

RSC Medicinal Chemistry

rsc.li/medchem

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

ISSN 2632-8682 CODEN RMCSCX 14(6) 995-1200 (2023)



Cover
See Pijus K. Sasmal *et al.*,
pp. 1088–1100.
Image reproduced by
permission of Ajay Gupta and
Pijus K. Sasmal from
RSC Med. Chem., 2023, **14**, 1088.



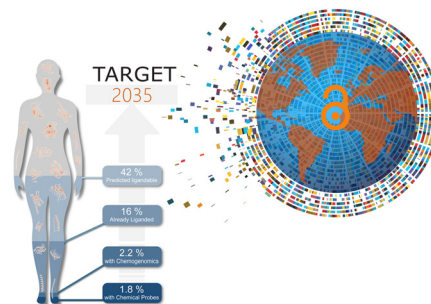
Inside cover
See Suzanne Ackloo,
Cheryl H. Arrowsmith *et al.*,
pp. 1002–1011.
Image created by and
reproduced by permission of
Suzanne Ackloo and
Albert A. Antolin from
RSC Med. Chem., 2023, **14**, 1002.

OPINION

1002

Target 2035 – an update on private sector contributions

Suzanne Ackloo,* Cheryl Arrowsmith,* *et al.*

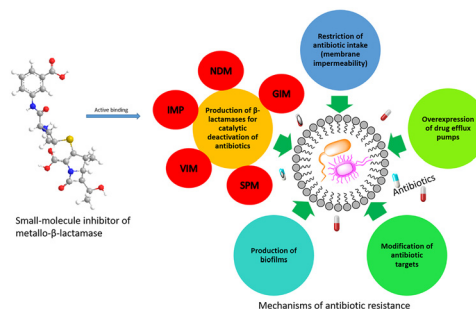


REVIEWS

1012

Small-molecule inhibitors of bacterial-producing metallo- β -lactamases: insights into their resistance mechanisms and biochemical analyses of their activities

Yusuf Oloruntoyin Ayipo,* Chien Fung Chong
and Mohd Nizam Mordi



Editorial Staff

Executive Editor

Rebecca Garton

Deputy Editor

Jack Washington

Editorial Production Manager

Sarah Whitehouse

Development Editor

Emily Cuffin-Munday

Publishing Editors

Nicola Burton, Tom Cozens, Katie Fernandez, Ryan Kean, Roxane Owen, Alex Rowles

Editorial Assistant

Amy Cook

Publishing Assistant

Andrea Whiteside

Publisher

Sam Keltie

For queries about submitted papers, please contact Sarah Whitehouse, Editorial Production Manager, in the first instance. E-mail medchem@rsc.org

For pre-submission queries please contact Rebecca Garton, Executive Editor. E-mail medchem-rsc@rsc.org

RSC Medicinal Chemistry (electronic: ISSN 2632-8682) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail orders@rsc.org

2023 Annual (electronic) subscription price: £1643; US\$2435. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip

Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017;

E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

RSC Medicinal Chemistry

rsc.li/medchem

RSC Medicinal Chemistry publishes significant research and review articles in medicinal chemistry and related drug discovery science.

