



International Journal of  
*Molecular Sciences*

Special Issue Reprint

---

# Natural and Synthetic Compounds for Management, Prevention and Treatment of Obesity, 2nd Edition

---

Edited by  
Marianna Lauricella and Antonella D'Anneo

[www.mdpi.com/journal/ijms](http://www.mdpi.com/journal/ijms)



**Natural and Synthetic Compounds for  
Management, Prevention and  
Treatment of Obesity, 2nd Edition**



# **Natural and Synthetic Compounds for Management, Prevention and Treatment of Obesity, 2nd Edition**

Editors

**Marianna Lauricella  
Antonella D'Anneo**

MDPI • Basel • Beijing • Wuhan • Barcelona • Belgrade • Manchester • Tokyo • Cluj • Tianjin



*Editors*

Marianna Lauricella  
University of Palermo  
Palermo, Italy

Antonella D'Anneo  
University of Palermo  
Palermo, Italy

*Editorial Office*

MDPI  
St. Alban-Anlage 66  
4052 Basel, Switzerland

This is a reprint of articles from the Special Issue published online in the open access journal *International Journal of Molecular Sciences* (ISSN 1422-0067) (available at: [https://www.mdpi.com/journal/ijms/special\\_issues/Prevention\\_Treatment\\_Obesity\\_2](https://www.mdpi.com/journal/ijms/special_issues/Prevention_Treatment_Obesity_2)).

For citation purposes, cite each article independently as indicated on the article page online and as indicated below:

LastName, A.A.; LastName, B.B.; LastName, C.C. Article Title. <i>Journal Name</i> <b>Year</b> , <i>Volume Number</i> , Page Range.
------------------------------------------------------------------------------------------------------------------------------------

**ISBN 978-3-0365-8348-8 (Hbk)**

**ISBN 978-3-0365-8349-5 (PDF)**

© 2023 by the authors. Articles in this book are Open Access and distributed under the Creative Commons Attribution (CC BY) license, which allows users to download, copy and build upon published articles, as long as the author and publisher are properly credited, which ensures maximum dissemination and a wider impact of our publications.

The book as a whole is distributed by MDPI under the terms and conditions of the Creative Commons license CC BY-NC-ND.

# Contents

**About the Editors** .....vii

**Antonella D’Anneo and Marianna Lauricella**

Multimodal Strategies to Fight Obesity: Research on Tailored Therapies Based on Natural and Synthetic Compounds for Prevention, Management and Treatment

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 10105, doi:10.3390/ijms241210105 ..... 1

**Lilli Arndt, Andreas Lindhorst, Julia Neugebauer, Anne Hoffmann, Constance Hobusch, Vasileia-Ismeni Alexaki, et al.**

The Role of IL-13 and IL-4 in Adipose Tissue Fibrosis

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 5672, doi:10.3390/ijms24065672 ..... 7

**Chiedozie Kenneth Ugwoke, Erika Cvetko and Nejc Umek**

Pathophysiological and Therapeutic Roles of Fascial Hyaluronan in Obesity-Related Myofascial Disease

Reprinted from: *Int. J. Mol. Sci.* **2022**, *23*, 11843, doi:10.3390/ijms231911843 .....27

**Lucyna Ostrowska, Joanna Smarkusz-Zarzecka, Agnieszka Gornowicz, Karolina Lendzion, Beata Zyśk and Damian Pogodziński**

Analysis of Selected Salivary Adipokines and Cytokines in Patients with Obesity—A Pilot Study

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 4145, doi:10.3390/ijms24044145.....45

**Matheus Felipe Zazula, Diego Francis Saraiva, João Lucas Theodoro, Mônica Maciel, Eliel Vieira dos Santos Sepulveda, Bárbara Zanardini de Andrade, et al.**

An Early and Sustained Inflammatory State Induces Muscle Changes and Establishes Obesogenic Characteristics in Wistar Rats Exposed to the MSG-Induced Obesity Model

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 4730, doi:10.3390/ijms24054730.....55

**Valentine Bordier, Fabienne Teysseire, Frank Senner, Götz Schlotterbeck, Jürgen Drewe, Christoph Beglinger, et al.**

Absorption and Metabolism of the Natural Sweeteners Erythritol and Xylitol in Humans: A Dose-Ranging Study

Reprinted from: *Int. J. Mol. Sci.* **2022**, *23*, 9867, doi:10.3390/ijms23179867.....77

**Giovanni Pratelli, Diana Di Liberto, Daniela Carlisi, Sonia Emanuele, Michela Giuliano, Antonietta Notaro, et al.**

Hypertrophy and ER Stress Induced by Palmitate Are Counteracted by Mango Peel and Seed Extracts in 3T3-L1 Adipocytes

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 5419, doi:10.3390/ijms24065419.....91

**Linghuan Li, Guangyao Zhu, Gaohang Fu, Weiwei Zha and Hanbing Li**

Metabolic Syndrome Ameliorated by 4-Methylesculetin by Reducing Hepatic Lipid Accumulation

Reprinted from: *Int. J. Mol. Sci.* **2022**, *23*, 10465, doi:10.3390/ijms231810465 ..... 111

