

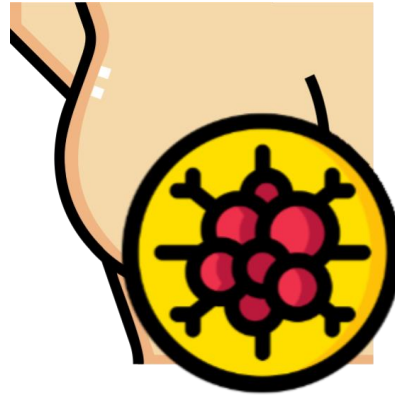


RAPIDLY SIGNAL-ENHANCED METABOLIC MRI – A FAST TRACK TO BETTER CANCER DIAGNOSTICS

Stefan Glögler



REDUCED MORTALITY DUE TO EARLY DIAGNOSTICS



Breast cancer

5 year survival rate >90%

Survival rate with early diagnostics >99%

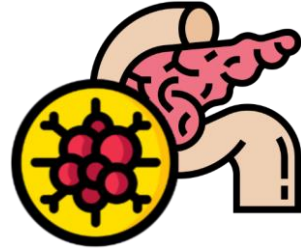
Rate of early diagnostics 63%

Programs since the 90s for early diagnostics:

Drop in mortality by 40%!



MANY CANCERS ARE DIAGNOSED TOO LATE



Pancreatic cancer

5 year survival rate 12.5%

Survival rate with early diagnostics >44%

Rate of early diagnostics 13%

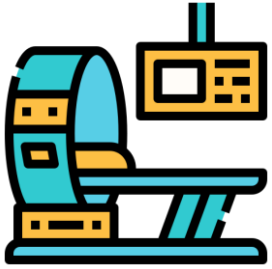
Pancreatic cancer usually leads to symptoms at a late stage

Highest mortality rate

Improved early diagnostics allow to discover new therapeutics and develop better treatments



DEMOCRATIZING FUNCTIONAL CANCER IMAGING

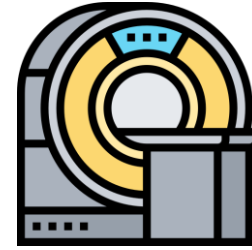


PET/CT

Uses ionizing radiation for imaging

Cannot depict soft tissues well

Offers functional imaging via radiotracers which requires certain infrastructures and strongly limits throughput and availability



MRI

Non-invasive imaging using magnetic fields

Good spatial resolution and depiction of soft-tissues

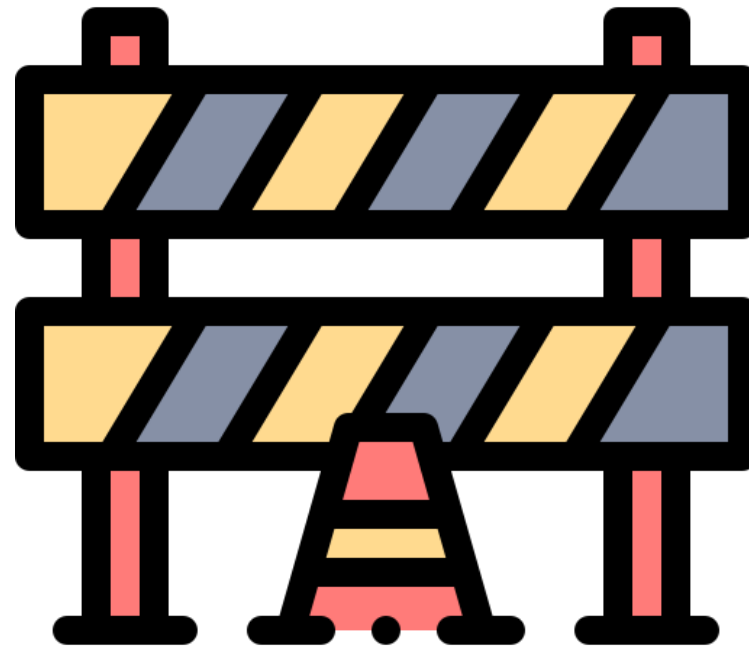
Broader availability

...but lacks functional imaging capabilities even with contrast agents

WHAT LIMITS THE DIAGNOSTICS OF MANY DEADLY TUMORS?



