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for translational medicine

Expertise of EATRIS member institutions for Horizon Europe calls

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In this overview, you will find summaries of the relevant expertise of EATRIS member institutions for the Horizon Europe Health Cluster and European Innovation Council calls with a translational dimension.

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Horizon Europe – Health cluster (2021-2022)

Call	Topic	Institutions' expertise
HORIZON-HLTH-2022-STAYHLTH-01-05-two-stage	Prevention of obesity through the life course	• Multiomics technologies (Genomics: NGS, deep genome sequencing, Mass spectrometry for multi-omic analysis) • Biomarkers expertise, (metabolic) Imaging capabilities, samples/data cohorts.
HORIZON-HLTH-STAYHLTH-2021-01-02	Towards a molecular and neurobiological understanding of mental health and mental illness for the benefit of citizens and patient	• Multiomics technologies (Genomics: NGS, deep genome sequencing, Mass spectrometry for multi-omic analysis) • Biomarkers expertise, Imaging capabilities, samples/data cohorts • Disease experts • In silico platforms to predict novel drug targets (systems biology approaches) • Study mode of action of (potential) drug targets correlated to mental disease • Neuroimaging (MRI, PET/CT) and data analsysis • (Early) clinical trial capacity with support of appropriate biomarker tools.
HORIZON-HLTH-2022-STAYHLTH-01-04-two-stage	Trustworthy artificial intelligence (AI) tools to predict the risk of chronic non-communicable diseases and/or their progression	• Regulatory expertise • Network of over 50 academic medical research centres with translational capacities to support validation of novel AI tools • Translational imaging data to support radiomics approaches
HORIZON-HLTH-2021-DISEASE-04-02	Building a European innovation platform for the repurposing of medicinal products	• Chemosensitivity screening in using existing drugs and patient materials • In silico/ systems biology approaches to support repurposing campaigns • Drug (re-)formulation expertise • Clinical expertise with experience in drug repurposing programs for oncology, rare disease, and infectious disease • Covid-19 research forum with listed translational research capabilities to support repurposing activities.

		• Upscaling of small molecule drugs production, incl. GXP compliant preclinical development activities.
HORIZON-HLTH-2021-DISEASE-04-07	Personalised medicine and infectious diseases: understanding the individual host response to viruses (e.g., SARS-CoV-2)	• Multiomics technologies (Genomics: NGS, deep genome sequencing, Mass spectrometry for multi-omic analysis) • Expertise in Biomarkers (Discovery, validation, assays), Samples/data cohorts, Preclinical models, Quality initiative, Innovation Management, • Covid-19 research forum with listed translational research capabilities to support development of personalised therapeutic treatment activities.
HORIZON-HLTH-2022-DISEASE-06-02-two-stage	Pre-clinical development of the next generation immunotherapies for diseases or disorders with unmet medical need	• Preclinical development and study of new immunotherapeutic agents in vitro and in relevant animal disease models • Preclinical and clinical Immune profiling, immune monitoring • Study of immune toxicity • Regulatory compliant development of next generation CAR-T cell therapies • Immune imaging (PET, PET/CT, MR) with over 70 validated tracers (GMP grade) available in translational imaging centres • HTA analysis capacity • Support in first in man clinical study design • Systems level characterization of immune cells in human tissues (multi-parametric flow cytometry, mass cytometry [CyTOF], Helios) and Immune assays (in vitro functional immune assays, high-throughput multiplex immunoassay) • Identification and isolation of tissue immunological subsets for deep profiling (RNAseq, Spectral Flow, single cell RNA-seq), SNP Array, TCR-sequencing (immunochip, immunoseq) of immune cell subsets • Large/Medium-scale analysis of the immune proteins (Mass spectrometry; Multiplex immuno-assays)

		• Access to 3D culture systems; patient-derived organoids; patient-derived xenografts, Spheroids and Multifluidic Devices for Immune surveillance in TME • Ex vivo and in vivo preclinical disease models • In vivo Imaging Technologies to Monitor the Immune System - Mass Cytometry Imaging (MCI), PET-CT, PET-MRI, US modalities for studies of the immune system response • Multimodal Imaging approaches to track cells to measure biodistribution and efficacy of immunotherapies including nanoparticle approaches, PET-CT, PET-MRI • Epigenetics of immune cells to study genome-wide epigenetic changes including DNA methylation, histone modifications and non-coding RNAs expression • Multiomics (epigenomic, transcriptomic, proteomic, metabolomics, study of the microbiome and virome, etc.) to assess functional characteristics of TME-tumour cell interplay within the primary tumour and/or metastases (e.g the underlying signaling, the transcriptional landscape, the cell-cell communication, the network regulation of immune cells, etc.), to identify candidate TME targets and to assess the activity of pathway-targeting agents. • Pre-clinical evaluation of immunogenicity, efficacy and toxicology • Preclinical Validation- Development of in vitro and in vivo validated assays for pre-clinical studies. • Expertise in cell therapy and genome editing products in targeted cells and tissues (e.g., base editing, prime editing, talens, zinc-finger nucleases, CRISPR). • Expertise in novel RNA-based therapeutics • Expertise in Regulatory Expertise for Advanced Therapies • Expertise in upscaling and product development of advanced therapies • Health Technology Assessment

