*Session 1-Oral 6 Presentation*

# Deconvolution of the structural characteristics from crystallising gelatin/honey systems in comparison to the entirely amorphous gelatin/glucose syrup systems

HTL Nguyen[1], VD Paramita[2], E Pang[1], N Mantri[1], S Kasapis[1,*]

[1] *School of Science, RMIT University, Bundoora Campus, Melbourne, Australia*
[2] *Department of Chemical Engineering, State Polytechnic of Ujung Pandang, Makassar, South Sulawesi, Indonesia*

Honey expedites numerous bioactivities including antibacterial, anti-inflammation and immune promoted functions. Its application in combination with other hydrocolloids (especially chitosan or alginate) has shown a great potential to form structured materials for biomedical use.[1,2] However, composite materials of low to high solid systems, which combine biomedical properties of honey and mechanical stability of gelatin have not been widely explored. Therefore, in this study, we aim to elucidate the physicochemical transformation of honey/gelatin composites with the protein concentration being set at 10% (w/w) and honey varied from 0 to 75% (w/w). Rheological measurements in shear, thermal analysis on micro- and modulated differential scanning calorimetry (DSC), Fourier-transform infrared spectroscopy (FTIR), wide angle X-ray diffraction (WAXD) and scanning electron microscopy (SEM) were employed to follow the structural changes in the systems. Networks became stronger and gelation shifted to higher temperatures (over 35 degree centigrade) as we increased the concentration of honey in the system. Rheological experiments of high-solid systems (75 and 85%, w/w) pinpointed the mechanical glass transition temperature at -61°C and -41°C, respectively, calculated with the Williams, Landel and Ferry (WLF) and modified Arrhenius equations. FTIR data represented the fingerprint regions of both gelatin and honey in line with the honey increment in the system. Results from honey with a high degree of crystallinity were contrasted with an entirely amorphous system made of gelatin/glucose syrup (85%, w/w solids). DSC heat flow data were deconvoluted in reversing and non-reversing thermograms to show the considerable contribution of honey to the non-reversing heat flow signal, whereas the amorphous glucose syrup exhibited a contribution on the reversing heat flow signal. Estimates of the glass transition temperature for both systems remained the same but clearly their textural characteristics are distinct.

*References*

[1] Barui, A., Mandal, N., Majumder, S., Das, R.K., Sengupta, S., Banerjee, P., ... & Chatterjee, J. (2013). Assessment of molecular events during in vitro re-epithelialization under honey-alginate matrix ambience. *Materials Science and Engineering: C, 33*(6), 3418-3425.

[2] Sarhan, W. A., Azzazy, H.M., & El-Sherbiny, I.M. (2016). Honey/chitosan nanofiber wound dressing enriched with *Allium sativum* and *Cleome droserifolia*: enhanced antimicrobial and wound healing activity. *ACS applied materials & interfaces, 8*(10), 6379-6390.

