

SERS-based biosensors for on-site determination of pancreatic cancer biomarkers

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Introduction

Pancreatic cancer is the most lethal cancer disease, as an outcome of its late diagnosis. Biomarkers that signal the disease include circulating vesicles as exosomes (EXOs) and their cargo, miRNA. Thus, this work aims to develop a new generation of biosensors sensitive to these EXOs and relevant miRNAs in their cargo, based on surface enhanced Raman scattering (SERS) as transducing element.

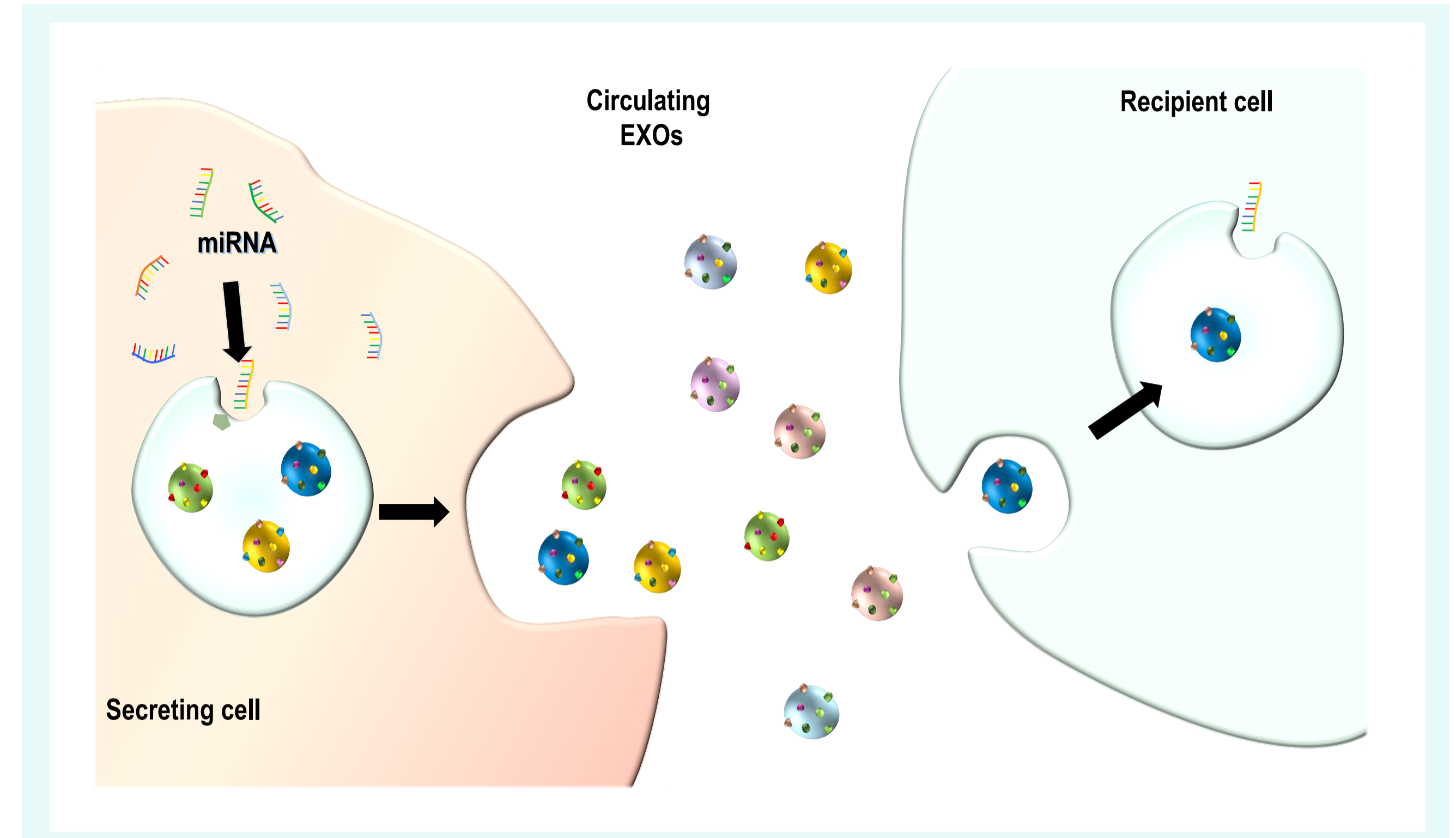


Figure 1. Exosomes and their cargo, exported from the origin cell and delivered to the target cell.

