

# Organic & Biomolecular Chemistry

An international journal of synthetic, physical and biomolecular organic chemistry

rsc.li/obc

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 1477-0520 CODEN OBCRAK 21(28) 5661-5882 (2023)



### Cover

See Arun K. Ghosh and Monika Yadav, pp. 5768–5774.

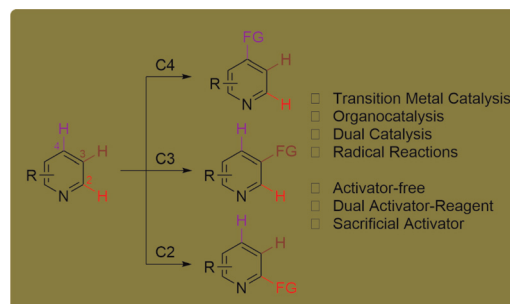
Image designed by Mr. Anando John Ghosh and reproduced by permission of Arun K. Ghosh from *Org. Biomol. Chem.*, 2023, **21**, 5768.

## REVIEWS

5671

### C–H functionalization of pyridines

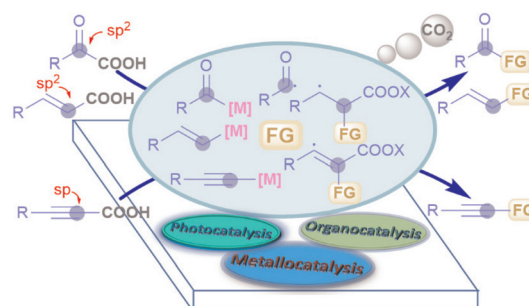
Susmita Maity, Asish Bera, Ayantika Bhattacharjya and Pradip Maity\*



5691

### Recent advances in catalytic decarboxylative transformations of carboxylic acid groups attached to a non-aromatic $sp^2$ or $sp$ carbon

Ajijur Rahaman, Shivani Singh Chauhan and Sukalyan Bhadra\*



**Editorial Staff****Executive Editor**

Rebecca Garton

**Deputy Editor**

Jack Washington

**Development Editor**

Daniel Robertshaw

**Editorial Production Manager**

Sarah Whitehouse

**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: [obc@rsc.org](mailto:obc@rsc.org)

For pre-submission queries please contact Rebecca Garton, Executive Editor. Email: [obc-rsc@rsc.org](mailto:obc-rsc@rsc.org)

Organic & Biomolecular Chemistry (electronic: ISSN 1477-0539) is published 48 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](mailto:orders@rsc.org)

2023 Annual (electronic) subscription price: £5164; US\$9267. 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 RSC 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](http://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](mailto:advertising@rsc.org)

For marketing opportunities relating to this journal, contact [marketing@rsc.org](mailto:marketing@rsc.org)

# Organic & Biomolecular Chemistry

Rapid publication of high quality organic chemistry research

[rsc.li/obc](http://rsc.li/obc)

*Organic & Biomolecular Chemistry* is a weekly journal for the publication of highly significant original research and reviews in all areas of organic chemistry, including organic synthesis, physical organic chemistry, and organic aspects of supramolecular chemistry and chemical biology.

**Editorial Board****Chair**

Anthony Davis, University of Bristol, UK

**Associate Editors**

Christian Hackenberger, Leibniz-Institut für Molekulare Pharmakologie and Humboldt Universität zu Berlin, Germany

