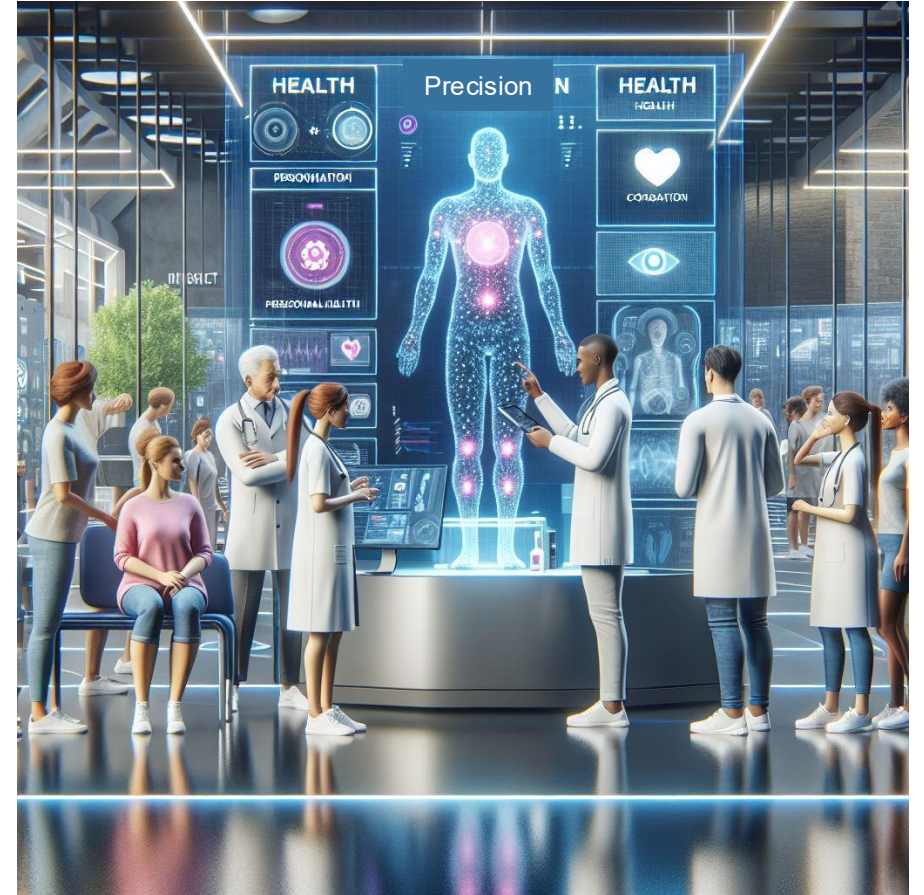


# REVOLUTIONIZING HEALTHCARE WITH AI

Dr Carine Poussin

May 26<sup>th</sup>, 2025 – LSZ IMPACT, Zurich



# CSEM AT A GLANCE

We are a public-private, non-profit Swiss **technology innovation center**

We enable competitiveness by **developing and transferring world-class technologies to the industrial sector**



