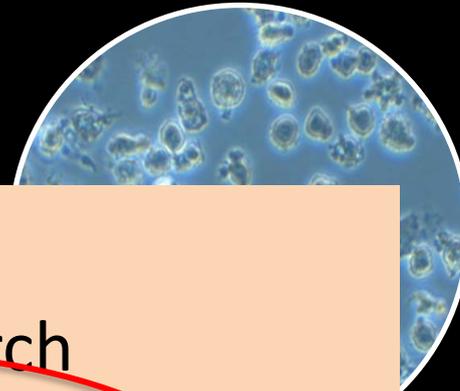
- Reproducible (lung) cell culture systems are needed for **low-cost** and **screening** studies
- **Lung endothelial cells** can be **printed** on matrigel



Bio-Nanomaterials: Research topics



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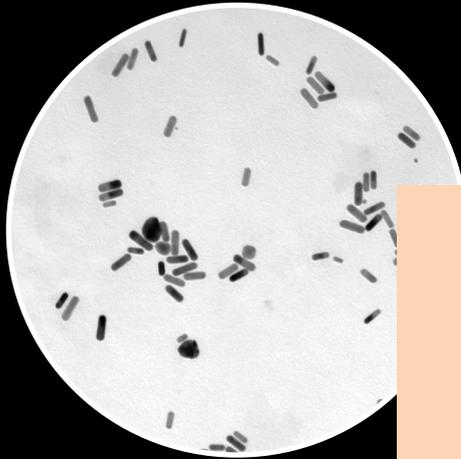


Biokinetic studies of liposomal ciclosporin *A in vitro*

- Realistic *in vitro* systems to **mimick inhalation** of drugs
- **No adverse effects of CsA** in lung cells when exposed at the air-liquid interface
- **Constant CsA level** inside cells over 24h

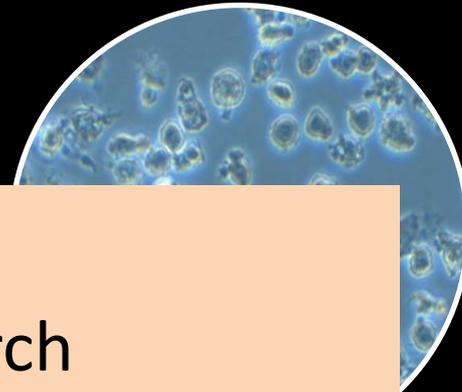


Bio-Nanomaterials: Research topics



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Material-
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Acknowledgments

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- Prof. Alke Fink
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Former member:

- Dr. Corinne Jud

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- Marc Thurner

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