

Materials Advances

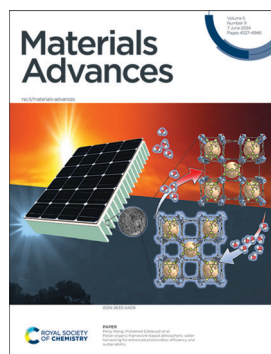
An open access journal publishing across the breadth of materials science

rsc.li/materials-advances

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.

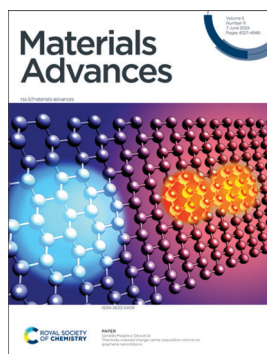
IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 5(11) 4527-4946 (2024)



Cover

See Peng Wang, Mohamed Eddaoudi *et al.*, pp. 4660–4667. Image reproduced by permission of Osama Shekhah from *Mater. Adv.*, 2024, 5, 4660.



Inside cover

See Geraldo Magela e Silva *et al.*, pp. 4668–4678. Image reproduced by permission of Geraldo Magela e Silva from *Mater. Adv.*, 2024, 5, 4668. The authors would like to thank Gabriela Hirata e Silva for the cover image.

EDITORIAL

4539

Introduction to Biomaterials in Innate Immunity

Erika Moore* and Shreya A. Raghavan*

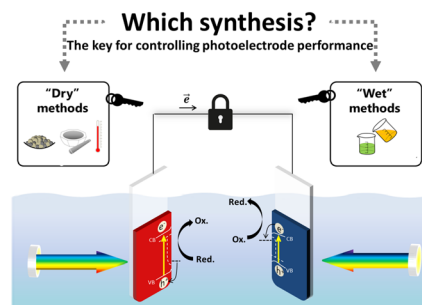


REVIEWS

4541

Strategies for the synthesis of complex oxides for application as light-responsive electrodes in photoelectrochemical cells – a review

Nadia Guerra Macedo, Jéssica Costa Alvim, Leonardo Carvalho Soares, Luelc Souza da Costa, Miguel Tayar Galante, Vanderlei Silva Lima and Claudia Longo*



Environmental Science journals

One impactful portfolio for
every exceptional mind

Harnessing the power of interdisciplinary
science to preserve our environment

rsc.li/envsci

Fundamental questions
Elemental answers

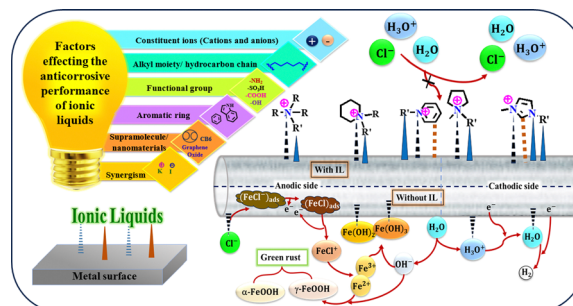


REVIEWS

4563

Unveiling the future of steel corrosion inhibition: a revolutionary sustainable odyssey with a special emphasis on N⁺-containing ionic liquids through cutting-edge innovations

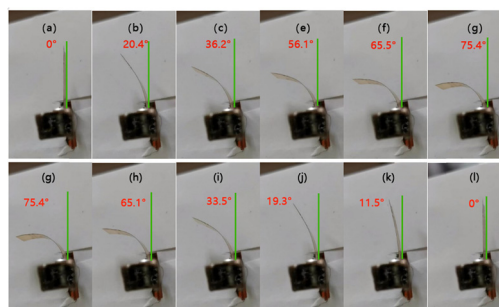
Sanjukta Zamindar, Sukdeb Mandal, Manilal Murmu and Priyabrata Banerjee*



4601

Current research status of ionic polymer–metal composites in applications of low-voltage actuators

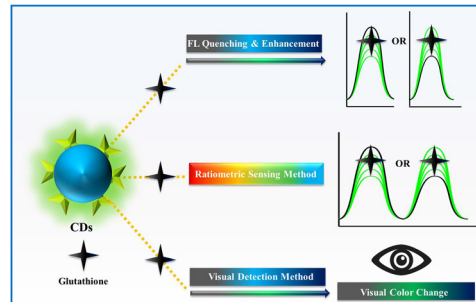
Jinguang Lai, Bo Zeng, Jiachen Liu,* Jianjun Zhang, Wenle Pei, Yi Zhou, Yueming Liu, Jungang Li and Yang Tong*