**1984**  
FOUNDED



**600**  
SPECIALISTS



**107.6**  
M TURNOVER  
in 2023

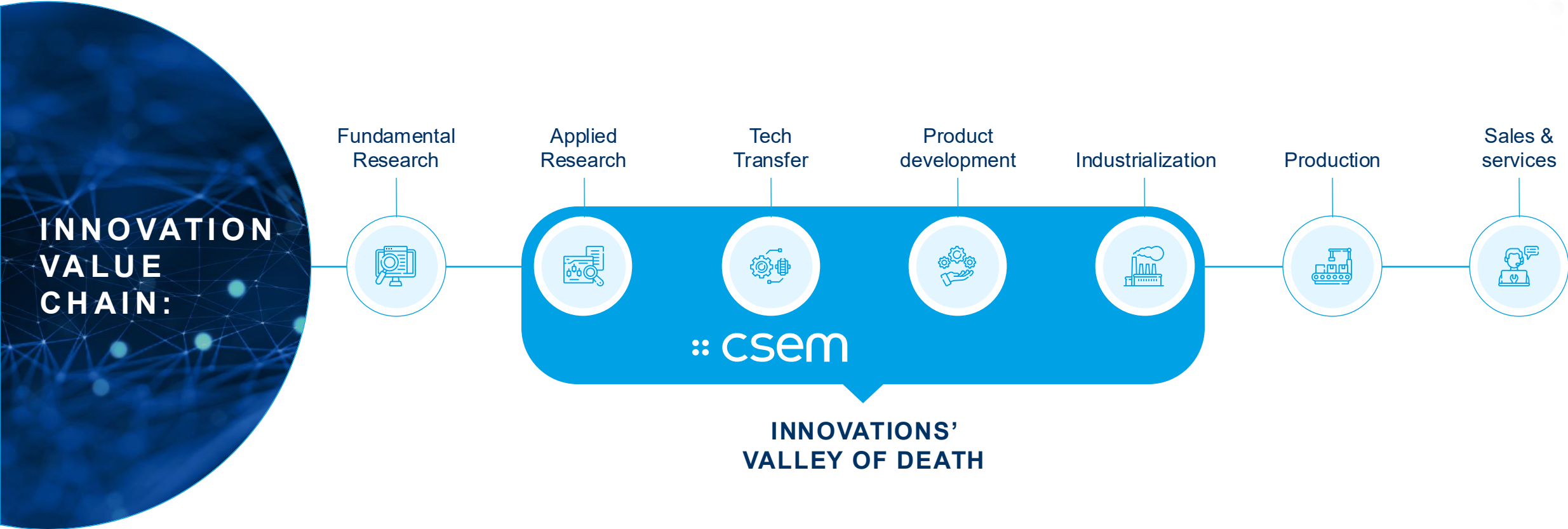


**177**  
PATENT  
FAMILIES



**> 50**  
VENTURES  
since 1984

# We support academic and industry partners to develop their technology and tech transfer for real-world applications

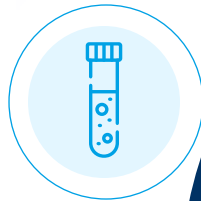


 **92%** satisfied customers

# Uniting Biology with Technology for Personalized Health

We innovate at the convergence of technology and life to help bring the right treatment to each patient.

**BIOSENSING**



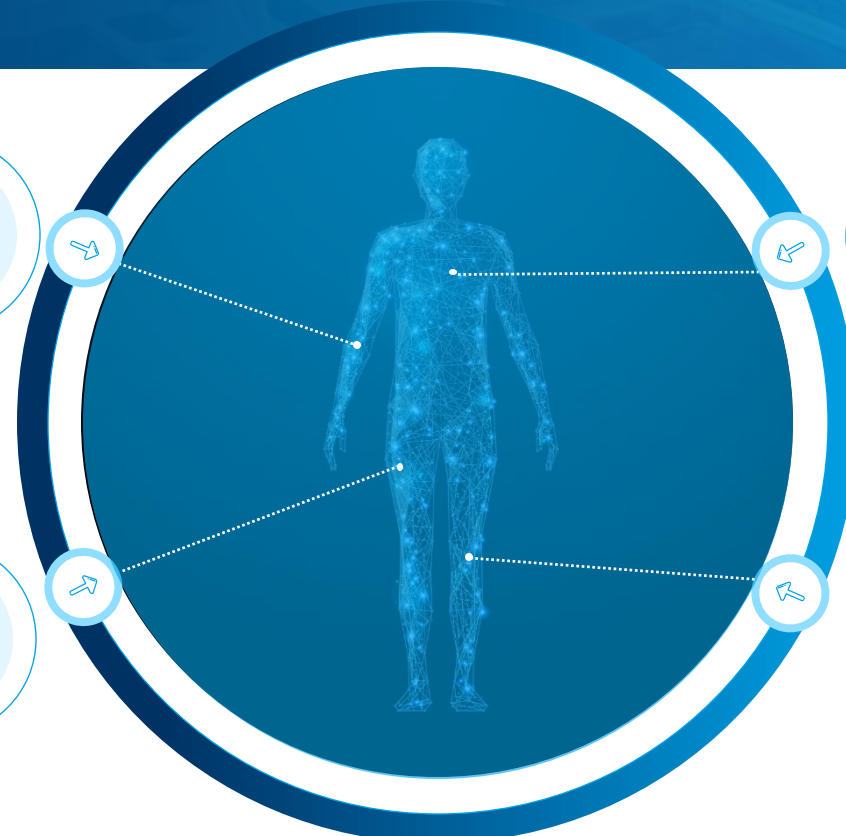
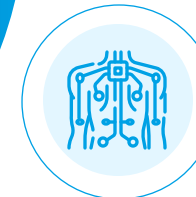
**LAB  
AUTOMATION**