**Simona Servida, Elena Panzeri, Laura Tomaino, Giovanni Marfia, Emanuele Garzia, Giuseppe Ciniglio Appiani, et al.**

Overview of Curcumin and Piperine Effects on Glucose Metabolism: The Case of an Insulinoma Patient’s Loss of Consciousness

Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 6621, doi:10.3390/ijms24076621..... 127

**Simona Terzo, Pasquale Calvi, Domenico Nuzzo, Pasquale Picone, Mario Allegra, Flavia**

**Mulè and Antonella Amato**

Long-Term Ingestion of Sicilian Black Bee Chestnut Honey and/or D-Limonene Counteracts  
Brain Damage Induced by High Fat-Diet in Obese Mice  
Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 3467, doi:10.3390/ijms24043467 ..... **143**  
Palermo, Italy

**Magdalena Kotańska, Anna Dziubina, Małgorzata Szafarz, Kamil Mika, Marek Bednarski,  
Noemi Nicosia, et al.**

Preliminary Evidence of the Potent and Selective Adenosine A2B Receptor Antagonist PSB-603  
in Reducing Obesity and Some of Its Associated Metabolic Disorders in Mice  
Reprinted from: *Int. J. Mol. Sci.* **2022**, *23*, 13439, doi:10.3390/ijms232113439 ..... **157**

**Kamil Mika, Małgorzata Szafarz, Monika Zadrożna, Barbara Nowak, Marek Bednarski,  
Katarzyna Szczepańska, et al.**

KSK-74: Dual Histamine H<sub>3</sub> and Sigma-2 Receptor Ligand with Anti-Obesity Potential  
Reprinted from: *Int. J. Mol. Sci.* **2022**, *23*, 7011, doi:10.3390/ijms23137011 ..... **175**

**Sara Cruciani, Alessandro Palmerio Delitala, Maria Laura Cossu, Carlo Ventura and  
Margherita Maioli**

Management of Obesity and Obesity-Related Disorders: From Stem Cells and Epigenetics to Its  
Treatment  
Reprinted from: *Int. J. Mol. Sci.* **2023**, *24*, 2310, doi:10.3390/ijms24032310 ..... **201**

# About the Editors

## **Marianna Lauricella**

Associate Professor in Biochemistry at the Department of Biomedicine, Neuroscience and Advanced Diagnostics, School of Medicine, University of Palermo. Lecturer in "Biochemistry" at master's degree Course in Medicine, University of Palermo. Member of the Italian Society of Biochemistry and Molecular Biology (SIB). Associate Editor of BMC Cancer and Editorial Board Member of International Journal of Molecular Sciences. The research activity mainly concerns the study of the mechanisms governing the control of survival and death in cultured tumor cells. In particular, the aim of the research is to identify natural and synthetic compounds which can selectively induce cell death processes (apoptosis, autophagy, necroptosis). She has also expertise in the study of role exerted by oxidative stress in inducing obesity and the anti-obesity effects of natural compounds in in vitro models of obesity. She is author of over 70 peer-reviewed articles. (<https://orcid.org/0000-0002-0157-3834>).

## **Antonella D'Anneo**

Associate Professor in Biochemistry at the Department of Biological, Chemical and Pharmaceutical Sciences and Technologies (STEBICEF), University of Palermo. Lecturer in "Biochemistry" at Bachelor degree in Biological Sciences, University of Palermo. Member of the Italian Society of Biochemistry and Molecular Biology (SIB). Associate Editor in Chief of Cancer Management and Research and Associate Editor for Frontiers in Pharmacology. She began her studies on the field of tumor biology, cell death mechanisms (apoptosis, necrosis, necroptosis, autophagy and anoikis) activated by natural and synthetic compounds and biochemical pathways which can be activated in tumor cells. To complement the graduate training in biochemistry, she obtained, as visiting scholar, a training at Rangos Research Center (University of Pittsburgh, USA) taking part in projects concerning gene therapy approaches to determine tolerization of diabetic patients against the cells of islet donor. More recently, her studies were focused on the identification nutraceutical properties (anti-tumor, anti-inflammatory, anti-obesity and antioxidant) of phytochemicals to disclose their biological activity and potential medicinal use. She is the author of over 60 scientific publications in ISI-indexed journals (<https://orcid.org/0000-0002-1785-8236>).

















































1.    tabolic disorders: Pathogenesis and therapeuticstrategies. *Life Sci.* **2016**, *148*, 183–193. [[CrossRef](#)] [[PubMed](#)]





























































































































MDPI  
St. Alban-Anlage 66  
4052 Basel  
Switzerland  
Tel. +41 61 683 77 34  
Fax +41 61 302 89 18  
[www.mdpi.com](http://www.mdpi.com)

*International Journal of Molecular Sciences* Editorial Office

E-mail: [ijms@mdpi.com](mailto:ijms@mdpi.com)  
[www.mdpi.com/journal/ijms](http://www.mdpi.com/journal/ijms)







Academic Open  
Access Publishing

[www.mdpi.com](http://www.mdpi.com)

ISBN 978-3-0365-8349-5