Characterization of the *Arabidopsis* Digestibility Mutant *4 coumarate co-a ligase 1*

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Project Goals: The overall aim of Area 1 of the Great Lakes Bioenergy Research Center (GLBRC) has focused on the improvement of plants for new sustainable sources of bioenergy. Specifically, our project involves identifying genes that are associated with cell wall digestibility, using the model plant *Arabidopsis*.

Through a reverse genetic screen of approximately 1,150 *Arabidopsis* T-DNA lines, with insertions in cell wall-associated genes, numerous outliers with increased digestibility (i.e. glucose and xylose yield per dry weight of sample) were isolated. WiscDsLox473B01 was identified as the mutant with the highest digestibility out of 102 outlier lines. This mutant develops and grows normally, although the stem tissue contains about 25% less lignin than wild type stem tissue. WiscDsLox473B01 has an insertion in the gene *At1g51680*, also known as *4 COUMARATE CO-A LIGASE* (*4CL1*). 4CL1 has been characterized to play an important role in the phenylpropanoid pathway, specifically monolignol synthesis. We will present results on digestibility and cell wall analytical assays and preliminary developmental characterization of this mutant and related family members.