

SURFACE PLASMON RESONANCE IMAGING FOR CLINICAL APPLICATIONS.

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The Surface plasmon Resonance imaging (SPRi) is an approach that allows the monitoring of biological recognitions occurring on the surface of a biochip bearing spots containing different biomolecules¹. In order to be compatible with the gold layer used for its optical properties, we have developed an electrochemical based process allowing the fast grafting of the biomolecules into a matrix of polypyrrole: the biomolecule is firstly modified with a pyrrole moiety and then copolymerized with free pyrrole. The electrochemical process occurs in less than 250ms that is compatible with a biochip construction²; the complexity of the biochip constructed (number of spots) is then directly related to the size of the spots. Different tools have been designed to optimize both the volume needed for the reaction and the size of the spot: from the pipette tip to the stainless steel pin allowing the electrochemical reaction to occurs in a volume of 30nL or a microdispenser⁴. Associated with the label free SPRi process, these new tools allowed us to develop different applications such as the measurement of the P53 affinity with different DNA sequences³, the recognition of proteins with oligosaccharides grafted on the surface⁴ and, more recently the detection of antibodies specific for the Hepatitis C Virus (HCV) directly in sera from patients on a polypyrrole peptide chip⁵. This latter application is currently developed to be applied for a fast antibody screening of samples from blood banks.