Analyst

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

Cover
See Shilun Feng, Bei Li *et al.*,
pp. 1939–1947.

Image reproduced
by permission of
Bei Li from *Analyst*,
2023, **148**, 1939.

CRITICAL REVIEW

Biological particles
Sample in
Result out
Cell counting
Cell characterization
Adherent cell layer analysis
Electrochemical impedance biosensors

Microfluidic impedance sensing platform
• Impedance flow cytometry
• Electrical impedance spectrocopy

Acquired signal
Single cell model
Machine learning
Scatter plot

TUTORIAL REVIEW

Target analyte

e^-

This journal is © The Royal Society of Chemistry 2023

Analyst

rsc.li/analyst

The home of premier fundamental discoveries, inventions and applications in the analytical and bioanalytical sciences

Information for Authors

Full details on how to submit material for publication in Analyst are given in the Instructions for Authors (available from **http://www.rsc.org/authors**). Submissions should be made via the journal's homepage: **rsc.li/analyst**

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023.
Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

☺ The paper used in this publication meets the requirements of ANSI/NISO Z39.48–1992
(Permanence of Paper).

Registered charity number: 207890

ROYAL SOCIETY OF CHEMISTRY

PAPERS

1939

A microfluidic immunosensor for automatic detection of carcinoembryonic antigen based on immunomagnetic separation and droplet arrays

Haoran Hu, Gaozhe Cai, Zehang Gao, Cheng Liang, Fengna Yang, Xiaohui Dou, Chunping Jia, Jianlong Zhao, Shilun Feng* and Bei Li*
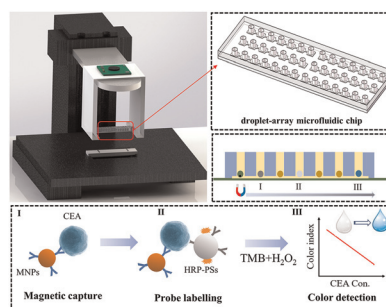
1948

Metric-based analysis of FTIR data to discriminate tissue types in oral cancer

Barnaby G. Ellis, James Ingham, Conor A. Whitley, Safaa Al Jedani, Philip J. Gunning, Peter Gardner, Richard J. Shaw, Steve D. Barrett, Asterios Triantafyllou, Janet M. Risk, Caroline I. Smith and Peter Weightman*
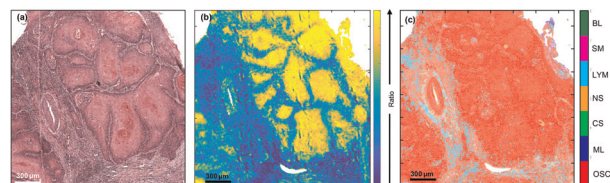
1954

Multifunctional Exo III-assisted scalability strategy for constructing DNA molecular logic circuits

Chenyi Zeng, Xin Liu, Bin Wang, Rui Qin and Qiang Zhang*
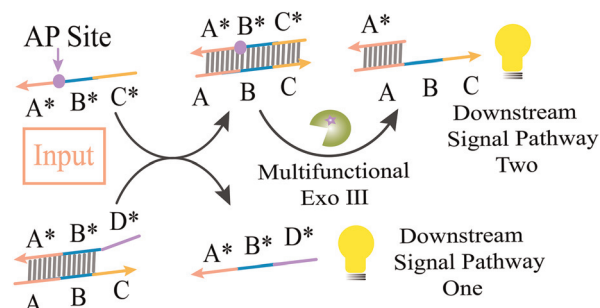
1961

Molecular simulation-guided aptasensor design of robust and sensitive lateral flow strip for cadmium ion detection

Muhammad Irfan, Ghulam Murtaza, Shangnan Fu, Ailiang Chen,* Feng Qu* and Xin Su*

PAPERS

1970

Rapid and sensitive detection of *Staphylococcus aureus via* an all-in-one staggered strand exchange amplification platform

Jian Zhang, Xiangning Han, Ye Wang, Xiaofeng Mu, Chao Shi, Yong Li* and Cuiping Ma*

1978

High-throughput Raman spectroscopy allows *ex vivo* characterization of murine small intestinal intra-epithelial lymphocytes (IEL)

