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### Electrochemical instrument for food safety

Food safety has been an increasing public concern worldwide, and rapid detection technologies for contaminants in food and agricultural products are of crucial importance to food safety. In the past few decades, various instruments based on optics, electrochemistry and acoustics have been exploited for food analysis. Despite much progress has been made, many of them are either too expensive, or inconvenient, or inaccurate, or too complicated for operation. Herein, there has been an increasing demand for developing highly efficient, reliable, and cost-effective instruments for rapid and on-line analysis. With this regard, considering simple fabrication, disposability and portability of Screen-Printed Carbon Electrodes (SPCEs), we have developed a series detection methods based electrochemistry. First, a portable electrochemical device capable of detecting and identifying heavy metals has been developed. With the square wave pulse anodic stripping voltammetry, this instrument can successfully achieve highly sensitive detection of seven different heavy metals (including copper, lead, zinc, cadmium, chromium, mercury and arsenic) in a variety foods including rice, vegetables, fish. Secondly, pesticide residue analysis in fruit and vegetables have been developed based on Acetylcholinesterase (AChE) enzyme modified SPCE. Other work such as detection of illegal additives, animal drug residues and pathogens are also being investigated. It is evident that SPCEs based electrochemical instruments would play a very important role in food safety analysis and environmental monitoring.

### Recent Publications

1. Zeng Y, Wang L, Zeng L, Shen A and Hu J (2017) A label-free SERS probe for highly sensitive detection of Hg<sup>2+</sup> based on functionalized Au@Ag nanoparticles. *Talanta* 162(1):374-379.
2. Wang L, Zeng Y, Shen A, Fu Y, Zeng L and Hu J (2016) Facile and controllable synthesis of triplex Au@Ag-Pt@infinite coordination polymer core-shell nanoparticles for highly efficient immobilization of enzymes and enhanced electrochemical biosensing activity. *RSC Advances* 6:86025-86033.
3. Lu X, Liang X, Dong J, Fang Z and Zeng L (2016) Lateral flow biosensor for multiplex detection of nitrofurans metabolites based on functionalized magnetic beads. *Analytical and Bioanalytical Chemistry* 408(24):6703-6709.
4. Liang X, Wang L and Zeng L (2016) Portable and quantitative monitoring of mercury ions using dna-gated mesoporous silica nanoparticles with a glucometer readout. *Chemical Communications* 52:2192-2194.
5. Wang D, Ge C and Zeng L (2015) A simple lateral flow biosensor for the rapid detection of copper (II) ion based on click chemistry. *RSC Advances* 5:75722-75727.

### Biography

Lingwen Zeng received his PhD degree in Genetics from McMaster University, Canada in 1993 and his Postdoctoral training from The University of Chicago, USA. He worked in three publicly traded companies (Quest Diagnostics Inc, Scios Inc, and Genetics Computer Group Inc) in USA as a Research Scientist and a Project Manager. Currently, he serves as a Principle Investigator in Guangzhou Institutes of Biomedicine and Health, Chinese Academy of Sciences, and Director in the Institute of Environment and Safety, Wuhan Academy of Agricultural Sciences. His research focuses on exploring novel molecular diagnostic technologies for human diseases, food and environmental safety.

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