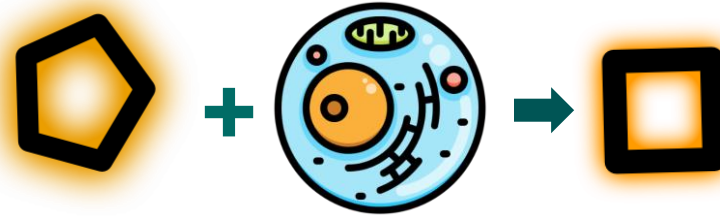
Contrast agents to monitor biochemical changes



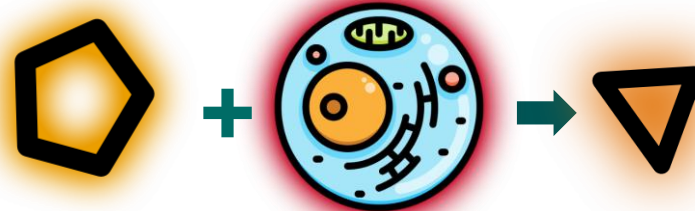
METABOLISM OFTEN ALTERED IN EARLY STAGES OF ILLNESSES



healthy



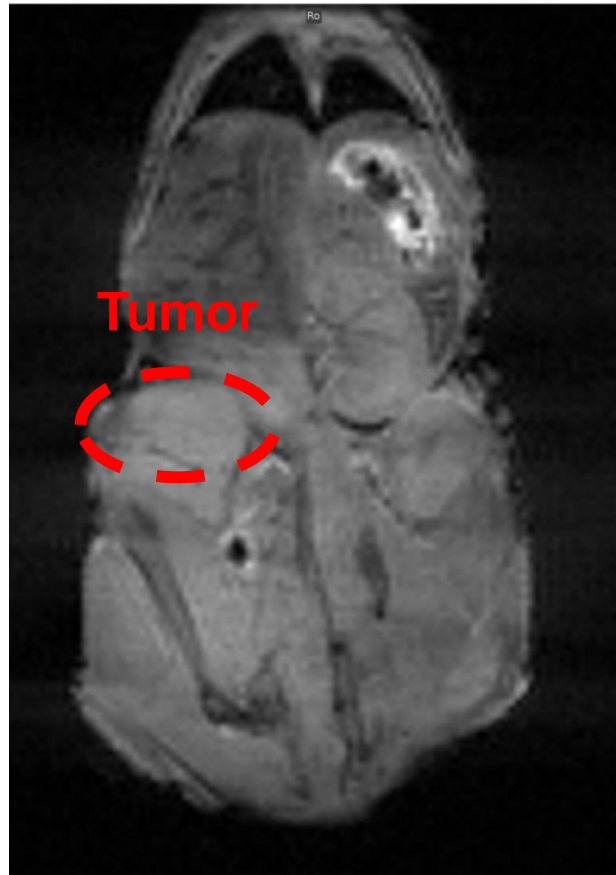
sick





METABOLIC IMAGING

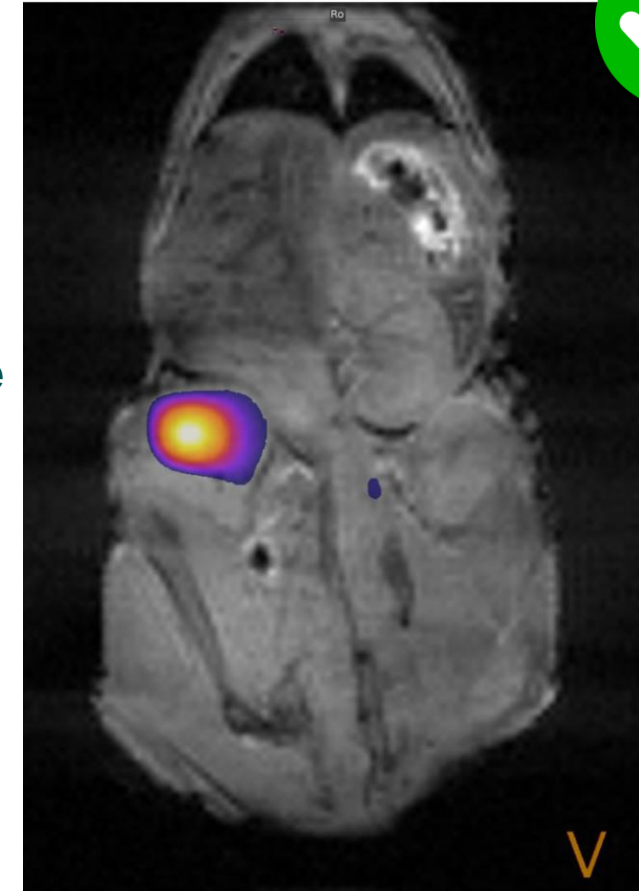
