The SolCAP project is supported by the Agriculture and Food Research Initiative Applied Plant Genomics CAP Program of the USDA’s Cooperative State Research, Education and Extension Service.

**SolCAP PROJECT OVERVIEW**

**The Basis of SolCAP:**
Leverage knowledge and resources from the Solanaceae species, potato and tomato, to positively impact applied breeding and crop quality across traditional commodity boundaries.

**Potato and Tomato:**
- Are the two most economically important species in Solanaceae
- Annually account for $6.3 Billion in farm value
- The United States is one of the world leading producers

**Breeding:**
- 90% of potato breeding is still conducted in the US public sector
- 8 University programs develop commercial tomato varieties

**SolCAP Germplasm Panels**
- Elite potato germplasm contributions were made from 16 programs across the US and 6 international programs. The panel consists of 480 potato lines currently used by the community and they are being SNP genotyped and phenotyped across 3 different environments. Phenotypic and genotypic data will be a community resource.
- Tomato:
  - The core collection of tomato germplasm has been assembled which includes 288 inbred lines from fresh market and processing tomato breeding programs. This includes 48 landraces representing geographic origin, diversity of fruit shapes and genetic variation. 44 Silene species have been selected representing the major fruit morphologies. Wild accessions have also been added to provide insight into traits that have been introgressed into cultivated backgrounds.

**SolCAP cDNA Libraries Sequenced**
- Targets included are: 1) Marker technologies 2) Analyzing quantitative trait loci 3) Marker assisted selection in tomato or potato 4) Effects of population structure on genetic analysis

**High Throughput SNP Analysis:**
From existing sequence databases, we have identified potato and tomato sequences with candidate Single Nucleotide Polymorphisms (SNPs). To identify additional SNPs, a panel of elite germplasm and mapping populations will be genotyped using Illumina, Lonza or Illumina platforms.

**SNP Development:**
- Illumina SNP Discovery Platform for 7600 potato SNPs
- Illumina OPA Platform for 1536 tomato SNPs

We have identified simple sequence repeats from tomato and potato and designed primers for use by the community that can be accessed, viewed and downloaded through the project website (http://solcap.msu.edu/tools.shtml). Figure 2. We have also identified putative SNPs (eSNPs) in Sanger-derived potato and tomato EST collections which can be accessed through the project website (http://solcap.msu.edu/tools.shtml) which includes a graphical view of the multiple sequence alignment of the EST assembly to confirm depth of support for the polymorphisms (Figure 3).

**Extension:**
- SolCAP’s extension component involves creation of a web community within the eXtension.org Community of Practice through which plant breeders, basic scientists, seed industry professionals, agricultural professionals, extension specialists and others can publish content and network.

**Solanaceae Genome Network:**
- Integrated genomic and phenotypic databases
- Solanaceae Genome Network (NGN) website database.

http://sgn.cornell.edu/