



Centre for Agriculture
and the Bioeconomy

Using functional genomics approaches to study mango flowering

Dr Stephanie Kerr

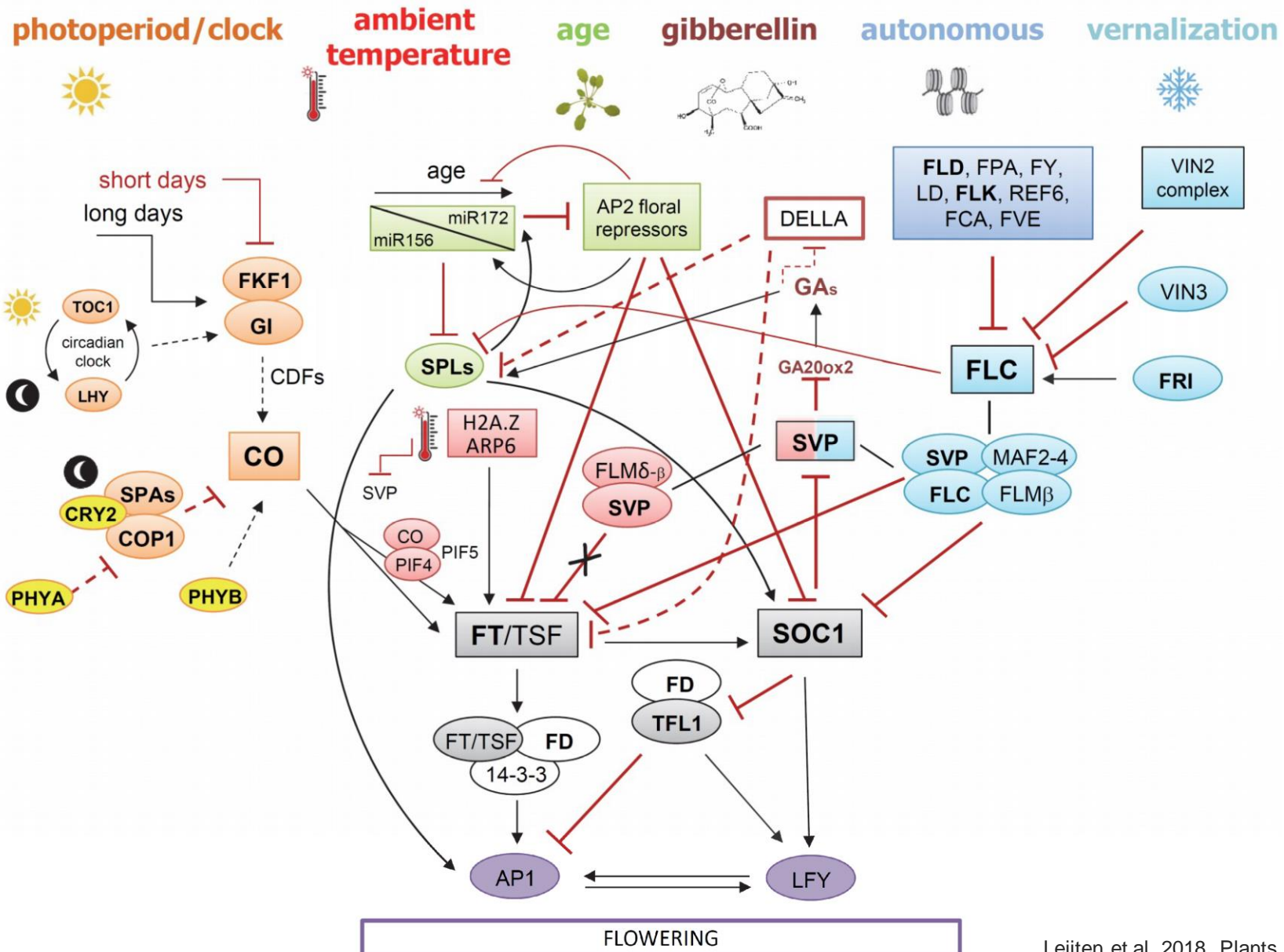
Mango Flowering

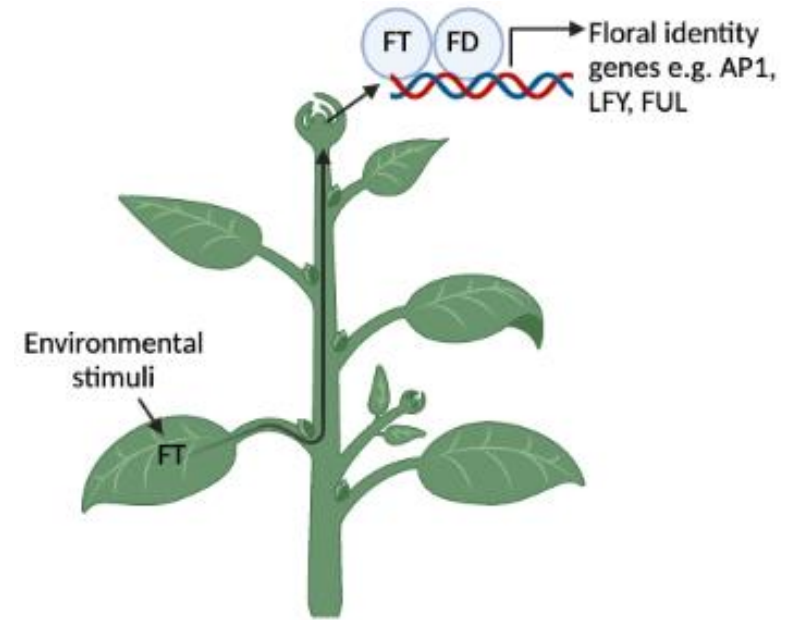
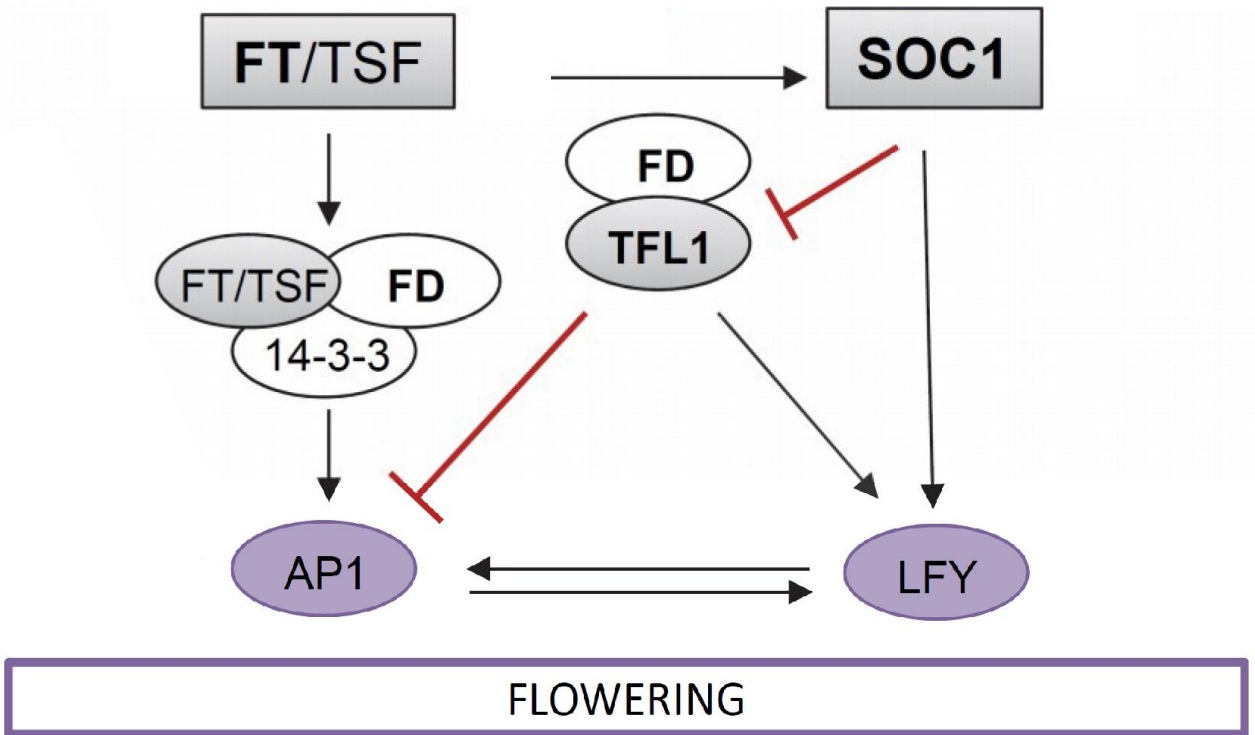
Several challenges:

