NHPig: Advancing Minipig and Micropig Models for Non-Clinical Safety Assessment

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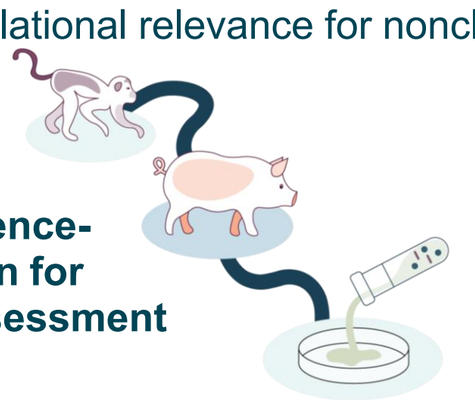
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FACTS & FIGURES

Start date:	01.10.2024
End date:	30.09.2029
IHI funding:	8.5 million €
Industry contribution:	8.2 million €
Contributing partners:	832 083 €
Total Cost:	17.5 million €
Project website:	nhpig.eu
Social media:	LinkedIn, Facebook

CHALLENGE

- Non-human primates (NHPs) remain essential in the safety testing of new drug candidates
- EU directive 2010/63/EU highlights ethical animal research -> replacement, reduction, refinement (3Rs)
- Mini- and micropigs are promising alternatives to NHPs, but knowledge gaps remain regarding their biology, immunology, and translational relevance for nonclinical safety assessment



➢ **Mission: Enable evidence-based model selection for nonclinical safety assessment**

APPROACH & METHODOLOGY

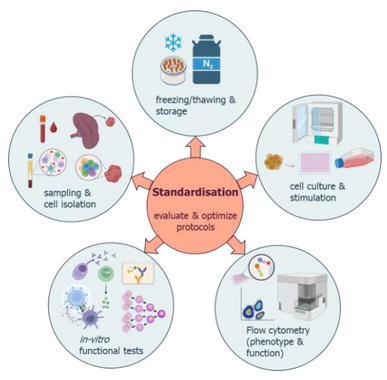


- Generate comprehensive datasets across multiple mini- and micropig models (Göttingen minipig (GMP), humanized Göttingen minipig (huGMP), Libechov minipig (LMP), Yucatan minipig (YMP), Göttingen micropig (GμP))
- Generation of new minipig models
- Characterize biological, immunological, and translational characteristics across mini- and micropig breeds
- Enable cross-species comparisons between minipigs, NHPs, and humans, summarized in an open-access database
- Integrate digital monitoring technologies, biomarker discovery, and centralized data infrastructure

➢ **Establish a scientific framework for data-driven species selection in nonclinical safety assessment**

APPROACH & METHODOLOGY

WP3: Immune System Characterization and Immunosafety

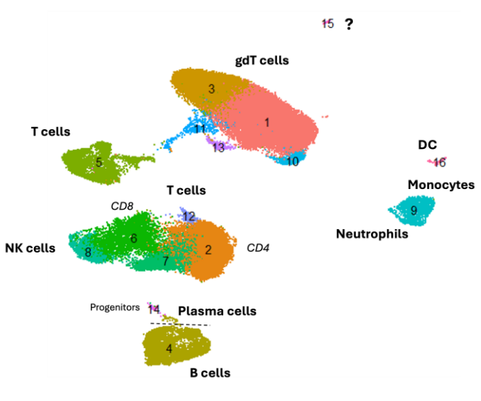


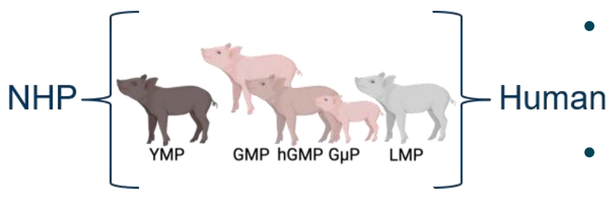
Standardization

- Protocol and assay standardization
- Reagent validation

Characterization

- Immune cell atlas of blood immune cells
- Cross-breed immunophenotyping
- Immunogenetic profiling (e.g. SLA/MHC haplotypes)





Translation

- Cross-species analyses
- *In vitro* immunosafety assessment
- Model selection
- Application to toxicology studies

VALUE OF IHI COLLABORATION

- 27 partners from academia and industry

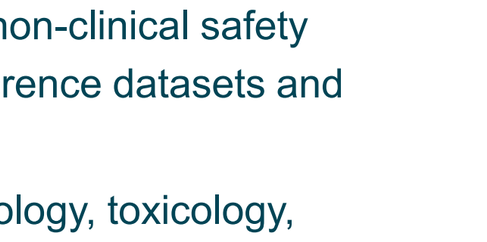


- Access to complementary mini- and micropig models, technologies, and infrastructures across institutions
- Harmonization of protocols and analytical workflows to improve reproducibility and study-site comparability
- Generation of *in vitro* assays for non-clinical safety assessment, and large-scale reference datasets and biobanks
- Integration of expertise in immunology, toxicology, biomarker discovery, bioinformatics, and digital technologies
- Interaction with regulatory and animal welfare advisory boards

➢ **Accelerating translation of scientific knowledge into informed model selection**

CAREER IMPACT

- Interdisciplinary training for early career researchers in immunology, toxicology, veterinary medicine, bioinformatics, and data science
- Diverse research environment
- International network



➢ Development of specialized expertise for translational biomedical research and nonclinical safety assessment

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