

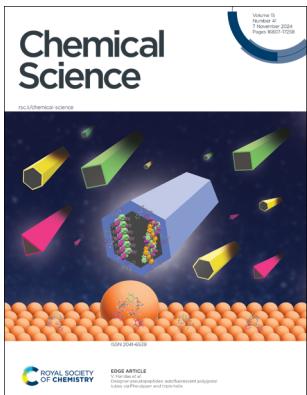
# Chemical Science

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### Cover

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### Inside cover

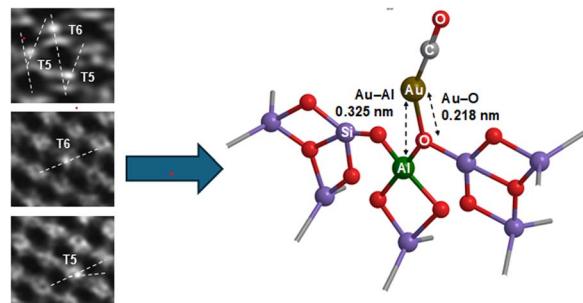
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## PERSPECTIVE

16821

### Mononuclear metal complex catalysts on supports: foundations in organometallic and surface chemistry and insights into structure, reactivity, and catalysis

Bruce C. Gates

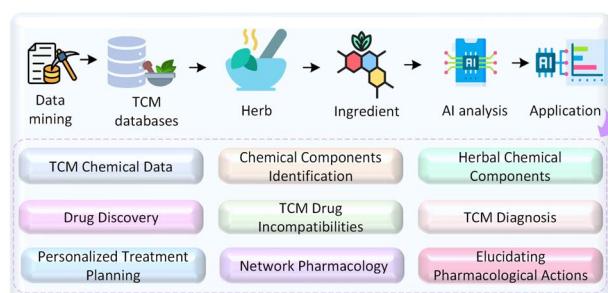


## REVIEWS

16844

### AI empowering traditional Chinese medicine?

Zhilin Song, Guanxing Chen and Calvin Yu-Chian Chen\*



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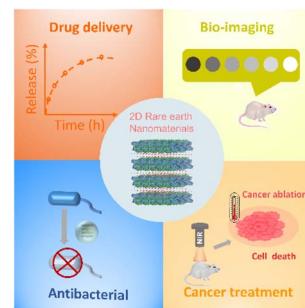
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## REVIEWS

16887

**Two-dimensional nanomaterials based on rare earth elements for biomedical applications**

Mingjun Bai, Hao Wan,\* Ying Zhang, Siqi Chen, Chunyin Lu, Xiaohe Liu,\* Gen Chen, Ning Zhang and Renzhi Ma\*

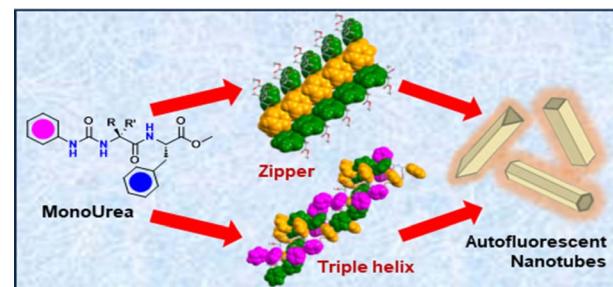


## EDGE ARTICLES

16908

**Designer pseudopeptides: autofluorescent polygonal tubes via Phe-zipper and triple helix**

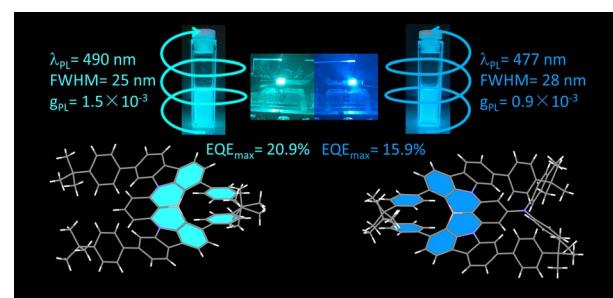
V. Haridas,\* Govind P. Maurya and Souvik Dutta



