Food & Function

rsc.li/food-function

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 2042-650X CODEN FFOUAL 14(22) 9953-10254 (2023)



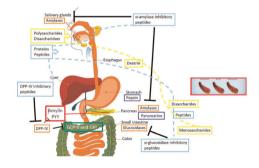
Cover See Yanan Li et al... pp. 9999-10013.

Image reproduced by permission of Yanan Li from Food Funct., 2023. 14. 9999.

REVIEWS

Protein-based nutritional strategies to manage the development of diabetes: evidence and challenges in human studies

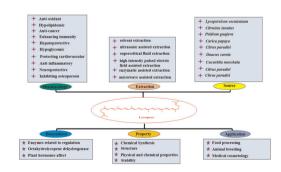
Sergio Montserrat-de la Paz, Antonio D. Miguel-Albarreal, Teresa Gonzalez-de la Rosa, Maria C. Millan-Linares and Fernando Rivero-Pino*



9974

The sources, properties, extraction, biosynthesis, pharmacology, and application of lycopene

Rong-Rui Wei, Qing-Yuan Lin, Mozili Adu, Hui-Lian Huang, Zhi-Hong Yan, Feng Shao, Guo-Yue Zhong, Zhong-Li Zhang,* Zhi-Pei Sang,* Lan Cao* and Qin-Ge Ma*



Editorial Staff

Executive Editor

Rebecca Garton

Deputy Editor

Alice Smallwood

Editorial Production Manager

Sarah Whitehouse

Development Editor

David Lake

Publishing Editors

Gabriel Clarke, Derya Kara-Fisher, Emma Stephen, Ziva Whitelock

Publishing Assistant

Andrea Whiteside

Editorial Assistant

Leo Curtis

Publisher

Jeanne Andres

For queries about submitted articles please contact Sarah Whitehouse, Editorial production manager, in the first instance. E-mail food@rsc.org

For pre-submission queries please contact Rebecca Garton, Executive Editor.

E-mail food-rsc@rsc.org Food & Function (electronic: ISSN 2042-650X) is published

12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK.

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: £2665; US\$4591. 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

Food & Function

Linking the chemistry and physics of food with health and nutrition rsc.li/food-function

Editorial Board

Editor-in-Chief

Christine Morand, INRA, France

Associate Editors

Lillian Barros, Polytechnic Institute of Braganca, Portugal

Charlotte Beaudart, University of Namur, Belgium

Catherine Bondonno, Edith Cowan University, Australia

Laura Bravo-Clemente, Institute of Food Science, Technology and Nutrition, Spain Center and University of Arkansas for Medical Sciences, USA

Monica Galleano, University of Buenos Aires, Argentina

Liwei Gu, University of Florida, USA Kee-Hong Kim, Purdue University, USA Xuebo Liu, Northwest A&F University, China Andrew Nielson, North Carolina State University, USA

Mario Ferruzzi, Arkansas Children's Nutrition Ana Rodriguez-Mateos, King's College London, UK

Hiroyuki Sakakibara, University of Miyazaki, Japan

Elke Scholten, Wageningen University, The Netherlands

Advisory Board

Mario Allegra, University of Palermo, Italy Hitoshi Ashida, Kobe University, Japan Letizia Bresciani, University of Parma, Italy Aedin Cassidy, University of East Anglia, UK Steven Feng Chen, Peking University, China Zhen-vu Chen, Chinese University of Hong Kong, Hong Kong

Peter Clifton, Baker IDI Heart & Diabetes Institute

Kevin Croft, University of Western Australia,

Eric Decker, University of Massachusetts, USA Inês Figueira, NOVA Medical School, Portugal Tim Foster, University of Nottingham, UK Cesar Fraga, University of Buenos Aires, Argentina & University of California, Davis,

Rocio García-Villalba, CEBAS-CSIC, Spain Mike Gidley, University of Queensland, Australia

H. Douglas Goff, University of Guelph, Canada George van Aken, NIZO Food Research, The Antonio Gonzales-Sarrias, CEBAS-CSIC, Spain Chi-Tang Ho, Rutgers University, USA Richard Hurrell, ETH Zurich, Switzerland Luana Izzo, University of Naples Federico II Italy

Rui Hai Liu, Cornell University, USA Aleiandro Marangoni, University of Guelph, Canada

Julian McClements, University of Massachusetts, USA

Dragan Milenkovic, University of California, Davis, USA Paul Moughan, Riddet Institute, Massey

University, New Zealand Kevin Murray, The University of Western

Australia, Australia Patricia Oteiza, University of California,

Junji Terao, Konan Women's University, Japan

Netherlands

Rob van Dam, National University of Singapore, Singapore

Erik van der Linden, TI Food & Nutrition, The Netherlands

Natalie Ward, University of Western Australia, Australia

Gary Williamson, University of Leeds, UK Jianping Wu, University of Alberta, Canada Xingbin Yang, Shaanxi Normal University,

Gow-Chin Yen, National Chung Hsing University, Chinese Taipei Beiwei Zhu, Dalian Polytechnic University,

Information for Authors

Full details on how to submit material for publication in Food & Function 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/food-function

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.