Katrina Jolliffe, University of Sydney, Australia

Motomu Kanai, University of Tokyo, Japan

Lei Liu, Tsinghua University, China

Xiaohua Liu, Sichuan University, China

Santanu Mukherjee, Indian Institute of

Science, Bangalore, India

Scott Silverman, University of Illinois at

Urbana-Champaign, USA

Cristina Trujillo, University of Manchester, UK

**Members**

Ivan Huc, Ludwig-Maximilian University of Munich, Germany

S.S.V. Ramasastry, Indian Institute of Science

Education and Research Mohali, India

Corinna Schindler, University of Michigan,

USA

Judy I-Chia Wu, University of Houston, USA

**Advisory Board**

Kyo Han Ahn, Pohang University of Science and Technology, Korea

Igor Alabugin, Florida State University, USA

Gonçalo Bernardes, University of Cambridge, UK

Shunsuke Chiba, Nanyang Technological

University, Singapore

Andre Cobb, Kings College London, UK

Steven Cobb, Durham University, UK

Ratmir Derdar, University of Alberta, Canada

Antonio Echavaren, Institute of Chemical

Research of Catalonia, Spain

Ben Feringa, University of Groningen, The

Netherlands

Amar Flood, Indiana University Bloomington,

USA

Carmen Galan, University of Bristol, UK

Jason Harper, University of New South Wales,

Australia

Elizabeth Krenske, University of Queensland,

Australia

Mahesh Lakshman, The City College of New

York, USA

Shih-Yuan Liu, Boston College, USA

Geraldine Masson, Institut de Chimie des

Substances Naturelles (CNRS), France

Elizabeth New, University of Sydney, Australia

Dhevalapally B. Ramachary, University of

Hyderabad, India

Paolo Scrimin, University of Padova, Italy

Oliver Seitz, Humboldt University of Berlin,

Germany

Jay Siegel, University of Zürich, Switzerland

Corey Stephenson, University of Michigan,

USA

Dean Tantillo, University of California Davis,

USA

Mark Taylor, University of Toronto, Canada

Georgios Vassilikogiannakis, University of

Crete, Greece

Helma Wennemers, ETH Zürich, Switzerland

Peter Wipf, University of Pittsburgh, USA

Shuli You, Shanghai Institute of Organic

Chemistry, China

Jian Zhou, East China Normal University,

China

**Information for Authors**

Full details on how to submit material for publication in Organic & Biomolecular 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/obc](http://rsc.li/obc)

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 number: 207890

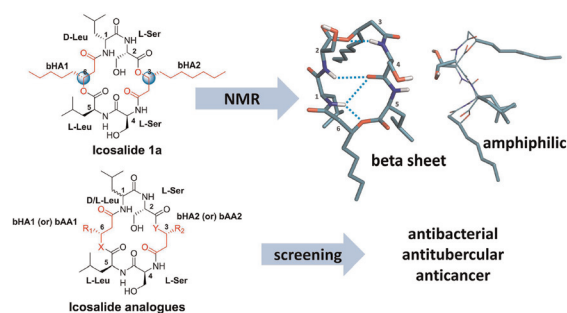


## COMMUNICATIONS

5725

### Total synthesis, structure elucidation and expanded bioactivity of icosalide A: effect of lipophilicity and ester to amide substitution on its bioactivity

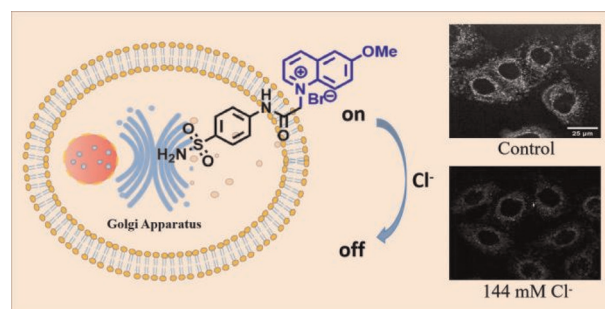
Abha Dangi, Bharat Pande, Sonia Agrawal, Dhiman Sarkar, Koteswara Rao Vamkudoth and Udaya Kiran Marelli\*



5732

### Synthesis of a Golgi-targeting fluorescent probe for the selective detection of chloride anions

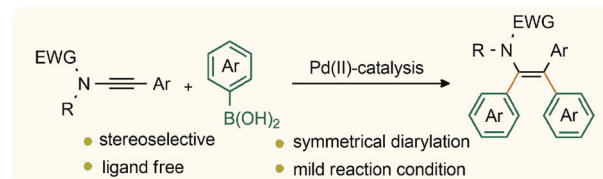
Min Yuan, Jinhui Hu\* and Wen-Hua Chen\*



5737

### Two-component symmetrical diarylation of ynarnides

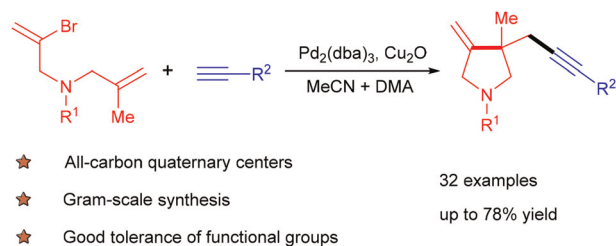
Aradhana Sahoo, Shubham Dutta and Akhila K. Sahoo\*