16917

**Helically chiral multiresonant thermally activated delayed fluorescent emitters and their use in hyperfluorescent organic light-emitting diodes**

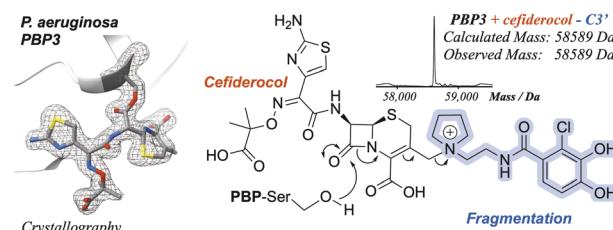
Jingxiang Wang, Dongyang Chen, Juan Manuel Moreno-Naranjo, Francesco Zinna, Lucas Frédéric, David B. Cordes, Aidan P. McKay, Matthew J. Fuchter,\* Xiaohong Zhang\* and Eli Zysman-Colman\*



16928

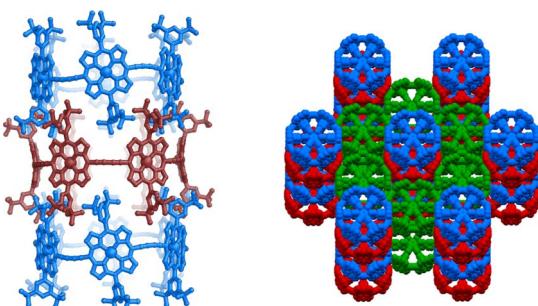
**Structural basis of *Pseudomonas aeruginosa* penicillin binding protein 3 inhibition by the siderophore-antibiotic cefiderocol**

Helen G. Smith, Shyam Basak, Victor Aniebok, Matthew J. Beech, Faisal M. Alshref, Mark D. Allen, Alistair J. M. Farley and Christopher J. Schofield\*



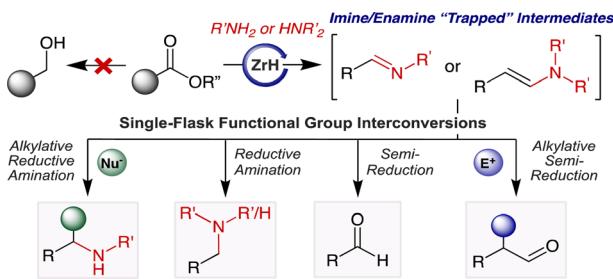
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**Polymorphism and flexibility of six-porphyrin nanorings in the solid state**

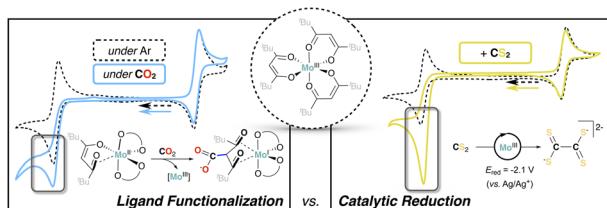
Wojciech Stawski\* and Harry L. Anderson\*

16947

**Direct conversion of esters to imines/enamines and applications to polyester waste upcycling**

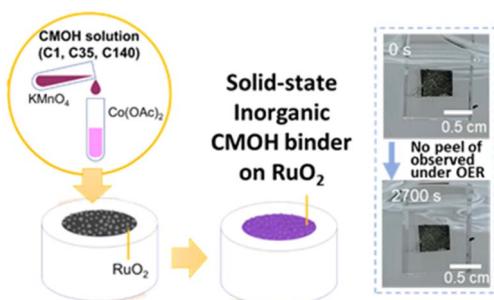
Rebecca A. Kehner, Weiheng Huang and Liela Bayeh-Romero\*