**CELL  
TECHNOLOGIES**



**AI FOR LIFE  
SCIENCES**



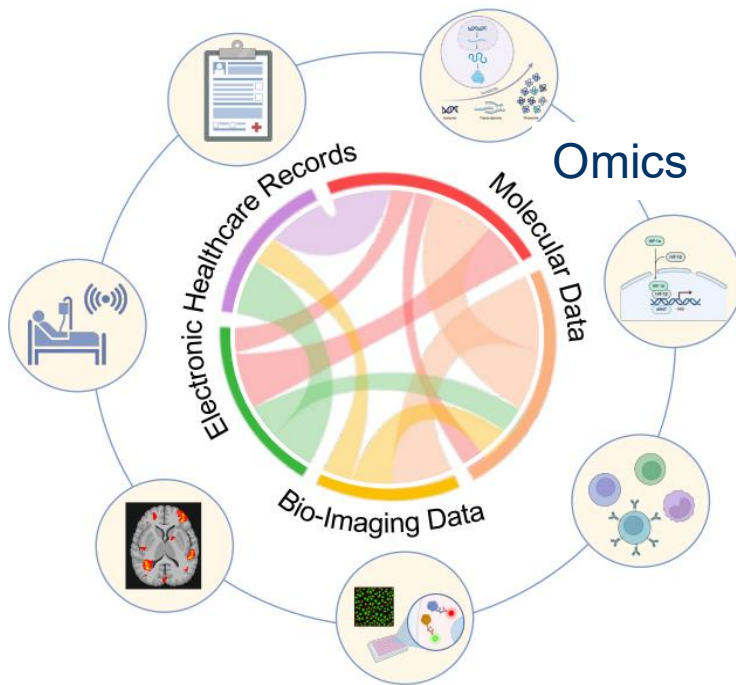
## Customized AI for your needs

We tailor predictive AI solutions by integrating and contextualizing multi-modal data to accelerate innovation in Life Sciences.



# CUSTOMIZED AI SOLUTIONS

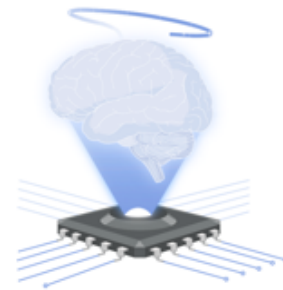
## MULTI-MODAL DATA INTEGRATION



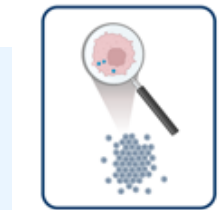
- Patient graph
- Disease graph

## AI ENGINE

- Machine Learning
- Explainable AI



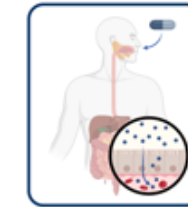
## PREDICTIVE AI



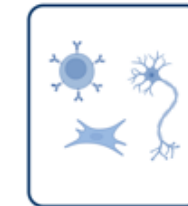
Biomarker discovery



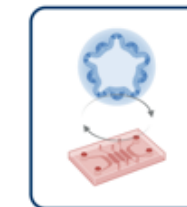
Personalized health



Mode of drug action



Novel cell populations



Disease mechanism



Digital twin

- Drug response
- Disease risk
- Disease severity
- Biological age
- Diagnosis
- Disease subtypes
- ...



# **Use case: Multimodal data integration platform for Clinical Decision Support**

# JOHN'S JOURNEY WITH MULTIPLE MYELOMA

John has been diagnosed with Multiple Myeloma (MM)