Rustam R. Guliev, Tina Vogler, Natalie Arend, Simone Eiserloh, Alexander Wiede, Timo Kunert, Martin Dinkel, Jürgen Popp, Iwan W. Schie, Kai Hildner and Ute Neugebauer*
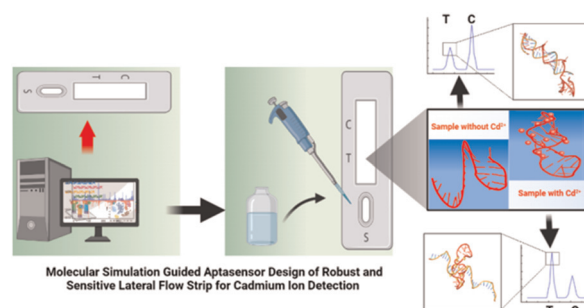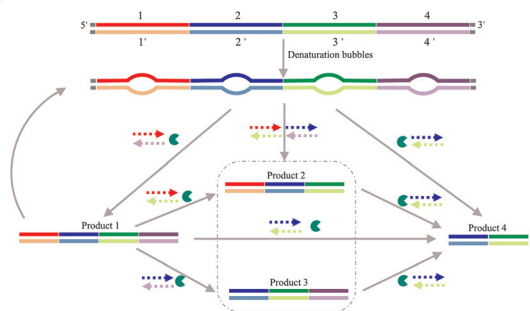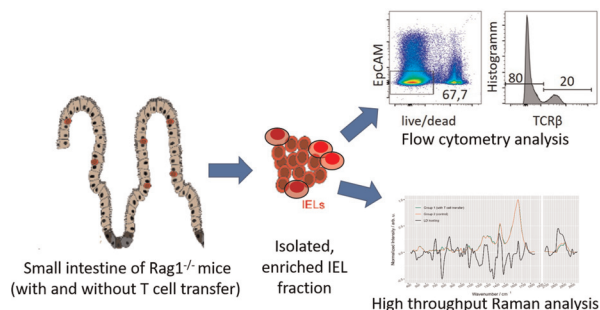
1991

A clinical Raman spectroscopy imaging system and safety requirements for *in situ* intraoperative tissue characterization

François Daoust, Hugo Tavera, Frédérick Dallaire, Patrick Orsini, Keven Savard, Jacques Bismuth, Philippe Mckoy, Israel Veilleux, Kevin Petrecca and Frédéric Leblond*

2002
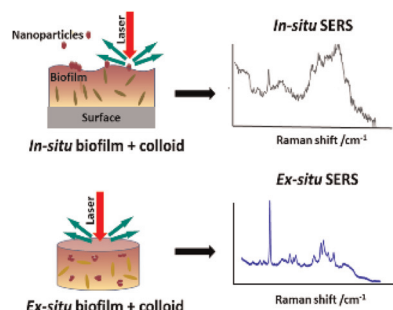
Probing the interaction of *ex situ* biofilms with plasmonic metal nanoparticles using surface-enhanced Raman spectroscopy
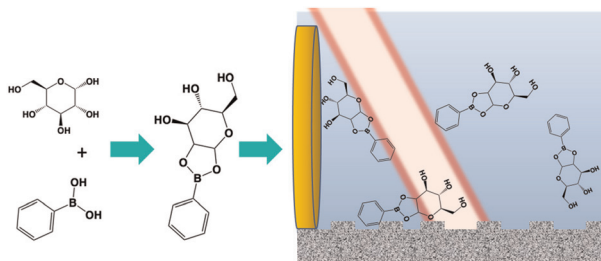
Wafaa Aljuhani, Yingrui Zhang, Matthew P. Wylie, Yikai Xu, Colin P. McCoy and Steven E. J. Bell*