16954

**Chemical and redox non-innocence in low-valent molybdenum  $\beta$  diketonate complexes: novel pathways for  $\text{CO}_2$  and  $\text{CS}_2$  activation**

Fabio Masero and Victor Mougel\*

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**A robust inorganic binder against corrosion and peel-off stress in electrocatalysis**

Joey Andrew A. Valinton, Meng-Yu Lin, Cheng-Han Tsai, Cheng-Te Tsai, Ming-Jia Chiu, Cheng-chau Chiu\* and Chun-Hu Chen\*



## EDGE ARTICLES

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**Making an inverted Keggin ion lacunary**

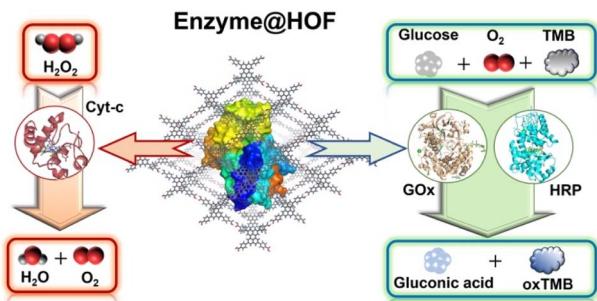
Lu-Lu Liu, Zi-Yu Xu, Peng Yi, Chao-Qin Chen,  
Zhong-Ling Lang\* and Peng Yang\*



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**Facile and scale-up syntheses of high-performance enzyme@meso-HOF biocatalysts**

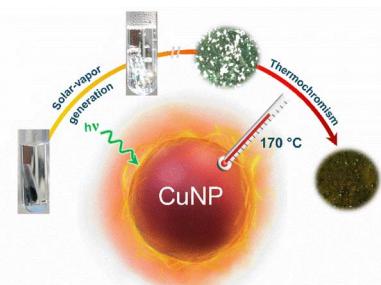
Zhengyi Di, Yu Qi, Xin-Xin Yu, Hai-Ruo Li,  
Meng-Xuan Zuo, Tian-Tian Ren, Cheng-Peng Li\*  
and Yanli Zhao\*



16997

**Plasmon-powered chemistry with visible-light active copper nanoparticles**

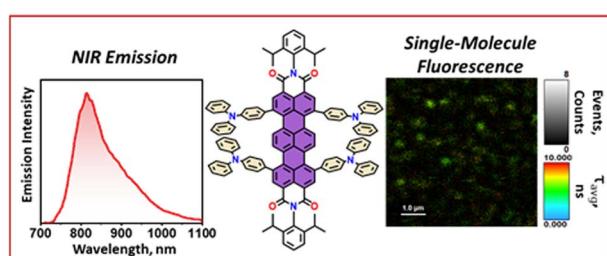
Shreya Tyagi, Radha Krishna Kashyap, Ankit Dhankhar  
and Pramod P. Pillai\*



17007

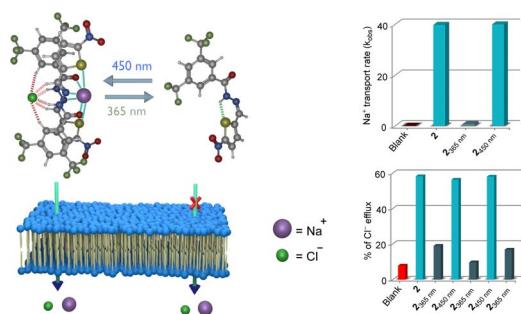
**Single-molecule detection of a terrylenediimide-based near-infrared emitter**

Suvarna Sujilkumar, Philip Daniel Maret, Kavya Vinod,  
Athira T. John and Mahesh Hariharan\*



