



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 37th cycle

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“Detection of a panel of markers for the personalized diagnosis of prostate cancer using an ultrasensitive biosensor based on Metal-Enhanced-Fluorescence (MEF)”

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The aim of the project is to develop a diagnostic test-based biosensor to evaluate the circulating levels of at least five molecules significantly associated with the aggressiveness of prostate cancer. This test will allow to obtain an index of risk that the patient is affected by an aggressive prostate tumor starting from a blood sample. The proposed biosensor allows the simultaneous measurement with high sensitivity of multiple analytes producing a complete profile of the patient with a method that aims to be more advantageous than the ELISA technique and will save time, money and human resources.

The transduction will be based on the amplification of the fluorescence by the nanostructured surface, through which signals produced even in the presence of a few fluorophores will be detectable, which will be accompanied by the high sensitivity provided by the Photochemical Immobilization Technique (PIT), whose molecular mechanisms were recently clarified [1]. The research we propose to conduct will benefit from the collaboration between the departments of Biology, Physics and Translational Medical Sciences. The Technogenetics S.r.l company will participate in the project, which will offer a double contribution thanks to its many years of experience in the field of immunodiagnosics and molecular genetics.

References

[1] [B. Della Ventura et al. “Biosensor Surface Functionalization by a Simple Photochemical Immobilization of Antibodies: Experimental Characterization by Mass Spectrometry and Surface Enhanced Raman Spectroscopy. *Analyst* 2019, 144 6871–6880].