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Strategic Focus Area
Personalized Health
and Related Technologies

SMOC

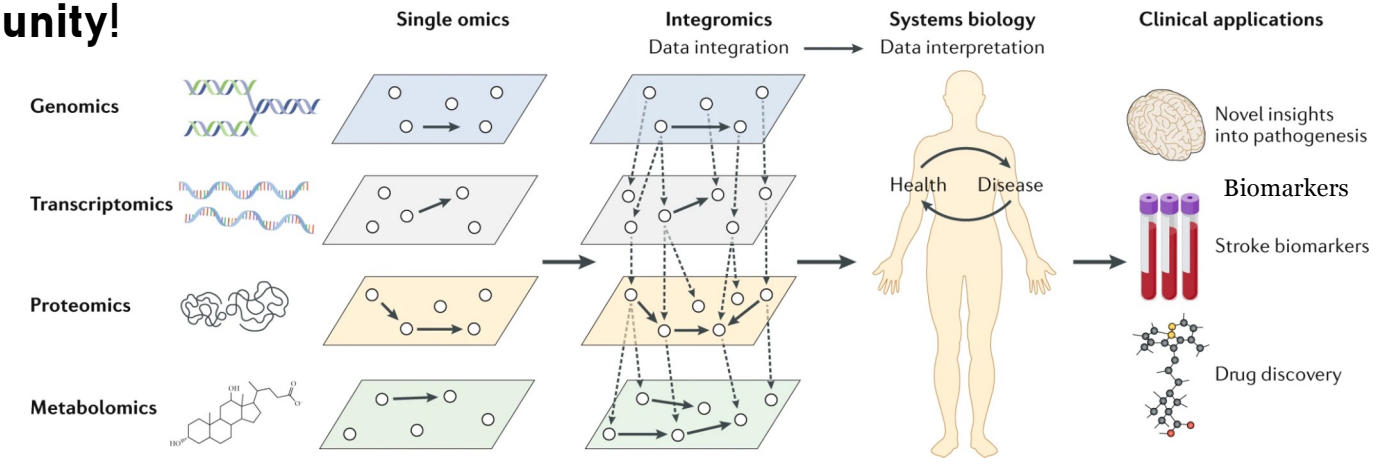
Personalized health builds on the combination of clinical and molecular data

Sample digitization is a necessity!

Clinical samples cannot be regenerated. Turning clinical specimens into searchable and reusable digital biobanks paves the road to retrospective and highly-powered studies.

Sample digitization is an opportunity!

Integrative analyses drive discovery of mechanisms and novel targets.



DOI:10.1038/s41582-020-0350-6

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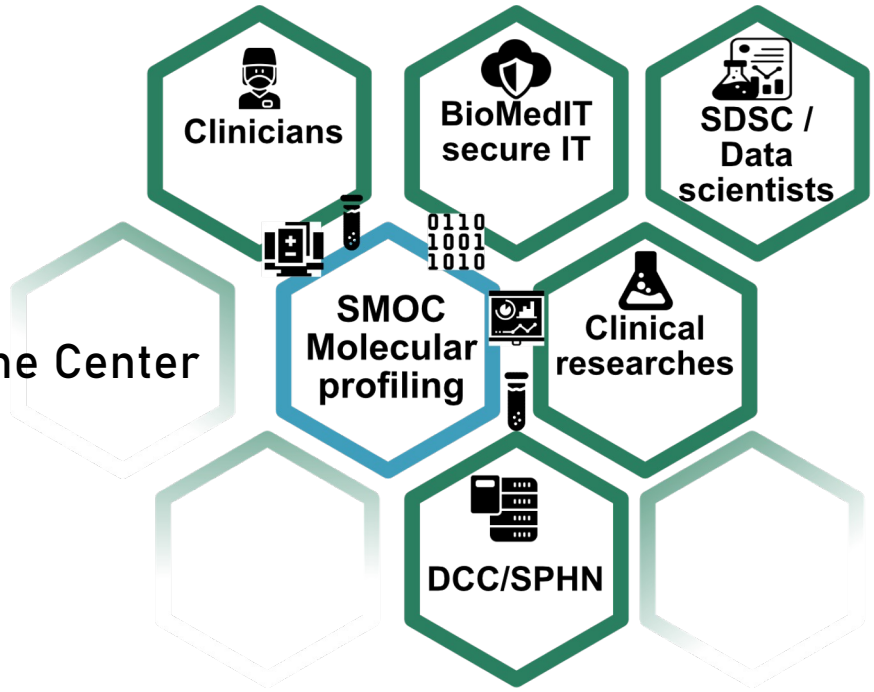
The ETH PHRT Swiss Multi-Omics Center (SMOC)