Red marrow where plasma cells are made

Bone

Normal plasma cells

Antibodies

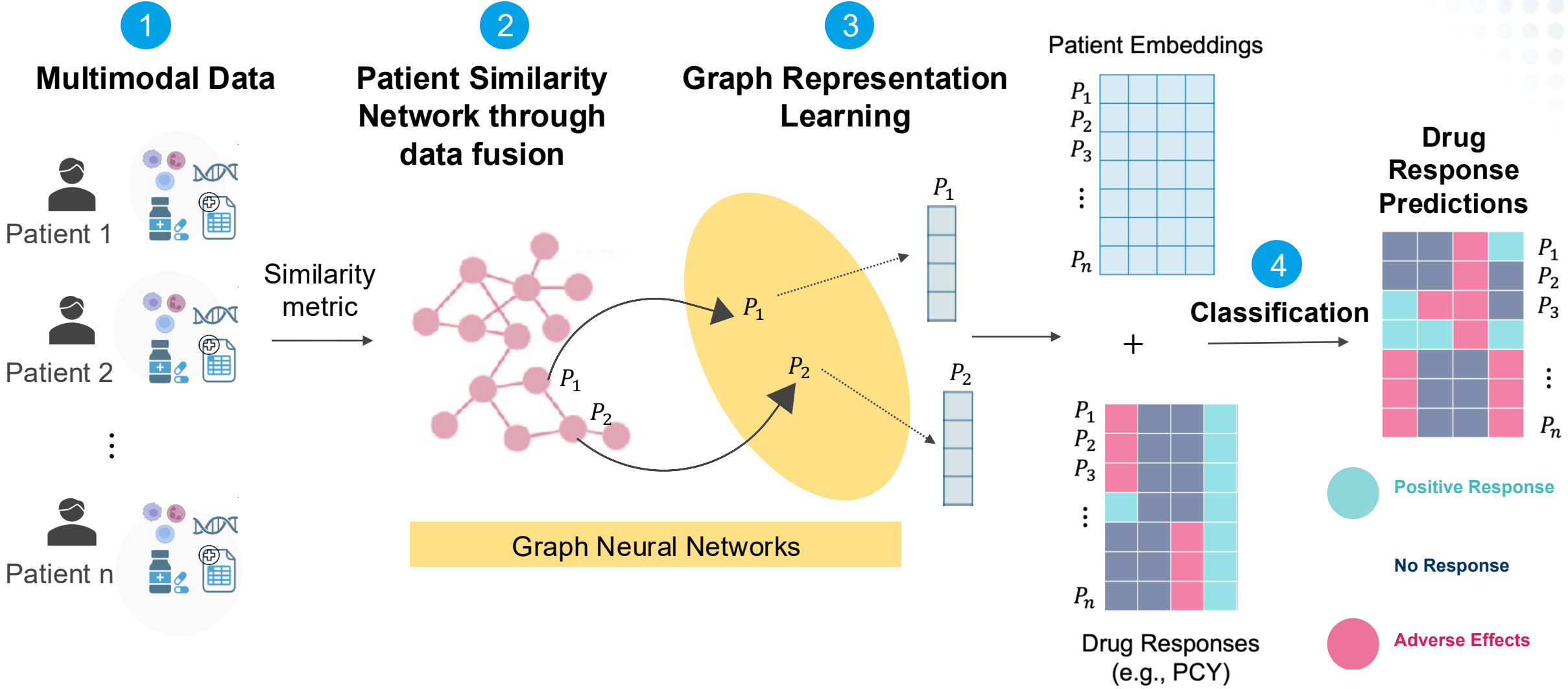
Multiple myeloma cells (abnormal plasma cells)