NORMAL MRI



Injection of
signal-enhanced pyruvate



METABOLIC MRI

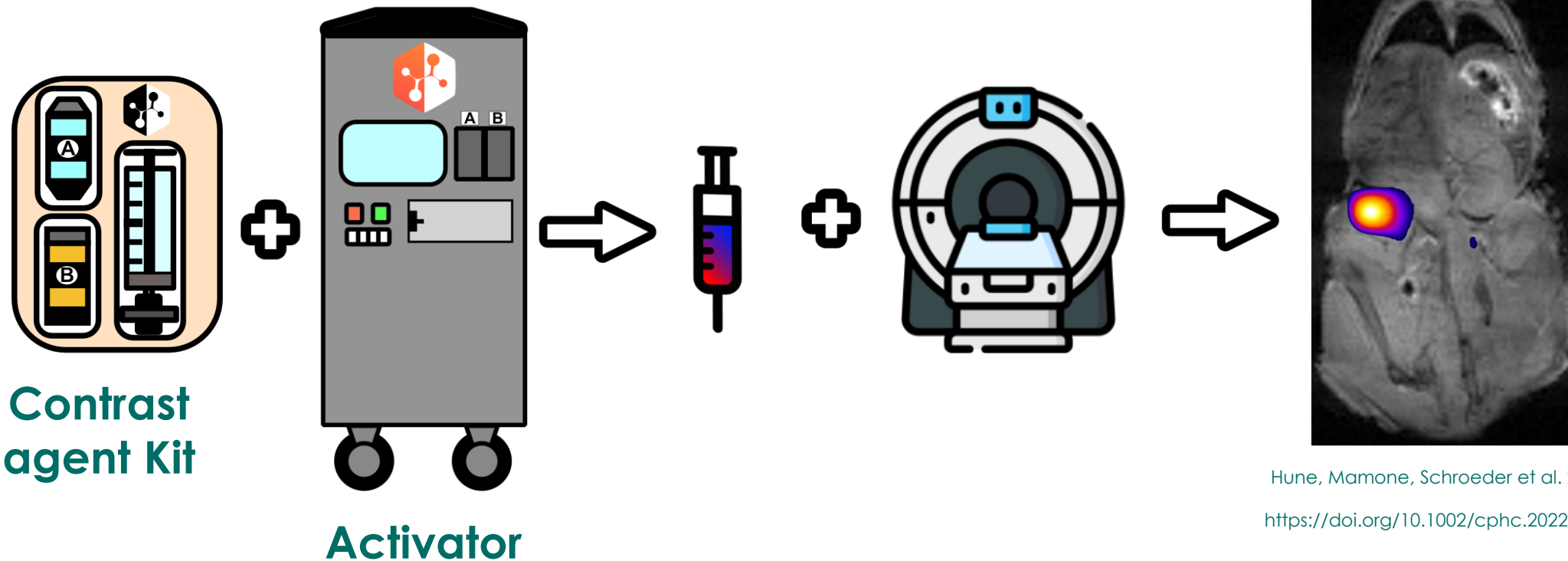


Example: **A malignant human tumor xenograft in a rodent**

FUTURE CLINICAL PRACTICE



Example: **A malignant human tumor xenograft in a rodent**





WHAT NEEDS TO BE ACCOMPLISHED TO BRING THIS TECHNOLOGY INTO THE CLINICS?