# 14th International Hydrocolloids Conference

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## Program

| Day | Time | Events | | | |
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| 21 May | 8:00-20:00 | Registration Open; Lobby of Pullman Nanchang Wanda Hotel | | | |
| 22 May Morning | 9:00-10:00 | Welcome Session; Present the Food Hydrocolloids Trust Medal; Room A | | | |
| | 10:00-10:20 | Morning Break | | | |
| | | Plenary Lecture; Chiar-Prof. Steve Cui and Prof. Mingyong Xie; Room A | | | |
| | 10:20-11:05 | Plenary Lecture 1–Prof. Lina Zhang, Wuhan University, China; Highly Strong Hydrogels Constructed from Polysaccharides in Alkali/Urea Aqueous Solution | | | |
| | 11:05-11:50 | Plenary Lecture 2–Prof. Mike Gidley, University of Queensland, Australia; Nutritional properties of plant cell wall hydrocolloids–digestion and fermentation | | | |
| | 11:50-1:20 | Lunch | | | |
| 22 May Afternoon | | Session 1–Hydrocolloid Functionality<br><br>Chair–Prof. Jian-Yong Wu and Prof. Song Miao<br>Room A1 | Session 2–Dietary Fibre and Polysaccharide<br><br>Chair–Prof. Quanbin Han and Prof. Phoency Lai<br>Room A2 | Session 3–Starch as Hydrocolloids<br><br>Chair–Prof. Lingyan Kong and Prof. Yong-Cheng Shi<br>Room B | Session 4–Hydrocolloid Functionality<br><br>Chair–Prof. Guohua Zhao and Prof. Hongbin Zhang<br>Room C |
| | 1:20-1:50 | **Invited**–Prof. Jian-Yong Wu, The Hong Kong Polytechnic University, Hong Kong, China<br><br>**Partial degradation of large polysaccharides with power ultrasound for improving water solubility and bioactivity** | **Invited**–Prof. Quanbin Han, Hong Kong Baptist University, Hong Kong, China<br><br>**Why are Ganoderma lucidum and G. sinense listed as Lingzhi in China? Chemical characteristics and antitumor activity of polysaccharides compared** | **Invited**–Prof. Lingyan Kong, The University of Alabama, USA<br><br>**Starch-guest inclusion complexes: structure, formation, and applications** | **Invited**–Prof. Guohua Zhao, Southwest University, China<br><br>**Synthesis, characterization and physicochemical properties of folic acid-modified octenyl succinate inulin** |

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| | 1:50-2:10 | Oral 1-Duanquan Lin[1,2], Baodong Zheng[2], Song Miao[1,2*]. 1Teagasc Food Research Centre, Ireland; 2 Fujian Agriculture and Forestry University, China<br><br>**Effects of plant protein mixtures on the rheological properties and microstructure of myofibrillar protein gel** | Oral 1-L Ai and P Lai, University of Shanghai for Science and Technology, China<br><br>**Antioxidant indices for some bioactivities of certain polysaccharide gums and preparations** | ***Invited**-Prof. Yong-Cheng Shi, Kansas State University, USA<br><br>**Preparation, Structure, and Nutritional Properties of Starch Crystallites** | ***Invited**-Prof. Hongbin Zhang, Shanghai Jiao Tong University, China<br><br>**Carboxymethylated curdlan: structural characterization and thickening behavior** |
| | 2:10-2:30 | Oral 2-Ruo-Jun Mu, Lin Wang, Yi Yuan, Yongsheng Ni, Chunhua Wu, Jie Pang, Fujian Agriculture and Forestry University, China<br><br>**Analyzing the topological stability of konjac glucomannan hydrogel from microfluidics** | Oral 2-YF Liu, YJ Ying, JS Zhang, QJ Tang, MQ Yan, S Zhou, Y Yang, CH Tang, D Wu, Shanghai Academy of Agricultural Sciences, China<br><br>**Purification, structure analysis and bioactivity study on polysaccharides from the fruiting bodies of Ganoderma sinense** | Oral 1-Chan Wang, Xiaowei He, Xiong Fu, Bin Zhang, Qiang Huang*, South China University of Technology, China<br><br>**Substituent distribution changes the pasting and emulsion properties of octenylsuccinate starch** | Oral 1- D-M Gao*, Q Liu, BZhao, H Liu, M Zeng, Z He, J Chen, Jiangnan University, China<br><br>**Synthesis of hierarchically porous niobium phosphate monolith by sol-gel method for fructose dehydration to 5-hydroxymethylfurfral** |
| | 2:30-2:50 | Oral 3-S Dhital, H Li, and MJ Gidley, The University of Queensland, Australia<br><br>**Interaction among alpha-amylase and hydrocolloids modulates the in-vitro glycaemic response** | Oral 3-Chun-Ping Xu, Zhengzhou University of Light Industry, China<br><br>**Polysaccharides from mushroom and its application in the cgarette industry** | Oral 2-Mingcong Fan, Xuxu Li, Siming Zhao, Qilin Huang, Huazhong Agricultural University, China<br><br>**Gel properties and spatial structure of myofibrillar protein affected by crosslinking/acetylation starches** | Oral 2-Ndegwa Henry Maina, Noora Mäkelä, Yujie Wang and Tuula Sontag Strohm,University of Helsinki, Finland<br><br>**Review on the Challenges in the molar mass analysis of cereal beta-glucan** |

