

국제 식품기능성전달(Delivery of Functionality in Complex Food Systems) 심포지엄 참관기

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2005년 1월 26일(수)부터 28일(금)까지 스위스의 남서부지역 로잔에 위치한 Nestlé Research Center에서 제 1차 국제 식품기능성전달(Delivery of Functionality in Complex Food Systems) 심포지엄이 개최되었다. Nestlé 연구소와 스위스 고분자 연구회가 공동으로 주관하여 진행한 본 학술회의는 식품의 기능성분 전달과 관련된 세계 여러 나라의 연구자들이 처음으로 함께 모여 심도 있는 논의를 나누는 기회가 되었으며, 17 개국으로부터 약 110여명이 참석하여 최근 연구결과를 발표하고 학술정보를 교환하였다. 주로 유럽국가의 연구자들이 다수를 차지하였고 동양권에서는 매우 소수(한국 2명과 일본 3명)가 참석하여 논문을 발표하고 향후 각자의 연구에 필요한 연구정보 및 자료들을 수집하였다.

I. 학회개요

- 1) 회의명 : The 1st International Symposium on Delivery of Functionality in Complex Food Systems
- 2) 일 시 : 2005. 1. 26(수) - 28(금)
- 3) 장 소 : 스위스 로잔, Nestlé Research Center
- 4) 참가자 : 약 110명 (한국인 참석자: 2명)
- 5) 학회 발표 개요
구체적인 학술행사는 Nestlé Research Center

의 대강당에서 특별강연(keynote lecture: 1건), 구두 발표(oral presentation: 40건), 포스터 발표(poster presentation: 27건)의 방식으로 나누어 다음과 같이 전체 5개의 세부 program session 순으로 연속하여 진행되었다.

- Session 1: Nano and microstructures for controlled release
- Session 2: Understanding and controlling the behavior of functional ingredients
- Session 3: Design of complex polymer and colloidal systems
- Session 4: Biophysical aspects of nutrients and nutrient absorption
- Session 5: Materials science of the solid state





II. 학술회의 내용 목록

1. Opening Ceremony

Dr. J. Ubbink: *Nestlé Research Center, Lausanne, Switzerland*

Dr. R. Mezzenga: *University of Fribourg, Switzerland*

Dr. H. Watzke: *Nestlé Research Center, Lausanne, Switzerland*

2. Keynote lecture

- Controlling delivery of functional ingredients: status and prospects (Dr. M. Karel, *MIT, Cambridge, USA*)

3. Oral Presentation and Moderated Poster Session

3.1. Nano and microstructures for controlled release

- Hydration of nanostructured aggregates

(Prof. H. Wennerström, *University of Lund, Sweden*)

- Stimuli responsive encapsulation and release by polyelectrolyte multilayer capsules (G. Sukhurokov, *Max planck institute for colloids and surfaces, Golm, Germany*)
- Formation and stability of biopolyelectrolyte multilayers (S.G. Ring, *Institute of Food Research, Norwich, UK*)
- Optimized baxter model of protein solutions: Electrostatics versus adhesion (Prof. P. Prinsen, *Delft University of Technology, The Netherlands*)
- Utilization of interfacial engineering to create food emulsion with novel and improved properties (Prof. J. McClements, *University of Massachusetts at Amherst, USA*)
- Water mobility in heterogeneous emulsions (SIK, *Göteborg, Sweden*)
- Ellipsometry studies of the lipid/surfactant adsorption at the oil aqueous phase and the formation of a liquid crystalline phase (Prof. T. Nylander, *Lund University, Sweden*)
- Thermodynamic and structural analysis of the effect of the surfactant-caseinate interactions on the molecular parameters and functionality of sodium caseinate nanoparticles (M.G. Semenova, *Institute of Biochemical Physics of Russian Academy of Sciences, Moscow, Russia*)
- Spontaneous vesicle formation in diluted sugar-based dimeric surfactant solutions (P.Fischer, *ETH Zürich, Switzerland*)