HORIZON-HLTH-2022-DISEASE-06-03-two-stage	Vaccines 2.0 - developing the next generation of vaccines	• Immunomonitoring - Systems level characterization of immune cells in human tissues (multi-parametric flow cytometry, mass cytometry [CyTOF], Helios) and Immune assays (in vitro functional immune assays, high-throughput multiplex immunoassay)
		  ○ Identification and isolation of tissue immunological subsets for deep profiling (RNAseq, Spectral Flow, single cell RNA-seq), SNP Array, TCR- sequencing (immunochip, immunoseq) of immune cell subsets
		  ○ Large/Medium-scale analysis of the immune proteins (Mass spectrometry; Multiplex immuno-assays)
		  ○ Access to 3D culture systems; patient-derived organoids; patient-derived xenografts, Spheroids and Multifluidic Devices for Immune surveillance in TME
		  ○ In vivo Imaging Technologies to Monitor the Immune System - Mass Cytometry Imaging (MCI), PET-CT, PET-MRI, US modalities for studies of the immune system response
		  ○ Multimodal Imaging approaches to track cells to measure biodistribution and efficacy of immunotherapies including nanoparticle approaches, PET-CT, PET-MRI
		  ○ Epigenetics of immune cells to study genome-wide epigenetic changes including DNA methylation, histone modifications and non-coding RNAs expression PET-CT, PET-MRI
		• Bioinformatics and Data Center
		• In vivo models:
		• Humanized mouse models (e.g., patient-derived xenograft; immuno-Avatar)
		• Immunocompetent and genetically engineered mouse models
		• Non-human primates and other species
		• High Throughput Genome Engineering – CRISPR
		• Vaccine Formulation-Optimisation of vaccine formulation in preparation for scale-up under GMP conditions.

		• Appropriate strategy for a delivery system and adjuventation. • Preclinical Validation- Development of in vitro and in vivo validated assays for pre-clinical studies. • Development of validated measures for the evaluation of humoral and cellular immune responses at systemic, mucosal and in situ levels. • Development of adequate potency tests. • Pre-clinical in vivo validation in disease specific animal models including primates up to BSL3 containment. • Pre-clinical evaluation of vaccine immunogenicity, efficacy and toxicology. • Exploration of upstream processing; evaluation of expression system. • Exploration of downstream processing (incl. possible inactivation). • Confirmation of a feasible small-scale process (scalability, reproducibility). • Scalability, reproducibility and initial process validation as required for phase I. • GMP pharmaceutical production centres with vaccine authorisations. Preparation of GMP batches of vaccines for toxicology and clinical studies. • Clinical trial centres for phase I and II studies in conjunction with a university medical centre to foster interaction between clinicians and specialist scientists. • Support for trial design and GCP execution. • Clinical imaging for analysis, integration and interpretation in various patient cohorts. • Data analysis centres manage the processing and integration of multi- modality data. • Regulatory Services- Scientific Advice, TPP and IMPD development

HORIZON-HLTH-2022-DISEASE-06-04-two-stage	Development of new effective therapies for rare diseases	• Preclinical and translational disease models • Clinical trial capacity with experience in evaluation of novel therapeutic treatments for rare diseases • Biomarker development expertise • Regulatory support for submission of Orphan Drug Designation requests • Drug repurposing expertise • Well connected to European Reference Network of rare diseases
HORIZON-HLTH-2021-DISEASE-04-04	Clinical validation of artificial intelligence (AI) solutions for treatment and care	• Regulatory expertise • Network of over 50 academic medical research centres with translational capacities to support validation of novel AI tools. • Broad experience in Personalised Medicine with potential research data to be shared • HTA analysis • Translational imaging data to support radiomics approaches
HORIZON-HLTH-2021-TOOL-06-01	Smart medical devices and their surgical implantation for use in resource-constrained settings	• Regulatory expertise • Clinical experts in various indications (oncology, neurology, rare diseases, infection, metabolic disorders, cardiology, endocrinology, etc) • HTA analysis
HORIZON-HLTH-TOOL-2021-06-02	Next generation advanced therapies to treat highly prevalent and high burden diseases with unmet needs	• Expertise in cell therapy and genome editing products in targeted cells and tissues (e.g., base editing, prime editing, talens, zinc-finger nucleases, CRISPR). • Expertise in novel RNA-based therapeutics • Expertise in upscaling and product development of advanced therapies • Clinical trial centres for phase I studies in conjunction with a university medical centre to foster interaction between clinicians and specialist scientists. • Support for trial design and GCP execution.

