Comparative Gene Expression and Biochemical Analysis of *Aspergillus*-Resistant and Susceptible Peanut (*Arachis hypogaea*) Testa Cell Walls

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Peanut (*Arachis hypogaea*) is an important crop used for human consumption, fodder, and oil production. Over 1.5 million acres were planted in the United States in 2016, hauling in over 1 billion in USD revenue according to the USDA National Agricultural Statistics Service. Its importance as an economic and food staple cannot be overstated, for both developed countries and rural farmers in developing countries. The threat of contamination from health damaging mycotoxins, namely Aflatoxin B1 (AF), is no new hazard in the community and preventative measures have been studied and implemented globally. However, the cost of maintaining acceptable low levels of AF can be considerable when both pre- and post-harvest storage techniques must be considered. The need for a cost-effective way to handle AF levels in peanut will benefit both the rural and industrialized farmer. A possible solution is the development of improved *Aspergillus*-resistant cultivars, reducing and/or eliminating the need for resources spent on maintaining low AF contamination. Increasing resistance to pathogens by identifying, and understanding cell wall components in peanut testa provides a promising road to developing new resistant cultivars. The cell wall is the primary physical barrier that protects the cell from abiotic and biotic stress in the environment. Cell wall components such as cellulose, hemicellulose, lignin, and pectin along with phenolic acids, condensed tannins and anthocyanins are potential factors important for disease resistance. Here we investigated these cell wall components in *Aspergillus*-resistant (55-437) and susceptible lines (TMV-2) to determine any significance related to increased. Results showed no significant difference in the overall percentage of lignin found within the cells of the two lines. However, lignin composition quantification showed 55-437 having a significant increase in the overall amount of H-lignin. Insoluble proanthocyanidins were shown to also be increased in 55-437. These cell wall factors potentially play important roles in providing the peanut cotyledon with both a chemical and physical barrier, on the cellular level, to infection from fungi.