To read Eudicot project

Plant pathology

Specialist defenses (immunity)

Generalist defenses

Biochemistry

Phytoalexins

JA defences

ABA

callose

Botrytis biology

Necrotrophic pathogens

transformations

Klieb group

Suzi

Jason

From Core:

From Tian:

Hannah 2010, Saito 2007

From Cook:

Ausubel 2005

Effects of domestication on secondary metabolism

Early stage project prep

ID 6 domesticated/ 6 wild genotypes per 7 species

Wild species: want closely related to domesticates (not diverse)

And advice for RNA library preps by spp (need 20 ng/uL cDNA minimum):

tomato (*Solanum spp*) – Roger Chetelet

lettuce (*Lactuca sativa*) – Kent Bradford, Richard Michelmore

grape (*Vitis vinifera*) – Andy Walker. OR CUCUMBER?

*Brassica juncea* - \*klieb for RNA

*Brassica oleracea* – include Vivian's 2 QTL parents. Grow field? \*klieb for RNA

Soybean (*Glycine max*) – not Brazil. Maybe not TX. Ask Tanya #rustproblems

\*\* how is cucumber genome quality?

RILS: year 4 or 5.

Vivian and Sun Tei RILS in Brassicas

Maybe stable F2 in tomato from Andy Walker

Learn Jason’s lesion morphology analysis

Modify?

Pilot exp for all genotypes?

Within grant:

- phenotype Botrytis (digital imaging for virulence= botry x eud genetics) on eudicots

- GWAS of Botrytis with each lesion phenotype:

- analysis for evolution of defenses

- confirm genetics of virulence in Botrytis by complementation

- transcriptome of infected plants – coexpression networks

Big questions:

- how do botrytis virulence and eudicot resistance coevolve?

- does domestication cause parallel effects in defense?

- which defense mechanisms are conserved or labile across eudicots?

- in generalist pathogen, gene-for-gene disease interaction unlikely: but maybe network-for-network interactions?

- ID first qualitative resistance genes for a generalist necrotrophic pathogen?

- why differential defense network connectivity across core eudicots?

- what are roles and relative strengths of conserved pathogen defenses?

- botrytis genetic targets for eudicot defense evo?

Differential connectivity in disease resistance signaling networks across eudicots

100 sequenced Botrytis isolates

- submitted for resequencing?

- genome assembly, de novo alignments?

- population structure?

- previous GWAS results with these isolates?

Tips RNA lib prep optimization;

- quantify at every step

- mRNA directly from leaf (no total RNA isolation) works best

Grape: PGs, PGIPs, root stocks vs. scions

Curious observations:

- PDB can induce defence responses in At (col) with nothing else

- growth rates are sensitive to seasonality. Even in growth chamber

Integrated consensus network may work well if: for an evolutionarily conserved trait

Would not expect this for a generalist defense strategy!