# IHI Call Days | Call 9 (SO2)

## PERSEOS Project –
## Pandemic and Endemic
## Respiratory Pathogens Sentinels
## and Early Optimization of Prevention
## by Severity Prediction

Contact person name:  **Prof. Avidan Neumann**

Organisation: **Institute of Environmental Medicine (IEM), Helmholtz Munich**

E-mail: avidan.neumann@uni-a.de

Links to the IHI brokerage platform:
Proposal sharing tool: PERSEOS Project
Participant profile: Avidan Neumann @ HMGU

innovative
health
initiative

# Challenges and objectives

- **Pandemic preparedness** is an unmet need essential for the prevention of a health crisis as occurred with the COVID-19 pandemic:
  - Need to **establish baseline** "normal" distribution of respiratory pathogens relevant to patients (compare environmental sentinels with patient-oriented sentinels).
  - Need to **establish cost/effective methodology** for pandemic surveillance of new pathogens.
  - Need to **establish methodology for rapid prediction** of disease severity for new pathogens.

- **Endemic respiratory pathogens** cause a significant public health burden, including a substantial hospitalization and death toll:
  - Need data on **prevalence of respiratory pathogens in primary (non-hospitalized) population**.
  - Need data on **public health burden association** with the specific different pathogens.
  - Need **personalized treatment clinical trials** to prevent severe disease based on accurate biomarkers.

- **Specific objective SO2**: integrate fragmented health research and innovation efforts focusing on unmet public health needs, to enable the development of tools, data, platforms, technologies and processes for improved prediction, prevention, diagnosis, treatment and management of diseases, meeting the needs of end-users.

innovative
health
initiative

# PERSEOS Project – Pandemic & Endemic Respiratory Sentinels and Early Optimization of Prevention by Severity Prediction

**Augsburg :** Patients with <u>primary respiratory symptoms</u>
City-wide registry: N= 24,000 / year
<u>linked with hospital admissions</u>

**=?**

**1b** **Endemic Respiratory Pathogens Prevalence in Primary Population**
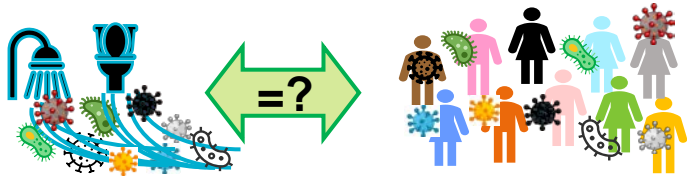
**4** **Endemic Respiratory Pathogen-Specific Association with Public Health Burden**

**Lost work days & quality of life**

**2** Detect new

**Pandemic Sentinels**
❖ **Novel SOP**
combining targeted and non-targeted genomics diagnosis

Detect new

**?** **?**
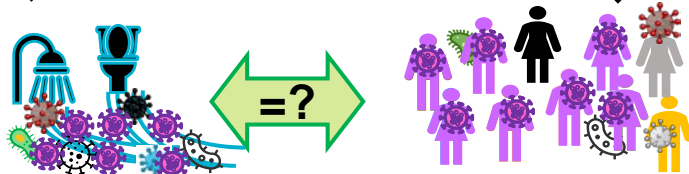
**3a**

**Symptoms Diary App**

**3b**

**Early Prediction of Severity due to Endemic / Pandemic Pathogens**

**Biomarkers**

**Hospitalization Risk**

**=?**
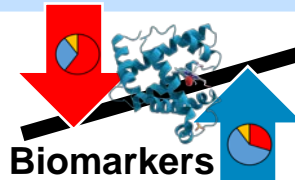
> **Detect Pandemic Hotspots !**

> **Focus Pharma on Pathogens of Interest**
> **Allow Early Personalized Treatment**
> **Optimize Clinical & Public Health Management**

# Outcomes → Impact

- Baseline distribution of respiratory pathogens in primary-symptom patients and sewage.
- Validated cost/effective targeted/non-targeted SOP for novel pathogen discovery.
- Platform and methodology for rapid discovery of biomarkers for disease severity.

→ **Patient relevant pandemic surveillance methodology and platform**,
   **which with help of industry partners can be implemented in EU healthcare system,**
   **for both discovery of new pandemic hotspots and optimize its clinical management.**

- Cost/effective rapid-turnover of endemic respiratory pathogen detection in primary population.
- Biomarkers for early accurate prediction of endemic respiratory pathogens related disease severity.
- Prevalence of endemic respiratory pathogens in primary-symptoms population
  and their specific association with public health burden.

→ **Optimization of clinical and public-health management of endemic respiratory pathogens**,
   **which with help of industry partners can be implemented in EU healthcare system to:**
   → **Focus pharma on pathogens-of-interest**
   → **Perform clinical trials for early personalized therapy.**

# PERSEOS project is suitable for IHI

- **PERSEOS** is a <u>**large-scale project**</u> aiming to address an **unmet public health need**, specifically, to integrate, develop and validate novel health technology and platforms for the prevention of both:

 - Pandemic associated health crisis,

 - Endemic respiratory pathogens related severe disease and public-health burden.

- <u>**Biotech industry partners**</u> are essential in the project in providing expertise and technology for:
  - **Nucleic diagnosis modules** that are patient-oriented and cost/eddective,
  - **Protein biomarker discovery** platform and point-of-care testing.

- <u>**Pharma industry partners**</u> for both:
- Developing new **drugs against endemic pathogens of public health interest**.
- Pharma industry partners will allow performing **clinical trials of personalized therapy** based on biomarkers (available and future) for prediction of disease severity.