		• Multimodal Imaging approaches to track cells to measure biodistribution and efficacy of immunotherapies including nanoparticle approaches, PET-CT, PET-MRI • In vivo Imaging Technologies to Monitor the Immune System - Mass Cytometry Imaging (MCI), PET-CT, PET-MRI, US modalities for studies of the immune system response • Data analysis centres manage the processing and integration of multi- modality data. • Regulatory Services- Scientific Advice, TPP and IMPD development • Access to 3D culture systems; patient-derived organoids; patient-derived xenografts, Spheroids and Multifluidic Devices for Immune surveillance in TME for ATMP products • Epigenetics of immune cells to study genome-wide epigenetic changes including DNA methylation, histone modifications and non-coding RNAs expression • Multiomics (epigenomic, transcriptomic, proteomic, metabolomics, study of the microbiome and virome, etc.) to assess functional characteristics of TME-tumour cell interplay within the primary tumour and/or metastases (e.g the underlying signaling, the transcriptional landscape, the cell-cell communication, the network regulation of immune cells, etc.), to identify candidate TME targets and to assess the activity of pathway-targeting agents • Immune profiling – Systems level characterization of immune cells in human tissues (multi-parametric flow cytometry, mass cytometry [CyTOF], Helios) and Immune assays (in vitro functional immune assays, high-throughput multiplex immunoassay) • Bioinformatics and Data Center • In vivo models: • Humanized mouse models (e.g., patient-derived xenograft; immuno-Avatar) • Immunocompetent and genetically engineered mouse models

		• Non-human primates and other species • Development of adequate potency tests. • Pre-clinical in vivo validation in disease specific animal models including primates • Pre-clinical evaluation of ATMP immunogenicity, efficacy and toxicology. • Access to collaborative network to provide a framework for hiPSC generation of hiPSC homozygous for frequent HLA haplotypes
HORIZON-HLTH-2022-TOOL-11-01	Optimising effectiveness in patients of existing prescription drugs for major diseases (except cancer) with the use of biomarkers	• Multiomics technologies (Genomics: NGS, deep genome sequencing, Mass spectrometry for multi-omic analysis) • Expertise in Biomarkers (Discovery, validation, assays)

Horizon Europe – European Innovation Council Pathfinder (2021 challenges)

EIC Pathfinder Challenge	Tools to measure & stimulate activity in brain tissue	• Expertise in cell therapy and genome editing products in targeted cells and tissues (e.g., base editing, prime editing, talens, zinc-finger nucleases, CRISPR). • Expertise in novel RNA-based therapeutics • Expertise in in gene delivery vehicles using next generation AAV or other recombinant vectors • Expertise in upscaling and GMP product development of advanced therapies in cell and gene therapies and vector production • Clinical trial centres for phase I/II studies in conjunction with a university medical centre to foster interaction between clinicians and specialist scientists. • Support for trial design and GCP execution. • Advanced technologies for disease specific research including cancer organoids, organ on a chip to test responses to different ATMPs

		• Multimodal Imaging approaches to track cells to measure biodistribution and efficacy of immunotherapies including nanoparticle approaches, PET-CT, PET-MRI • In vivo Imaging Technologies to Monitor the Immune System • Mass Cytometry Imaging (MCI), PET-CT, PET-MRI, US modalities for studies of the immune system response • Data analysis centres manage the processing and integration of multi- modality data. • Regulatory Services- Scientific Advice, TPP and IMPD development • Access to 3D culture systems; patient-derived organoids; patient-derived xenografts, Spheroids and Multifluidic Devices for Immune surveillance in TME for ATMP products • Epigenetics of immune cells to study genome-wide epigenetic changes including DNA methylation, histone modifications and non-coding RNAs expression • Multiomics (epigenomic, transcriptomic, proteomic, metabolomics, study of the microbiome and virome, etc.) to assess functional characteristics of TME-tumour cell interplay within the primary tumour and/or metastases (e.g the underlying signaling, the transcriptional landscape, the cell-cell communication, the network regulation of immune cells, etc.), to identify candidate TME targets and to assess the activity of pathway-targeting agents • Immune profiling • Systems level characterization of immune cells in human tissues (multi-parametric flow cytometry, mass cytometry [CyTOF], Helios) and Immune assays (in vitro functional immune assays, high-throughput multiplex immunoassay) • Bioinformatics and Data Center - In vivo models: o Humanized mouse models (e.g., patient-derived xenograft; immuno-Avatar) o Immunocompetent and genetically engineered mouse models o Non-human primates and other species • Development of adequate potency tests.

		• Pre-clinical in vivo validation in disease specific animal models including primates • Pre-clinical evaluation of ATMP immunogenicity, efficacy and toxicology. Access to collaborative network to provide a framework for hiPSC generation of hiPSC homozygous for frequent HLA haplotypes.
EIC Pathfinder Challenge	Emerging Technologies in Cell & Gene Therapy	• Animal models for brain diseases • Radiomics • Optogenetics • Neuroimaging (MRI/PET/CT) • Ultrasound methods • Optical methods • Electrophysiology (patch recording, MEG and EEG, recordings from cell cultures, brain slices) • Brain sensing and/or stimulation technologies (deep brain stimulation) • AI methods (machine learning/deep learning) • Data analysis centres manage the processing and integration of multi- modality data. • Regulatory services