第六届全国植物蛋白质研究大会暨第二届蛋白质组最新研究技术培训班

会议注册

大会官网：<http://www.plantprotein.org.cn/>

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征集论文摘要 (abstract) 范围及要求 (参照附件模板)

投稿论文摘要 (abstract) 收录入会议论文摘要集。

参会代表的研究成果, 均可投稿, 具体要求如下:

征文范围: 有关蛋白质组学及相关领域近年来研究的学术成果, 以中/英文论文摘要形式投稿。

稿件要求: 每篇论文摘要按正式发表论文要求撰写, 300 字以内, 使用 Word 软件撰写。文责自负 (参照附件模板)。

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截止日期: 论文摘要投稿截止日期为 2016 年 12 月 04 日

学术发言: 大会和分会发言的参会代表请在注册当日 (2016 年 12 月 17 日) 将报告材料交至大会组委会, 报告材料须为 Powerpoint 文件, 存储于移动硬盘、USB 闪盘或光盘之中, 大会提供笔记本电脑和幻灯放映设备, 不接受个人电脑接入。如有特殊需求, 请提前与大会会务组联系。

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摘要模板:

Comprehensive Proteomics Analysis of Laticifer Latex Reveals New Insights into Ethylene Stimulation of Natural Rubber Production

Xuchu Wang, Dan Wang, Yong Sun, Qian Yang, Lili Chang, Limin Wang, Xueru Meng, Qixing Huang, Xiang Jin, Zheng Tong.

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Ethylene is a stimulant to increase natural rubber latex. After ethylene application, both fresh yield and dry matter of latex are substantially improved. Moreover, we found that ethylene improves the generation of small rubber particles. However, most genes involved in rubber biosynthesis are inhibited by exogenous ethylene. Therefore, we conducted a proteomics analysis of ethylene-stimulated rubber latex, and identified 287 abundant proteins as well as 143 ethylene responsive latex proteins (ERLPs) with mass spectrometry from the 2-DE and DIGE gels, respectively. In addition, more than 1,600 proteins, including 404 ERLPs, were identified by iTRAQ. Functional classification of ERLPs revealed that enzymes involved in post-translational modification, carbohydrate metabolism, hydrolase activity, and kinase activity were overrepresented. Some enzymes for rubber particle aggregation were inhibited to prolong latex flow, and thus finally improved latex production. Phosphoproteomics analysis identified 59 differential phosphoproteins; notably, specific isoforms of rubber elongation factor and small rubber particle protein that were phosphorylated mainly at serine residues. This post-translational modification and isoform-specific phosphorylation might be important for ethylene-stimulated latex production. These results not only deepen our understanding of the rubber latex proteome but also provide new insights into the use of ethylene to stimulate rubber latex production.

墙报模板:

Progress in quantitative proteomics and application in tropical crops

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In the past 10 years, plant proteomics has taken as the essential sources of the concentrations, interactions, functions, and catalytic activities of proteins which are the major structural and functional determinants of cells in crops. Recently, significant technology development has played important roles both at the level of data analysis software and mass spectrometry in proteomics. Conceptual progress in proteomics such as DGE has made possible the analysis of entire proteomes at previously unprecedented density and accuracy. New concepts have emerged that comprise quantitative analyses of full proteomes, database-independent protein identification strategies, targeted quantitative proteomics approaches with proteotypic peptides such as iTRAQ technology and the systematic analysis of an increasing number of posttranslational modifications.

In the next 10 years, plant proteomics including both the model plants and tropical crops will be focused on sub-cellular proteomics (such as chloroplast proteomics and mitochondrion proteomics) and post-transcriptional modification proteomics (such as phosphoproteomics and glycoproteomics) by using relative and absolute quantification methods such as DGE and iTRAQ. At the same time, the emerging generation of genomics, proteomics and metabolomics approaches needs bioinformatic methods for data integration and network reconstruction. For plant proteomics, the integration of omics data with quantitative genetics data will be expected to contribute great opportunities for plant systems biology which help to our understanding of complex regulatory networks underlying important phenotypic traits in crops in the coming next 10 years.

Fig. 1 The laticifers in rubber tree on both cellular and subcellular after rubber tapping

Dr. Xuchu Wang's group mainly focused on the uncovering the molecular mechanism of latex biosynthesis and regulation in rubber tree *Hevea brasiliensis* using quantitative proteomic technologies. These quantitative proteomics revealed protein phosphorylation played crucial roles on ethylene-stimulation of latex production in rubber tree.

Fig. 2 Schematic representation of primary and secondary laticifers after rubber tapping

Totally 267 high abundant proteins have been identified from laticifer latex by MS. Similarly, 143 differential proteins from DGE gels under ethyphon compared to water treatment were positively identified, these mainly involved in posttranslational modification, carbohydrate transport and metabolism, energy production and conversion, translation, ribosomal structure and biogenesis. Based on our proteomic research results for rubber particles and the recently reported results, we speculated that ethylene can significantly improve the natural rubber biosynthesis by inducing the phosphorylation of the membrane proteins Ls, SRPP and RPP, on small rubber particle through activating the kinase signaling pathways, which results in stimulating the generation of a large number of rubber synthetic precursors in the cytoplasm of laticiferous cells.

Fig. 3 Typical 2-D DGE profiles of the MS-identified 143 differential proteins from laticifer latex of *H. brasiliensis* upon ethylene

Fig. 4 Phospho-proteomics of rubber latex proteins upon ethylene

The regulation network of salt tolerance in *Thebargella halophila*

The results of comparative proteomics as well as physiological and transcriptomic responses of its leaves under salinity showed that salt treatment retarded its leaf development due to Na⁺ accumulation. Finally, we brought forward a possible schematic representation for the systematic salt tolerance phenotype in *Thebargella* and suggested the increasing accumulation of starch and total soluble sugars as well as proline may be an important new mechanism for halophyte salt tolerance.

Fig. 5 Typical 2-D DGE profiles of proteins extracted from mature leaves of *Thebargella* treated with different concentrations of NaCl

Fig. 7 Schematic representation of salt tolerance mechanism in halophyte *Thebargella*

Fig. 6 Comparison of the expression patterns of the identified 269 salt responsive proteins and their genes

Proteome research on cotton fiber initiation

We performed an iTRAQ-based proteomic study of scales from the upland cotton species *Gossypium hirsutum* and its fuzzless-fuzzless mutant, which identified 2769 proteins that preferentially accumulated at anthesis in wild-type scales.

Fig. 8 Typical 2-D DGE profiles of WT and fl cotton ovules at the day of anthesis (0 DPA)

Fig. 9 Comparison of the differentially expressed genes (DEGs) identified in the iTRAQ and RNA-seq datasets from the WT and fl ovules at anthesis

References:

- Xuchu Wang et al., 2010, *Proteome Science*, 8, 38
- Xuchu Wang et al., 2013, *JPR*, 12, DOI: 10.1021/pr100037c
- Xuchu Wang et al., 2013, *MCP*, 12, 2174-2195

第六届全国植物蛋白质研究大会暨第二届蛋白质组最新研究技术培训班

会议地址和住宿宾馆

会议地址：中国-海南大学思源学堂报告厅：海南省海口市人民大道 58 号。

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走进海口

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