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New features in the detection of cadmium in water



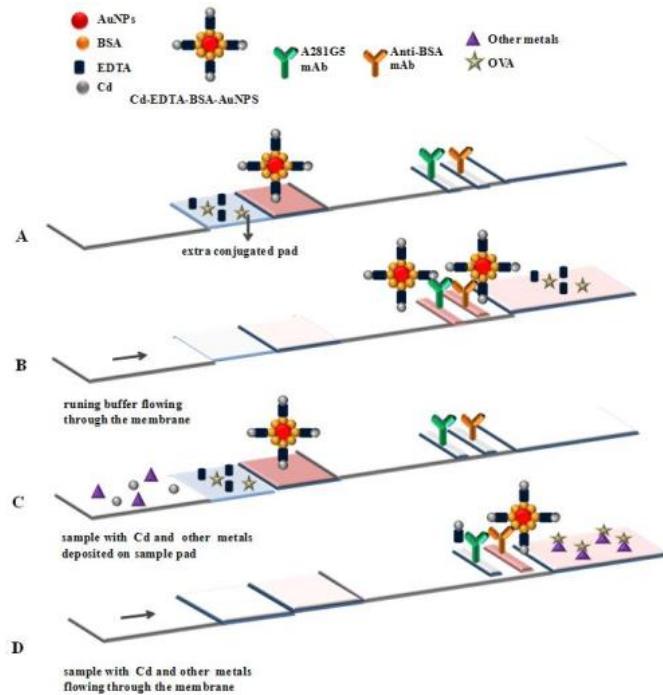
Cadmium is a contaminant element whose presence in the environment has increased in recent years and which can accumulate in the human body. A study in which a UAB researcher participated has developed a new device which not only detects cadmium in water but also simultaneously treats the sample. It consists of an integrated and highly sensitive paper which permits detecting very low concentrations of cadmium.

The release of cadmium into the environment has increased noticeably as a result of industrialization. Cadmium continues to be an analyte that requires careful environmental monitoring. It can be accumulated in the human body mainly in the liver and kidneys and shows a biological half-life of greater than 10 years.

Currently, the development of systems, devices, and methods that integrate several process steps into one multifunctional step for clinical, environmental, or industrial purposes constitutes a

challenge for many ongoing research projects.

We present a new integrated paper-based cadmium immunosensing system in lateral flow format, which integrates the sample treatment process with the analyte detection process. The system operates without any sample pre-treatment step. The detection and quantification limits found for the device were 0.1 and 0.4 ppb, respectively, these being the lowest limits reported up to now for paper-based analysed metals.



This work represents a suitable and available alternative for cadmium quantification in drinking and tap waters, able to detect heavy metals 50 times below the maximum allowable limit.

The extended application of the device developed here for analyzing cadmium in a large variety of samples like seawater, serum etc., could be easily implemented.

We expect that such sensors could be particularly useful in large scale routine screening of drinking water samples or industrial process streams in developing countries, where the heavy metal concentrations are usually relatively high.

Josefina Pons
josefina.pons@uab.es

References

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