## EDGE ARTICLES

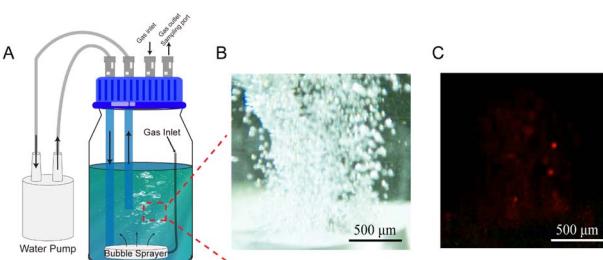
17017



### Acylhydrazone-based reversibly photoswitchable ion pair transporter with OFF-ON cotransport activity

Sandip Chattopadhyay, Paras Wanjari and Pinaki Talukdar\*

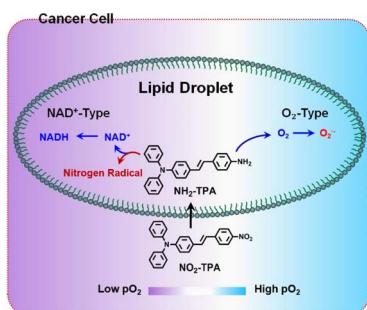
17026



### Methane C(sp<sup>3</sup>)–H bond activation by water microbubbles

Juan Li, Jinheng Xu, Qingyuan Song, Xinxing Zhang,\* Yu Xia\* and Richard N. Zare\*

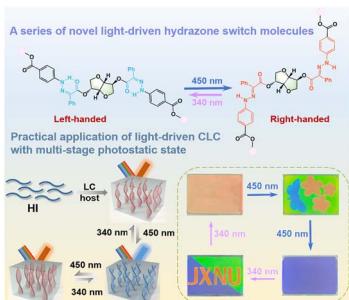
17032



### Tumor oxygen microenvironment-tailored electron transfer-type photosensitizers for precise cancer therapy

Yiting Yang, Yafu Wang, Yang Liu, Kui Wang, Ge Wang, Yonggang Yang, Won Jun Jang, Tony D. James, Juyoung Yoon\* and Hua Zhang\*

17041



### Dynamic handedness inversion of self-organized helical superstructures enabled by novel thermally stable light-driven chiral hydrazone switches

Jingyu Chen, Zichen Wang, Yuexin Yu, Jun Huang, Xinyu Chen, Tongji Du, Xinyue Song, Haiyang Yuan, Shuai Zhou, Xiang-Guo Hu, Xingping Zeng, Shengliang Zhong\* and Ruochen Lan\*

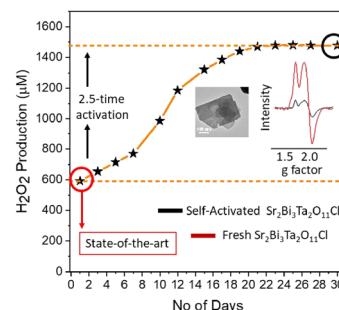


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**A surface reconstruction route for increasingly improved photocatalytic H<sub>2</sub>O<sub>2</sub> production using Sr<sub>2</sub>Bi<sub>3</sub>Ta<sub>2</sub>O<sub>11</sub>Cl**

Maqsuma Banoo, Arjun Kumar Sah, Raj Sekhar Roy, Komalpreet Kaur, Bramhaiah Kommula, Dirtha Sanyal and Ujjal K. Gautam\*



17058

**Intermolecular sulfur atom transfer cascade enabled late-stage introduction of sulfilimines into peptides**

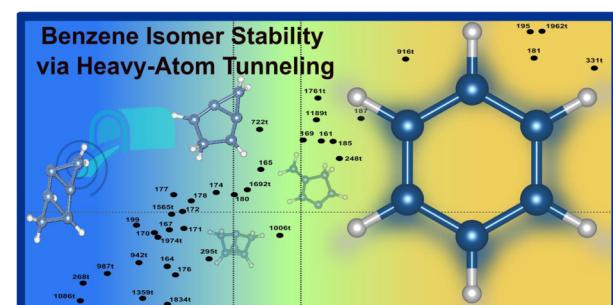
Zeyuan He, Yuyang Liu, Guangjun Bao, Yiping Li, Xiufang Zhao, Quan Zuo, Kai Li, Wangsheng Sun\* and Rui Wang