- Long juvenile period
- Flowering time influenced by environmental cues e.g. temperature
- Flowering time differs between cultivars
- Alternate bearing



Credit: Amanda Johnson



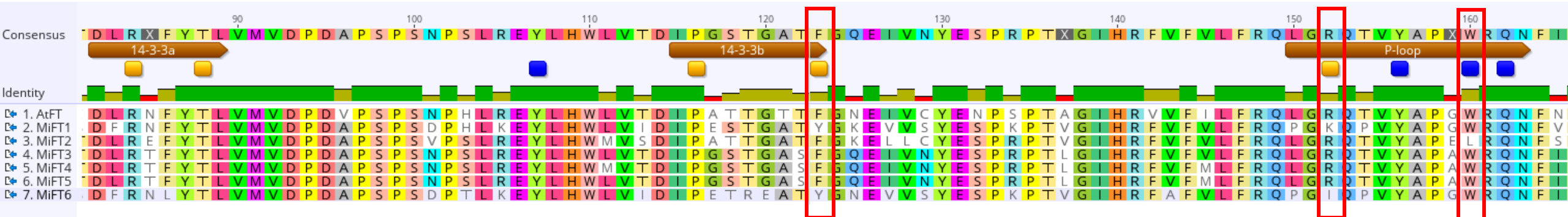


Functional genomic approaches

1. Sequence analysis
2. Transcriptomics
3. Complementation assays in model plants
4. Nanoparticle-mediated gene silencing

