

IHI Call Days | Call 12

- REACH

Researching the Epidemiology of the Cardiohepatic Axis in Cardiometabolic Health

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Challenges and objectives

- What problem(s) are you trying to solve
 - **Rising burden of cardiometabolic diseases**
 - **Heterogeneity of cardiometabolic patient trajectories with similar risk factors profile**
- Which IHI specific objective(s) are you addressing?
 - **Topic 2:** integrate fragmented health research and innovation efforts bringing together health industry sectors and other stakeholders, focussing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, interception, diagnosis, treatment and management of diseases, meeting the needs of end-users;
- Which unmet public health need are you addressing?
 - Coordinated and comprehensive care management promoting novel cardiohepatic biomarkers focusing on achievable goals and means (such as adaptation to exercise)

Your approach to solve the problem

- 1) Provide a **new comprehensive mapping** of **cardiometabolic phenotypes** of **MAFLD patients** to better predict patient trajectories and treatment response combining integration of physics-based digital twins with data-driven AI
- 2) **Identify novel biomarkers and therapeutic targets** of the **cardiohepatic axis** for MAFLD, Atrial cardiomyopathy or cardiometabolic HFpEF
- 3) Quality **novel more dynamic predictor tools** for better MASLD patient stratification taking into account individual exposure to pathophysiological risk factors and closer to organ remodelling

From Risk Factors Approach...

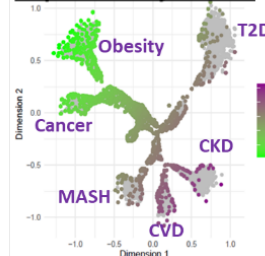
Crude classification

- Abdominal obesity
- Insulin Resistance
- Dyslipidemia
- Increased blood pressure
- Increased glycemia
- Sedentary lifestyle
- Smoking

Most patients share common Risk Factors

CARDIOMETABOLIC PANDEMIC

Heterogeneity of patient trajectories



...To the Cardiohepatic Paradigm Shift

Better understanding organ cross-talks
Precision Medicine

Retrospective cohorts

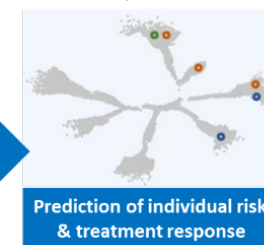
Metabolic
(at risk of MASH)

Cardiac
(at risk of AF)

5/10 years outcomes

Incident MACE
Incident LRE
Incident T2D RE
Incident Neoplasms

Dimensionality Reduction DDRTree



Prediction of individual risk & treatment response

DATA INTEGRATION

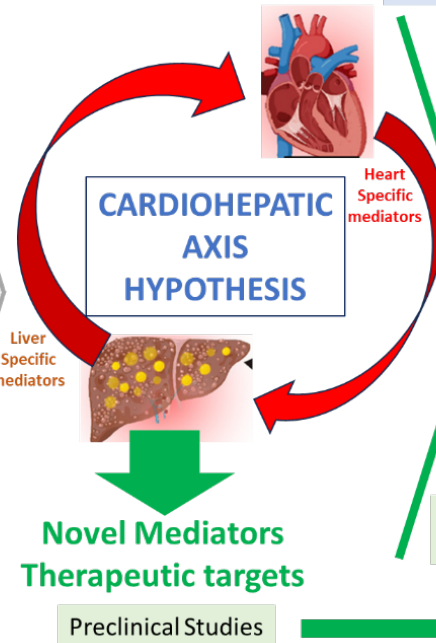
Metabolic
(at risk of MASH)

Cardiac
(at risk of AF)

Biomarkers Development

Deep Cardiometabolic phenotyping

Latest biomarkers (Imaging, Blood, ECG, lifestyle...)
to quantify dynamic risk factor & organ burdens



Is your project suitable for IHI?