Mission: Enable multi-omics analyses of clinical samples

- Deliver clinical-grade, population scale, molecular data enriched with expert data analysis
- Democratize access to data (costs, actionability)



Organization: Integration of existing expert units

- **genomics, transcriptomics** @ Health 2030 Genome Center
- **proteomics** @ ETH Zürich
- **metabolomics, lipidomics** @ ETH Zürich

- Tight collaboration and coordination across Centers
- ~10 PIs/Senior Scientists involved in management

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The ETH PHRT Swiss Multi-Omics Center: Portfolio

PHRT Swiss Multi-Omics Center

PHRT Clinical Omics Centers

Genomics
CGAC
Clinical Genomic Analysis Center

Proteotyping
CPAC
Clinical Proteotype Analysis Center

Metabolomics & Lipidomics
CMAC
Clinical Metabolomics Analysis Center

Measure

Single entry point for digitizing your clinical cohorts at the level of DNA, RNA, Proteins, Metabolites and Lipids

Integrate

Integrated FAST track and DEEP track analysis of multi-omics data

Analyze

Delivering molecular insights supporting publications and clinical decision making

Share

FAIR sharing of primary and derivative data based on ethical consent

GETTING THE MOST OF YOUR CLINICAL SAMPLES

Single entry point for integrated multiomic analysis.

MOLECULAR INSIGHTS INTO CLINICAL COHORTS

Standardised and automated processing of large clinical cohorts.

SAFE DATA STORAGE AND EXCHANGE

Handling of sensitive clinical data according to established SPHN/BioMedIT guidelines.

CONSULTANCY

We will find together the right strategy for digitizing and analizing you clinical samples.

FEASIBILITY STUDY

Small scale studies for optimizing clinical cohort experimental design and generating proof of concept data.

SUPPORT WITH GRANT AND PAPER WRITING

We will provide relevant text snippets supporting grants and publications.

**One entry point, three centers with expertise across the value chain.
Scalable production and analytics.**

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Multi-Omic investigation of rare disease led to therapeutic insights

nature metabolism

Article

https://doi.org/10.1038/s42255-022-00720-8

Integrated multi-omics reveals anaplerotic rewiring in methylmalonyl-CoA mutase deficiency