© 2014 Tenax Winflow LLC  
U.S. Govt. has certain rights

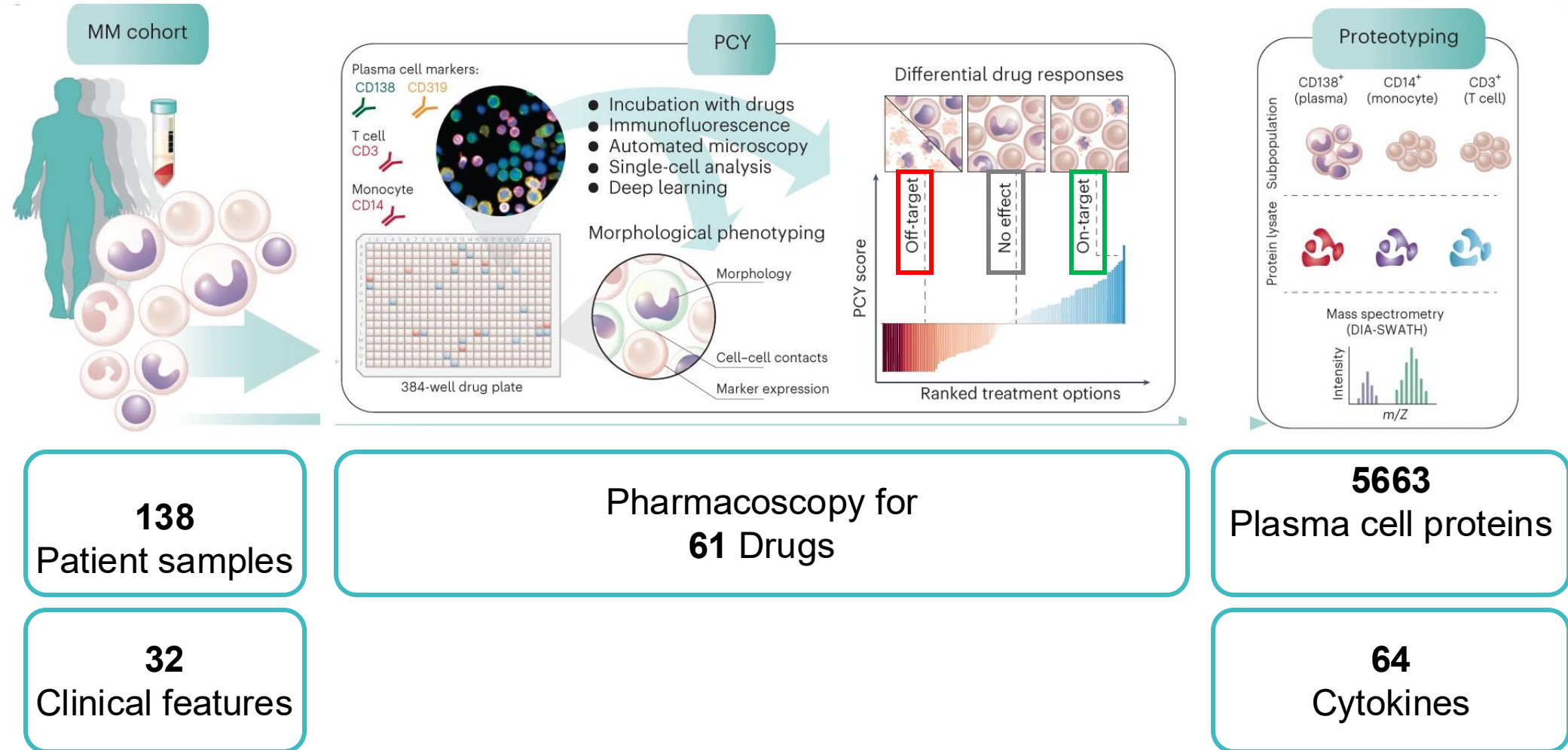
Unfortunately, John's myeloma has relapsed after several lines of treatments

How can we identify a personalized effective treatment for John?

