



Editorial to the special topical issue “Electrochemistry in Emerging Human Health”

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Since its beginning as a scientific discipline, electrochemistry has been directly involved with biological processes as shown initially by Galvani’s electrophysiology studies [1]. Hence, electrochemical measurements have since constantly addressed human health challenges. Over the last decades, the applications of electrochemistry in human health have increased significantly and included electrophysiology, electrochemistry of biological fluids, cell electrochemistry, electrochemical detection, treatment of tumors, electrochemical diagnostics, and biomedical sensors. Most of these applications have dealt with electrochemical analysis such as cancer detection associated with the seminal work by Brdička in the 1930s [2].

The purpose of this issue is to cover, for the readers and the authors, several aspects of electrochemistry in human health carried out recently. This issue contains contributions focusing on the electrochemical detection of specific biological analytes in human fluids (Deepanambiar et al., Li et al.), food additives, dyes, and pesticides (Baena-Moncada et al., Xuemei et al.), using different electrode modification strategies. Electrochemical detection has been extended to carcinoembryonic antigen (Mazloun-Ardakani et al.) and H-FAB (Li et al.). Within the same analytical approach, the issue includes a mini-review on the use of molybdenum disulfide as a sensing material (Singh Samra et al.).

Most of the analytical studies assume a linear correlation between the electrochemical signal and the analyte concentration. A theoretical discussion on non-linear concentration effects with applications to analyte quantification in biological fluids by Doménech-Carbó et al. is also included. The issue includes a study of the adsorption of polyvinylpyrrolidone on biomembrane-like layers and their

mutual interactions (Nelson et al.). Finally, solid-state electrochemistry is presented by the study of Cebrián-Torrejón et al. for the detection and screening of pesticides for *Aedes aegypti* mosquitoes.

The readers can access the permanent website of this collection through the link <https://link.springer.com/collections/bcdadhbfbf>.

Conjointly considered, these contributions offer a wide overview of the current directions followed by research in electrochemistry in human health. We sincerely expect that they will be of interest to the Journal of Solid State Electrochemistry readers.

Interested readers can also visit relevant literature dealing with electrochemistry for human health application in several publications of Springer’s book series: Modern Aspects of Electrochemistry.

Volume 52 of MAOE, published in 2011, is the first in a two-part series on electrochemical applications in biology and medicine with important edited reviews of electrochemical applications in that fields, also covering recent breakthroughs presented by pioneers in electrochemistry [3].

This was continued in part 2, volume 63 of MAOE, published in 2012 [4].

Volume 56, published in 2013, focuses especially on medical applications of electrochemistry in medicine, paving the way towards a personalized medicine and the new field of nanomedicine [5].

Finally, volume 60, published in 2016, covers the applications of electrochemistry to biomedicine and to pharmaceuticals. The book contains seminal reviews on developments related to various materials used in medical devices and implants, discusses the feasibility of biodegradable implants, and provides new concepts for future practical biomedical applications of electrochemistry [6].

In the same context, it should be referred to the following state-of-the-art textbook and reference book on titanium for biomedical applications, published in 2001 [7].

Other treatises are the publication by RLC Chen on Electrochemistry for Biomedical Researchers [8] and the themed

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collection “Electrochemistry for health applications” of Analytical Methods by the Royal Society of Chemistry in 2019 [9].

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