1. Sequence analysis

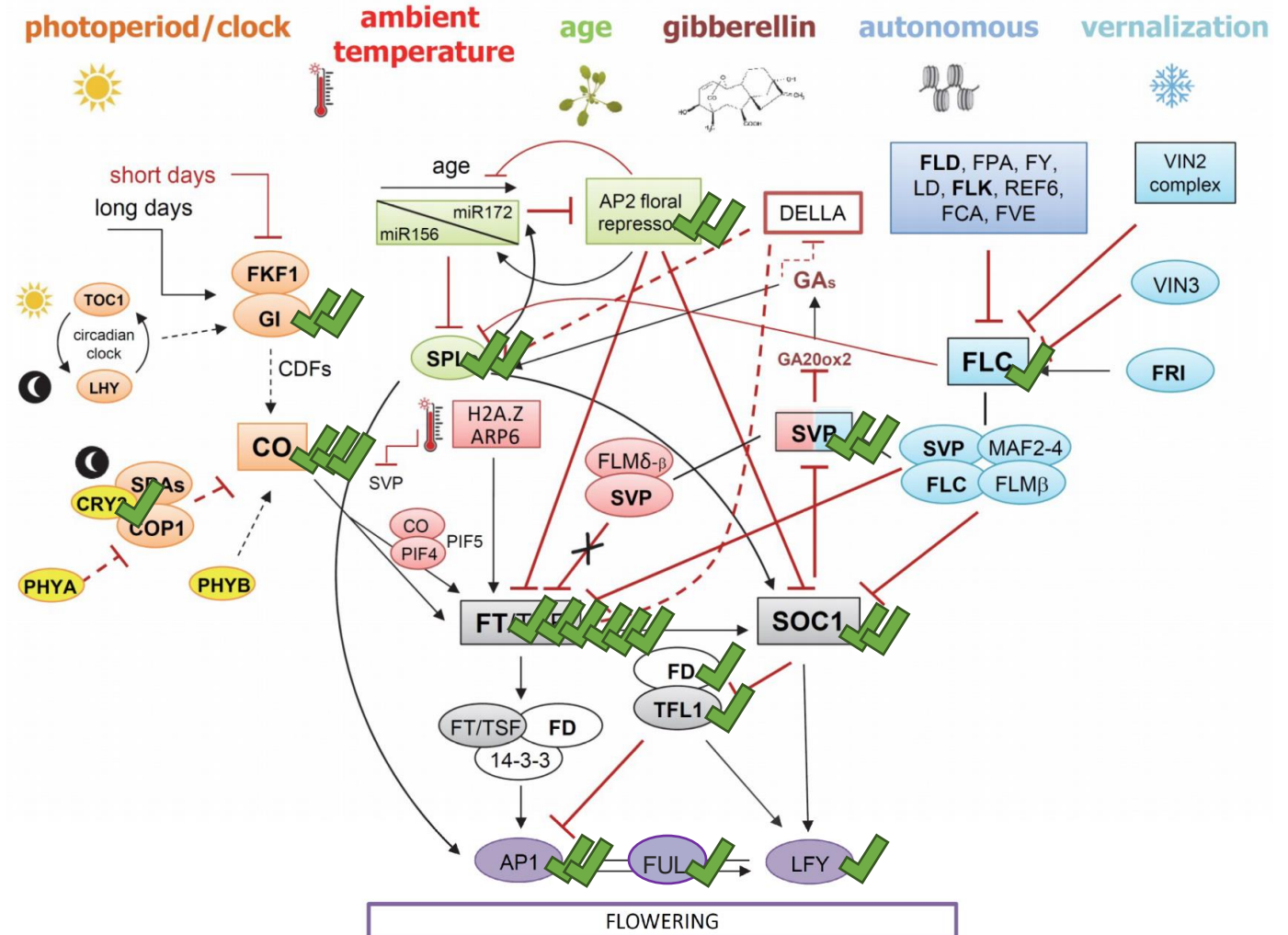
FT sequence alignment



1. Sequence analysis

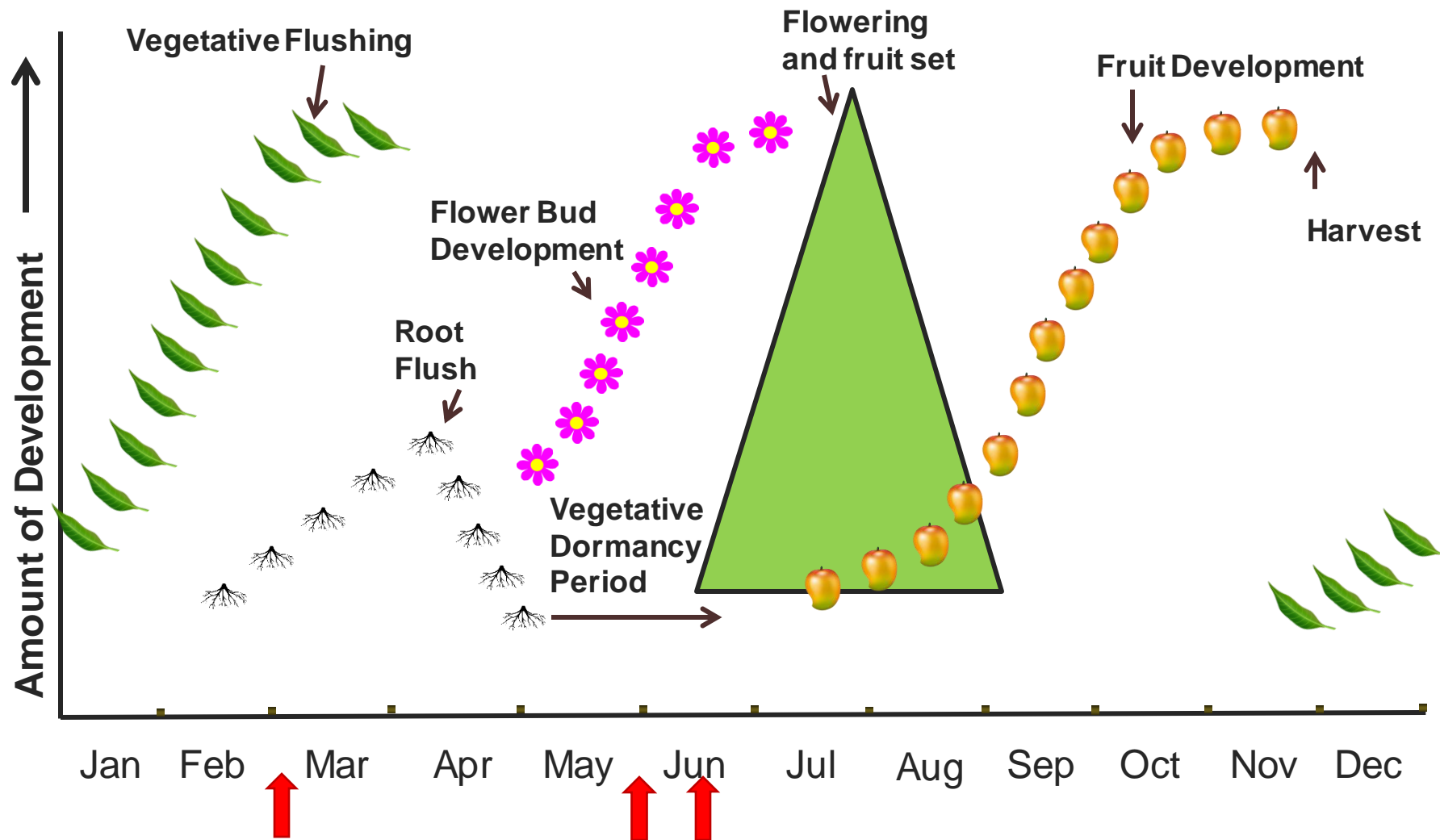
Outcome

- Have identified mango homologs for many of the key flowering genes



2. Transcriptomics

Mango Phenology Cycle in NT



Stacey Cook

RNA-seq sampling

Mango bud development

First sampling (vegetative flush)

Dormant
vegetative bud



Growing
vegetative bud



2nd and 3rd sampling (flower bud development)