4618

Carbon dot as fluorescence sensor for glutathione in human serum samples: a review

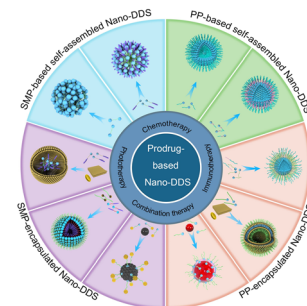
Kawan F. Kayani,* Sewara J. Mohammed, Dizar Ghafoor, Mohammed K. Rahim and Harez Rashid Ahmed



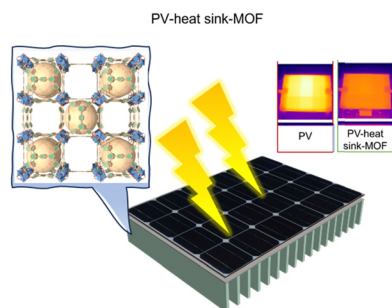
4634

Recent advances in engineering prodrug-based nanomedicines for cancer therapy

Linlin Shi,* Shanshan Lin, Fengping Zhou, Hao Jiang and Jin Zhang*



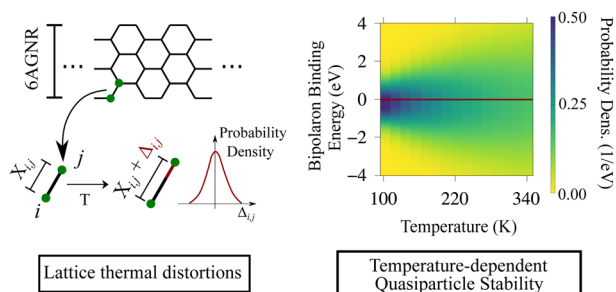
4660



Metal–organic framework-based atmospheric water harvesting for enhanced photovoltaic efficiency and sustainability

Dalal Alezi, Renyuan Li, Norah Alsadun, Arijit Malik, Osama Shekhah, Peng Wang* and Mohamed Eddaoudi*

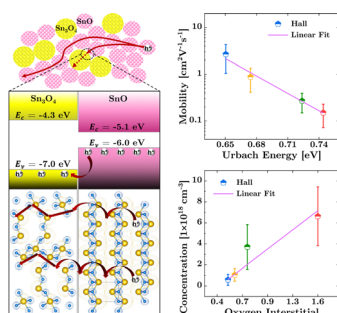
4668



Thermally-induced charge carrier population control on graphene nanoribbons

Tiago de Sousa Araújo Cassiano, Geraldo Magela e Silva* and Pedro Henrique de Oliveira Neto

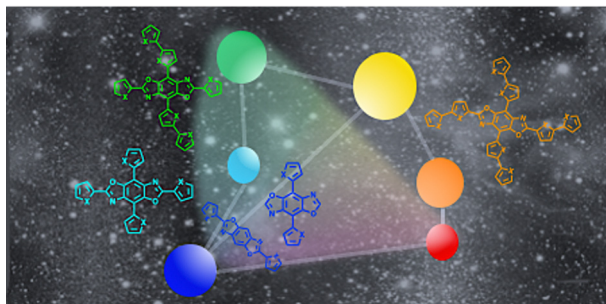
4679



Unveiling the nature of room-temperature-fabricated p-type SnO thin films: the critical role of intermediate phases, lattice disorder, and oxygen interstitials

Mochamad Januar, Cheng-Yu Lu, Horng-Chih Lin, Tsung-Yu Huang,* Chia-Ming Yang,* Kuo-Kang Liu and Kou-Chen Liu*

4689



Exploring color space: an investigation of heteroaryl-substituted benzobis[1,2-d:4,5-d']oxazoles and their application in organic light-emitting diodes

