

## Crosscutting technologies in biosensing for agro-environmental and biomedical applications

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Biosensors are extraordinary devices that arise from a synergistic combination of established scientific knowledge and cutting-edge technologies, including nanotechnology, biotechnology, rational design, and materials science (1-3).

This cross-disciplinary approach actively contributes to the customization of diverse biosensors with improved analytical performance. Indeed, nanomaterials such as carbon black, gold nanoparticles, and graphene, have proved their potential to enhance the sensitivity of such analytical tools, providing a large surface area for bioreceptor immobilization as well as higher electron transfer and thus improved opto-electrochemical signals (4,5).

In addition, different artificial molecules such as aptamers, peptidomimetics, molecular imprinting polymers (MIPs), and peptide nucleic acids (PNAs), can be nowadays designed and synthesized with tailored features of stability and affinity towards a specific target (6,7). Moreover, many innovative materials can be exploited for biosensor configuration, including paper as a sustainable and smart substrate for bioreceptor immobilization, microfluidic design, and sample treatment (8). Finally, pioneering strategies for bioreceptor immobilization demonstrated to improve standardization and repeatability in the realization of biosensors (9). In this scenario, the last trends on biosensors developed for environmental and biomedical applications are presented with recent examples of biosensing setup.

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**Presenter:** Dr SCOGNAMIGLIO, Viviana (Institute of Crystallography, CNR, Italy)

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