The protein corona of nanoparticles as a tool for early detection of pancreatic cancer

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Recent research demonstrated that the composition of the "protein corona", i.e. the complex protein layer that surrounds nanoparticles (NPs) following exposure to blood plasma proteins, is personalized and disease specific. Thus, its characterization is emerging as a powerful tool for cancer detection. Here, we present a nanoparticle enabled-based (NEB) blood test for early detection of pancreatic ductal adenocarcinoma (PDAC), a lethal malignancy that, due to the lack of effective detection strategies, leads to poor survival rate after diagnosis (< 1 year). The NEB test relies on acquisition, processing and statistical analysis of electrophoretic profiles obtained by incubating healthy and PDAC blood plasma with different NP types (i.e. gold NPs, silver NPs, graphene oxide nanosheets and liposomes). The NEB test exhibits high sensitivity (> 80%) and specificity (> 85 %) and is aligned the ASSURED (Affordable, Sensitive, Specific, User-friendly, Rapid and robust, Equipment-free and Deliverable to end-users) criteria stated by the World Health Organization for cancer screening and detection.