A new platform for biological discovery with cell-type resolution.

**Tomato Expression Atlas**

- Hormone biosynthesis and transport
- Inorganic ion accumulation
- Water relations
- Sugar import
- Developmental signals

**Organ/tissue homogenization:**
- Significant dilution effects
- Loss of valuable spatial information: biochemical pathway and regulatory networks

**Laser Capture Microdissection**
- Many genes preferentially expressed in the funiculus are absent from whole fruit RNA-seq data
  - Contributes small proportion of total fruit volume
  - Vasculature-rich tissue contributing to transport between seeds and the rest of the fruit
Co-expression analysis...how to find a needle in a haystack?

- Highly complex systems
- Spatiotemporal specificity

Project Objectives

- Generate a comprehensive fruit ontogeny gene expression database, cell/tissue type level of resolution at
  - *S. lycopersicum* and biologically informative wild relatives
- Environmental Responses
Gene ID
BLAST search
Custom list

Genotypes
Correlation filter
Dev. stage
Organ
Tissue
Cell type
Treatment

Fruit Ontogeny
- Spatial heterogeneity
- Developmental dynamics
- Genotypic variation
- Environmental responses

Transcriptome
Epigenome
Glycome
Metabolome
Proteome

Public Dissemination:
SGN: Tomato Expression Atlas
- Other tomato organs
- Related species
Acknowledgments

USDA-ARS Boyce Thomosn Institute for Plant Research

Jocelyn Rose
Carmen Catala
Jim Giovannoni
Zhiqiang Fei
Lukas Mueller

Stephen Snyder
Philippe Nicolas
Laetitia Martin
Yi
Noe Fernandez
Yimin Xu
Richard Paterson

Collaborators:
Alisdair Fernie
Max Planck Institute
William Willats
University of Copenhagen
David Domozych
Skidmore College

Oyo Shinozaki