

# PP5 IC-CNR presentation

AdSWiM | Institute of Crystallography |  
Viviana Scognamiglio

Kick off meeting | Udine | 9-10 th of April 2019

# About the Organisation

The IC-CNR group has expertise in the identification and characterization of biological systems of natural and synthetic origin for the development of biosensors to be applied in the agrifood, environmental and biomedical sectors:

- optical biosensors based on the green alga *Chlamydomonas reinhardtii* for herbicide and chemical weapons monitoring
- electrochemical biosensors based on the green alga *Chlamydomonas reinhardtii* for the detection of nano-herbicides
- use of new biocomponent deposition techniques (enzymes, algae) on different substrates (e.g. ITO, screen-printed electrodes) including the electron spray ionization technique (ESI)
- use of functional materials (e.g. hydrogel, paper) and nanomaterials (e.g. graphene, carbon black ) for the design of nanobiosensors

## Expertise linked with AdSWiM goals

The competence of IC-CNR is focused on the development of biosensors and bioassays for the assessment of seawater biotoxicity as well as pollutant monitoring, encompassing a combination of different technologies devoted to water analysis, including:

- i) selection of smart biocomponents as well as the design of novel artificial biocomponents for biosensing applications;
- ii) functionalisation and labelling with nanomaterials and fluorescent/electrochemical probes;
- iii) immobilisation on innovative eco-designed substrate;
- iv) biosensor prototype development.



**Interreg**  
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ZAVOD ZA JAVNO ZDRAVSTVO ZADAR



VODOVOD I  
KANALIZACIJA



UNIVERSITY OF SPLIT,  
FACULTY OF CIVIL ENGINEERING,  
ARCHITECTURE AND GEODESY

# Activities (WP) in AdSWiM project and equipment available

**WP 4.4.1:** An optical bioassay exploiting an array of green photosynthetic microalgae developed for monitoring relevant seawater pollutants. Test of biotoxicity for fecal pollution (E. Coli, other bacteria) and environmental pollution (i.e. heavy metals)

**WP 4.4.2:** rational design for the realisation of synthetic molecules (biomimetic peptides and/or mini-proteins) for pollutant detection; functional/structural characterisation

**WP 4.4.3:** immobilisation on innovative supports, development of biosensor prototype

**WP4.4.4:** Optimisation of sensor transducer testing different materials (optical fibers, LEDs, photodiodes) and optimizing the algorithm for the fluorescence analysis

## Facilities

Potentiostat  $\mu$ stat 400 Dropsens  
Potentiostat PG581 Uniscan  
Potentiostat Palmsens4  
Photo-electrochemical device Biosensor  
Fluorimeter FP-8200 Jasco  
Fluorimeter PEA Hansatech  
Fluorimeter HandyPEA Hansatech  
Spectrophotometer 8453 Agilent  
Pioneer AE (Surface Plasmon Resonance)  
Cell count TC10 Biorad  
Optical microscopes  
Centrifuges  
Incubators for cell cultures  
Laminar Flow Hood Faster TWO 30

# Team



**Viviana Scognamiglio**




**Amina Antonacci**




**Francesca Vergari**

Institute of Crystallography, National Research Council (IC-CNR)  
AdR1 Montelibretti  
Viviana Scognamiglio

 Via Salaria km 29.300, 00015, Monterotondo

 [viviana.scognamiglio@ic.cnr.it](mailto:viviana.scognamiglio@ic.cnr.it)

 +39 06 90672479

 [www.italy-croatia.eu/AdSWiM](http://www.italy-croatia.eu/AdSWiM)