3.2. Understanding and controlling the behavior of functional ingredients

- Understanding and controlling flavour delivery in baked products (K. de Roos, *Givaudan B.V., Barneveld, The Netherlands*)
- Characterisation of liposomes produced from phospholipid fractions of milk fat globule membrane using a microfluidiser (H. Singh, *Massey University, Palmerston North, New Zealand*)
- Starch flavor interactions in starch based food systems: Impact on structure and flavor Retention and release (B. Conde-Petit, *ETH Zürich, Switzerland*)
- Computer simulation of model protein denaturation, aggregation and gelation (S.R. Euston, *Heriot-Watt University, Edinburgh, UK*)
- Delivering flavour over different length scales (A. Taylor, *University of Nottingham, UK*)
- Droplet growth in orange oil nanoemulsions (M. Schultz, *Givaudan Schweiz, Dübendorf, Switzerland*)
- Probing the future in complex functional soft drinks on the nanometer scale- A Tour de force (K.D. Jandt, *Friedrich-Schiller-University Jena, Germany*)
- Self-assembly of milk proteins (C.G. De Kruijff, *University of Utrecht, The Netherlands*)

3.3. Design of complex polymer and colloidal systems

- Field-Theoretic simulations of mesostructured

polymeric fluids (G.H. Fredrickson, *University of California, Santa Barbara, USA*)

- Stimuli responsive systems (L. Leibler, *Ecole Supérieure de Physique et Chimie Industrielles, Paris, France*)
- Interfacial behaviour of emulsion droplets from whippable emulsions (J.-L. Courthaudon, *INSERM, Angers, France*)
- Protein particles derived from different treatments of milk-properties, compositions and activities (D.G. Dalgleish, *University of Guelph, Canada*)
- Emulsions, gels and emulsion gels based on casein (E. Dickinson, *University of Leeds, UK*)
- Structure and properties of pectin/ β -lactoglobulin mixtures (J.-L. Dublier, *INRA, Nantes, France*)
- Large scale structures of complexes revealed by SANS (J. Gummel, *CEA Saclay, Gif-sur-Yvette, France*)
- Behavior of whey proteins-hydroxypropylmethylcellulose mixtures in gels and at the air-water interface (A.M.R. Pilosof, *Universidad de Buenos aires, Argentina*)
- Microrheological and microstructural origins of food colloid instability (B.S. Murray, *University of Leeds, UK*)

3.4. Biophysical aspects of nutrients and nutrient absorption

- A biophysical answer to the puzzle of why

- the stomach doesn't digest itself (R. Bansil, *Boston University, USA*)
- Biophysical analysis of mucosal mucin, mucoadhesiveness and absorption (S.E. Harding, *University of Nottingham, UK*)
- Transport properties of drug vehicles through mucin solution (G. Lafitte, *University of Lund, Sweden*)
- Food protein hydrogels for the controlled release of bioactive compounds: the case of β -lactoglobulin (M. Subirade, *Laval University, Canada*)
- Exploring microbial cell surfaces by atomic force microscopy (Y. Dufrêne, *Université Catholique de Louvain, Louvain-la-Neuve, Belgium*)
- Biophysical aspects of bacterial adhesion examined using atomic force microscopy (B. Logan, *Penn State University, University Park, USA*)
- Competitive solubilization, cocrystallization of phytosterols and polymorphism in U-type microemulsions (N. Garti, *The Hebrew University of Jerusalem, Israel*)
- Lipid self-assembly particles as delivery systems (L. Sagalowicz, *Nestlé Research Center, Lausanne, Switzerland*)

3.5. Materials science of the solid state

- Small molecules in polymers: Atomistic modeling, stochastic analysis and experimental evidence (I. Tomka, *ETH Zürich, Switzerland*)
- Molecular mobility in dried and frozen foods effect on oxidative degradation (L. Skibsted, *Royal Veterinary and Agricultural University,*

Frederiksberg, Denmark)

- Whey protein films: mechanical properties, water-solubility and microstructure (I. Bodnar, *NIZO Food research, Ede, The Netherlands*)
- Multiscale modelling of polymers: methodology and applications (K. Kermer, *Max Planck Institute for Polymer Research, Mainz, Germany*)
- Polyelectrolyte multilayer encapsulation of spray-dried template particles (A. Millqvist-Fureby, *YKI Institute for Surface Chemistry, Stockholm, Sweden*)
- Flavor Release in inclusion complexes of cyclodextrins (H. Yoshii, *Tottri University, Tottri, Japan*)

