

ON-A-CHIP BIOSENSING WITH OPTICAL NANO- RESONATORS

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Optical nanoresonators, both dielectric and metallic, offer great opportunities for highly sensitive, compact and low-cost diagnostic devices. Although a diversity of nano-optical sensors with outstanding sensitivities has been introduced in the last two decades, analytical devices that are clinically relevant are yet to be developed. In this context, we present our latest advances in the optical, label-free detection of different biomarkers based on gold and silicon nanoantennas integrated into a state-of-the-art microfluidic setting.

First, we demonstrate the capability of our platform with gold nanoantennas to detect clinically relevant concentrations of protein cancer markers in human serum with low unspecific binding and high reproducibility [1]. We present our device design that enables the simultaneous quantification of four breast cancer markers in human serum [2]. Next, we discuss how the unique optical properties of all-dielectric nanoresonators can contribute to molecular biosensing. We present our biosensing results employing silicon nanostructures and compare them with their metallic counterparts [3].

REFERENCES:

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