

HEALTHY LONGEVITY GLOBAL COMPETITION

2024 Catalyst Awardees

Sponsor: EIT Health of the European Union

BoneQ

Principal Investigator	Dominik Maurer, MSc
PI Primary Affiliation	Bonescreen
Co-Investigator(s)	Jan Kirschke, Prof. Dr.; Anjany Sekuboyina, PhD; Sebastian Ruehling, Dr.; Giles Tetteh, PhD.; Malek El Hussein, PhD

PROJECT DESCRIPTION

Bonescreen's solution, BoneQ, offers a holistic approach to screening for bone diseases. With BoneQ we are closing the diagnostic gap and addressing the shortcomings of current technologies in the field of bone health. BoneQ enables an automated and proactive approach to screening medical images that are taken in the clinical routine. Based on 20 years of bone health related research within the founding team, BoneQ, is the first comprehensive AI-based software for bone health. The software serves radiologists and clinicians as an AI-assistant when analysing medical images. Through its opportunistic and automated nature, BoneQ can scan any CT or MRI scan for the prevalence of bone diseases. This helps doctors to early detect bone diseases like osteoporosis and bone lesions and start relevant treatment measures.

CAPTURE-HF

Principal Investigator	
PI Primary Affiliation	Acorai
Co-Investigator(s)	Matthew Mace (Chief Science Officer & Director of Sales) Helmene Verhoeven (Head of Clinical) Rita Peixoto (Clinical Affairs Manager)

PROJECT DESCRIPTION

CAPTURE-HF: A Multi-Site Observational Clinical Investigation to Collect Non-invasive Sensor Data During a Right Heart Catheterization and Train Machine Learning Models to Estimate Intracardiac Hemodynamic Parameters.

Acorai is developing a non-invasive monitoring system for the estimation of intracardiac hemodynamic parameters in patients with suspected or confirmed heart failure, and/or pulmonary hypertension, who require hemodynamic assessment. The device will be intended as a companion test or clinical decision support tool to be used and interpreted by qualified healthcare professionals to aid standard-of-care clinical assessment in identifying hemodynamic congestion and supporting personalized treatment of heart failure and pulmonary congestion.

This study is part of the development of a non-invasive monitoring system for the estimation of intracardiac hemodynamic parameters. It will be conducted to collect the data needed to train the machine learning models retrospectively.

Developing a first-in-class biologic targeting the nicotinic receptor on cancer cells to trigger cell death

Principal Investigator	Paul Francis Reid, PhD. Co-founder, CEO & Chief Scientific Officer
PI Primary Affiliation	Celtic Biotech Ltd
Co-Investigator(s)	John Eoghan Reid, MSc. Co-founder, Chief Operations Officer

PROJECT DESCRIPTION

CB-24 represents the world's first biologic anti-cancer monotherapy. Currently in Phase I clinical trials, the initial primary disease target will be the deadliest globally - non-small cell lung cancer. With 2.2m diagnosed annually, 1.8m people succumb to the disease yearly. Those with late-stage disease have a particularly poor prognosis. The drug is an injectable naturally derived, specialised receptor-binding bi-partite protein. It has shown specific tumour cell targeting capability in pre-clinical and clinical studies to-date. Targeting the nicotinic receptors on cancer cells this bi-partite protein has two subunits. Subunit A targets cancer cells preferentially and the B subunit triggers a process leading to automatic cell death. The drug by-passes healthy cells leaving patients with mild or no side effects. CB-24 has shown an excellent clinical safety profile with minimal disruption to daily life. It can be delivered at home via infusion pump and has shown promising efficacy in clinical trials. The drug additionally has significant anti-inflammatory properties whereby patients have been observed to require reduced pain medications during treatment. This effect is in keeping with observations in pre-clinical animal models. The drug has application not only against NSCLC but also a number of tumour types including breast, prostate, ovarian and cervical. It may also have application against gliomas as it has been shown to pass the BBB. We aim to make a positive impact on patients' lives through delivering a safe, efficacious, easily tolerable and cost-effective treatment which will lead to more curative outcomes across a number of different cancers.