UNIVERSITÄTS-
KINDERSPITAL
ZÜRICH

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Personalized Health
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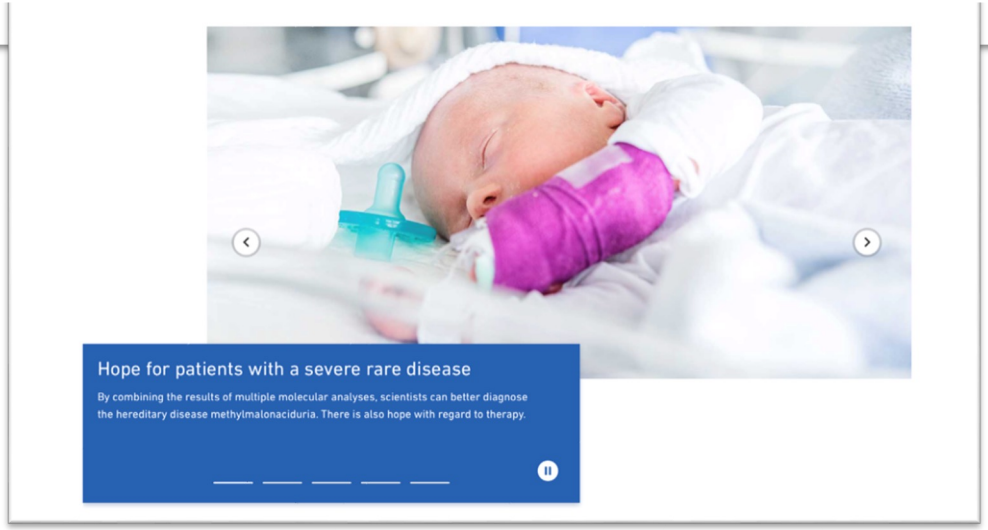
Pioneer Project



