



RETRACTED ARTICLE: Recent advances on applications of immunosensing systems based on nanomaterials for CA15-3 breast cancer biomarker detection

Ika Kustiyah Oktaviyanti¹ · Diyar Salahuddin Ali² · Sura A. Awadh³ · Maria Jade Catalan Oplencia⁴ · Shukhrat Yusupov^{5,6} · Rui Dias⁷ · Fahad Alsaikhan⁸ · Mais Mahmood Mohammed⁹ · Himanshu Sharma¹⁰ · Yasser Fakri Mustafa¹¹ · Marwan Mahmood Saleh¹²

Received: 20 April 2022 / Revised: 17 May 2022 / Accepted: 24 May 2022 / Published online: 31 May 2022
© Springer-Verlag GmbH Germany, part of Springer Nature 2022

The Editors have retracted this article because an investigation by the Publisher has shown evidence of authorship manipulation. The contributions of some of the listed authors cannot be confirmed and the Editors no longer have confidence in the content of the article. Diyar Salahuddin Ali agrees with this retraction. Marwan Mahmood Saleh does not agree with this retraction. Ika Kustiyah Oktaviyanti, Sura A. Awadh, Maria Jade Catalan Oplencia, Shukhrat Yusupov, Rui Dias, Fahad Alsaikhan, Mais Mahmood Mohammed, Himanshu Sharma and Yasser Fakri Mustafa have not responded to correspondence from the Publisher about this retraction.

The online version of this article contains the full text of the retracted article as Supplementary Information.

Supplementary Information The online version of this article (<https://doi.org/10.1007/s00216-022-04150-z>) contains supplementary material, which is available to authorized users.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.

✉ Marwan Mahmood Saleh
Salehmarwan1400@gmail.com

¹ Department of Pathology & Anatomy, Faculty of Medicine, Lambung Mangkurat University, Banjarmasin, South Kalimantan, Indonesia

² Chemistry Department, College of Science, Salahaddin University, Erbil 44002, Iraq

³ Department of Anesthesia, Al-Mustaqbal University, Babylon, Iraq

⁴ College of Business Administration, Ajman University, Ajman, United Arab Emirates

⁵ Department of Pediatric Surgical Diseases, Samarkand State Medical Institute, Samarkand, Uzbekistan

⁶ Department of Scientific Affairs, Tashkent State Dental Institute, Makhtumkuli Street 103, Tashkent, Uzbekistan

⁷ School of Business and Administration, Polytechnic Institute of Setúbal, Portugal and CEFAGE-UE, IIFA, University of Évora, Évora, Portugal

⁸ Department of Clinical Pharmacy, College of Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia

⁹ Department of Medical Laboratory Techniques, Medical Technology College, Al-Farahidi University, Baghdad, Iraq

¹⁰ Department of Computer Engineering and Applications, GLA University, Mathura, India

¹¹ Department of Pharmaceutical Chemistry, College of Pharmacy, University of Mosul, Mosul 41001, Iraq

¹² Department of Biophysics, College of Applied Sciences, University of Anbar, Al anbar, Iraq