Digistain: Transforming Cancer Diagnostics with Infrared Spectrometry

Principal Investigator	Hemmel Amrania, PhD
PI Primary Affiliation	Digistain LTD
Co-Investigator(s)	Carlo Palmieri, PhD, FRCP; Chris Phillips, PhD, FInstP; Darius S. Francescatti, MD; Sabrina Ali, Bsc; Nicholas Wright, PhD, FMedSci

PROJECT DESCRIPTION

Digistain is transforming the landscape of cancer diagnostics, specifically in guiding adjuvant chemotherapy decisions. Developed through 15 years of R&D, Digistain's technology was conceived by CEO Dr Hemmel Amrania during his PhD at Imperial College London, where he pioneered a method to directly measure chromosomal instability—a well-established biomarker of all solid tumours, underpinning their growth.

Digital brain health interventions for dementia prevention & healthy ageing

Principal Investigator	Jamie Kawadler
PI Primary Affiliation	Five Lives SAS and primary clinical partner Dementia Platforms UK (Oxford University) and Gerond'If (leading geriatric study center in Paris)
Co-Investigator(s)	Ivan Koychev, PhD MRCPsych Jenny Barnett, PhD Psych Sylvain Piquet, MSc Business Administration Xavier Louis, MSc Engineering

Lindsey Depledge, MSc

PROJECT DESCRIPTION

As life expectancy increases, so does the risk of developing dementia, which is a significant and much-feared public health concern. Five Lives' mission is to help people live better for longer by providing digital tools to prevent dementia. The products are inspired by the pivotal FINGER trial, which showed that intervention in multiple lifestyle domains can increase both cognitive function and physical health outcomes and reduce risk of developing dementia.

Five Lives offers two innovative products:

- The Five Lives app is a preventative solution focused on healthy cognitive ageing. The app interweaves a CE-marked dementia risk assessment, offering users their 10-year risk of developing dementia, with lifestyle coaching steeped in behavioural science, psychoeducation, cognitive tests, brain games
- The Five Lives MED app is a digital health intervention for older adults diagnosed with mild cognitive impairment that provides a prescribed 12-week journey of physical activity coaching and cognitive training exercises to improve cognitive function.

In the busy arena of digital health, Five Lives products are ingrained with evidence-based content, "sticky" gamification, accessible designs and latest behavioural science techniques. This combination is highly innovative and necessary to engage enough to support long-term behaviour change.

eyeTEST - remote eye examination

Principal Investigator	Joanna Przedziecka-Dolyk, MD; Wojciech Drzewinski, MSc
PI Primary Affiliation	Exhalation Technology Ltd
Co-Investigator(s)	Piotr Kruszynski, MSc, Mateusz Toporowicz, MA

PROJECT DESCRIPTION

Our project focuses on the development of eyeTEST, an innovative AI-powered mobile application designed to allow individuals to self-examine their eyes for refractive errors using only a smartphone. Addressing the global shortage of optometrists and the rising demand for accessible eye care, eyeTEST utilizes advanced technologies such as neural networks and image processing to provide an objective, accurate diagnosis of common vision problems like myopia, hyperopia, and astigmatism. The app requires no specialist involvement, thus reducing the need for in-person consultations and allowing users in remote or underserved areas to receive high-quality eye care.

In addition to its diagnostic capabilities, eyeTEST supports healthcare providers by freeing up resources, enabling specialists to focus on more complex cases. The project is currently at Technology Readiness Level (TRL) 7, with system prototype demonstrations in operational environments. We have secured partnerships and are planning pilot programs in several regions, including Africa and Southeast Asia, where access to optometry is limited.

By leveraging AI and mobile technology, this project aims to make eye health more accessible, affordable, and scalable on a global scale, potentially impacting millions of people who currently lack access to proper eye care.

Inflammacheck®, Disruptive Lung Cancer Screening

Principal Investigator	
PI Primary Affiliation	

Co-Investigator(s)	None
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PROJECT DESCRIPTION

Lung cancer poses an enormous burden for patients, families, systems, and caregivers. It causes most cancer-related death worldwide and ranks first in direct and indirect cancer-related health costs.

These are the consequences of diagnosis at late disease stages.

To drive early detection, when curative treatment is available, lung cancer screening programs are rolled out deploying LDCT scanning for early detection of tumours.

