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Special Issue "Structural/Functional Characterization of Plant Proteins"

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Department of Food, Environmental and Nutritional Sciences, Università degli Studi di Milano, Milan, Italy

Interests: food recycling; plant enzyme inhibitors; protein structure and function; recombinant proteins; seed germination; seed storage proteins**Special Issues, Collections and Topics in MDPI journals**

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Prof. Dr. Stefania Iametti [E-Mail](#) [Website](#)

Co-Guest Editor

Department of Food, Environmental and Nutritional Sciences, University of Milan, DISMA, Via G Celoria 2, I-20133 Milan, Italy

Interests: food allergens; structural investigation methodologies

Special Issue Information

Dear Colleagues,

Disentangling the relationship between protein structure and function continues to be a priority not only in several fields of structural biology, including molecular biology, biochemistry, and protein engineering, but also in plant physiology and food sciences, including new industrial applications.

It is a well-established fact that even minor structural variations of a protein may dramatically affect its function and its capacity to interact with other molecules, no matter which structural level is involved. Moreover, protein conformation is influenced, and can be modified, by its environmental surrounding. This is especially true for plant proteins that find applications in several complex systems.

Today, there is an increasing interest in plant proteins. Plants are able to accumulate—in specialized reserve tissues—huge amounts of proteins with unique and interesting structural features.

Apart from their natural biology, their nutritional impact, and their relevance to the food industry, plant proteins find applications in a variety of non-food systems. These are usually complex systems, where the interactions between different components are key factors that determine and influence some typical features of the final product.

This Special Issue aims to collect, from the broadest context, the current status about plant proteins and to contribute to their exploitation and valorization. Research papers and reviews that expand knowledge about the molecular determinants driving their structure–function relationships, including in vivo and in vitro interactions with other proteins and other macromolecules, as well as their potential for innovative applications in all fields, taking into account bioactivities implicated in human nutrition and health, are welcome.

Prof. Alessio Scarafoni

Prof. Stefania Iametti

Guest Editors

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Communication



The Nuclear Localization of the DnaJ-Like Zinc Finger Domain-Containing Protein EDA3 Affects Seed Development in *Arabidopsis thaliana*

by Meng-Juan Kong, Na Huang, Si-Ming Chen, Han-Yu Liang, Xin-Ya Liu, Zhong Zhuang and Shan Lu

Int. J. Mol. Sci. 2020, 21(21), 7979; <https://doi.org/10.3390/ijms21217979> - 27 Oct 2020

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Abstract The DnaJ-like zinc finger domain-containing proteins are involved in different aspects of plastid function and development. Some of these proteins were recently reported to have dual subcellular localization in the nucleus and plastids. One member of this family, PSA2 (AT2G34860), was found to [...] [Read more.](#)

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Hevein-Like Antimicrobial Peptides Wamps: Structure–Function Relationship in Antifungal Activity and Sensitization of Plant Pathogenic Fungi to Tebuconazole by WAMP-2-Derived Peptides

by Tatyana Odintsova, Larisa Shcherbakova, Marina Slezina, Tatyana Pasechnik, Bakhyt Kartabaeva, Ekaterina Istomina and Vitaly Dzhavakhiya

Int. J. Mol. Sci. 2020, 21(21), 7912; <https://doi.org/10.3390/ijms21217912> - 24 Oct 2020

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Abstract Hevein-like antimicrobial peptides (AMPs) comprise a family of plant AMPs with antifungal activity, which harbor a chitin-binding site involved in interactions with chitin of fungal cell walls. However, the mode of action of hevein-like AMPs remains poorly understood. This work reports the structure–function [...] [Read more](#).

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High-Resolution Crystal Structure of Chloroplastic Ribose-5-Phosphate Isomerase from *Chlamydomonas reinhardtii*—An Enzyme Involved in the Photosynthetic Calvin-Benson Cycle

by Théo Le Moigne, Pierre Crozet, Stéphane D. Lemaire and Julien Henri

Int. J. Mol. Sci. 2020, 21(20), 7787; <https://doi.org/10.3390/ijms21207787> - 21 Oct 2020

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Abstract The Calvin–Benson cycle is the key metabolic pathway of photosynthesis responsible for carbon fixation and relies on eleven conserved enzymes. Ribose-5-phosphate isomerase (RPI) isomerizes ribose-5-phosphate into ribulose-5-phosphate and contributes to the regeneration of the Rubisco substrate. Plant RPI is the target of diverse [...] [Read more](#).

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Lupinus albus γ -Conglutin, a Protein Structurally Related to GH12 Xyloglucan-Specific Endo-Glucanase Inhibitor Proteins (XEGIPs), Shows Inhibitory Activity against GH2 β -Mannosidase

by Stefano De Benedetti, Elisabetta Galanti, Jessica Capraro, Chiara Magni and Alessio Scarafoni

Int. J. Mol. Sci. 2020, 21(19), 7305; <https://doi.org/10.3390/ijms21197305> - 03 Oct 2020

Cited by 5 | Viewed by 1570

Abstract γ -conglutin (γ C) is a major protein of *Lupinus albus* seeds, but its function is still unknown. It shares high structural similarity with xyloglucan-specific endo-glucanase inhibitor proteins (XEGIPs) and, to a lesser extent, with *Triticum aestivum* endoxylanase inhibitors (TAXI-I), active against fungal glycoside hydrolases [...] [Read more](#).