17064

**Heavy-atom tunnelling in benzene isomers: how many tricyclic species are truly stable?**

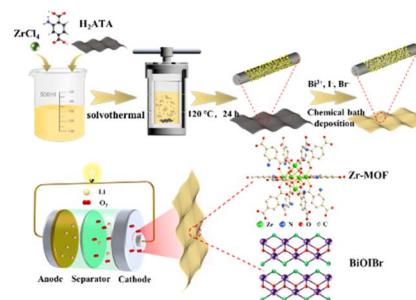
Sindy Julieth Rodríguez\* and Sebastian Kozuch\*



17073

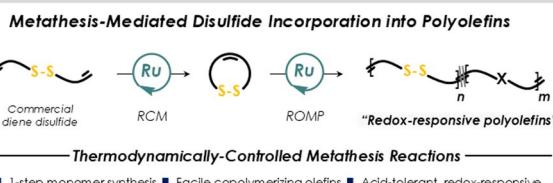
**Promoting oxygen electrode reaction kinetics in photo-assisted Li–O<sub>2</sub> batteries through heterostructure design and built-in electric field construction**

Yinglei Tao, Tao Wang,\* Xingyu Yu, Ke Gong, Hao Gong, Haixia Chen, Xiaoli Fan, Aidi Zhang, Xianli Huang, Kun Chang and Jianping He



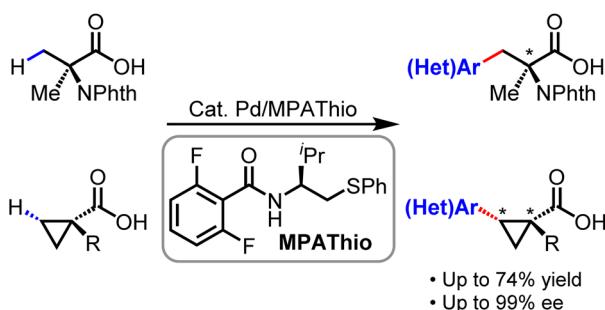
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**Degradable polyolefins prepared by integration of disulfides into metathesis polymerizations with 3,6-dihydro-1,2-dithiine**

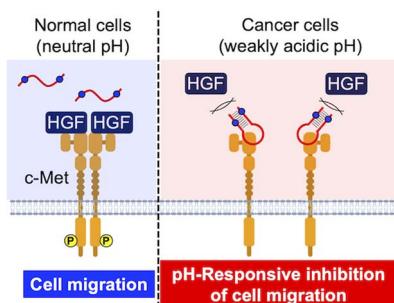
Hong-Gyu Seong, Thomas P. Russell and Todd Emrick\*

17092

**Synthesis of chiral  $\alpha$ -amino acids *via* Pd(II)-catalyzed enantioselective C–H arylation of  $\alpha$ -aminoisobutyric acid**

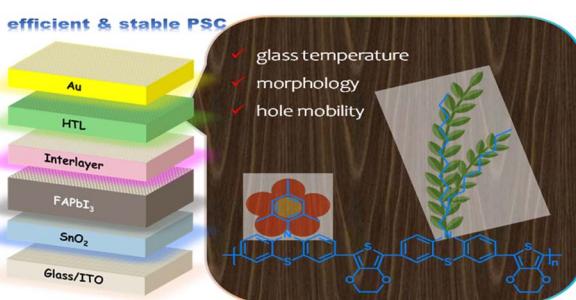
Zi-Yu Zhang, Tao Zhang, Yuxin Ouyang, Peng Lu, Jennifer X. Qiao and Jin-Quan Yu\*

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**Selective inhibition of cancer cell migration using a pH-responsive nucleobase-modified DNA aptamer**

