enterprise europe network

Partnering Opportunity

Profile status : Published

Research Development Request

[Horizon Europe cluster 1 or Eurostars] : Icelandic company seeking research partner to solidify new findings in cardiorespiratory fitness and physical performance in the middle-aged and the elderly.

Summary

Icelandic software company founded in 2018 focusing on analysis of the human heart rate curve and currently pending PCT patent application to the European Patent Office. Breakthrough discoveries made in cooperation and validated by Icelandic university. Universities or research centers sought with qualified specialists, state-of-the-art equipment, and the capacity to perform large scale validation and development projects sought within Horizon Europe program or Eurostars.

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Details

Description

With increased life expectancy the senior part of the population is expanding fast all over the world. The share of the world population aged 65 years or older, sometimes affectionately called the “silver generation”, is expected to increase from today´s 10% to about 16% by 2050. This population trend carries many demographic challenges

such as battling the age-related decline in physical and mental fitness. Cardiorespiratory fitness (CRF) has in recent years emerged as a strong predictor of all-cause and disease-specific mortality. The age-related decline in CRF is now considered a major underlying cause of mortality and disease in the aging population.

It is therefore important to develop reliable and easily accessible methods for personal monitoring of CRF using today's digital technology.
Several submaximal fitness tests, using smartphones or watches, have recently been suggested for personal monitoring of CRF. These tests usually involve walking tests and concurrent analysis of step-count or heart rate for the indirect estimation of VO2max (maximum oxygen consumption), as a proxy for CRF. However, independent studies have shown that this methodology is overly simplistic and extremely inaccurate.

The relationship between CRF and physical performance (such as walking or running) is not properly studied or known by the scientific community.

The company has developed new revolutionary methodology for analysis of the human heart rate curve and currently has a pending PCT patent application to the European Patent Office. It has made breakthrough discoveries in the fields of exercise physiology and discovered the first scientifically valid direct measure of aerobic endurance. This new Endurance parameter reflects the alignment of energy thresholds and can be presented on a scale from 0-100%. Independent studies at icelandic university have validated the methodology and suggested the approach as a new breakthrough in exercise physiology.
The methodology is based on patent-pending discoveries in the fields of exercise physiology, including a breakthrough discovery of new definition of aerobic endurance

The company and the icelandic university now aim to test the company's methodology as a general test of cardiorespiratory fitness (CRF). If successful, this new fitness test could be a great improvement over current test methods for CRF. The aim of the study is to develop and validate a submaximal test to monitor CRF in middle-aged and elderly citizens, to help people battle the age-related decline in CRF.

Proposed is a validation study for a new submaximal and non-invasive method of testing CRF and physical performance in middle-aged and elderly citizens, using personal heart rate monitors.

The company and the icelandic university therefore seek European research partners with large research capacity to validate the company's methodology on a larger scale than possible in Iceland.
The company's performance test is designed especially for personal fitness monitoring using personal heart rate monitors, such as smartwatches. The study involves performing the company's walking test by a large group of middle-aged and elderly citizens and novel analysis of ECG cardiograms, and scientific validation through traditional laboratory testing of cardiorespiratory fitness.
The Icelandic company is now looking for Universities or research centers with qualified specialists, state-of-the-art equipment, and the capacity to perform large scale validation and development projects within the Horizon Europe program or Eurostars in order to solidify the new findings.

Advantages and innovations

The company has developed a new methodology for analysis of the human heart rate curve. A PCT patent pending application to the European Patent Office has recently been approved and the company is now entering into the national phase with regional patent applications. Breakthrough discoveries have been made by the company in the fields of exercise physiology and discovery of the first scientifically valid direct measure of aerobic endurance. The company's pending patent offers a key to the human heart rate code and might even open a new era for the assessment of cardiorespiratory fitness. The company identifies CRF parameters through the analysis of heart rate from submaximal exercise using data from personal heart rate monitors. These parameters include fitness parameters (such as endurance and VO2max), energy thresholds (such as lactate threshold), heart rate thresholds (such as HRmax) and physical performance (such as running or walking

capacity). The company's methodology thus offers scientifically based fitness tracking for the silver generation. Results from a larger R&D procedure like this could be a strong player with competitive advantage in fighting disease-specific mortality especially as the company's discoveries has patent pending aswell.
The company's innovations and advantages over the current state-of-art methodology of CRF fitness tracking:
- submaximal tracking of CRF from heart rate (no user info needed).
- the tracking of CRF parameters from an easy walking test:

In comparison to other solutions:
-the exercise-induced heart rate response is neither studied nor understood.
-the new Endurance parameter is not yet known in exercise physiology.
-VO2max is wrongly presented as a measure of aerobic endurance.
*Two runners with equal VO2max can differ by an hour in marathon performance.
-max. Heart Rate, Heart Rate Reserve, Critical Aerobic Power and Lactate threshold can only be measured with a maximum effort laboratory test.

Technical Specification or Expertise Sought

The partner should preferably be a university or an independent research institution. A partner sought with qualified specialists, state-of-the-art equipment, and the capacity to perform large scale validation and development projects using the company's methodology.

Stage of development

Under development/lab tested

Comments Regarding Stage of Development

The discoveries that have been validated in Iceland in cooperation with an icelandic university will need a larger field of research in Europe. The company needs a bigger testing group

IPR Status

Patent(s) applied for but not yet granted

Comment Regarding IPR status

A validated discoveries for analysis of the human heart rate curve and currently has a pending PCT patent application to the European Patent Office. The company's pending patent offers a key to the human heart rate code and might even open a new era for the assessment of cardiorespiratory fitness

Keywords

Technology

01004001	Applications for Health
09001009	Sensor Technology related to measurements

Market

Network Contact

Issuing Partner

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Open for EOI: Yes

Client

Type and Size of Organisation Behind the Profile

Industry SME <= 10

Year Established

2018

Already Engaged in Trans-National Cooperation

No

Languages Spoken

Icelandic
English

Client Country

Iceland

Partner Sought

Type and Role of Partner Sought

The company is looking for a research partner at university level to further solidify the new findings in exercise physiology and heart rate kinetics. The partner should preferably be a university or an independent research institution. The company is seeking a partner with qualified specialists, state-of-the-art equipment, and the capacity to perform large scale validation and development projects using the company's methodology. An Icelandic university is also willing to collaborate on transnational European research projects with the company.

Type and Size of Partner Sought

University,R&D Institution

Type of Partnership Considered

Research cooperation agreement

Program - Call

Framework Program

ICT for a low carbon economy and smart mobility

Call title and identifier

A specific call has not been found as the company needs a better overview over the specific calls and have a conversation with potential partner.

Coordinator required

No

Deadline for EOI

31 Jul 2021

Deadline of the Call

29 Sep 2021

Attachments