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| | 2:50-3:10 | Oral 4-Liu Hongzhi, Bai Wenqiang, Li Yanan, Wang Qiang*, Chinese Academy of Agriculture Sciences, China<br><br>**Solubilization and Characterization of Yeast β-glucan after the Treatment of EmimAc and EmimAc Combined with High Pressure Microfluidization** | Oral 4-K. Alba, G. M. Campbell and V. Kontogiorgos, University of Huddersfield, UK<br><br>**The effect of blackcurrant fibre on dough rheology and bread quality** | Oral 3-SS Wong, RA Wicklund, LG Howarth, and JK Whaley, Tate & Lyle, UK<br><br>**Application of Food Starch in Yoghurt** | Oral 3-LJ Sun[1,2], X Yang, YJ Hou, YR Guo, 1 Shannxi Normal University, China ; 2 The University of Queensland, Australia<br><br>**The preservative effects of chitosan film incorporated with thinned young apple polyphenols on the quality of grass carp(Ctenopharyngodon idellus) fillets during cold storage: Correlation between the preservative effects and the active properties of the film** |
| | 3:10-3:30 | Oral 5-Zhili Wan*, Lulu Ma, Qi Ling, and Xiaoquan Yang,South China University of Technology, China<br><br>**Design of Stable and Responsive Multiphase Soft Materials by Using Fibrillar Supramolecular Assemblies as Natural Building Blocks** | Oral 5-Kexue Zhu, Yanjun Zhang, Lehe Tan*, Chinese Academy of Tropical Agricultural Sciences, China<br><br>**Physicochemical characterization, bioactive properties and antioxidant activities of polysaccharide from Artocarpus heterophyllus Lam. pulp** | Oral 4-Haiteng Li, Sushil Dhital, Ann Slade, and Michael J. Gidley, University of Queensland, Australia<br><br>**Resistant starch in high amylose wheat** | Oral 4-Yuge Niu, Qi Xia and Meidong Gu, Shanghai jiao Tong University, China<br><br>**Novel composite gels with interpenetrating polymer networks by double cross-linking** |
| | 3:30-3:50 | **Afternoon Break** | | | |

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| | 3:50-4:10 | Oral 6-HTL Nguyen, VD Paramita, E Pang, N Mantri, S Kasapis*, RMIT University, Australia<br><br>**Deconvolution of the structural characteristics from crystallising gelatin/honey systems in comparison to the entirely amorphous gelatin/glucose syrup systems** | Oral 6-L Chen, ZQ Wang, MD Ge and BB Zhang, Jiangnan University, China<br><br>**Submerged fermentation of exopolysaccharides from Antrodia camphorate and their structure and morphological properties** | Oral 5-Peng Guo and Shujun Wang, Tianjin University of Science & Technology, China<br><br>**Starch gelatinization behavior in intact cotyledon cells of small red bean, mung bean and pea** | Oral 5-Jianhua Liu*, Yanping Cai, Yahong Luo, Qi Su and Yuting Ding Zhejiang University of Technology,China<br><br>**Effects of konjac oligo-glucomannan on the physicochemical properties of frozen surimi from red gurnard (Aspitrigla cuculus)** |
| | 4:10-4:30 | Oral 7-AL Ellis, TB Mills, IT Norton and AB Norton, University of Birmingham, UK<br><br>**The role of hydrocolloid particles in the stabilisation of foams** | Oral 7-L. Geonzon, R. Bacabac, S. Matsukawa,Tokyo University of Marine Science and Technology, Japan<br><br>**Gelation mechanism and phase separation in mixed polysaccharide solutions studied by multiple particle tracking** | Oral 6-X Liu, F Xie, S Zhou, Chinese Academy of Agricultural Sciences (CAAS), China<br><br>**Application of small-angle X-ray scattering techniques to the characterisation of starch structure and phase transition** | Oral 6-Haining Zhuang, Tao Feng, Zhongqiu Chen, Wenxin Wang, Yan Yang, Jingsong Zhang*, Zhimin Xu, Ran Ye, Shanghai Academy of Agricultural Sciences, China<br><br>**Hericium Erinaceus β-glucan Modulates in vitro Wheat Starch Digestibility** |
| | 4:30-4:50 | Oral 8-YP Xie, Y Wei, HB Zhang, Shanghai Jiao Tong University, China<br><br>**Characterization and emulsifying properties of chemically modified corn fiber gum** | Oral 8-Qiao-Zhen Li, Di Wu, Yan Yang, Yan-Fang Liu, Shuai Zhou, Jingsong Zhang, Shanghai Academy of Agricultural Sciences, China<br><br>**Structure characteristics elucidation and biological activities of Polysaccharides from Medicinal Mushroom Hericium erinaceus in Different Maturation Stages** | Oral 7-Zhen Ma*, Xiuxiu Yin, Xinzhong Hu, Shaanxi Normal University, China<br><br>**Structural Characterization of Resistant Starch Isolated from Laird Lentils (Lens culinaris) Seeds Subjected to Different Processing Treatments** | Oral 7-F Fang, X Luo, X Tong, O Campanella and B Hamaker, Purdue University, USA<br><br>**Shear-induced Ordering of Highly-branched Macromolecules Influenced by Hydrocolloids** |

