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Partnering Opportunity

Profile status : Published

Research Development Request

Horizon 2020: FET Open Challenging Current Thinking – consortium seeks SME in the area of surface transducers and metallic nanostructures

Summary

An Italian research centre will coordinate a FET Open in the field of DNA manipulation and exploitation for sensing technology and biomarkers detection/identification. SMEs are required with experience in R&D in field of sensor surface development nanostructuration and coating, as well as in machine learning, mechatronic and prototyping enable to manage the quality and quantity of produced data. Partners will lead the experimental development and validation stage under standard conditions.

Creation Date	27 February 2020
Last Update	28 February 2020
Expiration Date	15 March 2020
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Public Link	https://een.ec.europa.eu/tools/services/PRO/Profile/Detail/dfb92c46-fc83-4016-918f-40aad20131e0

Details

Description

Among the cutting edge of diagnostic technologies, many are based on DNA manipulation for building nano-scaffolds utilizing physical techniques to induce different conformation. Cutting edge quantum technologies are currently being used in the areas of communications, computing, and sensing. This project aims to explore the application of biology to produce DNA structures for biomarkers discovery. The research Institute is currently studying the DNA conformation induced by mesophilic and thermophilic topoisomerases enable to trigger the

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formation of specific DNA structures covering the full spectrum of biologically relevant topologies relevant for biological applications.
DNA topology modulation, based on conformational changes in the supercoiling state, influences the surface charge density and optical properties of the DNA scaffold, induced by enzymatic activity of selected topoisomerases. The presence on a metallic electrode of either negative or positive supercoiling states DNA, deposed on a gold electrode, leads to a difference of the average potential at the DNA scaffold/Au interface when interact with the target analyte, and an average potential variation which is proportional to the concentration of the supercoiling states DNA on the metallic surface, leading to multi-level electrical signal detection to reach a single molecule level.
Within the project the research Institute would like to explore the different DNA topologies and their different electrochemical and optical properties as scaffolds carrying a specific sequence complementary to a selected target (e.g. micro-RNA associated to cancers, heart conditions, or neurological diseases) for biomarkers discovery and early diagnosis of determined pathology states.
The proposal is being prepared for the next FET OPEN call (Horizon 2020: FET-Open Challenging Current Thinking, deadline 13 May 2020) by an international consortium represented by an academic institution,a research centre and small industries that combine basic and applied research.
Missing partners are SMEs with experience in sensor surface development nanostructuration and coating, as well as in machine learning, mechatronic and prototyping. They will participate in the development and validation stage under standard conditions of sensing surfaces and the prototyping stage, providing expert advice during the theoretical and the experimental stages.

Advantages and innovations

DNA manipulation method relies on biomolecular processes avoiding the use of complex instrumentation to induce specific molecular conformations. This method allows the mass-production of different species with a wide range of applications such as the biomarkers discovery, and early stage identification.

Stage of development

Concept stage

IPR Status

Secret Know-how

Comment Regarding IPR status

The EPO search report did find methods based on the proposed technology

Keywords

Technology

02002009	Machine Tools
02003006	Prototypes, trials and pilot schemes
05002001	Biosensor
06001005	Diagnostics, Diagnosis
10002010	Remote sensing technology

Market

04001004	Other recombinant DNA
05001005	Molecular diagnosis

NACE

M.72.1.9	Other research and experimental development on natural sciences and engin

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Issuing Partner

ZACHODNIOPOMORSKI UNIWERSYTET TECHNOLOGICZNY W SZCZECINIE

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Open for EOI: Yes

Dissemination

Relevant sector groups

Bio Chem Tech
Healthcare
Nano- and Microtechnologies

Client

Type and Size of Organisation Behind the Profile

R&D Institution

Year Established

0

Already Engaged in Trans-National Cooperation

Yes

Languages Spoken

English
Italian

Client Country

Italy

Partner Sought

Type and Role of Partner Sought

The consortium is seeking SME partners to participate in the development and validation stage under standard conditions of sensing surfaces and the prototyping stage, providing expert advice during the theoretical and the experimental stages.

Type and Size of Partner Sought

SME 11-50

Type of Partnership Considered

Research cooperation agreement

Program - Call

Framework Program

Future and Emerging Technologies

Call title and identifier

Horizon 2020 FETOPEN-01-2018-2019-2020 FET-Open Challenging Current Thinking

Submission and evaluation scheme

Programme: H2020-FETOPEN-2018-2020
Type of Action: Research and Innovation action

Coordinator required

No

Deadline for EOI

15 Mar 2020

Deadline of the Call

13 May 2020

Weblink to the call

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/topic-details/fetopen-01-2018-2019-2020;freeTextSearchKeyword=;typeCodes=1;statusCodes=31094501,31094502,31094503;programCode=H2020;programDivisionCode=null;focusAreaCode=n

Attachments