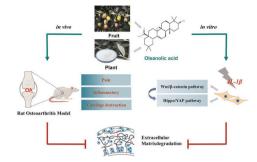
Registered charity number: 207890



9999

Oleanolic acid, a small-molecule natural product, inhibits ECM degeneration in osteoarthritis by regulating the Hippo/YAP and Wnt/β-catenin pathways

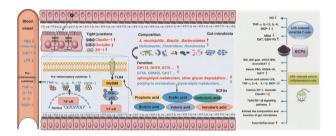
Tianwen Ma, Hongri Ruan, Liangyu Lv, Chengwei Wei, Yue Yu, Lina Jia, Xiaopeng Song, Jiantao Zhang and Yanan Li*



10014

Black chokeberry (Aronia melanocarpa L.) polyphenols attenuate obesity-induced colonic inflammation by regulating gut microbiota and the TLR4/NF-κB signaling pathway in high fat diet-fed rats

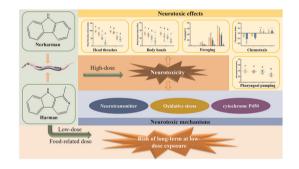
Yue Zhu, Peng-ju Cai, Han-chu Dai, Yu-hang Xiao, Cheng-li Jia and Ai-dong Sun*



10031

β-Carbolines norharman and harman change neurobehavior causing neurological damage in Caenorhabditis elegans

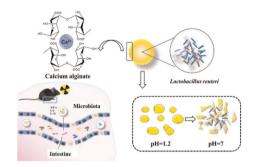
Luyao Zhang, Jialu Liu, Bufan Xu, Di Wu, Yongning Wu and Guoliang Li*



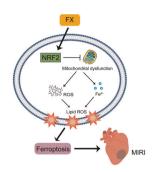
10041

The effects of Lactobacillus reuteri microcapsules on radiation-induced brain injury by regulating the gut microenvironment

Yizhi Zhang, Jinglu Hu, Xingshuang Song, Jing Dai, Ziyan Tang, Guiyu Huang, Wencheng Jiao, Yanping Wu, Chenyun Wang, Lina Du* and Yiguang Jin



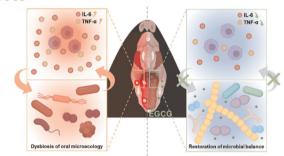
10052



Fucoxanthin alleviated myocardial ischemia and reperfusion injury through inhibition of ferroptosis *via* the NRF2 signaling pathway

Jing Yan, Zehua Li, Yu Liang, Chaobo Yang, Wen Ou, Huaqiang Mo, Min Tang, Deshu Chen, Chongbin Zhong, Dongdong Que, Liyun Feng, Hua Xiao, Xudong Song* and Pingzhen Yang*

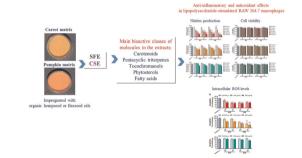
10069



Epigallocatechin gallate (EGCG) alleviates the inflammatory response and recovers oral microbiota in acetic acid-induced oral inflammation mice

Yani Pan, Helin Lv, Xinyu Feng, Su Zhou, Hao Hu, Shuxi Chen, Yan Cheng, Fangyuan Fan, Shuying Gong, Ping Chen* and Qiang Chu*

10083



The ability of supercritical CO₂ carrot and pumpkin extracts to counteract inflammation and oxidative stress in RAW 264.7 macrophages stimulated with LPS or MDA-MB-231 cell-conditioned media

Luca Frattaruolo, Miriana Durante,* Maria Stella Cappello, Anna Montefusco, Giovanni Mita, Anna Rita Cappello and Marcello Salvatore Lenucci

A R1 P8 18N 42N Calmodulin Calcineurin NMDAR1 NMDAR2A NMDAR2B β-actin NMDAR2B

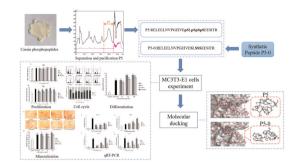
Fermented soybean foods (natto) ameliorate age-related cognitive decline by hippocampal TAAR1-mediated activation of the CaMKII/CREB/BDNF signaling pathway in senescence-accelerated mouse prone 8 (SAMP8)

Yifeng Zheng, Mayu Yasuda, Mizuki Yamao, Toshiya Gokan, Yudai Sejima, Takanobu Nishikawa and Shigeru Katayama*