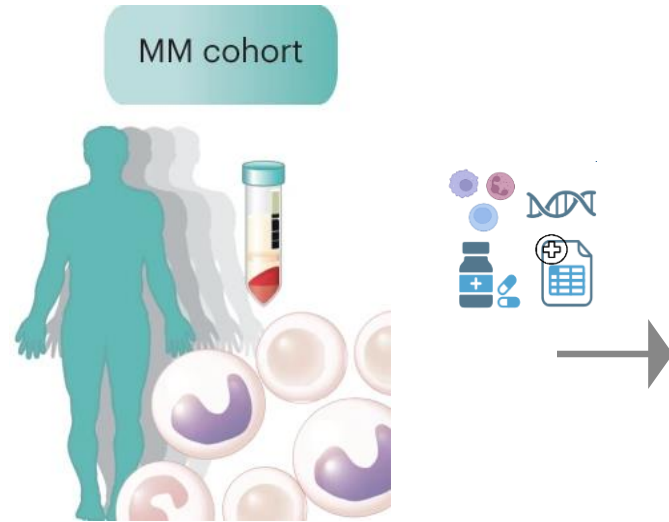
# A MULTIMODAL DATA-BASED PATIENT STRATIFICATION PLATFORM



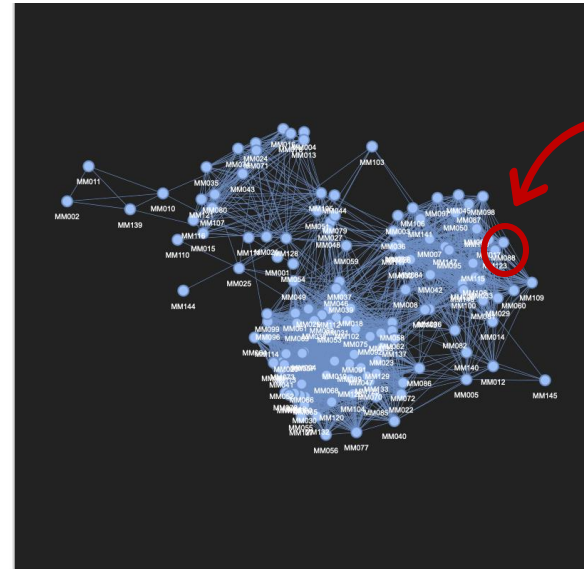
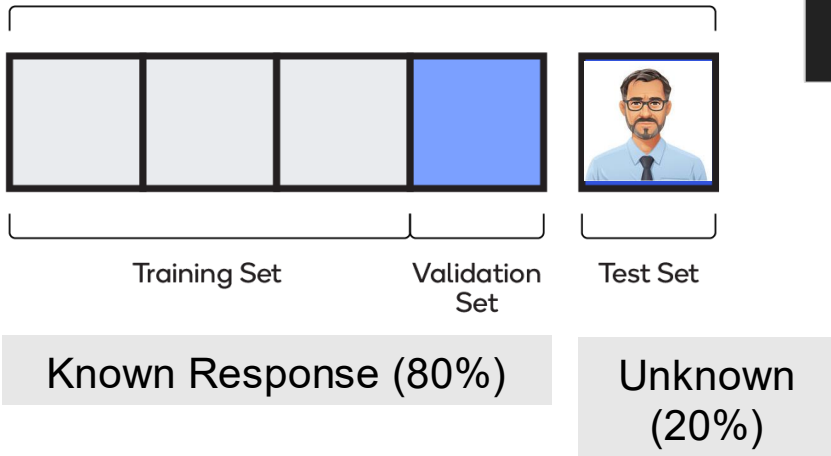
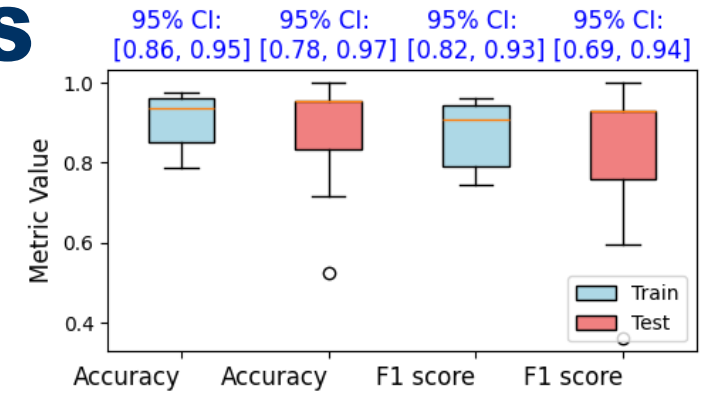
# MULTIPLE MYELOMA COHORT



# PATIENTS' DRUG RESPONSE PREDICTIONS

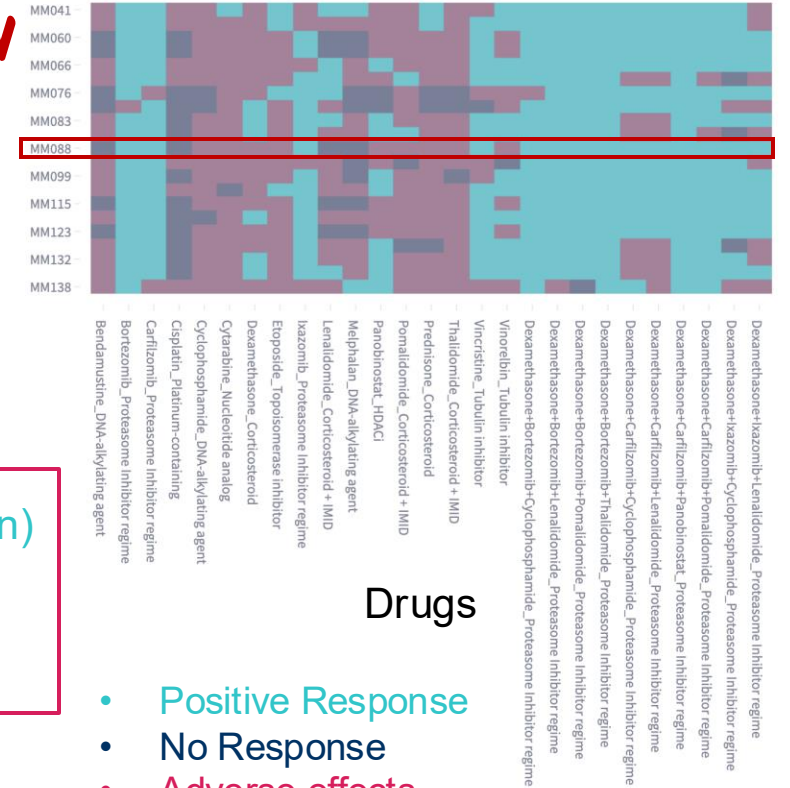


Performance –  
61 drugs –  
One-vs-Rest



Patients

## Drug Response Prediction



+ Proteasome inhibitors (±combination)  
0 DNA-alkylating agents  
- Corticosteroids

