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# Electrochemical immunosensor for the determination of fibronectin as a breast cancer diagnosis biomarker

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## INTRODUCTION & AIM

Cancer is one of the leading causes of death worldwide. Deaths from cancer are mainly due to metastasis. The metastatic process involves the spread of cells from the primary tumor to distant locations, either within the same organ or to other organs. This is generally responsible for patient death as it affects the proper functioning of organs. The present work reports an electrochemical immunosensor based on magnetic nanoparticles (MNPs) that can determine the fibronectin (FN) biomarker in epithelial extracellular vesicle (EpEV) patient samples.

## METHOD

Our method employs MNPs as an immobilization platform. In this work, we report an electrochemical sandwich-type assay for assessing FN + EpEVs in the early stages of breast cancer. Through the immobilization of the monoclonal anti-FN on $NH_2$-MNPs, its incubation with EpEVs, and a conjugated antibody labeled with horseradish peroxidase was performed. The amperometric detection of the affinity reaction was performed using disposable screen-printed carbon electrodes (SPCEs) and the hydroquinone (HQ)/$H_2O_2$ system.

## RESULTS & DISCUSSION

The detection limit for the proposed sensor and the commercial ELISA test were 8 pg $mL^{-1}$ and 0.1 ng $mL^{-1}$, and the intra- and inter-assay coefficients of variation were below 3.80% and 6.51%, respectively. Moreover, the total analysis time was around 30 minutes. Figure 1 shows a representative scheme of developed electrochemical immunosensor.

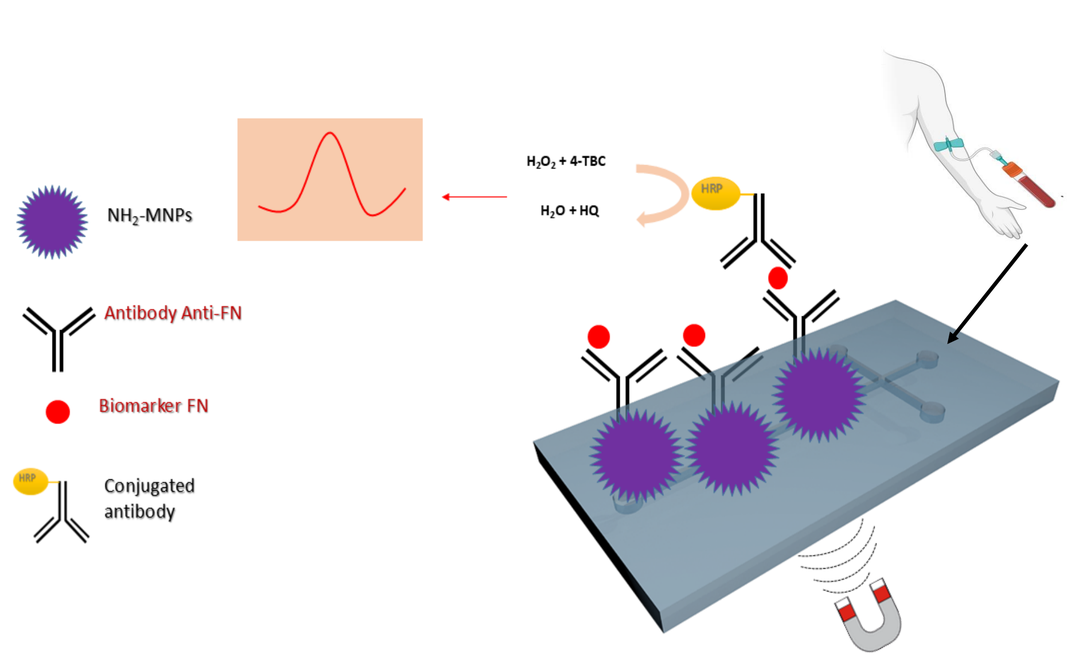


**Figure 1.** Representative scheme of electrochemical immunosensor for FN determination.

## CONCLUSION

Our immunosensor could be an interesting analytical tool for breast cancer diagnosis and prognosis.

## FUTURE WORK / REFERENCES

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