PAPERS

PAPERS
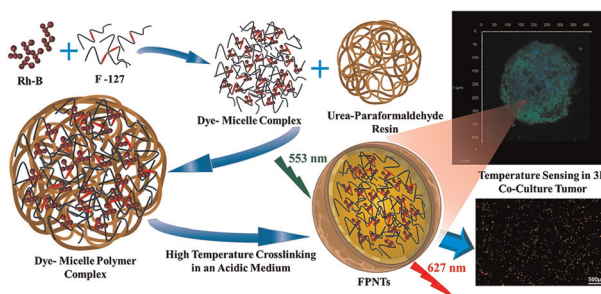
2058
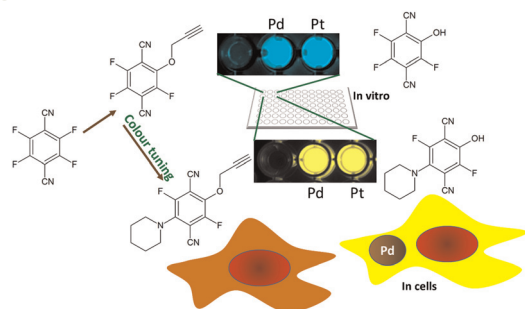
A color-tunable single-benzene fluorophore-based sensor for sensitive detection of palladium in solution and living cells

Paulina Takacsova, Marie Kudlickova Peskova, Pavel Svec, Zbynek Heger* and Vladimir Pekarik*
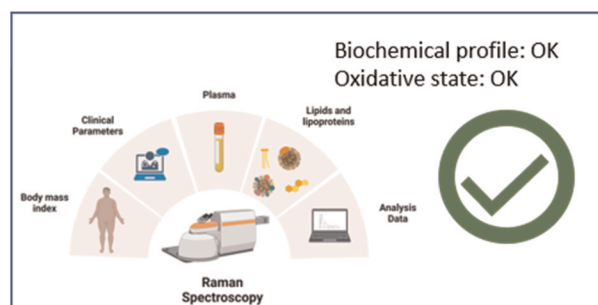
2064
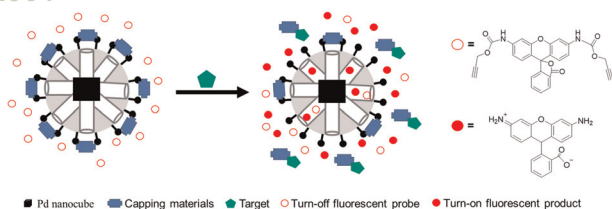
Palladium encapsulated mesoporous silica nanoparticles for the rapid detection of analytes

Tianwei Jia, Ying Luo, Xiaolin Sheng, Jieqiong Fang, Didier Merlin and Suri S. Iyer*

2073
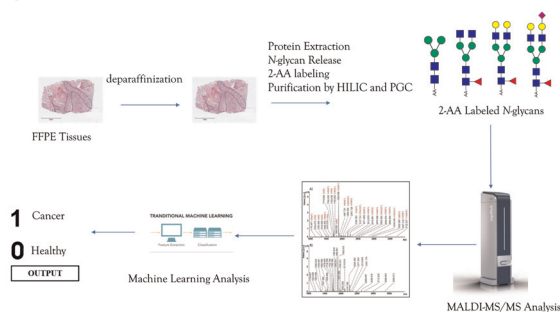
Prediction of gastric cancer by machine learning integrated with mass spectrometry-based *N*-glycomics

Deniz Baran Demirhan, Hakan Yılmaz, Harun Erol, Haci Mehmet Kayili* and Bekir Salih*

2081
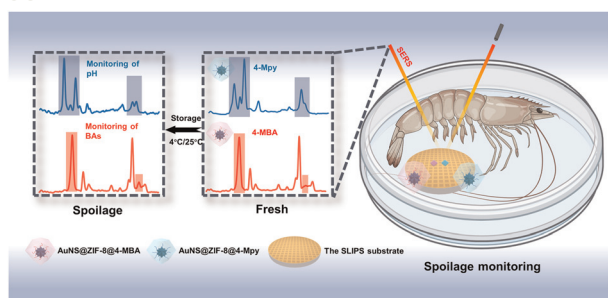
Sensitive and reproducible gold nanostar@metal–organic framework-based SERS membranes for the online monitoring of the freshness of shrimps

Hanlin Guo, Yu Li and Fuwei Pi*

PAPERS

2092

Sensitive colorimetric assay of T4 DNA ligase by the oxidase nanozyme of LaMnO$_{3.26}$ coupled with a hyperbranched amplification reaction

