

ALLEGATO 2

DESCRIZIONE DELLE TEMATICHE DEL BANDO

TEMATICA	IMPORTO COMPLESSIVO A BANDO	DI CUI QUOTA SUD
TEMATICA 1 - Advanced solution for sustainable energy production and management	500.000,00	500.000,00
TEMATICA 2 - Innovative solutions for the monitoring of environmental pollution	1.085.000,00	1.085.000,00
TEMATICA 3 - Hardware and software solutions for telemedicine, diagnosis and therapy	1.030.000,00	1.030.000,00
TEMATICA 4 - Data collection and analysis for precision agriculture and water management	500.000,00	500.000,00
TEMATICA 5 - Innovative digital strategies for sustainable and smart mobility	515.000,00	515.000,00
TOTALE COMPLESSIVO	3.630.000,00	3.630.000,00

TEMATICA 1: Advanced solution for sustainable energy production and management - € 500.000,00.

- **Ambito di Intervento:** ENERGY
- **Titolo dell'attività:** Direct energy conversion with dyes-based photoelectrochemical cells.
- **Obiettivi:** Development of photoelectrochemical cells based on dyes for the direct energy conversion.

TEMATICA 2: Innovative solutions for the monitoring of environmental pollution - € 1.085.000,00

- **Ambito di Intervento:** ENVIRONMENT
- **TEMATICA 2.1:**
 - **Titolo dell'attività:** Development of an assembled gas sensing platform using advanced packaging strategies for monitoring pollutant gases in air.
 - **Obiettivi:** Monitoring of gaseous pollutants in air through the assembled gas sensing platform developed in task 2.3 (Development chemical sensors for atmospheric and marine environment monitoring). Monitoring of the main pollutant gases such as NO_x, NH₃, H₂S, SO₂, CO_x, H₂ and VOCs in industrial and risky areas.

TEMATICA 2.2:

- **Titolo dell'attività:** Development of a semi-automated/automated miniaturized sensing systems for sample collection and analysis of pollutants in water resources.
- **Obiettivi:** Monitoring of pollutants in water through a miniaturized and automated system for water sample collection and their analysis.

TEMATICA 3: Hardware and software solutions for telemedicine, diagnosis and therapy - € 1.030.000,00

-Ambito di Intervento: HEALTH

- TEMATICA 3.1:

-**Titolo dell'attività** Advanced artificial organs (organ-on-chip) development and characterization for produce more personalized models of hepatocarcinoma therapies.

- **Obiettivi:** Organ-on-a-chip technology is ideally suited to cultivate and analyze organoids in vitro. These microphysiological systems have been shown to generate architectures, structural organization, and functions that closely resemble their respective human tissues and organs. Thus, the possibility to use a large number of human organoids derived from individual patients in order to produce more personalized models of hepatocarcinoma therapies urge to be determined. Organoids which are derived from healthy and pathological individuals can be stored and obtained from biobanks where collections of human biomaterials for medical scientific research purpose are available.

- TEMATICA 3.2:

- **Titolo dell'attività:** Evaluation of hepatocarcinoma organ-on-chip biological information to support diagnosis and prognosis

- **Obiettivi:** A clear issue in the Tumor on chip (ToC) application is the extraction and interpretation of the rich biological information. To overcome this limitation, is requested:

(1) the development of a novel video analysis algorithm (Machine Learning and Pattern Recognition) that automatically measure the cytotoxic effects on human cancer cells

(2) the use of genomics, transcriptomics, proteomics, and metabolomics along with the integration of data from these different omics technologies and the use of bioinformatics tools and statistical methods to correlate all the datasets will help in providing a comprehensive view of the tumor biology, offering insights into gene expression, protein interactions, and metabolic pathways, facilitating the discovery of novel biomarkers and therapeutic targets, thus refining and extend the purpose of Task 3.2 (Advanced BioChip Design, Development and Characterization).

TEMATICA 4: Data collection and analysis for precision agriculture and water management - € 500.000,00

- **Ambito di Intervento:** AGRICULTURE

- **Titolo dell'attività:** New digitalization perspectives in the field of smart agriculture aimed to on-site monitoring and refining the correlation between plant health and environmental contamination.

- **Obiettivi:** The sensors and systems, developed and validated in task 5.1 (Monitoring of contaminants in irrigation water by electrochemical sensors) and 5.2 (AI powered CPS for plant health detection) for the monitoring of pollutants in water environment and plant health detection, need to be assembled in an organized sensing systems using innovative approaches able to monitor in situ the relationship between plant health and environmental contamination. Activities addressed to optimize, by on field validation tests, new engineered systems in correlation between plant health and environmental contamination are required. New digitization perspectives will support the optimal device definition and its performance evaluation.

TEMATICA 5: 2 Innovative digital strategies for sustainable and smart mobility - € 515.000,00

- **Ambito di Intervento:** SMART MOBILITY

- **TEMATICA 5.1:**

- **Titolo dell'attività:** Cyber-Physical Systems for Smart Road services

- **Obiettivi:** ICT solutions at the Edge for the collection and early AI-based analysis of data on users and infrastructures, exploiting vehicle-to-infrastructure communications and enabling real-time services on smart roads.

- **Tematica 5.2:**

- **Titolo dell'attività:** Distributed Framework for Smart Mobility

- **Obiettivi:** Cloud services for AI-based analysis and cross-relation of crowd-sensed data aimed at Road Anomaly Detection and Driver Safety, enabling the scheduling of road maintenance activities.