# TAKE HOME MESSAGES

With a **wide range of technical competencies**, **CSEM** is a trusted **partner to accelerate innovation in Life Sciences**

Among our AI-driven solutions, **our multimodal, graph-based data integration platform** offers:

- 1. Deep insights into patient clusters** — enabling navigation through the complexity and heterogeneity of diseases
- 2. Predictive modeling capabilities** — supporting outcome forecasting such as drug response
- 3. High adaptability** — tailored to diverse data types and problem domains

**CONTACT US!**



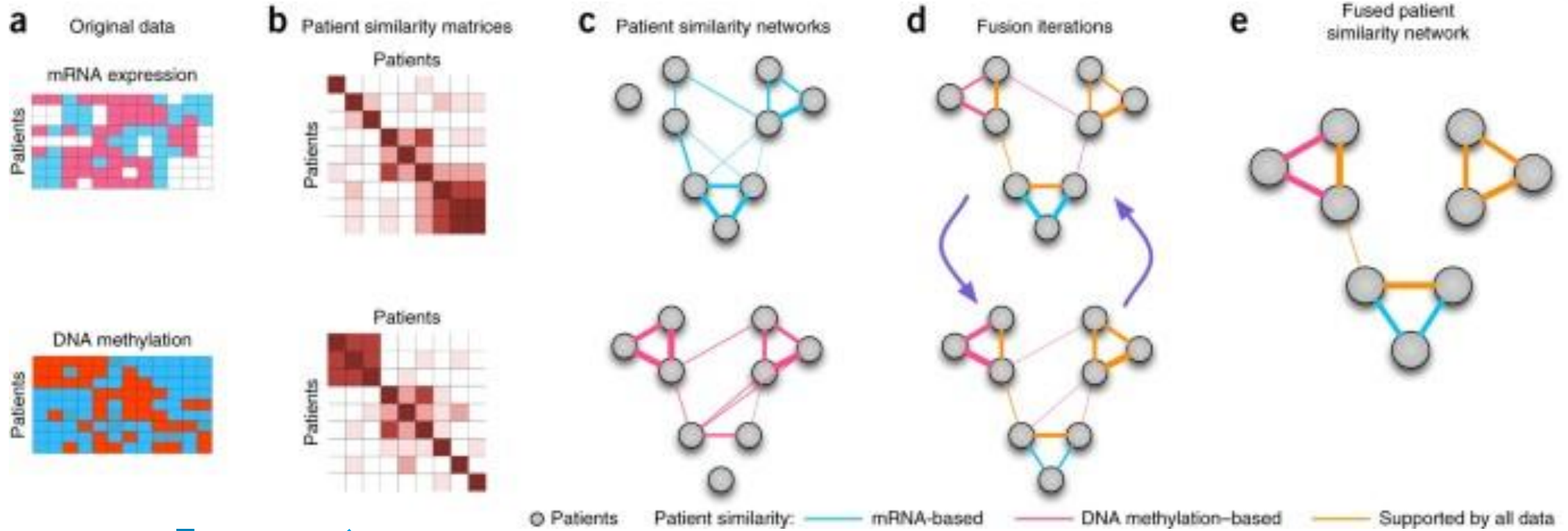
**Carine Poussin, PhD, MBA**  
**Head AI for Life Sciences**