III. Poster 발표논문

1. Poster session A : 16건

- Kinetics of aroma release as a function of the structure of starch dispersions (N. Cayot - *INRA/ENESAD, Dijon, France*)
- Foam formation and stabilisation by heat-denatured egg white proteins (S.R. Euston, *Heriot-Watt University, Edinburgh, UK*)
- Microdroplet and microcapsule formation in a co-flowing environment (P. Fischer, *ETH Zürich, Switzerland*)
- Complex coacervates of whey protein/gum Arabic. Structure, rheology and applications (K. De Kruif, *NIZO Food Research, Ede, The Netherlands*)

- Milk fat globule membrane as a natural delivery system for tocopherol
(F. Morgan, *Nestlé Research Center, Lausanne, Switzerland*)
 - Evolution of the microstructure of heat-induced β -lactoglobulin stabilised emulsion gels: effects of solutes and surfactants
(S. Kerstens, *University of Leeds, UK*)
 - Swelling of DNA charged-compensated complexes
(C. Leal, *Lund University, Sweden*)
 - Functional properties of conjugates prepared by dry-incubation of β -lactoglobulin/acacia gum electrostatic complexes
(Ch. Schmitt, *Nestlé Research Center, Lausanne, Switzerland*)
 - Phase behavior and application of glycerol monooleate (GMO)/ glycerol monooleyl ether (GME)/ water system
(G.S. Popescu, *Lund University, Sweden*)
 - Retention of acetaldehyde in gelatin microcapsule
(J.C. Soper, *Givaudan Flavors Corporation, Cincinnati, USA*)
 - Water transport in double emulsion: The effect of the osmotic pressure
(B. Folmer, *Nestlé Research Center, Lausanne, Switzerland*)
 - Influence of pH and iota-carrageenan concentration on properties of beta-lactoglobulin stabilized oil-in water emulsion
(Y.S. Gu, *University of massachuserrrs at Amherst, USA*)
 - Charge-induced adsorption of semi-flexible polyelectrolytes: a poisson-boltzmann theory
(J. Ubbink, *Nestlé Research Center, Lausanne, Switzerland*)
 - Microemulsion templating for biopolymer nanoparticle production
(C. Sommer, *University of Fribourg, Switzerland*)
 - Integrated nanoreactor systems: Triggering the Release and mixing of compounds inside single vesicles
(P.Y. Bolinger, *Ecole Polytechnique Fédérale, Lausanne, Switzerland*)
 - Shear rheology of lyotropic liquid crystals
(R. Mezzenga, *University of Fribourg, Switzerland*)
2. Postet session B : 11건
- Surface polymers of bacteria: how physical chemistry and structural organization contribute to biological function
(P. Zammaretti, *Nestlé Product Technology Center, Konolfingen, Switzerland*)
 - Alignment optimization using structural assessment
(P. Chodanowski, *Institute Suisse de Bioinformatique, Epalinges, Switzerland*)
 - Solid-state characterisation of self-emulsifying formulation
(O. Chambin, *IMSAPS, Dijon, France*)
 - In-situ coating of spray-dried powders (A. Millqvist-Fureby, *YKI Institute for Surface Chemistry, Stockholm, Sweden*)
 - Inner and outer structure of spraydried powders by CLSM and SEM
(T. Furuta, *Tottori University, Koyama,*

Japan)

- Impact of encapsulated flavors on edible film products
(T. Thomas Virgallito, *Givaudan Flavors Corporation, Cincinnati, USA*)
- Diffusion and degradation of aroma compounds in entrapment matrices
(J. Ubbink, *Nestlé Research Center, Lausanne, Switzerland*)
- Enthalpy relaxation of gelatin in the glassy state
(F. Badii, *University of Nottingham, Loughborough, UK*)
- Release of nisin from chitosan coating on PP film as affected by nisin content and plasticizer type
(S. Hong, *Korea Food Research Institute, Seongnam, South Korea*)
- Migration of incorporated 4-hexylresorcinol from WPI-coated PP film
(S. Hong, *Korea Food Research Institute,*

Seongnam, South Korea)

- Water in glassy carbohydrates: Opening it up at the Nanolevel
(J. Claude, *Nestlé Research Center, Lausanne, Switzerland*)

IV. 수집자료 목록

- 1) First International Symposium on Delivery of Functionality in Complex Food Systems, ***Program and Abstracts***
- 2) First International Symposium on Delivery of Functionality in Complex Food Systems, ***List of Participants***
- 3) The Fountain of Knowledge: Research for Nutrition, Health and Wellness, ***Nestlé Research Center***
- 4) Nutrition, Health and Wellness: improving consumer wellness through research and innovation, ***Nestlé Research Center***