News & views

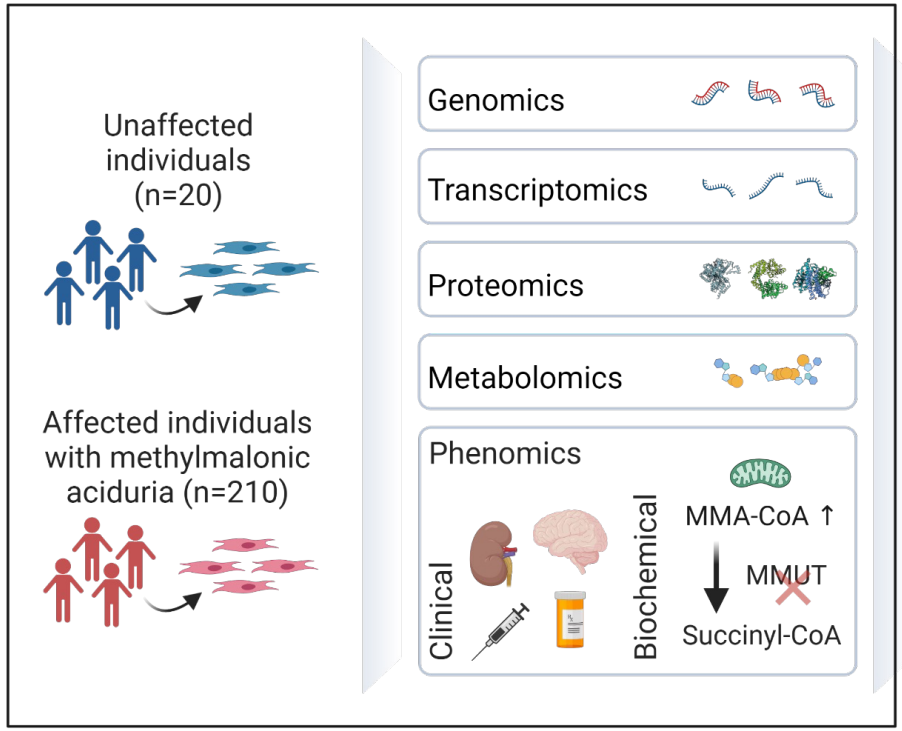
Mechanisms of disease

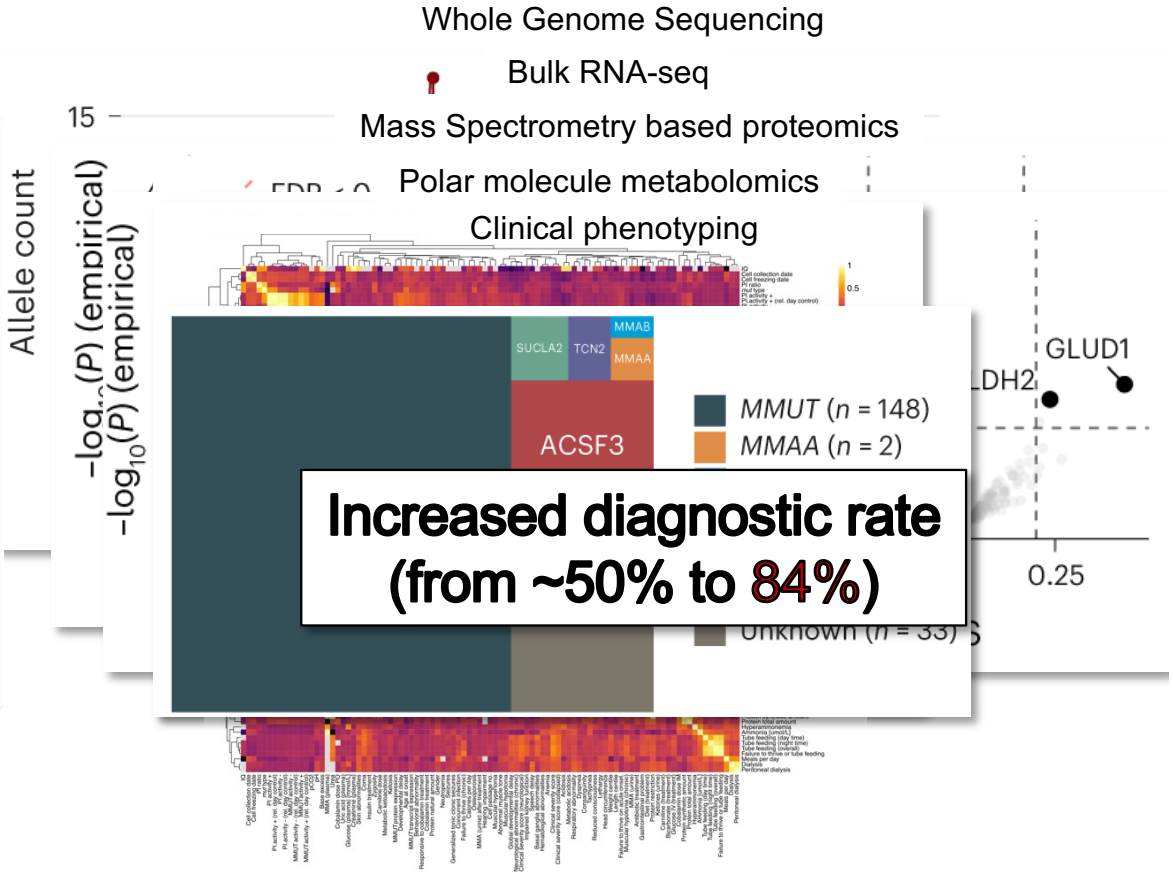
Anaplerosis in action

PamelaSara E. Head & Charles P. Venditti

Investigation of multi-omic changes and their effects on regulation of metabolic pathways confirm anaplerotic deficiencies in methylmalonic acidaemia, strengthening the need for future therapies aimed at replenishing intermediates of the tricarboxylic acid cycle.

Integrated multi-omics analysis in methylmalonic aciduria





Forny, P., Bonilla, X., Lamparter, D., Shao, W., Plessl, T., Frei, C., Bingisser, A., Goetze, S., van Drogen, A., Harshman, K., Pedrioli, P.G.A., Howald, C., Poms, M., Traversi, F., Bürer, C., Cherkaoui, S., Morscher, R.J., Simmons, L., Forny, M., Xenarios, I., Aebersold, R., Zamboni, N., Rätsch, G., Dermitzakis, E.T., Wollscheid, B., Baumgartner, M.R., Froese, D.S., 2023. *Nature Metabolism*.