**[carine.poussin@csem.ch](mailto:carine.poussin@csem.ch)**



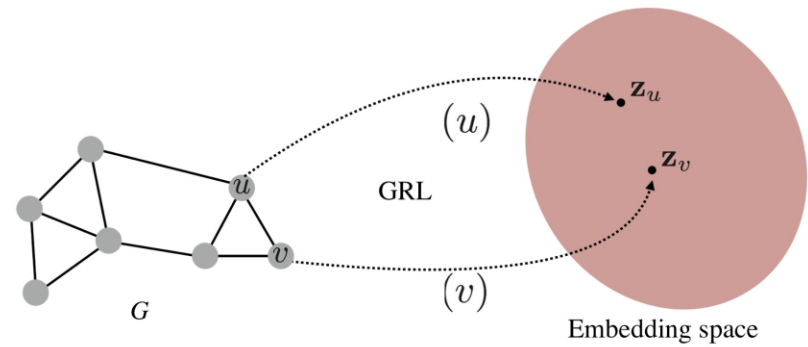
FACING THE CHALLENGES OF OUR TIME

# SIMILARITY NETWORK FUSION

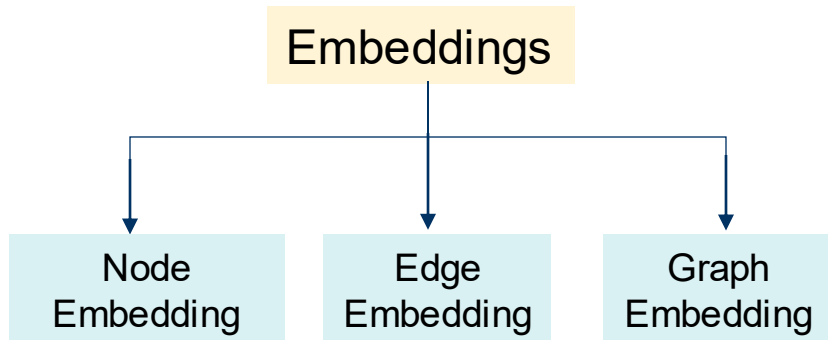


  
Mutual Information

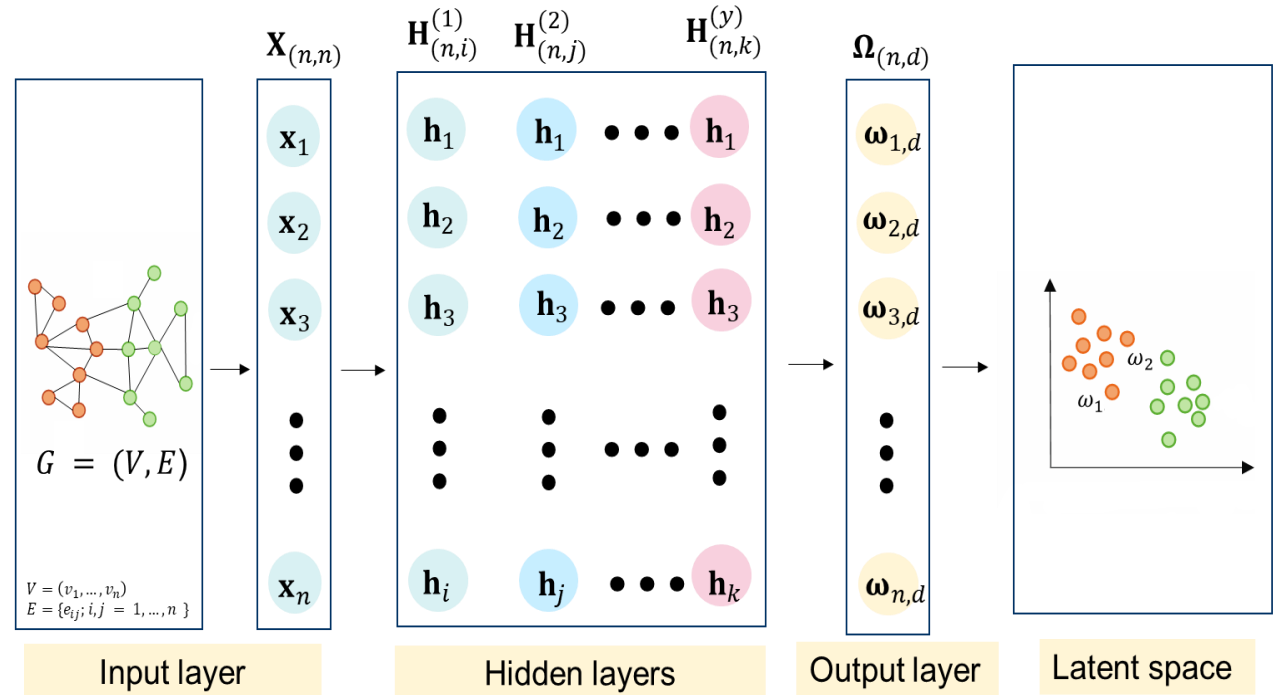
# GRAPH REPRESENTATION LEARNING



## Graph representation learning



## Graph Neural Network



# ONE-VS-REST

