

EDITORIAL

Plastid-derived Natural Products of Medicinal Use – (Part II.)

The aim of these two Special Issues is to provide a gap-filling multidisciplinary overview about the diverse and complex roles of plastids in plant metabolism beyond photosynthesis with emphasis on their involvement in the synthesis of pharmaceutically or nutritionally important compounds. Although often the concerted action of several organelles is required for the production of complex (secondary) metabolites, plastids are evidently key players in this process in case of the molecules discussed below. In addition to the detailed description of the biosynthetic pathways of these compounds and their occurrence and potential functions in plants, our aim was also to critically review data related to their applications by the health as well as food industries. This way we intended to present a broad but also in-depth analysis readily available for a large public also including students, teachers and decision makers from various fields.

Evidently it was impossible to cover in detail all important natural products synthesized by plastids and all potential ways plastids could be used in human medicine or nutrition. At the same time, the reviews of the first Issue covered topics like diterpenoids; lysine-derived alkaloids; an overview about compounds derived from the shikimate and phenylpropanoid pathways but also specific papers about vitamins K₁; E; B₉ and lignans; as well as other vitamins of the B group (B₁, B₂ and B₃) and fatty acids. This second Issue contains contributions about carotenoids; tetrapyrrole pigments (chlorophylls and phycobilins) and the terpenophenolic compounds of *Cannabis*. Furthermore, the potential use of transplastomic plants (i.e. plants with genetically modified plastid genome) for the production of various important pharmaceuticals and oral vaccines is also discussed. The role of vesicles and vesicle transport in plastid biology represents a new and developing area. In one contribution the potential link between our understanding of plastid vesicle transport and human diseases is discussed.

It would have been impossible to prepare these Special Issues without the patience and devoted work of the authors and reviewers (in general 3 reviewers have carefully checked each manuscript) who were all leading scientists in their fields. I am also profoundly indebted to external editors who kindly edited the manuscripts to which I have contributed as author: Prof. Ken Mackie (Indiana University, USA) who edited the paper about cannabinoids, Dr. Laurent Picot (University of La Rochelle, France) who edited that about carotenoids, and Prof. Benoît Schoefs (University of Le Mans, France) who edited the manuscripts about tetrapyrroles. As stated already in the previous Issue I am dedicating these two Special Issues to the 75th birthday of my teacher and colleague, Dr. Áron Keresztes (Eötvös Loránd University). My work was supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences.

1) Understanding Plastid Vesicle Transport – Could It Provide Benefit for Human Medicine?

Nadir Zaman Khan¹, Emelie Lindquist², Mohamed Alezzawi^{2,3} and Henrik Aronsson²

¹Department of Biotechnology, University of Malakand, Pakistan

²Department of Biological and Environmental Sciences, University of Gothenburg, Gothenburg, Sweden

³Faculty of Nursing, Sebha University, Libya

2) Carotenoids of Microalgae Used in Food Industry and Medicine

Hélène Gateau¹, Katalin Solymosi², Justine Marchand¹ and Benoît Schoefs¹

¹MicroMar, Mer Molécules Santé, University of Le Mans, IUML – FR 3473 CNRS, Le Mans, France;

²Department of Plant Anatomy, Institute of Biology, Eötvös Loránd University, Budapest, Hungary

3) Phycobilins and Phycobiliproteins Used in Food Industry and Medicine

Beata Mysliwa-Kurdziel¹ and Katalin Solymosi²

¹Department of Plant Physiology and Biochemistry, Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Krakow, Poland

²Department of Plant Anatomy, Institute of Biology, Eötvös Loránd University, Budapest, Hungary

4) Chlorophylls and Their Derivatives Used in Food Industry and Medicine

Katalin Solymosi¹ and Beata Mysliwa-Kurdziel²

¹Department of Plant Anatomy, Institute of Biology, Eötvös Loránd University, Budapest, Hungary

²Department of Plant Physiology and Biochemistry, Faculty of Biochemistry, Biophysics and Biotechnology, Jagiellonian University, Krakow, Poland

5) Cannabis: A Treasure Trove or Pandora's Box?

Katalin Solymosi¹ and Attila Köfalvi²

¹Department of Plant Anatomy, Institute of Biology, Eötvös Loránd University, Budapest, Hungary

²Laboratory of Neuromodulation and Metabolism, CNC - Center for Neuroscience and Cell Biology of Coimbra, University of Coimbra, Coimbra, Portugal

6) Plastid Molecular Pharming I. Production of Oral Vaccines via Plastid Transformation

Bernadett Berecz¹, Helga Zelenyánszki¹, Sára Pólya¹, Cecília Tamás-Nyitrai² and Mária Oszvald¹

¹Department of Plant Physiology and Molecular Plant Biology, Eötvös Loránd University, Budapest, Hungary;

²Institute of Media Technology and Light Industry Engineering, Óbuda University, Budapest, Hungary

7) Plastid Molecular Pharming II. Production of Biopharmaceuticals by Plastid Transformation

Sandra Bains, Petter Larsson and Henrik Aronsson

Department of Biological and Environmental Sciences, University of Gothenburg, Gothenburg, Sweden

Katalin Solymosi

Guest Editor: Mini-Reviews in Medicinal Chemistry

Department of Plant Anatomy

Institute of Biology

Eötvös Loránd University

Budapest

Hungary

E-mails: katalin.solymosi@ttk.elte.hu,

solymosikata@hotmail.com