Methodology

- Preparing biosensing supports.
- Using plastic antibodies as biorecognition elements.
- Enable suitable SERS detection for single analytes.

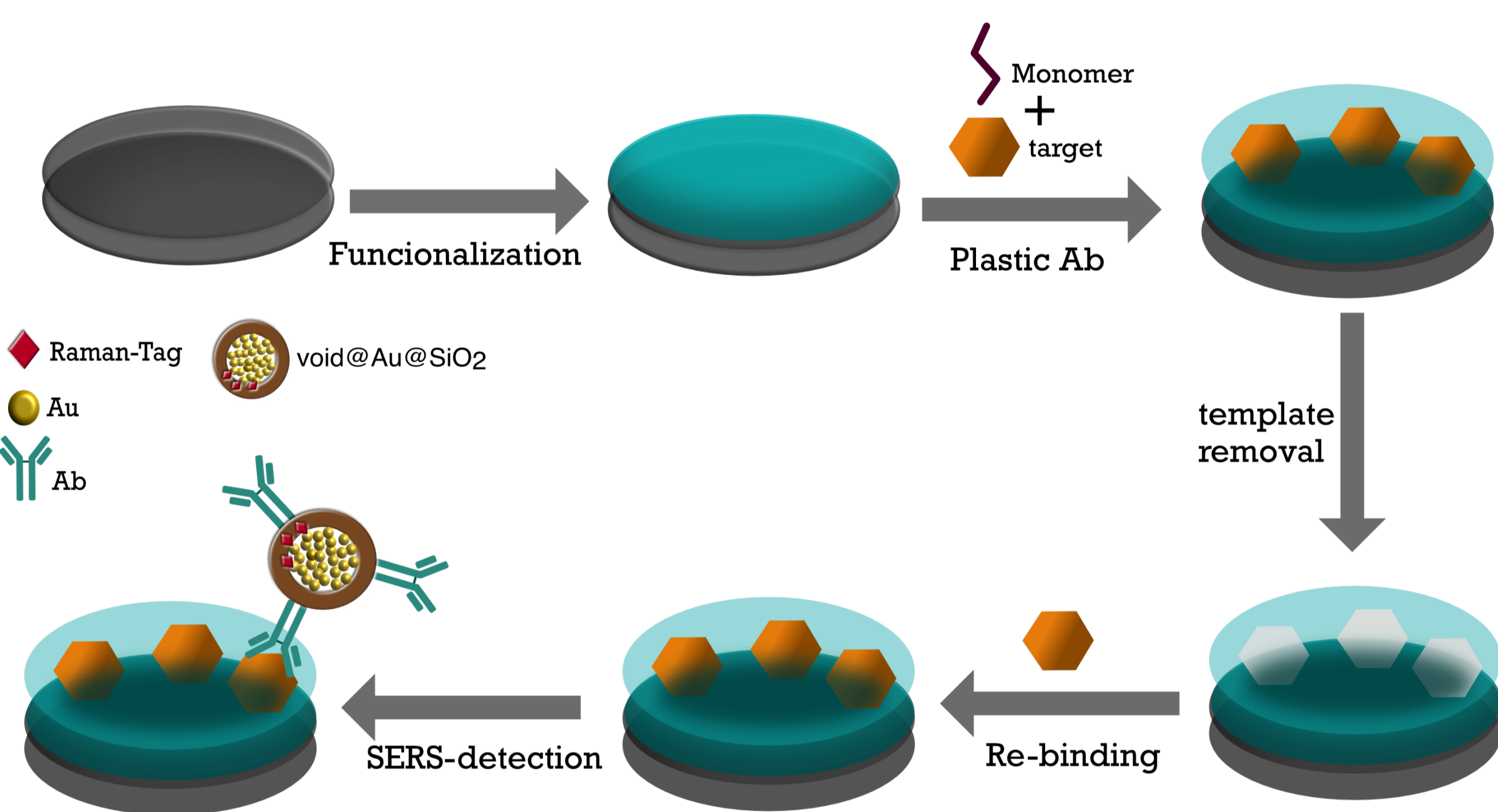
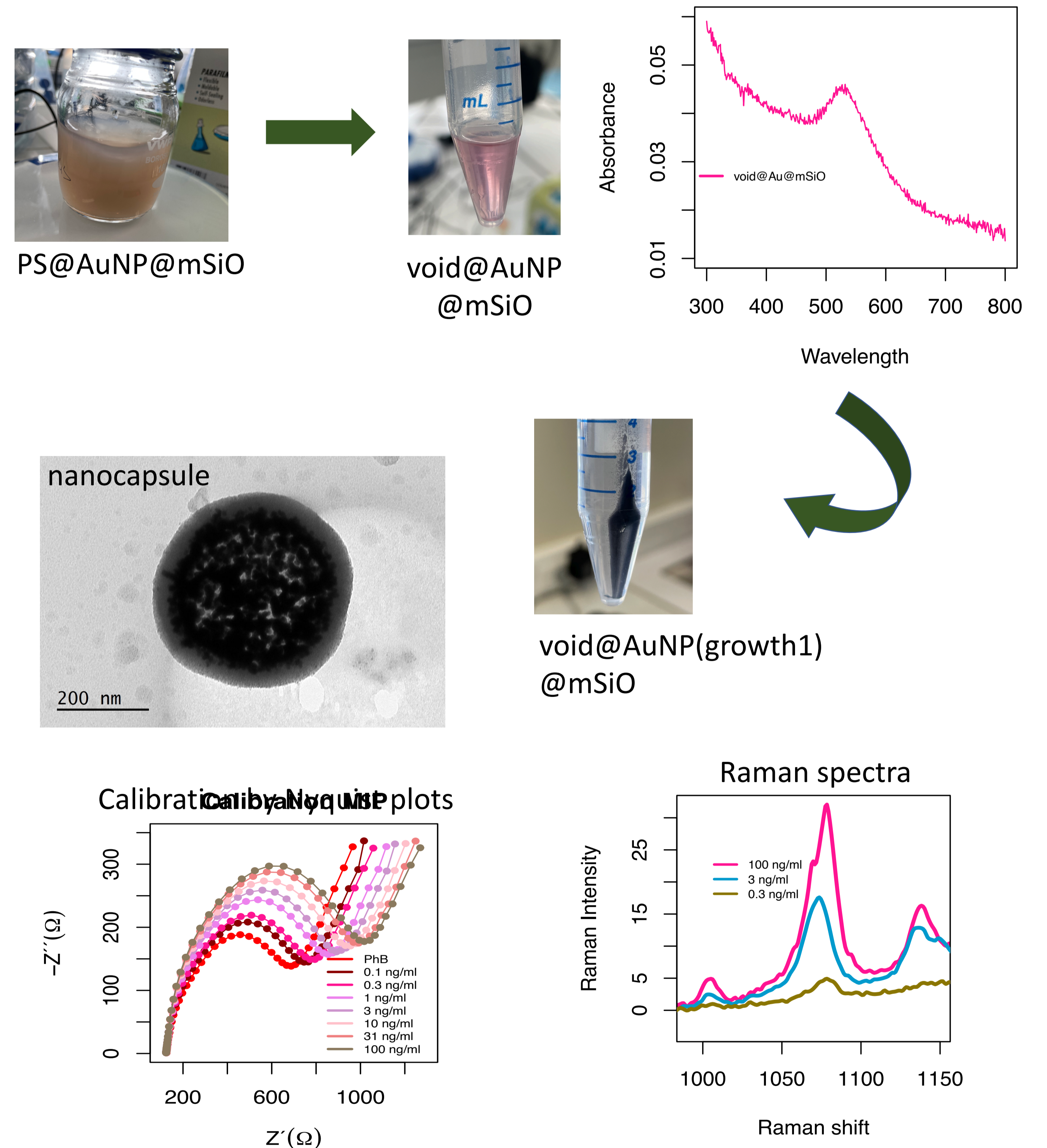


Figure 2. Schematic representation of the operation of the SERS platform to detect exosomal biomarkers.

General considerations

SERS detection employs metal nanostructures that may enhance the signal. Different surface protein biomarkers in pancreatic cancer are explored to this end. Different metal nanostructures are used and tested to carry the Raman reporter. Simple or mixed standard solutions may be employed following this approach.

Results



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