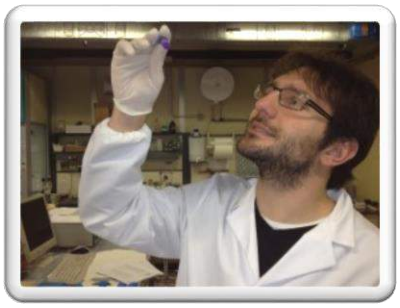
Words of our SMS sensors' experts on their progress …

After months of work to develop and integrate water monitoring biosensors for marine toxins, biocidal and flame retardant, sulphonamide and toxic algae species, it's time for our researchers and engineers to discuss their latest progresses.

Alessandro Porchetta, University of Roma on

BIOSENSOR FOR MARINE TOXINS



"Our team is developing an optical aptamer sensor for the detection of **saxitoxin** and a flow through system for the detection of **okadaic acid**. We also worked on an alternative method consisting in a **FIA analysis of saxitoxin** to reach detection limits at levels of PPB which is of great value for SMS.

We are also working on novel selected aptamers for the detection of **palitoxin** and **domoic acids**."

Arben Merkoçi, Catalan Institute of Nanotechnology on

BIOSENSOR FOR BIOCIDAL AND FLAME RETARDANT

"We are progressing towards the objectives related to development of microfluidic platforms as well as novel electrical and optical-based nanobiosensing systems with interest for pollutants control. **Ink-jet** and **screen-printed** plastic/paper electrodes with interest for electrochemical detection has already been developed. The electrochemical detection of polybrominated diphenyl ethers (**PBDE**s) using iridium oxide nanoparticles is progressing. Meantime we have developed a multifunctional composite material able to detect Tributyltin (**TBT**) and already has tested its performance in waters samples. This multifunctional composite material is based on magnetic silica beads modified

This project has received funding from the European Union's Seventh Frame Programme for research, technological development and demonstration u grant agreement no 613844

Sensing toxicants in Marine waters makes Sense using biosensors

with graphene quantum dots and molecularly imprinted polypyrrole engineered to specifically and effectively capture and signal small molecules due to the synergy among chemical, magnetic and optical properties combined with molecular imprinting of TBT. The integration of such nanomaterial-based detection system that includes **graphene** and **nanoparticles** with **microfluidic system** is still in progress".

Aziz Amine, University of Mohammedia on

ELECTROCHEMICAL SENSOR FOR SULPHONAMIDE

"**Pharmaceutical residues** have been the subject of recent scientific research due to their increased presence in the environment. Among these residues, we can find **sulfonamides**, which belong to the family of antibiotics. They are widely used in the veterinary and human medicine but present a major risk of pollution. Several analytical methods have been reported for the determination of sulfonamides but they are expensive, time-consuming and required skilled persons. In the present SMS project, we developed a simple and low cost **colorimetric method**. The intensity of the pink color observed is proportional to sulfonamide concentration. Concentration lower than 1 mg/L can be detected at naked-eye and concentration of few micrograms/L can be detected if we combine colorimetric detector with pump for injecting and mixing reagents and samples".

Linda Medlin, Microbia Environnement on

BIOSENSOR FOR TOXIC ALGAL SPECIES

"We have completed **probe design** and testing them with positive controls for 21 probes using both a microtiter colorimeter detection kit and with **electrochemical electrodes.** Testing against total **RNA** has begun along with **calibration curves** to convert signal to cell numbers. We also have decided to use magnets to regenerate the chips for remote use and accordingly have redesigned the flow diagram to construct a revised **ALGADEC device**."

This project has received funding from the European Union's Seventh Frame Programme for research, technological development and demonstration u grant agreement no 613844

Sensing toxicants in Marine waters makes Sense using biosensors

Luca Sanfilippo, SYSTEA on

THE DEVELOPMENT OF MODULAR AUTOMATED MEASUREMENT PROTOTYPES

"Our main progress consisted in designing, building, assembling and testing a **portable analyzer** for fully **automated on-line analysis** of **sulphonamides**. The instrument allowed to achieve highly repeatable and accurate results and decrease the limit of detection to 3 ppb. A similar analyzer for the determination of **okadaic** was also realized and is currently under testing."

This project has received funding from the European Union's Seventh Frame Programme for research, technological development and demonstration u grant agreement no 613844

Sensing toxicants in Marine waters makes Sense using biosensors