Editorial Board

Editor-in-Chief

Mike Waring, Newcastle University, UK

Associate Editors

Cynthia Dowd, George Washington University, USA

Maria Duca, Université Côte d'Azur - CNRS, France

Sally-Ann Poulsen, Griffith University, Queensland, Australia

Jian Zhang, Shanghai Jiao Tong University School of Medicine, China

Members

Hayley Binch, Hoffmann-La Roche, Switzerland

Paola Castaldi, LifeMine Therapeutics, USA

Matthew Fuchter, Imperial College London, UK

Jayanta Haldar, Jawaharlal Nehru Centre for Advanced Scientific Research, India

Lyn Jones, Dana-Farber Cancer Institute, Boston, USA

Jean-Louis Reymond, University of Bern, Switzerland

Advisory Board

Timor Baasov, Israel Institute of Technology, Israel

Andreas Bender, University of Cambridge, UK

Julian Blagg, Institute of Cancer Research, Sutton, UK

Margaret Brimble, University of Auckland, New Zealand

Mark Bunnage, Vertex Pharmaceuticals, USA

Christopher Burns, Certar Therapeutics, Australia

Andrea Cavalli, University of Bologna, Italy

Young-Tae Chang, POSTECH, South Korea

James Crawford, Genentech, Inc., USA

Matthew Duncton, Rigel Pharmaceuticals Inc, San Francisco, USA

Stephen Frye, University of North Carolina at Chapel Hill, USA

Sylvie Garneau-Tsodikova, University of Kentucky, USA

Barry Gold, University of Pittsburgh, USA

Gyoonhee Han, Yonsei University, Korea

Mike Hann, GSK Medicine Research Centre, UK

Christian Heinis, EPFL, Switzerland

Laura H. Heitman, Leiden University, Netherlands

Yoshinori Ikeura, Axcelad Drug Discovery Partners, Japan

Ahmed Kamal, NIPER, Hyderabad, India

Bob (Robert) Langer, MIT, USA

Steven V. Ley, University of Cambridge, UK

Maria Luz López Rodríguez, Complutense University of Madrid, Spain

Christa Müller, University of Bonn, Germany

Roberto Pellicciari, University of Perugia, Italy

David Rees, Astex Therapeutics, Cambridge, UK

Motonari Uesugi, Kyoto University, Japan

John C. Vederas, University of Alberta, Canada

Paul Wender, Stanford University, USA

Zhen Yang, Peking University, China

Ming-Qiang Zhang, Amgen, Shanghai, China

Information for Authors

Full details on how to submit material for publication in RSC Medicinal Chemistry 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/medchem

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.

Registered Charity No. 207890.

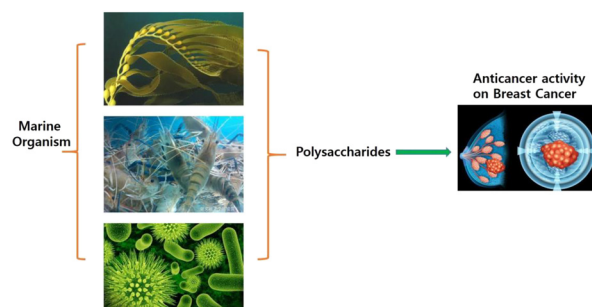


REVIEWS

1049

Polysaccharides from marine biological resources and their anticancer activity on breast cancer

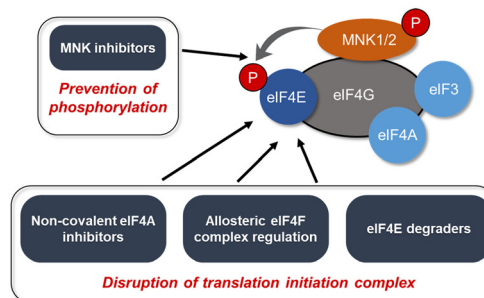
Shengfeng Yang, Dacheng Li,* Weili Liu and Xiaolin Chen



1060

Medicinal chemistry approaches to target the MNK-eIF4E axis in cancer

Ann Fernandez, Paige J. Monsen, Leonidas C. Platanias and Gary E. Schiltz*

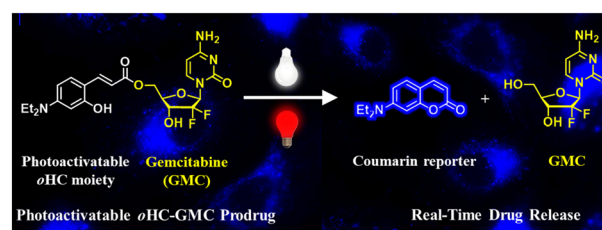


RESEARCH ARTICLES

1088

Visible and NIR light photoactivatable o-hydroxycinnamate system for efficient drug release with fluorescence monitoring

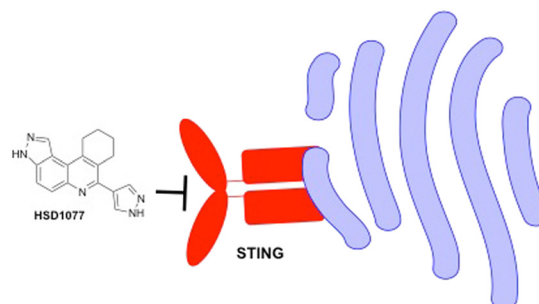
Ajay Gupta, Neelu Singh, Aryan Gautam, Neetesh Dhakar, Sunil Kumar and Pijus K. Sasmal*



1101

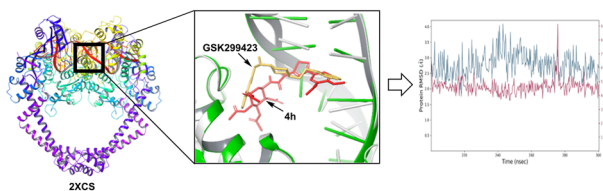
STING antagonists, synthesized via Povarov-Doebner type multicomponent reaction

Wilson W. S. Ong, Neetu Dayal, Riddhi Chaudhuri, Jones Lamptey and Herman O. Sintim*



RESEARCH ARTICLES

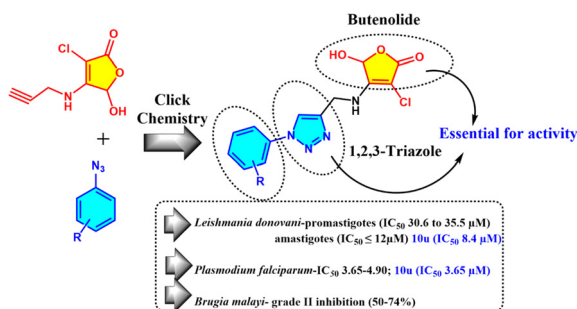
1114



Thiourea derivatives containing 4-arylthiazoles and D-glucose moiety: design, synthesis, antimicrobial activity evaluation, and molecular docking/dynamics simulations

