

FRIL lectin variability among *Lablab purpureus* genetic resources

S. Tolford¹, J.G. McArthur¹, and J.B. Morris²

¹Phylogix Inc., Scarborough, ME; ²USDA, ARS, PGRCU, Griffin, GA.

Many legumes such as *Lablab purpureus* contain potential bioactive phytochemicals in sufficient quantity to be utilized in the pharmaceutical markets. More than 90 accessions of this species are conserved at the USDA, ARS, Plant Genetic Resources Conservation Unit, Griffin, GA. The lectin FRIL, which was discovered in *Phaseolus vulgaris*, is present in significant quantities in the seeds of *Lablab purpureus*. Lectins are known to play a role in plant defenses against pathogen attack and symbiotic relationships with bacteria. Lectins have also been reported to interact with specific glycoproteins on human cells and induce various biologic responses. FRIL has been observed to interact with the FLT3 receptor on human stem cells and prevent them from proliferating or undergoing apoptosis. The lectin FRIL was extracted from 22 *Lablab purpureus* accessions collected from 13 different countries and 4 continents. FRIL was isolated using sugar based affinity beads and then quantified and examined by SDA-PAGE. FRIL, like most legume lectins, consists of a homodimer of 2 alpha and 2 beta chains. FRIL from *Lablab* demonstrates a 5-band pattern on SDS page. This heterogeneity results from the use of 2 alternative N-termini and 2 alternative glycosylation sites on the alpha chain. Interestingly, there was no significant variability in stoichiometry of the 5 band purified FRIL among the 22 *Lablab* accessions. However, there was over 7-fold variability in the quantity of FRIL among the accessions on a seed weight basis. Fresh and older *Lablab* seeds were compared and found to be consistent in terms of high FRIL producers and low FRIL producers. We observed a large amount of heterogeneity in the relative size and coloration of the seeds suggesting that sufficient time and distance separates the beans to allow a certain amount of genetic drift. In addition, several of these *Lablab* accessions produced quality plant and seed regeneration when grown in a field at Griffin, GA from transplants.