

Surface functionalization approaches for biosensing

Biosensors are increasingly applied to analytical and biological issues due to their intrinsic properties of being flexible, compact, easy-to-use and possibly automated. These qualities allow also the implementation of biosensors as point-of-care tests (POCT). Microfluidic systems have indeed demonstrated their potential to enhance the performance of many biomolecular analyses from raw biological materials, such as blood, urine and saliva fostering the shift of health screening from traditional laboratory to rapid, economic, easy-to-use tests. A general requisite for the successful implementation of biosensors for diagnostic purposes is the development of suitable bio-functionalization of surfaces. Biofunctional surfaces can capture and concentrate circulating biomarkers related to several pathologies, helping to improve the sensitivity of biosensors. Biosensor surfaces can be suitably functionalized with different strategies, spanning various surface properties, for example positive or negative charge, hydrophobicity, or the anchorage of specific recognizing elements. Biomarkers to be detected can be nucleic acids, proteins or even lipid vesicles. Some examples of surfaces for biosensing will be discussed.