5742

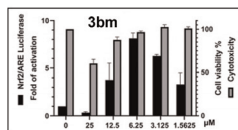
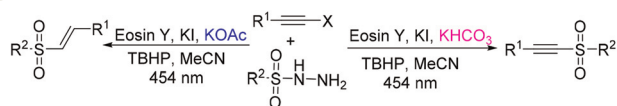
### Pd/Cu-catalyzed cascade Heck-type reactions of alkenyl halides with terminal alkynes toward substituted pyrrolidine analogues

Shiji Xu, Qiang Wang, Jing Sun, Ying Han, Weiming Hu,\* Lei Wang\* and Chao-Guo Yan\*



## COMMUNICATIONS

5747

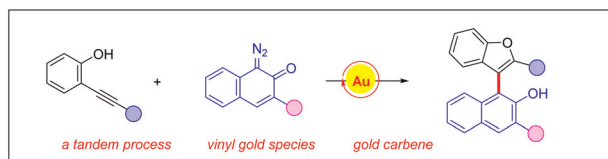


- 41 examples, up to 98% yield
- excellent in vitro antioxidant activity
- metal-free, mild conditions
- good functional group tolerance
- broad substrate scope

### Photocatalytic synthesis of alkyne sulfones and alkenyl sulfones using sulfonylhydrazides and alkynes

Xiaoju Yang, Jumei Yi, Xinhan Li, Yihang Wu, Jun Dong, Zhenxiu He, Guangzhi Zeng,\* Jianbin Xu\* and Baomin Fan\*

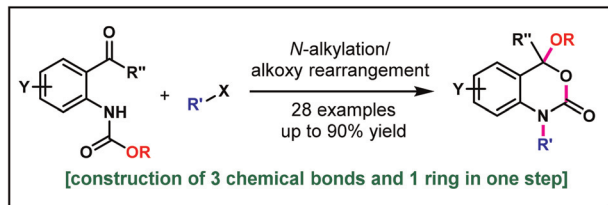
5752



### Gold-catalyzed tandem reaction of o-alkynylphenols with diazo compounds: access to 2,3-disubstituted benzofurans

Tingzhong Huang, Ying Shao, Shengbiao Tang and Jiangtao Sun\*

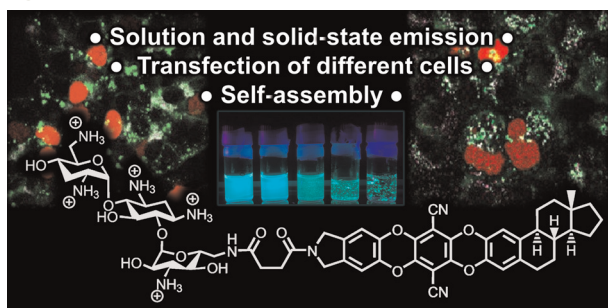
5757



### Convenient synthesis of N-alkyl-3,1-benzoxazin-2-ones from carbamate protected anthranil aldehydes and ketones via one-step alkylation/alkoxy rearrangement

Guang Tian, Wei-Li Jin, Chuanguang Qin\* and Jie Wang\*

5762



### Deoxystrone-based lipofection agents with solution- and solid-state emission properties

Alexander Huber, Johannes Koch, Kevin Rudolph, Alexander Höing, Fabio Rizzo, Shirley K. Knauer and Jens Voskuhl\*

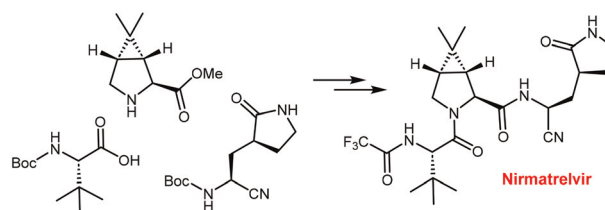


## PAPERS

5768

### Synthesis of optically active SARS-CoV-2 Mpro inhibitor drug nirmatrelvir (Paxlovid): an approved treatment of COVID-19