However, due to cost and capacity constraints they are only offered to people at highest risk of developing lung cancer, typically with heavy smoking histories. Yet, detection rates remain and up to 99% are scanned for no reason, driving up costs and challenging health economy. Further, high false positive rates (benign nodules are detected) cause anxiety and additional costs. Finally, 35% or more of all new lung cancer cases are found in individuals not eligible for lung cancer screening by current criteria, including never-smokers.

Our technology, Inflammacheck® is a first of its kind, non-invasive, cost-effective, easy-to-use, early-stage lung-cancer screening tool for Point of Care. It tests for multiple biomarkers in breath, supporting decentralized and inexpensive pre-screening in community settings.

Pre-screening with Inflammacheck® to qualify individuals for lung cancer screening by LDCT scanning will drive up detection rates, drive down false positive rates, and enable broader screening coverage. To the benefit of patients, relatives, and societies, all while improving health economy.

Moreover, our platform technology is easily adapted to diagnose other respiratory conditions that currently lack rapid diagnostic options, such as COPD, asthma, and pneumonia.

iYoni: An AI-powered Multifactorial System for Early Detection of Fertility Disorders Integrated with a Digital-First Fertility Care Platform.

Principal Investigator	Krzysztof Łukaszuk
PI Primary Affiliation	Medical University of Gdansk
Co-Investigator(s)	Katarzyna Goch, MA; Janusz Przewocki, PhD; Dominik Kossinski, MS; Anna Bering, MA, Edyta Hoffmeister, MA;

PROJECT DESCRIPTION

Infertility is a pervasive issue, affecting one in five couples globally—approximately 180 million individuals. Many fertility journeys begin with confusion and misinformation, leading to delays in seeking help. Alarmingly, only 30% of couples receive professional support within their first year of trying to conceive, with an average wait time of four years to achieve pregnancy. Geographical and financial barriers further complicate access to qualified fertility specialists, leaving many without the necessary resources.

Recognizing the urgent need for improved access to fertility care, our team has developed an innovative solution leveraging advanced artificial intelligence to support fertility journeys. Initially, users input essential health data into the iYoni platform. This data is analyzed with accuracy of approximately 94%, allowing iYoni to identify areas requiring further investigation and to provide tailored educational content. After three months of consistent use, the system tracks over 240 symptoms, enabling early detection of various fertility disorders, including polycystic ovary syndrome (PCOS), endometriosis, luteal phase defects, and anovulation. The system effectively navigates users through their fertility journey, offering personalized insights and recommendations for next steps. Additionally, our platform connects users to vital e-health services, facilitating access to qualified experts, clinics, and online consultations. By integrating AI-driven insights with a robust network of healthcare professionals, we enhance individual understanding of fertility health and foster a collaborative approach to treatment. This comprehensive solution addresses the pressing need for accessible and effective fertility care, empowering couples to make informed decisions toward achieving their reproductive goals.

Lumetry Diagnostics: Revolutionizing lung care with AI-Powered Breath Analysis

Principal Investigator	Christian Neubauer (Founder) & Antonia Riva-Frizberg (Founder)
PI Primary Affiliation	Lumetry Diagnostics GmbH
Co-Investigator(s)	None

PROJECT DESCRIPTION

Lumetry Diagnostics is revolutionizing care for chronic lung disease with its innovative AI-driven breath analysis platform. Respiratory diseases, especially COPD— the third leading cause of death globally—affect over 900 million people annually. In Europe, 36.6 million individuals suffer from COPD, resulting in healthcare costs exceeding €38.6 billion due to hospitalizations and lost productivity.

Existing diagnostic methods, such as spirometry and invasive blood gas analysis, are uncomfortable, exhausting and need training. Many patients, particularly those with severe conditions, experience significant diagnostic delays that impact their quality of life. Lumetry's platform provides a non-invasive alternative.

By monitoring pCO₂ levels, Lumetry will enable early detection of lung diseases and hypercapnic attacks through simple breath analysis. Patients only need to breathe naturally while the AI analyzes biomarkers in their breath, reducing the need for invasive procedures and forced exhalation.