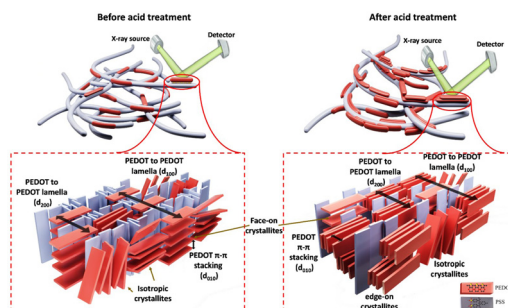
David L. Wheeler, Shambhavi Tannir, Hadar R. Yakir, Or Dishi, Ori Gidron and Malika Jeffries-EL*



4699

Beyond acid treatment of PEDOT:PSS: decoding mechanisms of electrical conductivity enhancement

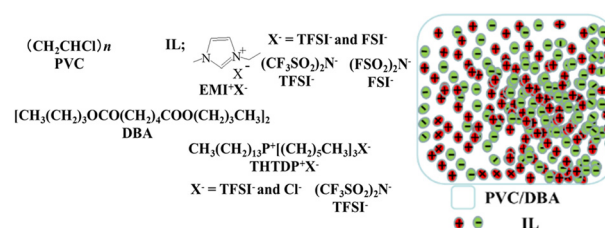
Hatef Yousefian, Seyed Alireza Hashemi, Amin Babaei-Ghazvini, Bishnu Acharya, Ahmadreza Ghaffarkhah* and Mohammad Arjmand*



4715

High-performance transparent hybrid (ionic and dielectric) gel actuator system based on poly(vinyl chloride)/dibutyl adipate/ionic liquid gels operating at a low applied voltage

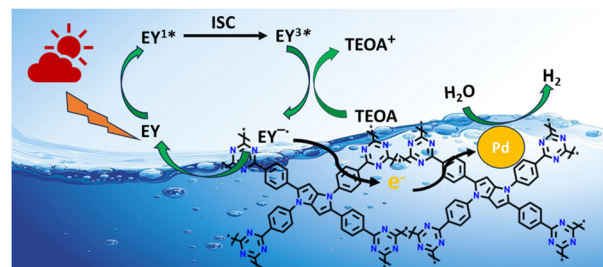
Naohiro Terasawa* and Hirosato Monobe



4720

A pyrrolo[3,2-b]pyrrole core containing a covalent triazine-based framework (CTF) for photocatalytic H₂ production

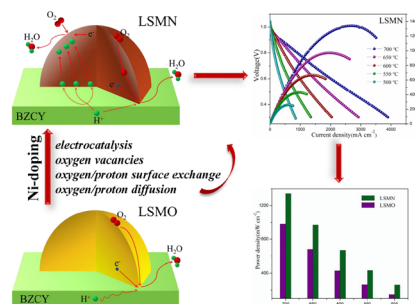
Osman Ali, Anupam Jana, Aruntima Das, Sandeep Kumar Dey and Asamanjoy Bhunia*



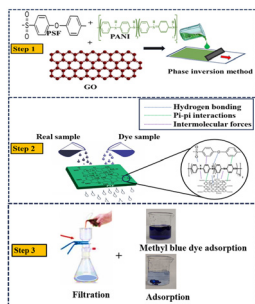
4728

Ameliorating La_{0.5}Sr_{1.5}MnO₄ with Ni-doping to enhance cathode electrocatalysis for proton-conducting solid oxide fuel cells

Jiapeng Xu, Junyi Gong, Kunpeng Du, Wei Liu and Jie Hou*



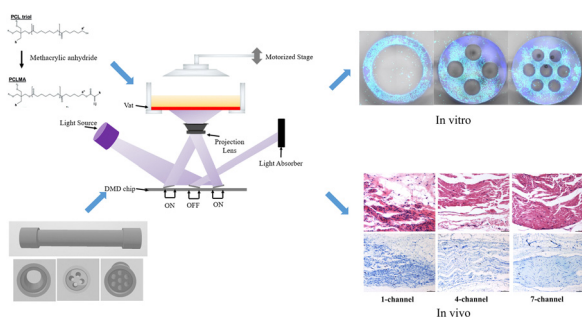
4736



Integrated synergy: PSF/PANI/GO membranes for dual-action textile dye detoxification

Anila Tabasum, Amna Siddique, Humaira Razaq,*
Hafiza Hifza Nawaz, Shumaila Razaque, Saba Tahir,
Shaista Taimur, Nusrat Jabeen and Samreen Shehzadi