Yuyuan Chen, Kunihiko Morihiro,\* Yui Nemoto, Akito Ichimura, Ryosuke Ueki, Shinsuke Sando and Akimitsu Okamoto\*

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**An alternating copolymer of phenothiazine and ethylenedioxythiophene for perovskite solar cells: effects of flexible and rigid substituent alternation**

Bing Zhang, Yaohang Cai, Lifei He, Niansheng Xu,\* Yi Yuan, Jing Zhang, Yuyan Zhang\* and Peng Wang\*



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**Reconstructing nearly isotropic microstructures to construct a one-dimensional framework causing record birefringence in thiophosphates**

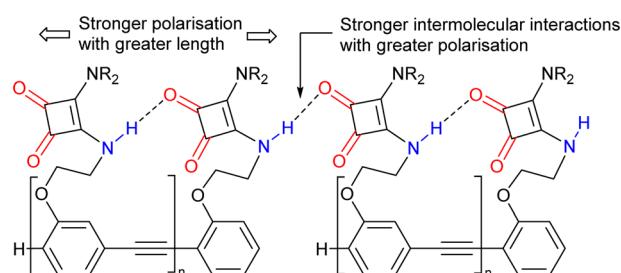
Lin-Tao Jiang, Xiao-Ming Jiang, Yu-Hang Fan,  
Bin-Wen Liu\* and Guo-Cong Guo\*



17120

**Cooperative intra- and intermolecular hydrogen bonding in scaffolded squaramide arrays**

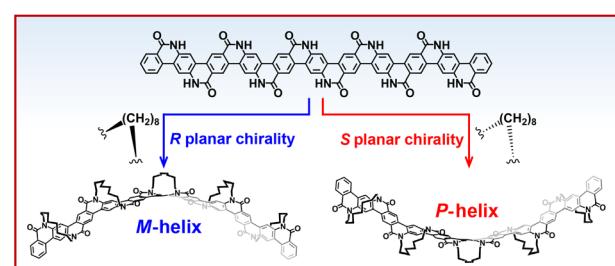
Luis Martínez-Crespo,\* George F. S. Whitehead, Iñigo J. Vitórica-Yrezábal and Simon J. Webb\*



17128

**Tether-entangled conjugated helices**

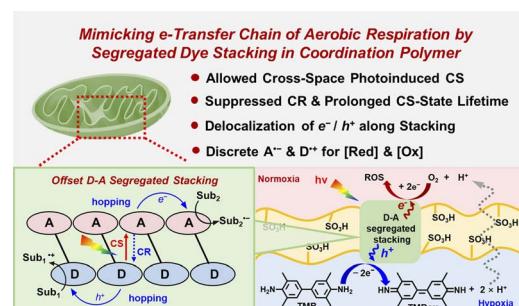
Ke Jin, Zuo Xiao,\* Huidong Xie, Xingxing Shen,\*  
Jizheng Wang, Xiangyu Chen, Zhijie Wang, Zujin Zhao,  
Keyou Yan, Yong Ding and Liming Ding\*



17150

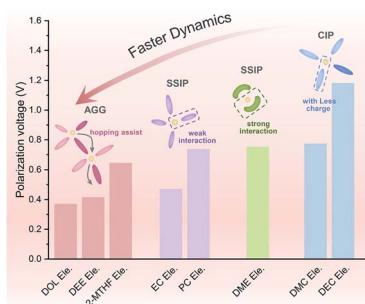
**Electron transport chain-inspired coordination polymers for macroscopic spatiotemporal scales of charge separation and transport in photocatalysis**

Lin Ma, Tiexin Zhang,\* Mochen Li, Xu Zhang, Lanqiao Li,  
Yusheng Shi, Rui Cai, Xueming Yang and Chunying Duan



