Exploiting the versatility of nanostructured transistors for biosensing applications

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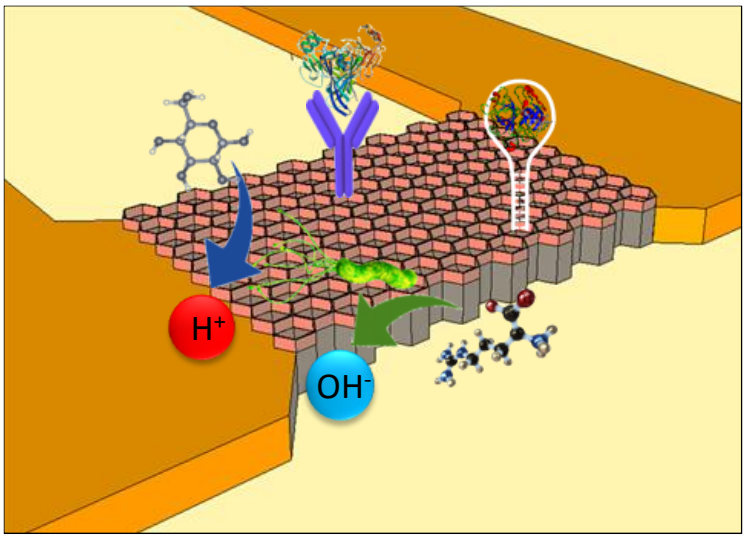
Rapid demographic changes demand improved biomedical diagnostic technologies with rapidness, low cost and high-throughput, without sacrificing the sensitivity. Considering the miniature size, scalability of fabrication, and ease of chemical modification, nanoscale ion-sensitive field-effect transistors packaged in small chips and integrated with additional circuits and lab-on-a-chip structures are ideal candidates to fulfill the task.

In this talk, I will give an overview of the advances that we have achieved in this direction, showing a variety of technologies and solutions for different applications. We have demonstrated the validity of these transistors for microorganism monitoring activity and screening of antibody effects[1]. We have also shown high sensitivity in disease diagnostics[2], giving steps toward multiplexing of a variety of pathogens[3]. Additionally, I will discuss the integration of microfluidics offering compartmentalization approach[4] and high-density sensor areas in CMOS circuits for molecule mapping and the use of alternative measurement methodologies[5,6]. Finally, the transfer possibilities to flexible supports will be shown, envisioning their use in wearable devices[2,7].



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