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Characterization of FcXTH2, a Novel Xyloglucan Endotransglycosylase/Hydrolase Enzyme of Chilean Strawberry with Hydrolase Activity

by Luis Morales-Quintana, Dina Beltrán, Ángela Mendez-Yañez, Felipe Valenzuela-Riffo, Raúl Herrera and María Alejandra Moya-León

Int. J. Mol. Sci. 2020, 21(9), 3380; <https://doi.org/10.3390/ijms21093380> - 11 May 2020

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Abstract Xyloglucan endotransglycosylase/hydrolases (XTHs) are cell wall enzymes with hydrolase (XEH) and/or endotransglycosylase (XET) activities. As they are involved in the modification of the xyloglucans, a type of hemicellulose present in the cell wall, they are believed to be very important in different processes, [...] [Read more](#).

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Engineering Herbicide-Tolerance Rice Expressing an Acetohydroxyacid Synthase with a Single Amino Acid Deletion

by Jun Fang,, Changzhao Wan, Wei Wang, Liuyin Ma, Xinqi Wang, Can Cheng, Jihua Zhou, Yongjin Qiao and Xiao Wang

Int. J. Mol. Sci. 2020, 21(4), 1265; <https://doi.org/10.3390/ijms21041265> - 13 Feb 2020

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Abstract The acetohydroxyacid synthase (AHAS) is an essential enzyme involved in branched amino acids. Several herbicides wither weeds via inhibiting AHAS activity, and the *AHAS* mutants show tolerance to these herbicides. However, most AHAS mutations are residue substitutions but not residue deletion. Here, residue [...] [Read more](#).

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New Insights into the Structure-Function Relationship of the Endosomal-Type Na^+ , K^+/H^+ Antiporter NHX6 from Mulberry (*Morus notabilis*)

by Boning Cao, Zhongqiang Xia, Changying Liu, Wei Fan, Shuai Zhang, Qiao Liu, Zhonghuai Xiang and Aichun Zhao

Int. J. Mol. Sci. 2020, 21(2), 428; <https://doi.org/10.3390/ijms21020428> - 09 Jan 2020

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Abstract The endosomal-type Na^+ , K^+/H^+ antiporters (NHXs) play important roles in K^+ , vesicle pH homeostasis, and protein trafficking in plant. However, the structure governing ion transport mechanism and the key residues related to the structure–function of the [...] [Read more](#).

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Comparative Analysis of the PIN Auxin Transporter Gene Family in Different Plant Species: A Focus on Structural and Expression Profiling of PINs in *Solanum tuberosum*

by Chenghui Yang, Dongdong Wang, Chao Zhang, Nana Kong, Haoli Ma and Qin Chen

Int. J. Mol. Sci. 2019, 20(13), 3270; <https://doi.org/10.3390/ijms20133270> - 03 Jul 2019

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Abstract Plant growth and morphogenesis largely benefit from cell elongation and expansion and are normally regulated by environmental stimuli and endogenous hormones. Auxin, as one of the most significant plant growth regulators, controls various phases of plant growth and development. The PIN-FORMED (PIN) gene [...] [Read more](#).

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Roles of Organellar RNA-Binding Proteins in Plant Growth, Development, and Abiotic Stress Responses

by Kwanuk Lee and Hunseung Kang

Int. J. Mol. Sci. **2020**, *21*(12), 4548; <https://doi.org/10.3390/ijms21124548> - 26 Jun 2020

Cited by 20 | Viewed by 2751

Abstract Organellar gene expression (OGE) in chloroplasts and mitochondria is primarily modulated at post-transcriptional levels, including RNA processing, intron splicing, RNA stability, editing, and translational control. Nucleus-encoded Chloroplast or Mitochondrial RNA-Binding Proteins (nCMRBPs) are key regulatory factors that are crucial for the fine-tuned regulation [...] [Read more.](#)

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Molecular Functionality of Plant Proteins from Low- to High-Solid Systems with Ligand and Co-Solute

by Vilia Darma Paramita, Naksit Panyoyai and Stefan Kasapis

Int. J. Mol. Sci. **2020**, *21*(7), 2550; <https://doi.org/10.3390/ijms21072550> - 06 Apr 2020

Cited by 8 | Viewed by 2317

Abstract In the food industry, proteins are regarded as multifunctional systems whose bioactive hetero-polymeric properties are affected by physicochemical interactions with the surrounding components in formulations. Due to their nutritional value, plant proteins are increasingly considered by the new product developer to provide three-dimensional [...] [Read more.](#)

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