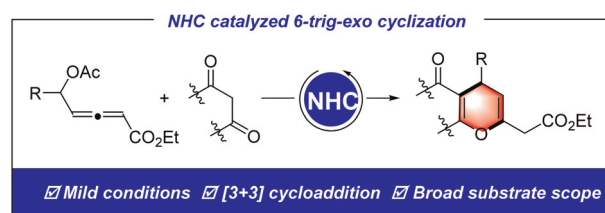
Arun K. Ghosh\* and Monika Yadav



5775

### NHC-catalyzed formal [3 + 3] annulations of $\delta$ -acetoxy allenates for the synthesis of 4*H*-pyran derivatives

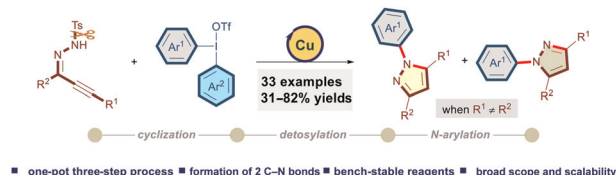
Bai Shi, Fangyi Jin, Qi Lv, Xinrong Zhou, Zhixiao Liao, Chenxia Yu, Kai Zhang\* and Changsheng Yao\*



5784

### Copper-catalyzed tandem cyclization/arylation of $\alpha,\beta$ -alkynic hydrazones with diaryliodonium salts: synthesis of *N*-arylpyrazoles

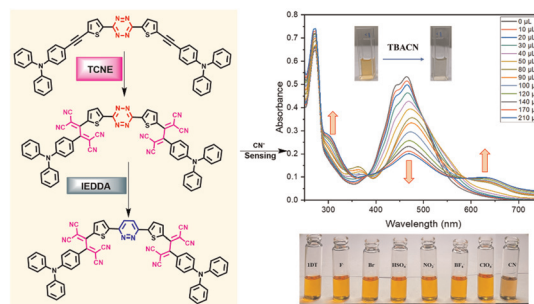
Sushanta Kumar Parida, Saurav Joshi and Sandip Murarka\*



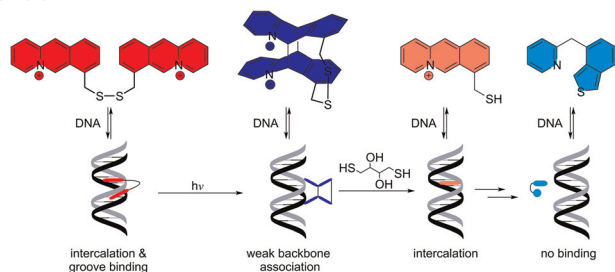
5790

### Synthesis of tetrazine-tetracyanobutadienes and their transformation into pyridazines *via* inverse-electron demand Diels–Alder cycloaddition (IEDDA)

Abhijeet V. Kamble, Aswani Raj K and Rajeswara Rao Malakalapalli\*



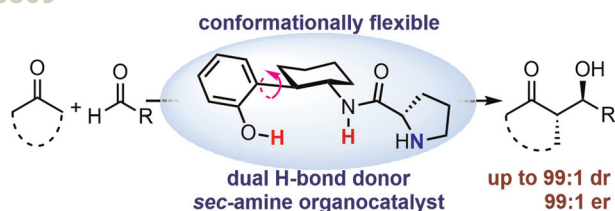
5799



## Switching between DNA binding modes with a photo- and redox-active DNA-targeting ligand, part II: the influence of the substitution pattern

Christoph Dohmen and Heiko Ihmels\*

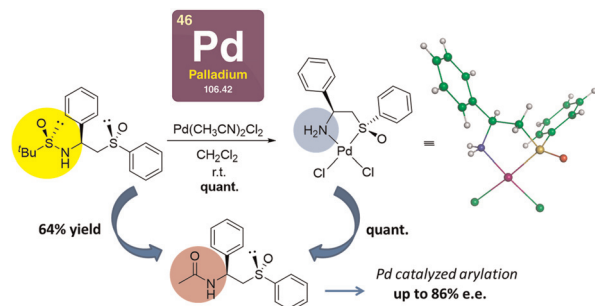
5809



## Prolinamides containing 2-(2-aminocyclohexyl) phenols as highly enantioselective organocatalysts for aldol reactions

Tolga A. Yeşil, Taner Atalar, Mustafa Yavuz and Erkan Ertürk\*

5827

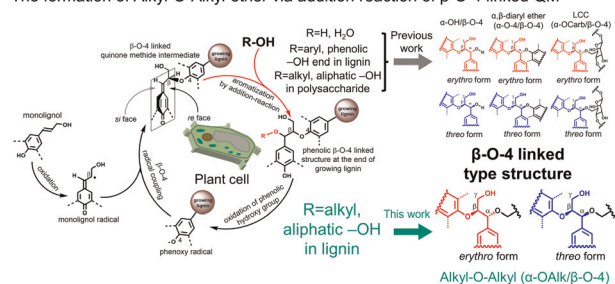


## Synthesis and characterization of enantiopure chiral NH<sub>2</sub>/SO palladium complexes

Nazaret Moreno-Rodriguez, L. Gabriel Borrego, Rocío Recio,\* Victoria Valdivia, M. Carmen Nicasio, Eleuterio Álvarez, Noureddine Khair and Inmaculada Fernández\*

