

2022 Short Course Agenda

Tuesday, October 4, 2022

| Time | Event/Speaker | Description | Location |
|------------------|------------------------------|---|---|
| 7:45 - 8:25am | Check-in | Coffee, tea, and muffins available | Stewart Center Room 307 |
| 8:25 – 8:30 am | Conference Opening | Opening remarks: Bruce Hamaker - Director, Whistler Center for Carbohydrate Research | Stewart Center Room 306 |
| 8:30 – 9:45 am | Dr. Yuan Yao | <i>Introduction to carbohydrates: Basic concepts - monosaccharides, oligosaccharides, and polysaccharides</i> | Stewart Center Room 306 |
| 9:45 – 10:00 am | Break | Refreshments available | Stewart Center Room 307 |
| 10:00 – 11:30 am | Dr. Senay Simsek | <i>Starch granule structure and properties</i> | Stewart Center Room 306 |
| 11:30- 11:40 am | Break | Refreshments available | Stewart Center Room 307 |
| 11:40 – 12:50 pm | Dr. Yuan Yao | <i>Modifications of starch and other polysaccharides</i> | Stewart Center Room 306 |
| 12:50 – 2:00 pm | Lunch | On your own | PMU |
| 2:00 – 3:30 pm | Dr. Jozef Kokini | <i>Basic principles of Rheology and viscoelasticity and applications in the world of Cereal Products</i> | Stewart Center Room 306 |
| 3:30 – 3:40 pm | Break | Refreshments available | Stewart Center Room 307 |
| 3:40 – 4:25 pm | Dr. Yuan Yao | <i>Polyols and high-intensity sweeteners</i> | Stewart Center Room 306 |
| 4:25 – 5:15 pm | Dr. Bruce Hamaker | <i>Carbohydrate nutrition and labeling</i> | Stewart Center Room 306 |
| 5:15 – 7:00 pm | Faculty & Attendee Reception | Beverages and hors d'oeuvres available | Anniversary Drawing Room/Room 304 Purdue Memorial Union |
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Wednesday, October 5, 2022

| Time | Event/Speaker | Description | Location |
|---------------------------|--|---|---|
| 7:45 - 8:25am | Check-in | Coffee, tea, and muffins available | Stewart Center Room 278 |
| Breakout Session 1 | | | |
| 8:30 – 10:00 am | John Keller | <i>Part I: Hydrocolloids and functionality</i> | Director's Room/ PMU Room 230 (On Zoom) |
| | Dr. Srinivas Janaswamy | <i>Polysaccharide architecture and functionality</i> | Stewart Center Room 278 |
| 10:00 – 10:30 am | Break | Refreshments available | Stewart Center Room 278 |
| Breakout Session 2 | | | |
| 10:30 – 12:00 pm | John Keller | <i>Part II: Hydrocolloids and functionality</i> | Director's Room/ PMU Room 230 (On Zoom) |
| | Dr. Brad Reuhs | <i>Complex carbohydrate structure analysis (non-starch)</i> | Stewart Center Room 278 |
| 12:00 – 1:00 pm | Lunch | On your own | PMU |
| Breakout Session 3 | | | |
| 1:00 – 2:30 pm | Dr. Lisa Mauer | <i>Starch material properties</i> | Director's Room/ PMU Room 230 |
| | Dr. Steve Lindemann | <i>Metabolism of fibers in the gut microbiome</i> | Stewart Center Room 278 |
| 2:30 – 3:00 pm | Break | Refreshments available | Stewart Center Room 278 |
| Breakout Session 4 | | | |
| 3:00 – 4:30 pm | Dr. Lavanya Reddivari | <i>Dietary polysaccharide and phenolic interactions in gut health</i> | Director's Room/ PMU Room 230 |
| | Dr. Osvaldo Campanella and Dr. Oguz Ozturk | <i>Texturization of plant proteins using different techniques</i> | Stewart Center Room 278 |