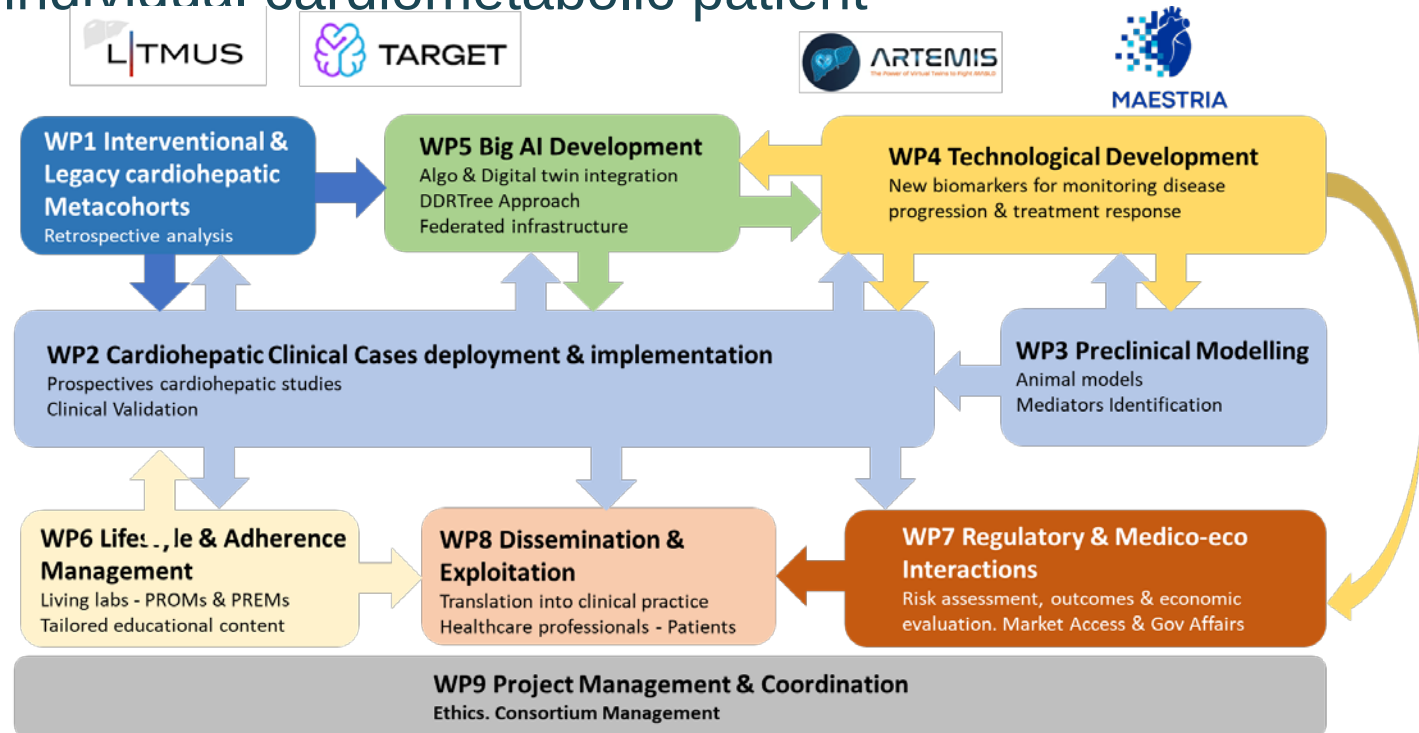
- Public-Private collaboration is essential for the development of these novel diagnostic, prognostic and monitoring tools that will ensure the tailored treatment for each individual cardiometabolic patient

This project will need the contribution of different types of industrial actors:

Pharmaceutical companies providing and developing novel cardiometabolic pharmacotherapies

Biomarkers field for novel diagnostic, prognostic & monitoring tools (from in vitro diagnostics, medical devices & medical imaging fields)

IT & AI companies to ensure the built up of a sustainable European cardiometabolic federated data infrastructure for efficient data sharing & analysis taking advantage of the GAIA-X ecosystem



REACH - Researching the Epidemiology of the Cardiohepatic Axis in Cardiometabolic Health

Outcomes and Impact

- What do you expect out of your proposal in terms of concrete results/outcomes and impact?
 - **New comprehensive mapping of cardiometabolic phenotypes of MAFLD patients**
 - **Qualification of novel more dynamic predictor tools** for better MASLD patient stratification taking into account individual exposure to pathophysiological risk factors and closer to organ remodelling
 - **Identification of novel biomarkers and therapeutic targets of the cardiohepatic axis** for MAFLD, Atrial cardiomyopathy or cardiometabolic HFpEF
- How do you envisage your proposal to ensure translation from research to innovative solutions that can be integrated/implemented into the healthcare ecosystem
 - **Training** the European healthcare professionals, scientists and patients **on cardiometabolic diseases**
 - **New care pathways to explore the necessary cross disciplinary biomarkers**
- How does your project proposal contribute to strengthening the competitiveness of the Union's health industry?
 - **Leading** scientific contribution to **understanding cardiohepatic axis** for cardiometabolic diseases
 - **Innovative care management of cardiometabolic diseases**
- How does your project proposal contribute to the expected benefits for patients?
 - **Ensure faster, complete and equitable translation of novel cardiometabolic pharmacotherapies** into wider clinical practice
 - **Tailored treatment of each cardiometabolic patient** based on the analysis of robust and cost-effective set of biomarkers linking heart and liver

Expertise and resources

- We have:
 - A CORE set of willing academic and SMEs partners coming from the various European projects IHU ICAN is / has been involved in (such as MAESTRIA, LITMUS, LIVERAIM or ARTEMIS...)

Pr V RATZIU
Hepatologist
LITMUS / LIVERAIM / ARTEMIS



Pr S HATEM
Cardiologist
MAESTRIA

- We are looking for:
 - Pharmaceutical companies willing to bring in-kind contributions, especially with clinical trials data
 - IT & AI companies who could help with the cardiometabolic federated data infrastructure

REACH is looking for 10-15 M € of industrial in-kind contribution