Upscaling of contrast agents for clinical quantities



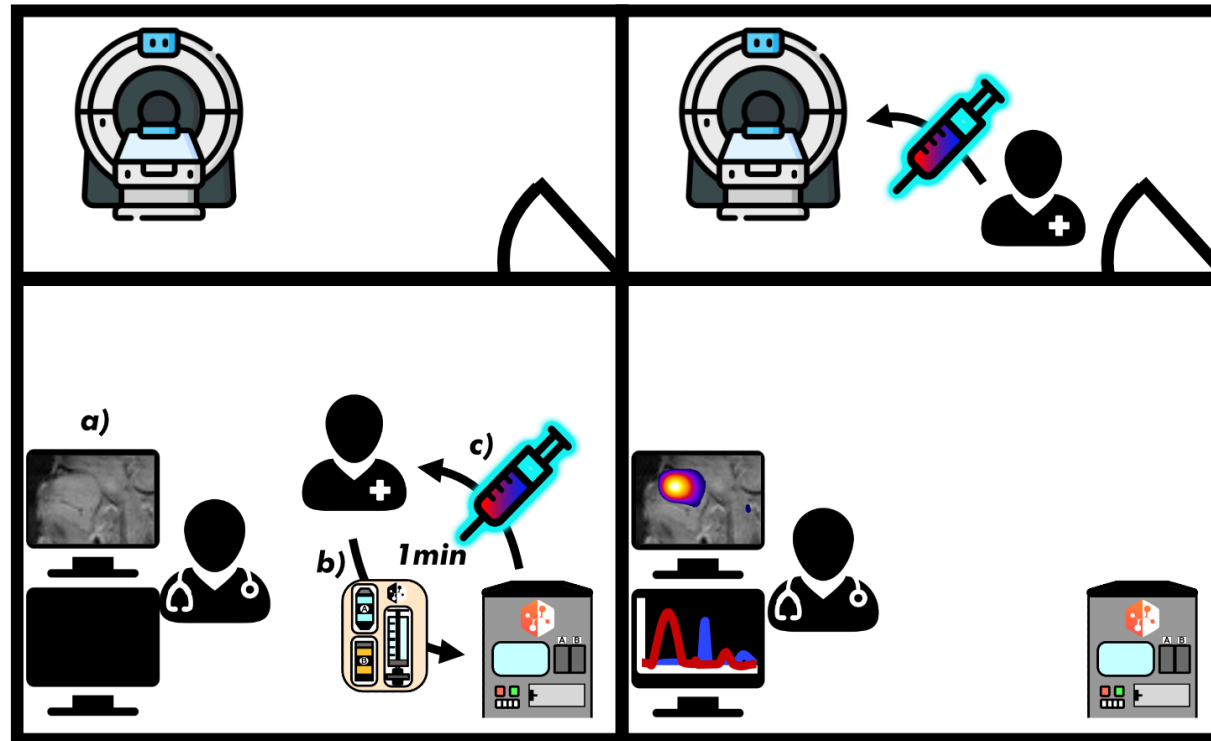
Development of devices that activate the contrast agents



Development of imaging protocols



WORKFLOW IN HOSPITAL – RESULTS IN MINUTES





THANK YOU!!!



 Else
Kröner
Fresenius
Stiftung



MAX!mize