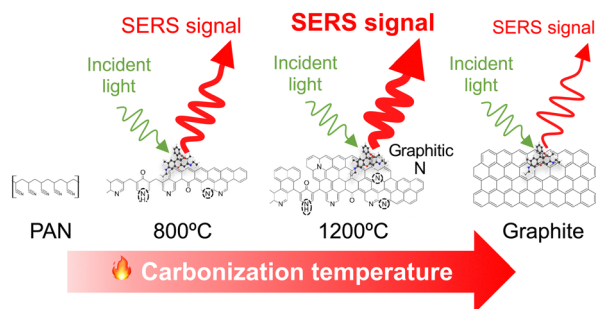
4753



Projection-based 3D printing of multichannel poly(caprolactone) methacrylate nerve guidance conduit for peripheral nerve regeneration

Haibing Li, Ke Yao, Yuewei Chen, Wensong Ye and
Qiang Shu*

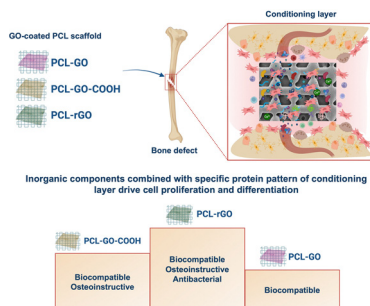
4764



A highly simple and controllable nitrogen-doping method for carbon-based surface-enhanced Raman spectroscopy substrates

Machiko Marumi, Xuke Tang, V. Kesava Rao,
Abdullah N. Alodhayb, Manish M. Kulkarni,
Prabhat K. Dwivedi, Fabio Lisi, Yasutaka Kitahama,*
Ting-Hui Xiao and Keisuke Goda*

4772



The osteoconductive properties of graphene-based material surfaces are finely tuned by the conditioning layer and surface chemistry

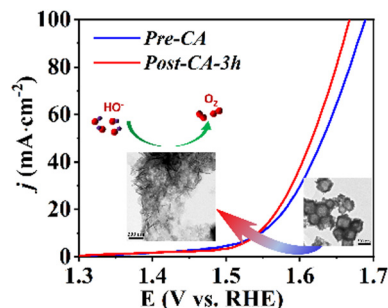
Federica Tiberio, Francesco Amato, Claudia Desiderio,
Federica Vincenzoni, Giordano Perini, Irene Moretti,
Alberto Augello, Ginevra Friggeri, Lishan Cui,
Leonardo Giaccari, Martina Salvati, Luca Polito,
Ornella Parolini, Marco De Spirito,
Andrea Giacomo Marrani, Wanda Lattanzi,*
Massimiliano Papi,* Lorena Di Pietro and
Valentina Palmieri



4786

In situ formation of robust nanostructured cobalt oxyhydroxide/cobalt oxide oxygen evolution reaction electrocatalysts

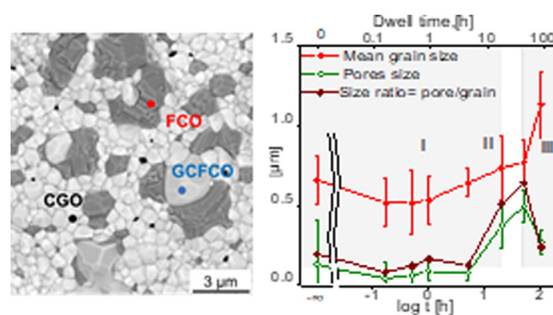
Yupeng Zhao, Dandan Gao, Johannes Biskupek, Ute Kaiser, Rongji Liu* and Carsten Streb*



4794

Impact of the sintering parameters on the microstructural and transport properties of 60 wt% Ce_{0.8}Gd_{0.2}O_{2-δ}-40 wt% FeCo₂O₄ composites

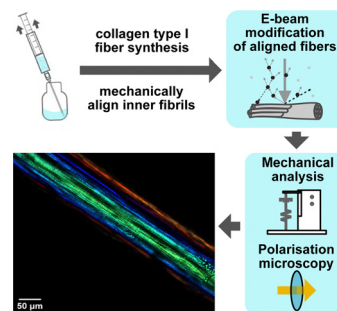
Liudmila Fischer,* Ke Ran, Doris Sebold, Patrick Behr, Stefan Baumann,* Joachim Mayer, Arian Nijmeijer, Henny Bouwmeester, Olivier Guillon and Wilhelm A. Meulenber