10107

Effect of the phosphorylation structure in casein phosphopeptides on the proliferation, differentiation, and mineralization of osteoblasts and its mechanism

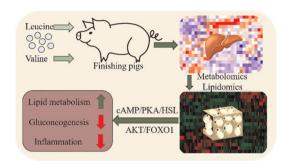
Wanying Zhong, Jian He, Wen Huang, Guangling Yin, Guo Liu, Yong Cao and Jianyin Miao*



10119

Branched-chain amino acid modulation of lipid metabolism, gluconeogenesis, and inflammation in a finishing pig model: targeting leucine and valine

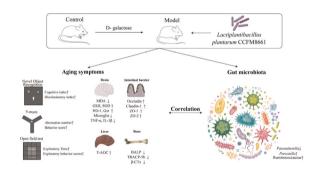
Xinbo Zhou, Junjie Zhang, Jian Shen, Baojing Cheng, Chongpeng Bi and Qingquan Ma*



10135

Lactiplantibacillus plantarum CCFM8661 alleviates D-galactose-induced brain aging in mice by the regulation of the gut microbiota

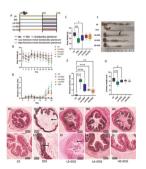
Feng Chen, Jiani Pan, Leilei Yu,* Shunhe Wang, Chengcheng Zhang, Jianxin Zhao, Arjan Narbad, Qixiao Zhai and Fengwei Tian



10151

Alleviating effect of selenium-enriched Lactobacillus plantarum 6076 on dextran sulfate sodium-induced colitis and liver inflammation in mice

Lixia Zan, Wenyi Zhang, Shufeng Shang, Yuanyuan Cui, Jinjin Pei, Yahong Yuan and Tianli Yue*



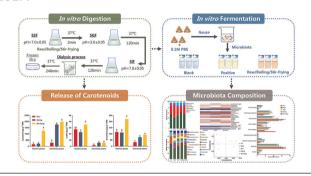
10163



Acute effects of drinks containing blackcurrant and citrus (poly)phenols and dietary fibre on postprandial glycaemia, gut hormones, cognitive function and appetite in healthy adults: two randomised controlled trials

Ana M. Pinto,* Mark R. Hobden, Katherine D. Brown, Jonathan Farrimond, Darren Targett, Christopher P. Corpe, Peter R. Ellis, Yvanna Todorova, Klaudia Socha, Shatha Bahsoon, Claudia Haworth, Morgane Marcel, Xirui Nie and Wendy L. Hall*

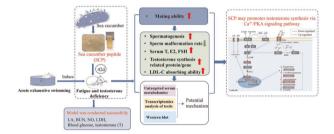
10177



Effects of different processed tomatoes on carotenoid release and microbiota composition during *in vitro* gastrointestinal digestion and colonic fermentation

Xinyi Wu, Changan Zhu, Min Zhang, Shuwen Wang, Jingquan Yu, Jinhu Tian and Zhangjian Hu*

10188



Sea cucumber peptides positively regulate sexual hormones in male mice with acute exhaustive swimming: possibly through the Ca²⁺/PKA signaling pathway

Xianliang Luo, Wangxin Liu, Baodong Zheng, Yafeng Zheng, Minjie Zhao, Fengqin Feng* and Ling Liu*

10204



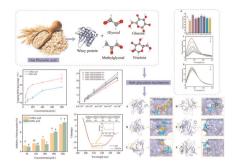
Polar lipid-enriched milk fat globule membrane supplementation in maternal high-fat diet promotes intestinal barrier function and modulates gut microbiota in male offspring

Han Gong, Qichen Yuan, Min Du and Xueying Mao*

10221

The binding mechanism of oat phenolic acid to whey protein and its inhibition mechanism against AGEs as revealed using spectroscopy, chromatography and molecular docking

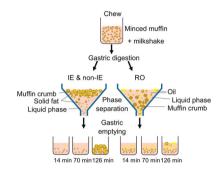
Lezhen Dong, Yunzhen Zhang, Ying Li, Yahui Liu, Qin Chen, Lingyi Liu,* Mohamed Farag and Lianliang Liu*



10232

Mechanisms of interesterified fat digestibility in a muffin matrix using a dynamic gastric model

Louise J. Salt, Giuseppina Mandalari, Mary L. Parker, Mahamoud Hussein, Charlotte E. Mills, Robert Gray, Sarah E. Berry, Wendy Hall and Peter J. Wilde*



10240

Differences between soluble and insoluble undenatured type II collagen in improving osteoarthritis in rats and their potential mechanisms

Rong Xu, Yulan Du, Xiaomin Li, Xinliang Mao, Lin Zheng* and Mouming Zhao*