Thursday, October 6, 2022

| Time | Event/Speaker | Description | Location |
|---------------------------|-----------------------------------|---|--|
| 7:45 - 8:25am | Check-in | Coffee, tea, and muffins available | Stewart Center Room 278 |
| Breakout Session 5 | | | |
| 8:30 – 10:00 am | Dr. Owen Jones | <i>When polysaccharides and proteins interact and stop behaving as simple solutions</i> | Stewart Center Room 278 |
| | Dr. Mario Martinez | <i>Formulating plant-based semisolid foods</i> | Director's Room/PMU Room 230 (On Zoom) |
| 10:00 – 10:30 am | Break | Refreshments available | Stewart Center Room 278 |
| Breakout Session 6 | | | |
| 10:30 – 12:00 pm | Dr. Senay Simsek and Dr. Yuan Yao | <i>Modification of starch for enhancement of functional and nutritional properties</i> | Stewart Center Room 278 |
| | Dr. Bruce Hamaker | <i>Precision nutrition concept and dietary carbohydrates</i> | Director's Room/PMU Room 230 |

Advanced course descriptions:

Part I and II: Hydrocolloids and functionality (John Keller)

A practical and thorough overview of that specialized branch of “Carbohydrate Science” covering classification, sources, structure, rheology, properties, and utilization in food, pharmaceutical & industrial systems. Emphasis is placed on the relationship of structure to unique properties for solving specific application problems and functionality.

Polysaccharide architecture and functionality (Srinivas Janaswamy)

Polysaccharides exhibit a wide variety of unique chemical structures with different physiological functions and applications. Many of them are water-soluble and are capable of significantly modulating gelation, viscosity, texture and physical stability of food dispersions, to name a few. This course highlights the three-dimensional structure of selected polysaccharides with a view on understanding structure-function relationships.

Complex carbohydrate structure analysis (non-starch) (Brad Reuhs)

In this course, you will learn about instrumentation and technology for structural analysis of complex polysaccharides.

Starch material properties (Lisa Mauer)

This segment will cover common analytical techniques used to characterize starch material properties and the effects of co-formulated molecules thereon.

Metabolism of fibers in the gut microbiome (Steve Lindemann)

In this session, we will discuss the various strategies microbes use to degrade fibers of various structures and how these influence gut microbiome structure and metabolic function. We will examine how the genes involved in polysaccharide degradation are distributed and regulated among organisms, and how this can be expected to influence fiber targeting.

Dietary polysaccharide and phenolic interactions in gut health (Lavanya Reddivari)

In this course, we are going to look at the structure and function of different polysaccharides and polyphenols and how the interaction between these two components influences physiological function.

Texturization of plant proteins using different techniques (Osvaldo Campanella and Oguz Ozturk)

Extrusion is one of the technologies used for the texturing of proteins. Distinctive features of the extrusion technologies currently used and under development and their different capabilities will be discussed and linked with the development of innovative food products. The role of formulations in the rheology of the extruded product and their effects on product quality shall be described. Other technologies will also be briefly discussed.

When polysaccharides and proteins interact and stop behaving as simple solutions (Owen Jones)

Polysaccharides and proteins are macromolecules, many of which are marginally soluble in water and have a blend of colligative and colloidal attributes. This course describes general conditions in which mixtures of polysaccharides and proteins can repel or associate with one another, facilitating transition to a liquid-in-liquid dispersion with associated textural and visual attributes.

Formulating plant-based semisolid foods (Mario Martinez)

- Starchy flours, cell wall materials and protein-rich fractions are complex systems that could represent a versatile platform of building blocks for novel semisolid foods.
- Knowledge across nutrients (e.g., cell walls, flavonoids) and hierarchical structures (e.g., food supramolecular structuring) will be in focus.
- The structuring synergies among endogenous proteins and non-proteinaceous components (e.g., polysaccharides and minerals) in the molten state will be discussed.

Modification of starch for enhancement of functional and nutritional properties (Senay Simsek and Yuan Yao)

Starch modification methods alter the functional and nutritional properties of native starches. This section will cover strategies for starch modification, preparations of resistant starch, and their impacts on starch functionality with regard to their application in food systems and digestibility characteristics.

Precision nutrition concept and dietary carbohydrates (Bruce Hamaker)

The term “precision nutrition” can be taken in different ways including a personalized nutrition approach to individual needs or a design of foods for targeted health function. Available carbohydrates and dietary fibers have the potential to be designed to give targeted benefit to a broad population, and will be presented and discussed.