4807

Programming fibril alignment and mechanical response in reconstituted collagen fibers using reagent-free biomimetic energetic electron crosslinking

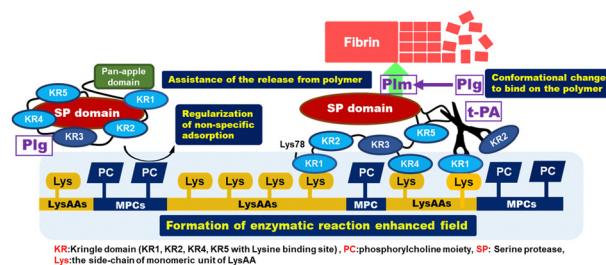
Anastassiya Bublikova, Friedrich Schütte* and Stefan G. Mayr*



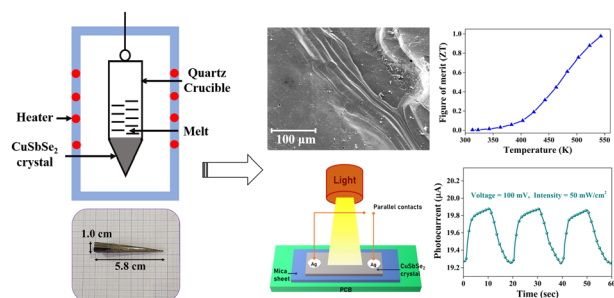
4818

Preparation of zwitterionic random and block poly(*N*-α-acrylamide-L-lysine-co-2-methacryloyloxyethyl phosphorylcholine) copolymers and their effect on fibrinolytic activity

Tomoya Nakago, Yuto Oki, Tatsuki Nousou, Tomohiro Ogawa and Kohei Shiraishi*



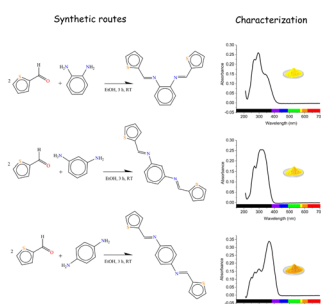
4832



Growth of a CuSbSe_2 single crystal by the Bridgman technique and its utility as a photodetector and thermoelectric material

Zubin R. Parekh,* M. P. Deshpande,* Sandip V. Bhatt, Rohitkumar M. Kannaujiya, Hiteshkumar R. Bhoi, Yash V. Joshi, S. H. Chaki and Swati J. Pandya

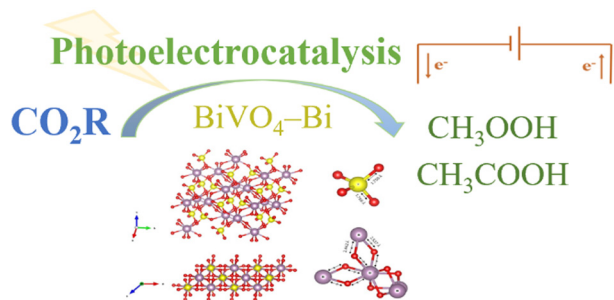
4848



Synthesis and characterization of N,N' -bis(2-thienylmethylene)-1, X -diaminobenzene isomers ($X = 2, 3, 4$) and their metal complexes

Parastoo Vahdatiyekta, Mohammed Zniber, Kostiantyn Nikiforow and Tan-Phat Huynh*

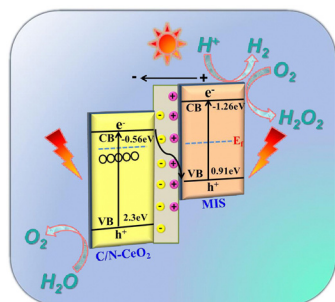
4857



Unveiling BiVO_4 photoelectrocatalytic potential for CO_2 reduction at ambient temperature

Ricardo Marques e Silva, Eduardo Henrique Dias, Florymar Escalona-Durán, Gelson Tiago dos Santos Tavares da Silva, Wajdi Alnough, Jessica Ariane de Oliveira, Drew Higgins and Caue Ribeiro*