Nguyen Dinh Thanh,* Pham Hong Lan, Do Son Hai, Hoang Huu Anh, Nguyen Thi Kim Giang, Hoang Thi Kim Van, Vu Ngoc Toan, Nguyen Minh Tri and Duong Ngoc Toan

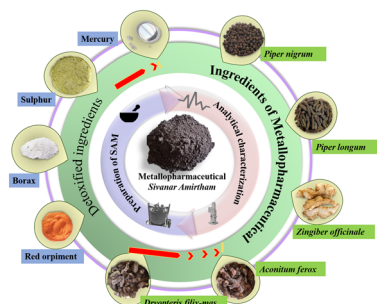
1131



Antileishmanial evaluation of triazole-butenolide conjugates: design, synthesis, *in vitro* screening, SAR and *in silico* ADME predictions

Alka Raj Pandey, Suriya Pratap Singh, Karthik Ramalingam, Kanchan Yadav, Amol Chhatrapati Bisen, Rabi Sankar Bhatta, Mrigank Srivastava, Renu Tripathi, Neena Goyal and Koneni V. Sashidhara*

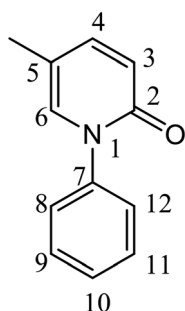
1143



Analytical insights into the detoxification process and characterization of a traditional metallopharmaceutical formulation

Malarvizhi K., Vedha Hari B. N., Rajalakshmi P., Devaraj S. and Ramyadevi Durai*

1158



Novel pirfenidone derivatives: synthesis and biological evaluation

Maoling Yao, Maoru Sun, Congdi Chen, Liming Jin, Hongjun Yang,* Yong Li* and Shufan Yin

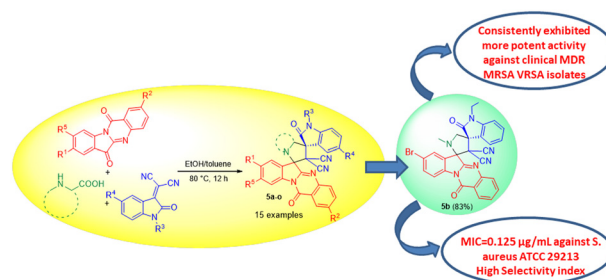


RESEARCH ARTICLES

1165

Synthesis of tryptanthrin appended dispiropyrrolidine oxindoles and their antibacterial evaluation

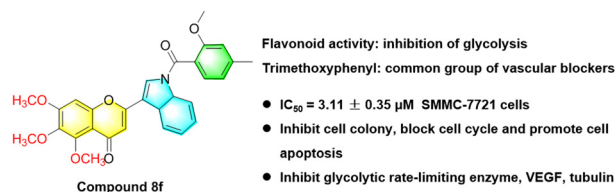
Sruthi Sudheendran Leena, Abdul Akhir, Deepanshi Saxena, Rahul Maitra, Sidharth Chopra* and Ani Deepthi*



1172

Synthesis and anti-hepatocellular carcinoma evaluation of salicylic acid-modified indole trimethoxy flavonoid derivatives

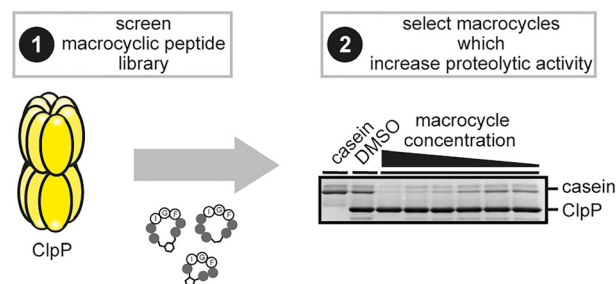
Yang Zou, Na Lu, Xiaoyan Yang, Zhizhong Xie, Xiaoyong Lei, Xingyun Liu, Yong Li, Sheng Huang, Guotao Tang* and Zhe Wang*



1186

Identification of macrocyclic peptides which activate bacterial cylindrical proteases

Raoul Walther, Linda M. Westermann, Sheiliza Carmali, Sophie E. Jackson, Heike Brötz-Oesterhelt* and David R. Spring*



1192

Detection of intact vancomycin-arginine as the active antibacterial conjugate in *E. coli* by whole-cell solid-state NMR

Sabrina H. Werby, Jasna Brčić, Madeline B. Chosy, Jiuzhi Sun, Jacob T. Rendell, Lewis F. Neville, Paul A. Wender* and Lynette Cegelski*