5840

The formation of Alkyl-O-Alkyl ether via addition reaction of  $\beta$ -O-4 linked QM



## Formation of lignin alkyl-O-alkyl ether structures via 1,6-addition of aliphatic alcohols to $\beta$ -O-4-aryl ether quinone methides

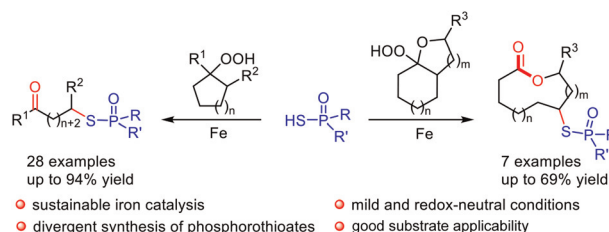
Xuhai Zhu, Dazhi Zhang, Rui Lu and Fang Lu\*



5855

### Iron-catalyzed alkoxy radical-mediated C–C bond cleavage/phosphorothiolation: a new approach to functionalized *S*-alkyl phosphorothioates

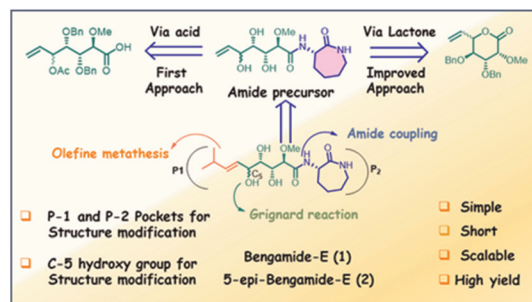
Ming Bai, Shuai Liu, Hong Xin, Xu Yang, Xin-Hua Duan and Li-Na Guo\*



5861

### A simple and efficient pathway for the total synthesis of marine natural products: bengamide E and 5-*epi*-bengamide E

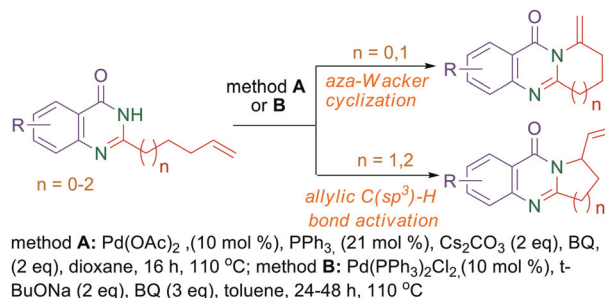
Akanksha Gupta, Praveen Ambati and Ramu Sridhar Perali\*



5866

### Pd-catalyzed oxidative amination of 2-alkenylquinazolin-4(3*H*)-ones: synthesis of methylene and vinyl derivatives of pyrrolo(pyrido)[2,1-*b*]quinazolinones

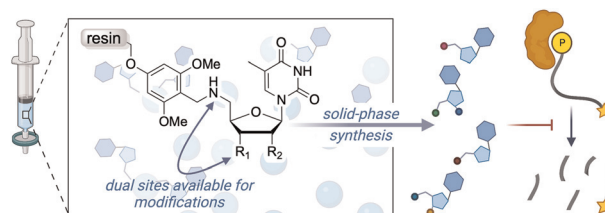
Alla I. Vaskevych,\* Nataliia O. Savinchuk, Ruslan I. Vaskevych, Svitlana V. Shishkina and Mykhailo V. Vovk



5873

### Deploying solid-phase synthesis to access thymine-containing nucleoside analogs that inhibit DNA repair nuclease SNM1A

Christine A. Arbour, Ellen M. Fay, Joanna F. McGouran and Barbara Imperiali\*



## EXPRESSION OF CONCERN

5880

**Expression of concern: Total synthesis of tubulysin U and N<sup>14</sup>-desacetoxytubulysin H**

Bohua Long, Cheng Tao, Yinghong Li, Xiaobin Zeng,\* Meiqun Cao\* and Zhengzhi Wu\*