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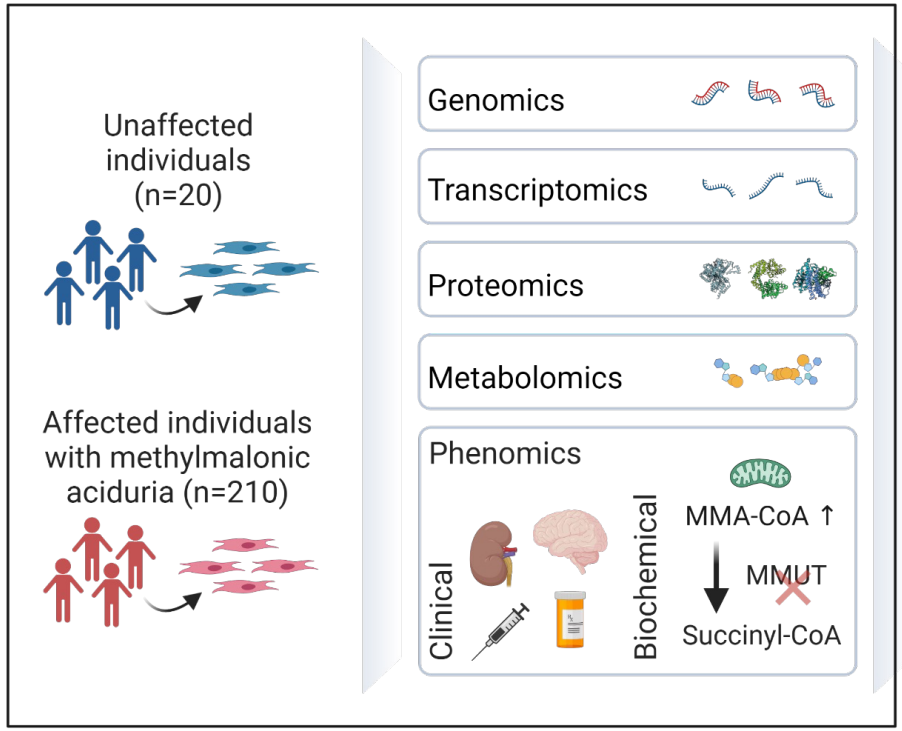

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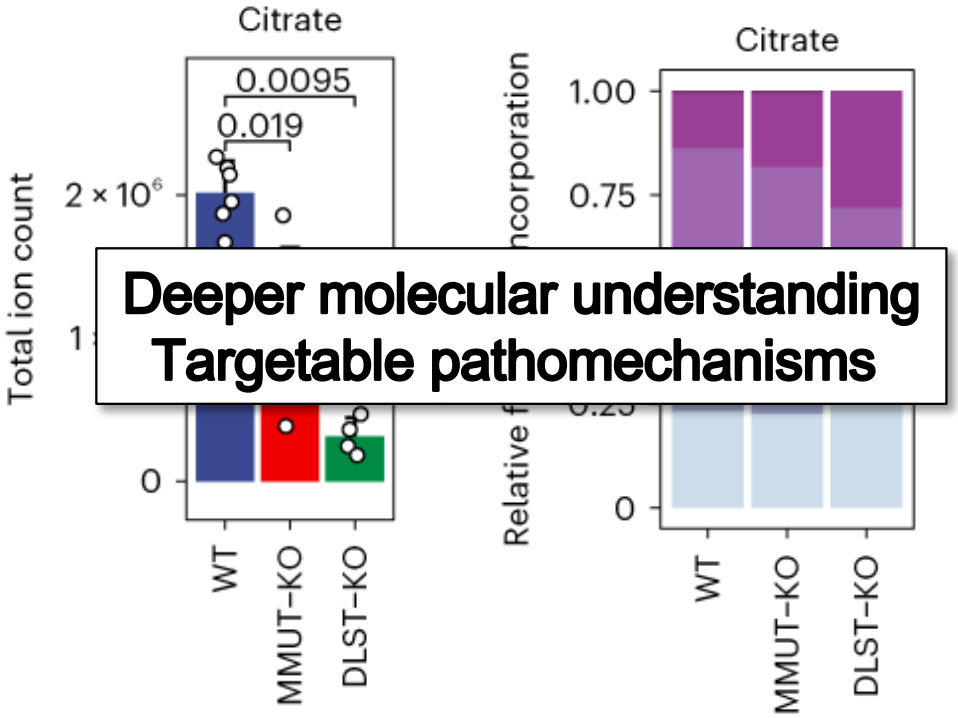
Disturbed TCA Metabolism