4865



MgIn_2S_4 -decorated MOF-derived C/N- CeO_2 nanorod heterojunctions as efficient photocatalysts towards H_2O_2 production reactions and H_2 evolution reactions

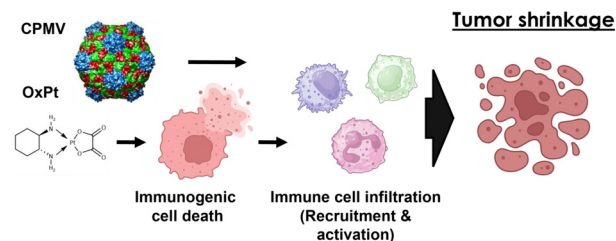
Jayashree Panda, Pragyandeepi Behera, Satyabrata Subudhi, Suraj Prakash Tripathy, Gayatri Swain, Srabani Dash and Kulamani Parida*



4878

Combination of cowpea mosaic virus (CPMV) intratumoral therapy and oxaliplatin chemotherapy

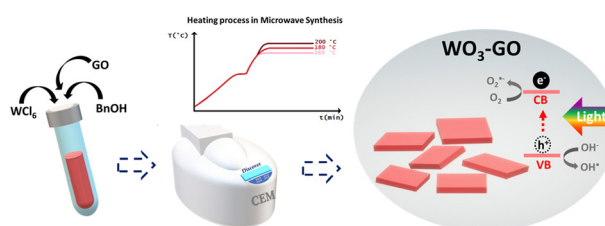
Miguel A. Moreno-Gonzalez, Zhongchao Zhao, Adam A. Caparco and Nicole F. Steinmetz*



4889

Exploring the effects of synthesis parameters on the properties and photoactivity of WO₃-graphene oxide synthesized via a microwave route

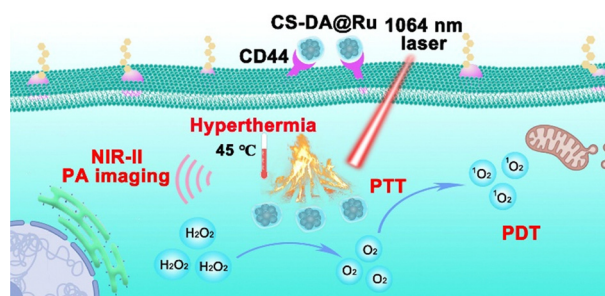
Bárbara S. Rodrigues, Markus Niederberger and Juliana S. Souza*



4902

A self-assembled Ru nanozyme with H₂O₂-activated oxygenation for NIR-II photoacoustic imaging-guided photothermal/photodynamic therapy

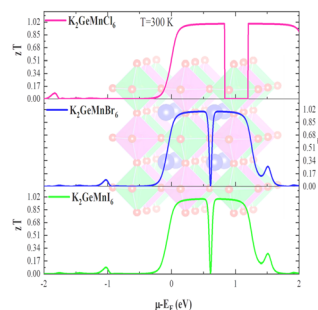
Guang Liu, Zhilang Li, Zirong Lv, Qiuping Zheng, Cunji Gao,* Jianniao Tian and Xing-Can Shen*

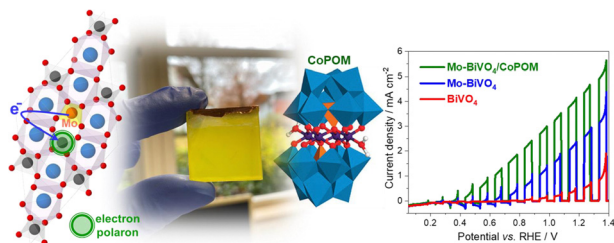


4913

Control of spin on ferromagnetism and thermoelectric properties of K₂GeMnX₆ (X = Cl, Br, I) halide perovskites: emerging candidates for semiconductor spintronics and thermoelectric applications

Mudasir Younis Sofi, Mohd Shahid Khan and M. Ajmal Khan*





High-performance BiVO₄ photoanodes: elucidating the combined effects of Mo-doping and modification with cobalt polyoxometalate

Fan Feng, Dariusz Mitoraj, Ruihao Gong, Dandan Gao, Mohamed M. Elnagar, Rongji Liu, Radim Beranek* and Carsten Streb*