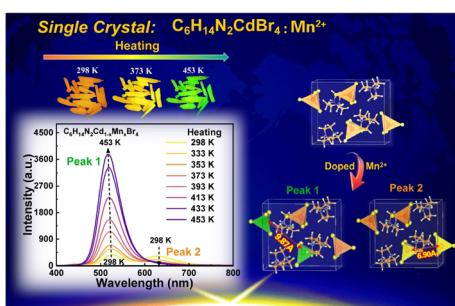
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**Solvation structure dependent ion transport and desolvation mechanism for fast-charging Li-ion batteries**

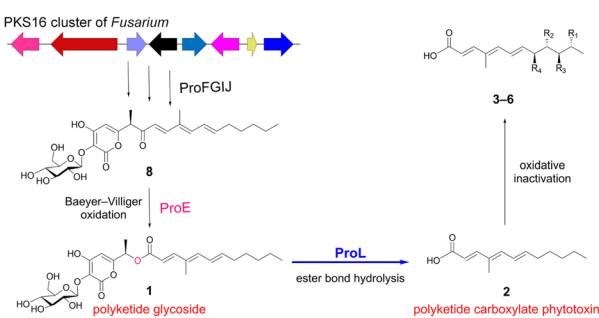
Zhenyu Fan, Jingwei Zhang, Lanqing Wu, Huaqing Yu, Jia Li, Kun Li and Qing Zhao\*

17173

**Dual-emissive luminescence in OIHMH single crystals: tunable red-green emissions via  $\text{Mn}^{2+}$  doping and theoretical insights**

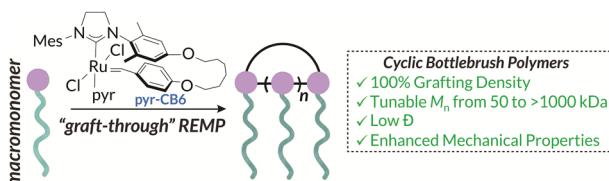
Qianrong Jin, Rui Wu, Yuxiao Pan,\* Yihong Ding, Hongzhou Lian, Jun Lin\* and Liyi Li\*

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**Discovery of a polyketide carboxylate phytotoxin from a polyketide glycoside hybrid by  $\beta$ -glucosidase mediated ester bond hydrolysis**

Xin Wang, De-Kun Kong, Hua-Ran Zhang and Yi Zou\*

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**A general synthesis of cyclic bottlebrush polymers with enhanced mechanical properties via graft-through ring expansion metathesis polymerization**

Matthew J. Elardo, Adelaide M. Levenson, Ana Paula Kitos Vasconcelos, Meredith N. Pomfret and Matthew R. Golder\*

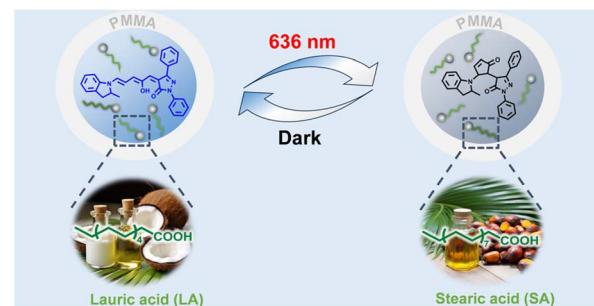


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**A DASA displaying highly efficient and rapid reversible isomerization within sustainable nano/micro capsules: one step closer to sustainability**

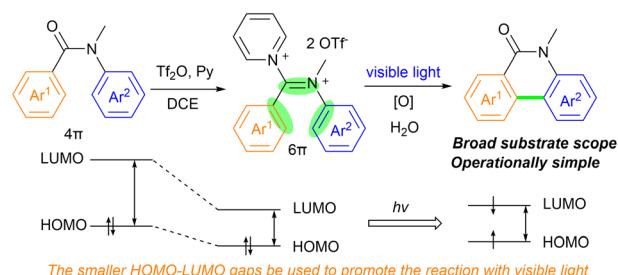
Baoshuo Liu, Xinnian Fan, Hao Ma, Yutong Xie, Haojun Fan, Qiang Yan and Jun Xiang\*