Targeted at clinics, physicians, and pharmacies, Lumetry aims to reduce diagnostic costs and improves accessibility to high-quality respiratory care. As the company scales, it aims to expand into direct-to-consumer markets, empowering patients to monitor their respiratory health from home, facilitating early interventions, and improving long-term outcomes.

By transforming the way lung diseases are screened and monitored, Lumetry Diagnostics is making respiratory care more accessible, efficient, and patient-friendly, helping millions to live better lives.

MICRO-TICK: From Misdiagnosis to Clarity: How TICKPLEX Revolutionizes Tick-Borne Disease Detection

Principal Investigator	Leona Gilbert, PhD
PI Primary Affiliation	Te?ted Oy
Co-Investigator(s)	Kunal Garg, MSc

PROJECT DESCRIPTION

The standard of care for people who have been bitten by a tick is testing 1 microbe and 1 disease stage at a time, but ticks can pass multiple pathogens, causing multiple diseases that doctors are not testing for. Patients have testified that getting a proper diagnosis takes 11 doctors, years, and tests. With our solution, TICKPLEX tests 15 different microbes against 2 antibodies at a 90% cost reduction for the patient and 98% sensitivity. 14.5% of the global population has already been infected with Borrelia, and 20 M of these treated cases have chronic Lyme Disease because of testing one microbe at a time. TICKPLEX is clinically validated in 9 countries and has first adopters.

Next generation T cell therapy for solid tumors: exploiting novel targets and overcoming tumor suppression_x000B_

Principal Investigator	Rachel Abbott, DPhil
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PI Primary Affiliation	Pan Cancer T
Co-Investigator(s)	Dora Hammerl, PhD Tom Holdich, MBBS Reinout Hasselink, PhD Lars Ottevanger, MSc

PROJECT DESCRIPTION

Pan Cancer T B.V. aims to empower a patient's own immune T cells to cure their cancer with just a single treatment. So-called adoptive T cell therapies can cure blood cancers but their effectiveness in hard-to-treat solid cancers remains constrained. A lack of solid cancer-specific targets limits the number of eligible patients, and the hostile solid tumour microenvironment actively inhibits and exhausts T cells, thereby limiting the duration of clinical responses. Our approach includes key differentiating elements that provide solutions to these challenges. Our novel targets with high prevalence in solid tumor indication(s) increase the eligible patient populations. We have a validated platform to discover highly specific, natural T cell receptors (TCRs) with optimal avidity for the cancer target. Moreover, our proprietary T cell engineering technology is designed to further armour the T cells to resist immune suppression and enhance response durability. We are preparing to take our lead TCR-T cell therapy into clinical trials for the treatment of triple negative breast cancer, exploiting a novel target robustly expressed in >90% of patients. Our portfolio of untapped cancer-restricted targets, additional TCRs, and next generation engineering approaches offer potential future therapies and/or partnering opportunities.

Noory: digital nutrition care as adjuvant to standard treatment

Principal Investigator	Jochem Bossenbroek, MSc, MBA
PI Primary Affiliation	Verdify
Co-Investigator(s)	Sandrin Bergheanu, MD, PhD. Fleur Pasman, BSc

PROJECT DESCRIPTION

Nutrition care, as adjuvant to standard treatment, can potentially lead to 40% savings on healthcare cost in cancer, cardiovascular disease, obesity and other conditions (ESPEN, 2021). This involves less complications, less readmissions and less treatment dropouts. However, most healthcare providers don't have the time and the tools to provide nutrition guidance beyond the hospital, even though patients are mostly at home during the lengthy treatment periods. Plus, most patients struggle with implementation of dietary advice in daily life. NooryMed enables remote nutrition care at massive scale. It facilitates healthcare providers in generating a guideline-based nutrition plan for each unique patient in less than a minute. It processes all the relevant health & treatment parameters and seamlessly integrates in medical workflows. The nutrition plan converts into a fully personalised meal plan in seconds, that can be shared with patients through scanning a QR-code. Patients can access their meal plan in their secure Noory environment, giving them control over nutritional intake at home. Noory provides endless meal inspiration - even for the most challenging cases, swaps foods that trigger treatment related side effects and avoids potential food-drug interactions. It is the only system that can handle all medically relevant data - ranging from medication use to blood biomarker levels - and still provide realistic meal options. The software can be scaled to cost-effective application across medical domains.