Development of sensors and sensing strategies using emerging nanomaterials and low-cost bench-top technologies for the analysis of agri-food markers

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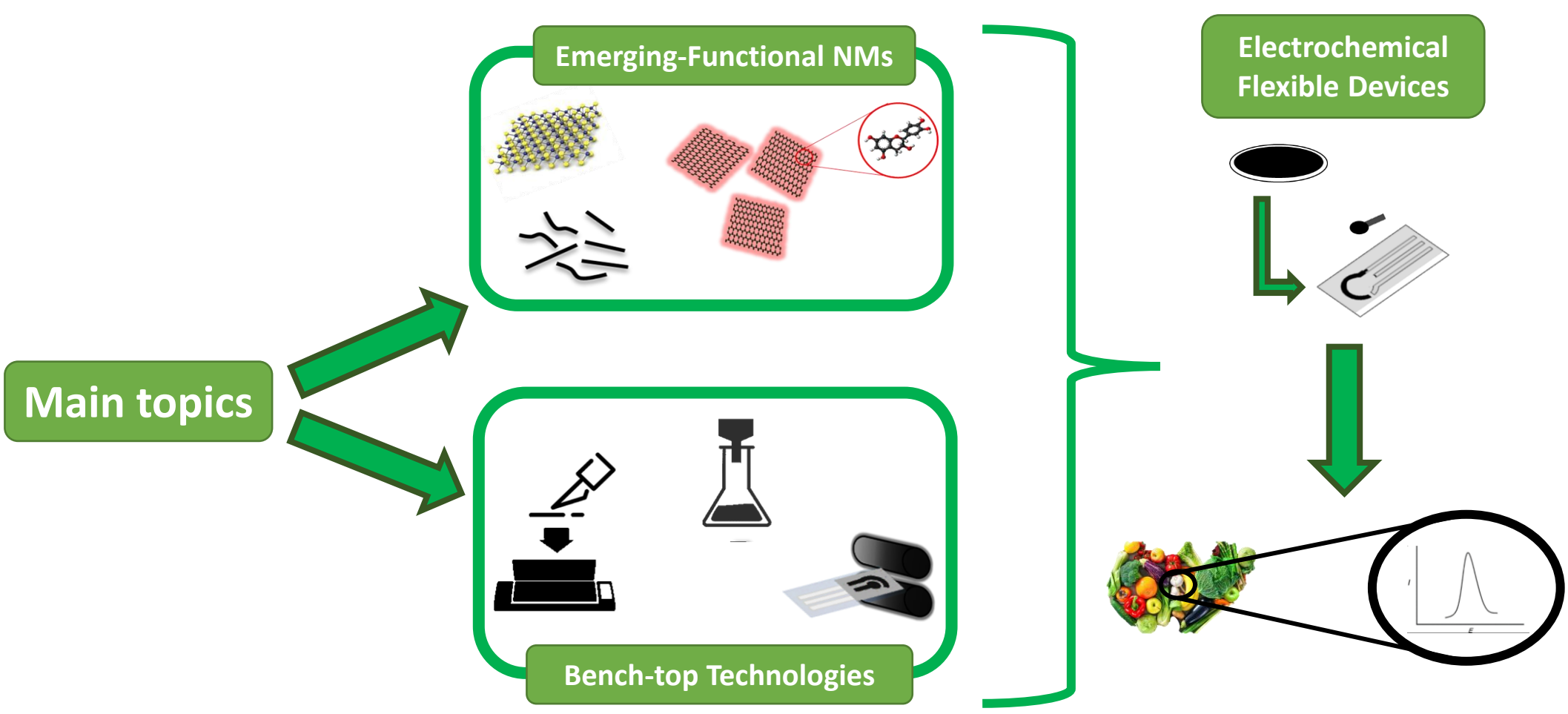
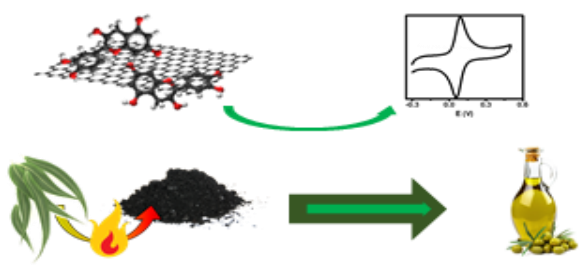
State of the Art

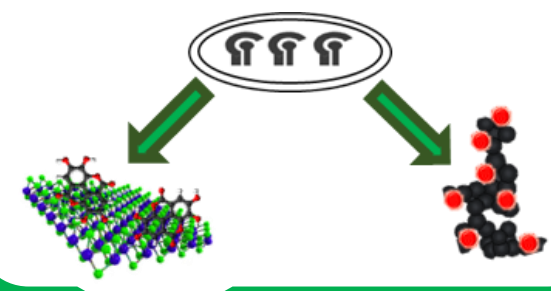
The use of screen-printed electrodes (SPEs) has limitations mainly due to the default and non-modifiable design, along with a poor analytical performance**.** For this reason, the use of flexible supports represents a fervent field of research, offering promising alternatives for the development of electrochemical (bio)sensors. In particular, the implementation of flexible and stretchable electrodes has grown significantly in the last decade (Jeerapan & Poorahong, 2020), representing a potential alternative for the detection of food quality and safety markers (Shu et al., 2018; Tao et al., 2012). These flexible substrates can be integrated with nanomaterials (NMs) in order to increase their analytical performance; NMs such as carbon nanotubes, carbon black, graphene, as well as metal nanoparticles (MNPs) and transition metal dichalcogenides (TMDs) have been widely used for various electrochemical sensing strategies, obtaining increases in sensitivity, selectivity and reproducibility (Della Pelle & Compagnone, 2018). In this regard, the on-course green transition pushes towards the use of natural phytochemical instead of chemicals to promote the synthesis of nanomaterials. Among the others, polyphenol compounds (PCs) have been largely employed to assist the production of different kind of NMs, such as MNPs (Della Pelle et al., 2018), graphene (Liao et al., 2011) and TMDs (Peng et al. 2020), or to modify nano-structured surfaces (da Silva et al., 2018). Nevertheless, a lack of study about the specifical molecules employed to promote NMs synthesis and their ability to confer additional properties is evident.



On course/under writing

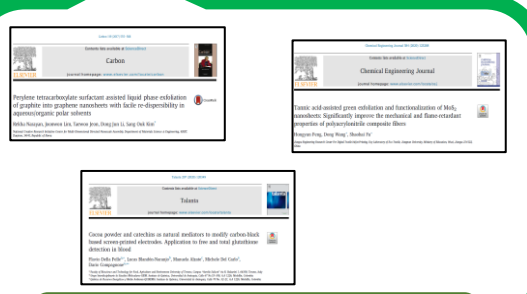


Future perspectives

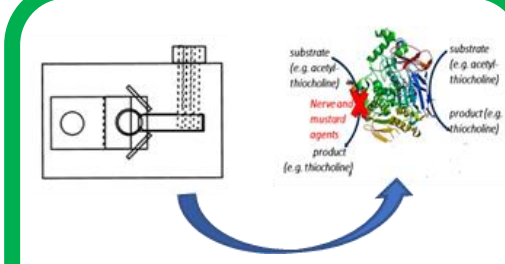


1st year → 2nd year → 3rd year → PhD Thesis

Bibliographic research



Next steps



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