

## SUMMER 2022 – SC EPSCOR / INBRE RET PROJECT DESCRIPTION FORM

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<b>Research Subject Area</b>	Agricultural Biotechnology

**A. Briefly describe overall research program at your laboratory.**

My group's research focus is to develop healthier, safer staple grains for individuals with food sensitivities. We took a multifaceted approach in this direction, which includes screening germplasm for reduced-immunogenicity lines, engineering plant genomes for reduced immunogenicity, or expressing enzymes capable of degrading immunogenic proteins.

**B. Briefly describe specific project(s) for your teacher:**

We screened a US Department of Agriculture mini-core collection for genotypes with reduced content of immunogenic proteins and identified a diploid wild peanut (*Arachis diogeni*) genotype with significantly reduced allergenic protein content. Interestingly, we have access to a unique population derived from a cross between a cultivated tetraploid peanut genotype and a wild diploid *A. diogeni* genotype, where segments of the wild peanut genome are introgressed in the cultivated peanut genome. We evaluated this population for DNA sequence variations (single nucleotide polymorphisms - SNP) at more than 7,000 loci using the 48K SNP chip. In the research project intended for the incumbent, the aim is to characterize the population for the quantitative and qualitative differences in the seed storage proteins employing electrophoresis, chromatography, and enzyme-linked immunosorbent assay and use this data as the phenotype to study associations with SNP marker data generated earlier. The associated markers or protein quantity loci (PQLs) identified here will be used to select the reduced-immunogenicity trait at an early developmental stage in the later breeding efforts to developed genotypes with further reductions in the immunogenic protein content.

**C. Will any other people (post docs, grad students, undergraduate students, colleagues, etc.) be involved directly with your teacher?**

The graduate student who performed the earlier research would assist the incumbent.

**D. Will you require any advanced reading/preparation for the teacher? If yes, please briefly describe.**

No; however, a basic understanding of the principles of genetics and biochemistry would be an advantage.