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**Visible light-induced Mallory reaction of tertiary benzanilides via iminium intermediates**

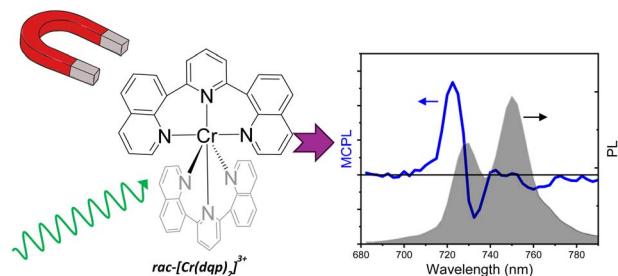
Xiaoqiang Ma, Si Wang, Zhanyong Tang, Jialin Huang, Tianhao Jia, Xingda Zhao and Depeng Zhao\*



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**Magnetic circularly polarized luminescence from spin–flip transitions in a molecular ruby**

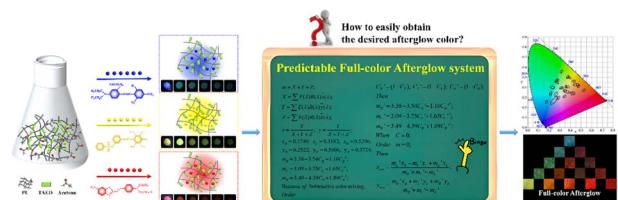
Alessio Gabbani, Maxime Poncet, Gennaro Pescitelli, Laura Carbonaro, J. Krzystek, Enrique Colacio, Claude Piguet, Francesco Pineider, Lorenzo Di Bari, Juan-Ramón Jiménez\* and Francesco Zinna\*



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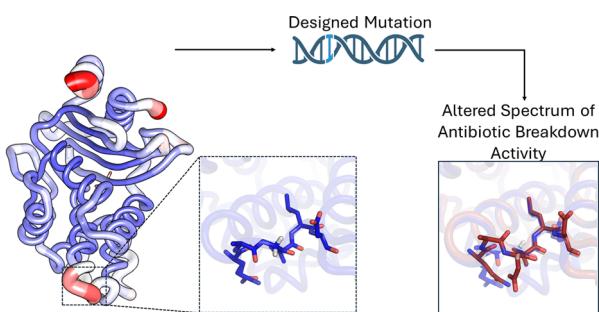
**Simplifying complexity: integrating color science for predictable full-color and on-demand persistent luminescence using industrial disperse dyes**

Guowei Xiao, Xiaoyan Wang, Xiaoyu Fang, Jinmei Du, Yang Jiang, Dagang Miao, Dongpeng Yan\* and Changhai Xu\*



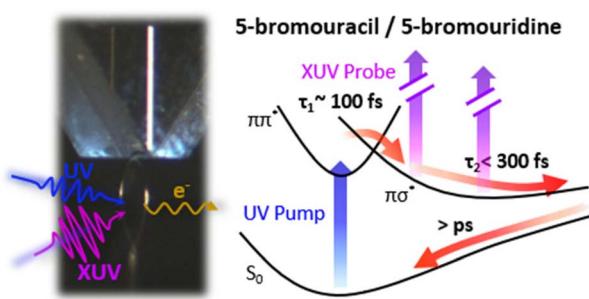
## EDGE ARTICLES

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**Dynamical responses predict a distal site that modulates activity in an antibiotic resistance enzyme**

Michael Beer, Ana Sofia F. Oliveira, Catherine L. Tooke, Philip Hinchliffe, Angie Tszy Yan Li, Balazs Balega, James Spencer\* and Adrian J. Mulholland\*

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**Dynamics of photoexcited 5-bromouracil and 5-bromo-2'-deoxyuridine studied by extreme ultraviolet time-resolved photoelectron spectroscopy in liquid flat jets**

Do Hyung Kang, Masafumi Koga, Neal Haldar and Daniel M. Neumark\*