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| | 4:50-5:10 | Oral 9-Q Liu, D-M Gao, B Zhao, H Liu, Z He, M Zeng, J Chen*, Jiangnan University, China<br><br>**Glucose to fructose isomerization on hierarchically macro-porous niobium phosphate monolith supported magnesium oxide** | Oral 9-SN Wang, LL Zhao, HY Zhang, QH Li, DS Zhu, H Liu*, Bohai University, China<br><br>**Effect of $Ca^{2+}$ and $K^{+}$ on gelation properties and molecular chain conformation of soybean hull water soluble polysaccharide fractions** | Oral 8-Zubala Lutfi, University of Karachi, Pakistan<br><br>**Effect of Salts on Microstructural, Pasting and Thermal Properties of Water Chestnut Starch** | Oral 8- LD Condict, J Kaur, A Hung, S Kasapis, RMIT University, Australia<br><br>**Interactions between B-casein and ferulic acid under ultra-high temperature conditions** |
| | 5:10-5:30 | Oral 10-Yaqin Wang*, Ndegwa Henry Maina, Rossana Coda, Päivi Sorvali, Arja Laitila, Diarra Compaoré-Sereme, Hagrtoué Sawadogo-Lingani, Kati Katina, University of Helsinki, Finland<br><br>**The influence of dextran synthesized in situ on rheology and texture of faba bean, millet and sorghum composite wheat dough and bread** | | Oral 9-H Wang, LY Kong, and GR. Ziegler, Penn State University, USA<br><br>**Electrospinning of reinforced starch fibers** | Oral 9- Ming Li, Ruibin Wang, Bo Zhang, Yimin Wei, Institute of Food Science and Technology, Chinese Academy of Agriculture Sciences, China<br><br>**Effect of Flour Particle Size on the Buckwheat Noodles Eating Qualities: water distribution, fluidity, or water absorption** |
| | 5:30-5:50 | | | Oral 10-YU Jie, SCIEX，Field Application Specialist, F&E<br><br>**SCIEX LC-MS/MS Application Technology on Foodomics and Carbohydrate** | Oral 10-Lei Wang and Yue Zhang, University of Nebraska-Lincoln, America<br><br>**Development of pH-responsive zein nanoparticles as oral drug delivery system** |
| | **4:00-7:30** | **Poster Session** | | | |
| **23 May Morning** | | **Plenary Lecture; Chair-Prof. ThavaVasanthan and Prof. Stefan Kasapis; Room A** | | | |
| | **8:30-9:30** | **Plenary Lecture 3 (Food Hydrocolloids Trust Medal Lecture)–Prof. Steve Cui, Agriculture and Agri-Food Canada, Canada** | | | |