

# Techniques for Characterization of Carbohydrate Structure of Polysaccharides

August 10-14, 2015

## LABORATORY EXERCISE

### Section I

Alditol acetate (AA) composition

### Section II

Methyl glycosides (TMS) composition

### Section III

Partially methylated alditol acetate (PMAA) linkage

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# Techniques for Characterization of Carbohydrate Structure of Polysaccharides

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## Monday, August 10, 2015

- 9:00 a.m.- 9:15 a.m.            **Welcome and Introduction** - Dr. Parastoo Azadi
- 9:15 a.m.- 9:30 a.m. Hydrolysis of AA sample
- 9:30 a.m.-11:00 a.m.            **Lecture: Dr. Parastoo Azadi:**  
*“Structural Characterization of Carbohydrates”*
- 11:00 a.m.-12:15 p.m.            Remove AA sample from heat and dry down with nitrogen  
  
Sodium borodeuteride reduction of AA sample
- 12:15 p.m.- 1:15 p.m.            **LUNCH**
- 1:15 p.m.- 2:15 p.m.            Neutralization and drying of AA sample  
  
Acetylation of AA sample
- 2:15 p.m.- 3:45 p.m.            **Lecture: Dr. Geert-Jan Boons:**  
*“Different Forms of D-Glucose”*
- 3:45 p.m.- 5:00 p.m.            Drying, extraction and injection of AA sample  
  
Overnight methanolysis of methyl glycosides (TMS) sample

## Tuesday, August 11, 2015

- 9:00 a.m.- 9:30 a.m.            Dry down methyl glycosides (TMS) sample.  
  
Prepare NaOH base for permethylation (Linkage)
- 9:30 a.m.-10:25 a.m.            Permethylation of the linkage sample  
  
N-acetylation of methyl glycosides samples (TMS)
- 10:25 a.m.-10:40 a.m.            **BREAK**

- 10:40 a.m.-11:15 a.m. Remove the CH<sub>3</sub>I, DCM Extraction and drying (Linkage)  
Drying of N-acetylated methyl glycosides (TMS) sample after 30 min reaction
- 11:15 a.m.-12:15 p.m. **Lecture: Dr. Debra Mohnen**  
*TBA*
- 12:15 p.m.- 1:15 p.m. **LUNCH**
- 1:15 p.m.- 2:15 p.m. Silylation of the methyl glycosides (TMS) sample  
Laboratory demonstration (Lab 1025)  
Preparation of (dimethyl) potassium dimethylsulphanyl anion
- 2:15 p.m.- 2:30 p.m. **BREAK**
- 2:30 p.m.- 4:00 p.m. Laboratory  
Drying, filtration and injection of the methyl glycosides (TMS) samples
- 4:00 p.m.- 5:00 p.m. **Lecture: Dr. Artur Muszynski**  
*“Isolation and Characterization of Bacterial Surface Polysaccharides”*

### Wednesday, August 12, 2015

- 9:00 a.m.- 9:15 a.m. Hydrolysis of PMAA sample
- 9:15 a.m.- 9:45 a.m. **Demonstration: Dr. Roberto Sonon**  
*“Lignin, MBMS”*
- 9:45 a.m.- 10:00 a.m. **BREAK**
- 10:00 a.m.-11:00 a.m.  
**Lecture: Dr. Parastoo Azadi**  
*“Introduction to High Performance Anion Exchange Chromatography”*
- 11:00 a.m.-12:15 p.m. Remove linkage sample from heat and dry down with nitrogen  
Sodium borodeuteride reduction of linkage sample
- 12:15 p.m.- 1:15 p.m. **LUNCH**
- 1:15 p.m.- 2:30 p.m. Neutralization and drying of AA sample

Acetylation of AA sample

2:30 p.m.- 3:15 p.m. Data analysis of AA: Dr. Parastoo Azadi

3:15 p.m.- 3:30 p.m. **BREAK**

3:30 p.m.- 5:00 p.m. Drying, extraction and injection of PMAA sample

**Thursday, August 13, 2015**

9:00 a.m.- 9:45 a.m. Data analysis of TMS: Dr. Zhirui Wang

9:45 a.m.-10:00 a.m. Break

10:00 a.m.-11:00 a.m. **Lecture: Dr. Michael Hahn**  
**TBA**

11:00 a.m.-12:15 p.m. **Lecture: Dr. Stephanie Archer-Hartmann**  
***“Labeling and Separation of Carbohydrates”***

12:15 p.m.- 1:15 p.m. **LUNCH**

1:15 p.m.- 2:00 p.m. HPAEC demonstration: Oligosaccharide profiling analysis and monosaccharide composition analysis: Dr. Roberto Sonon

2:00 p.m.- 2:45 p.m. Data analysis of linkage: Dr. Parastoo Azadi

2:45 p.m.- 3:20 p.m. **BREAK**

3:20 p.m.- 3:45 p.m. **Lecture: Saeid Roushanzamir**  
***“FACES Scheduling”***

3:45 p.m.- 5:00 pm Questions and answers for data interpretation of all the analyses

**Friday, August 14, 2015**

**Choose one of the following:**

**NMR Module or Mass Spectrometry Module**

**NMR Module**

9:00 a.m.-12:00 p.m. **Lecture: Dr. John Glushka**  
***“Introduction to NMR of Glycoproteins and Carbohydrates”***

