Micro swimmers-based collective biosensing for *in vitro* diagnosis: what is next?

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The utilization of self-propelled micromotors in (bio)chemical assays has led to a fundamentally new approach where their continuous collective movement around the sample and the mixing associated effect greatly enhances the target-receptor interactions and hence the performance of the bioassay [1-3].

In our lab, we are focusing on the design and development of micromotors which are constituted by (nanostructured) layers (tubular-based shape) and particles (Janus-based shape) that confer them self-propulsion using (photo)-catalytic propulsion and magnetic guidance with compatibility in biological media due its tremendous significance [4-6]. They also smartly incorporate nanomaterials and molecular recognition-based functionalization to obtain sensitivity and exquisite selectivity on board using electrochemical and fluorescence detection approaches. Also, we have explored the coupling of micromotors even with electrochemical microfluidics. In our experience, we humbly found that micromotor technology is an attractive alternative to performing fast, and reliable bioassays and diagnostic testing, especially when an extremely low volume of samples is available or when the analysis must be performed in a micro-size environment.

In this communication, selected micromotors-based bioassays with potential in diagnostics, and some future directions will be discussed. But ultimately, we try to answer the talk title's central and disturbing question.

References

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