Analysis and Synthesis of *Arabidopsis Thaliana* Xylans using PACE

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Cell wall polysaccharides are highly complex and little is known about their structures. We are trying to characterize some of these cell wall polysaccharides, from *Arabidopsis* Wild Type, using specific hydrolase enzymes. We have obtained a number of novel xylanases from a collaboration with Diversa (USA). The aim is to profile xylans using a technique we have developed called Polysaccharide Analysis using Carbohydrate gel Electrophoresis (PACE). Xylans are hemicelluloses of cell wall polysaccharides and typically posses a β1,4 backbone of xylose which can be substituted with arabinose [1], glucuronic acid and even xylose [2]. The technique PACE relies upon the migration of fluorophore labeled mono- or oligo- saccharides according to their degree of polymerization (DP), conformation and charge. Both uncharged and charged mono-/oligo-saccharides are being studied using a range of different fluorophores that may or may not possess a charge themselves.

We are also studying genes encoding putative glycosyl transferases and their possible roles in cell wall polysaccharide synthesis. We have obtained mutants for these genes from SALK and will study these for phenotypic changes and/or structural changes of cell wall polysaccharide. The aim is to use PACE to study changes in polysaccharide profiles and to correlate this to their synthesis. It is also our goal to identify whether these putative glycosyl transferases are also Golgi localized.

[1] QK. Beg, M. Kapoor, L. Mahajan & GS. Hoondal. *Appl Microbiol Biotechnol*. **56** (2001) 326-38

[2] O. Ishurd, Y. Ali, W. Wei, F.Bashir, A. Ali, A. Ashour & Y. Pan. *Carbohyr. Res.* **338** (2003) 1609-1612