5

innovative
health
initiative

# Skeleton of PERSEOS consortium

Prof. Michael Hoelscher
**Fraunhofer Institute Munich for Immunology, Infection and Pandemic Research**

Prof. Avidan Neumann
**Helmholtz Munich Institute for Environmental Medicine**

Prof. Guy Gorochov
**Sorbonne University, Paris Department of Immunology**

Prof. Claudia Traidl-Hoffmann
**University Hospital Augsburg**

**Other academic partners from different countries**

**Nucleic Diagnostic Biotech Industry IHI members (under negotiation)**

**Protein Diagnostic Biotech Industry IHI members (under negotiation)**

**Pharma Industry company IHI members (under negotiation)**

**Bavarian State Office for Health, Ministry of Health of Bavaria**

**Public-Health administration and non-govt stakeholders (under negotiation)**

innovative
health
initiative

# Expertise and resources <u>offered</u>

- We have:

  - **Expertise** in: infectious disease, pandemic surveillance, virology, immunology, bioinformatics, biomarker discovery.

  - **Infrastructure for pandemic surveillance** of environmental sentinels.

  - **High throughput robotic lab platform** for protein biomarkers and genomic measurements.

  - **Validated app for symptoms diary.**

  - **Large potential cohort of patients with primary respiratory symptoms.**

  - **Preliminary results**: biomarker for early accurate prediction of COVID-19 severity.

**Predictor of covid-19 hospitalization at day of PCR test (accuracy=96%)**



**Non-hospitalized**    **Hospitalized**



IFN-INF Function

innovative health initiative
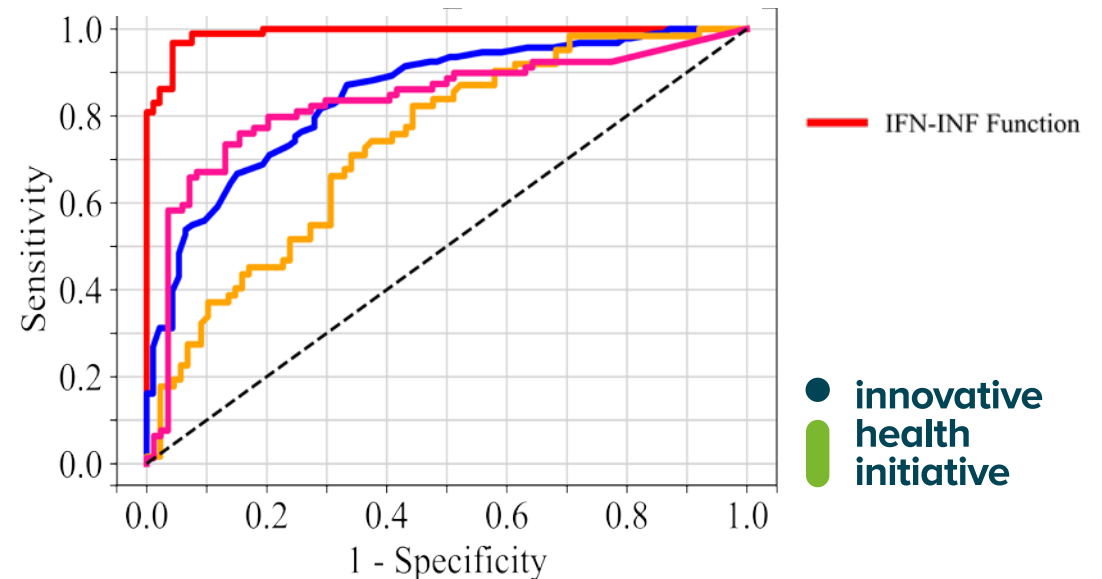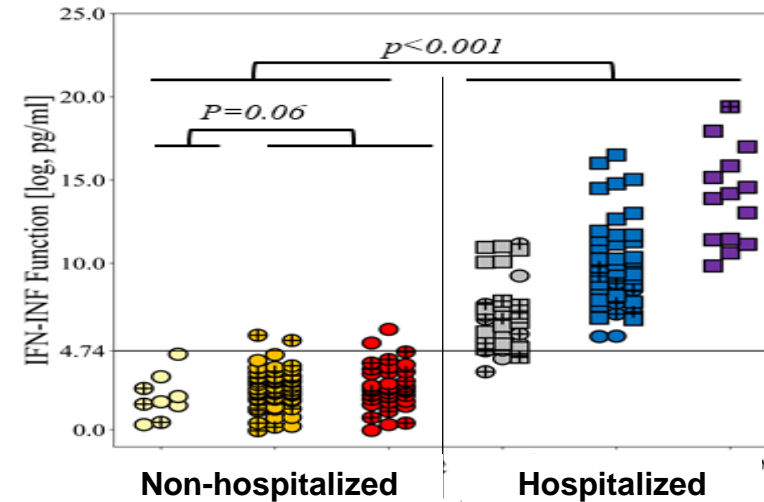
# Expertise and resources <u>sought</u>

- We are looking for:

  o **<u>Biotech companies</u> interested in developing <u>genomics</u> based platform**
     for pandemic surveillance (SME or large biotech company).

  o **<u>Biotech companies</u> for development of <u>protein</u> <u>biomarker</u> instrument**
     for point-of-test multiplex measurement (SME or large biotech company).

  o **<u>Pharma companies with pipeline on respiratory infectious disease</u>**
     interested in clinical trials of early personalized therapy (large biopharma).

  o Organization with **epidemiological expertise in validation studies**
     (academia, research institute, CRO company).

  o Organization **with regulatory expertise in biomarkers for disease progression**
     (academia, large company or regulatory body).

  o **Public health stakeholders** (such as the Bavarian Health Ministry,
     and/or  **health insurance companies**).

innovative
health
initiative