Aohuan Guo, Jie Sun, Menghua Yan and Guang-Li Wang*

2100

The facile activation of graphite for the improved determination of dopamine, rutin and acetamidophenol

Yanxue Xu, Guihua Chen, Yunting Qin and Dan Xiao*

2110

Rapid exocytosis kinetics measured by amperometry within volcano microelectrodes

Nicolas Maïno,* Arnaud Bertsch and Philippe Renaud

2122

A dual-emitting immunosensor based on manganese dioxide nanoflowers and zinc sulfide quantum dots with enhanced electrochemiluminescence performance for the ultrasensitive detection of procalcitonin

Na Wang, Juan Yang, Zhi Luo, Dongmiao Qin, Yusheng Wu and Biyang Deng*

PAPERS

2133

A low-cost automated titration system for colorimetric endpoint detection

Naga P. D. Boppana, Robyn Snow, Paul S. Simone, Gary L. Emmert and Michael A. Brown*

2141

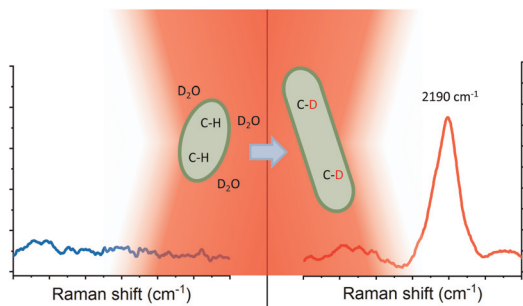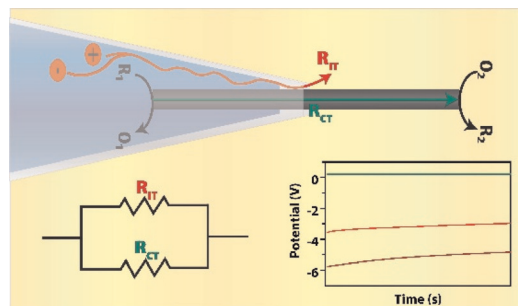Monitoring bacterial spore metabolic activity using heavy water-induced Raman peak evolution

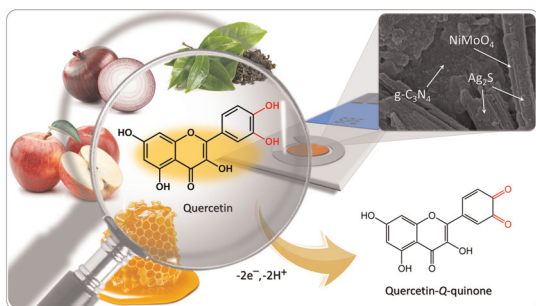Rasmus Öberg, Tobias Dahlberg, Dmitry Malyshev* and Magnus Andersson*

2149

On the mechanism of the bipolar reference electrode

Nicole L. Walker and Jeffrey E. Dick*

2159

A new sensing platform based on a ternary nanocomposite of graphitic carbon nitride–silver sulfide–nickel molybdate for quercetin determination

Khadija Valiyeva, Salih Zeki Bas,* Keziban Atacan, Adem Sarilmaz, Faruk Ozel and Mustafa Ozmen
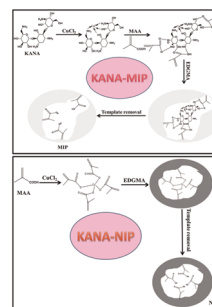
PAPERS

2170

A molecularly imprinted electrochemical sensor for specific and ultrasensitive determination of an aminoglycoside drug: the role of copper ions in the determination

Alanazi A. Z., Khalid Alhazzani, Ali M. Alaseem, Abdullah R. Alanzi, Saeed Abdullah Al Awadh, Fahaad S. Alenazi, Ahmad J. Obaidullah and Mohamed M. El-Wekil*

2180

Ultrasensitive electrochemical sensing platform for miRNA-21 detection based on manganese dioxide-gold nanoparticle nanoconjugates coupled with hybridization chain reaction and horseradish peroxidase signal amplification

Mengyao Li, Tingting Zhang and Yuzhong Zhang*