Deeper molecular understanding
Targetable pathomechanisms

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The ETH PHRT Swiss Multi-Omics Center in the Swiss Health Ecosystem

Catalyst for

translation of basic science into clinics

longitudinal multi-omics

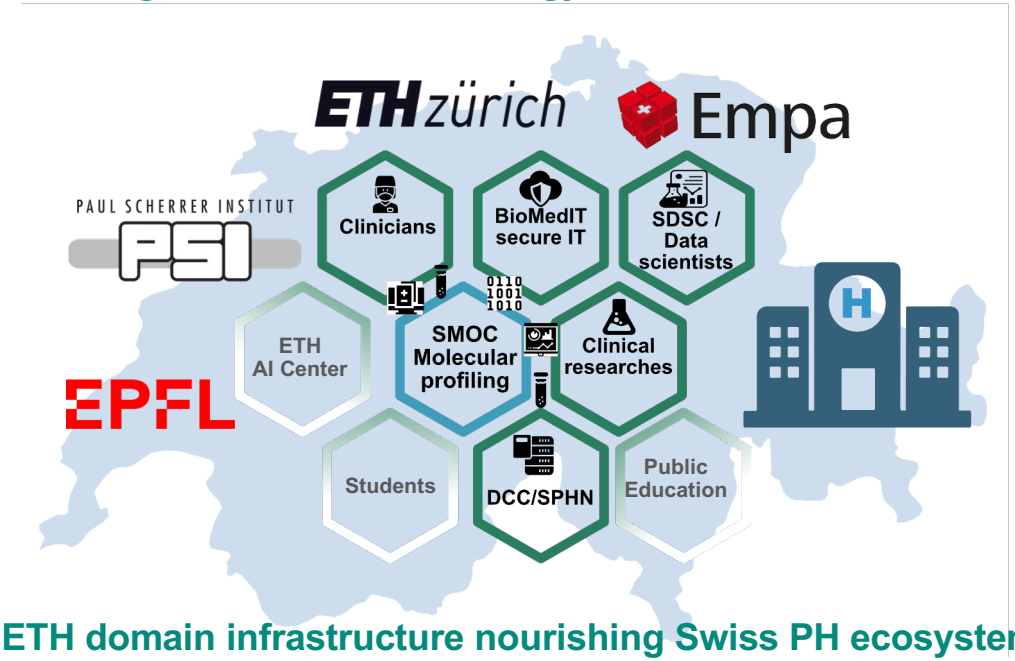
interventional trials

mechanistic and functional understanding of disease

new predictive diagnostics

novel treatment approaches

Digital Switzerland Strategy & BFI-Botschaft 25–28



ETH domain infrastructure nourishing Swiss PH ecosystem

Enabler of

SPHN Swiss Personalized Health Network

FNSNF

TPC Tumor Profiler Center Switzerland

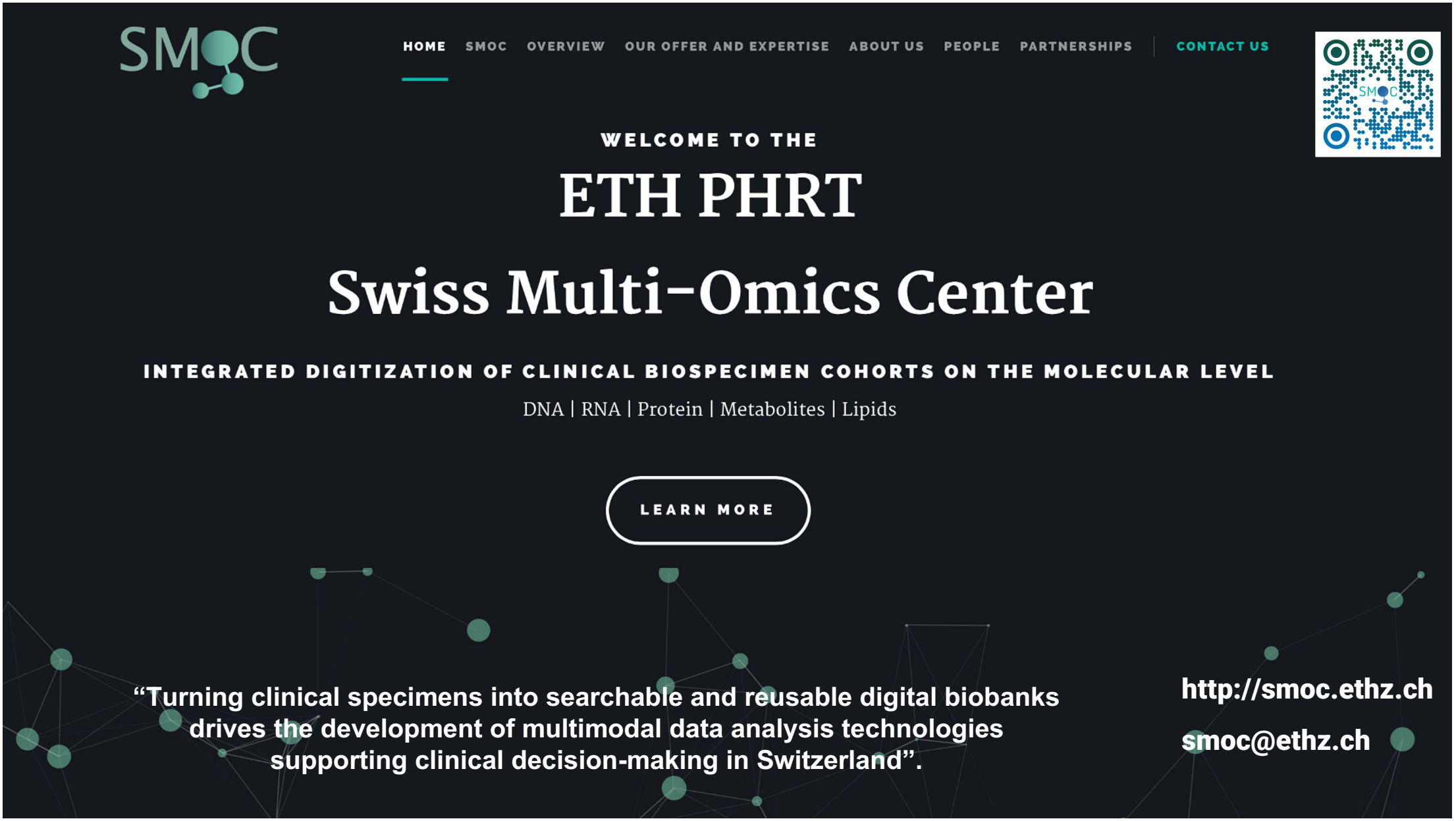
Rapid Personalized Diagnosis of Sepsis in Children (RAPIDS)

Genome of Switzerland (GoS)

NDS

Swiss Ped Health

Building on the strategic investments made by the SFA-PHRT and SPHN initiatives to establish a sustainable infrastructure for deep human molecular analysis.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“Turning clinical specimens into searchable and reusable digital biobanks drives the development of multimodal data analysis technologies supporting clinical decision-making in Switzerland”.
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