Growing floral
bud



Growing floral
bud

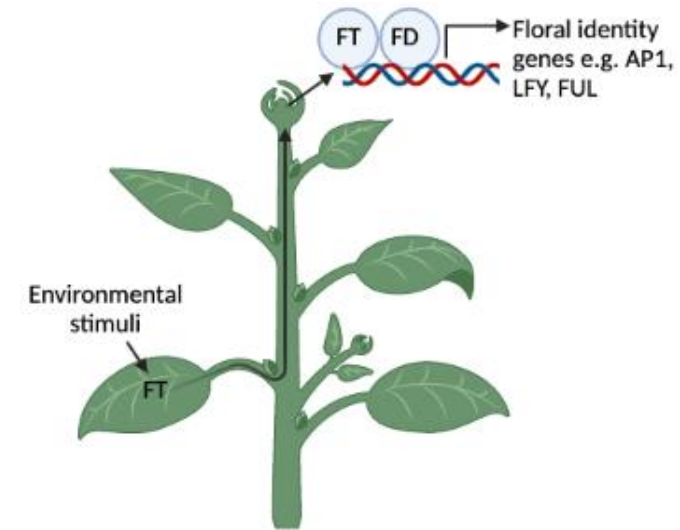
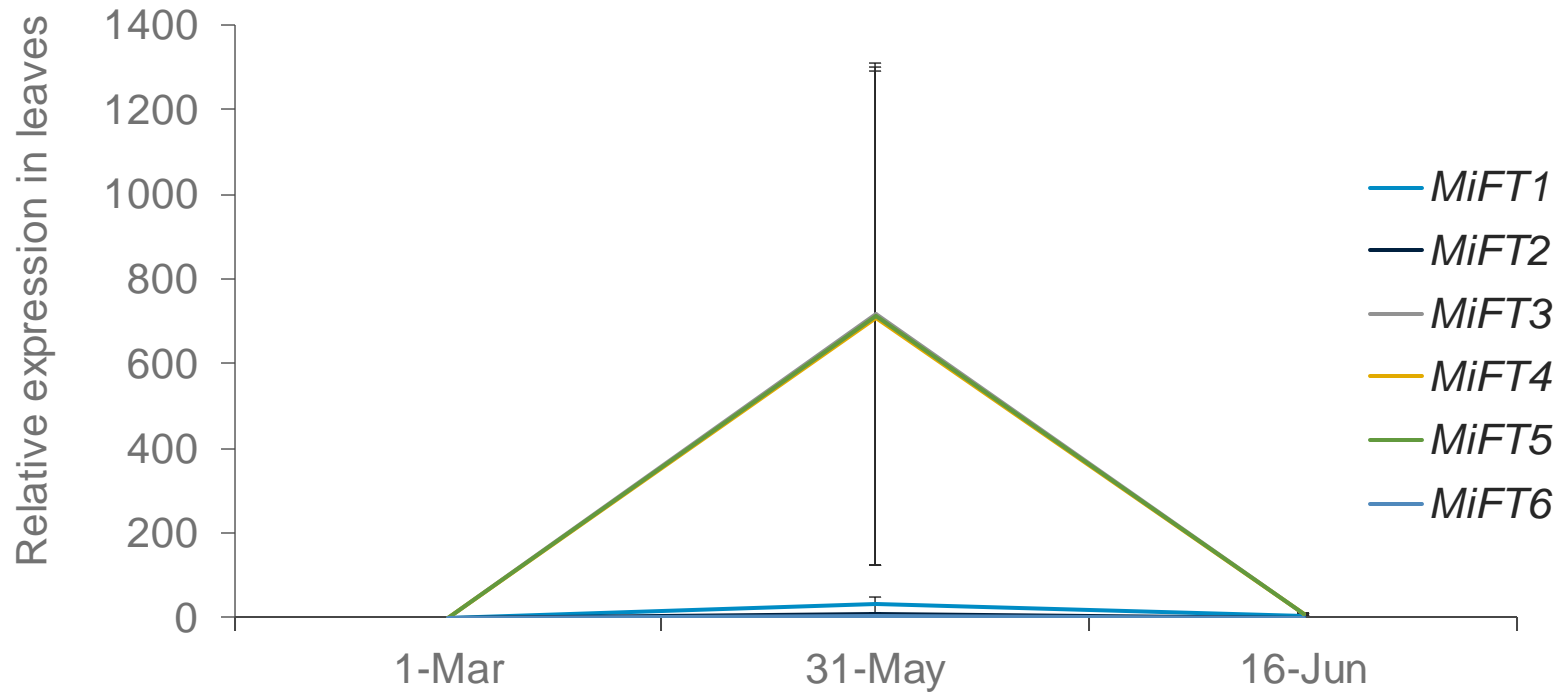


2. Transcriptomics

Some *MiFT* genes dramatically increase in expression in leaves during floral development



Zac Stewart

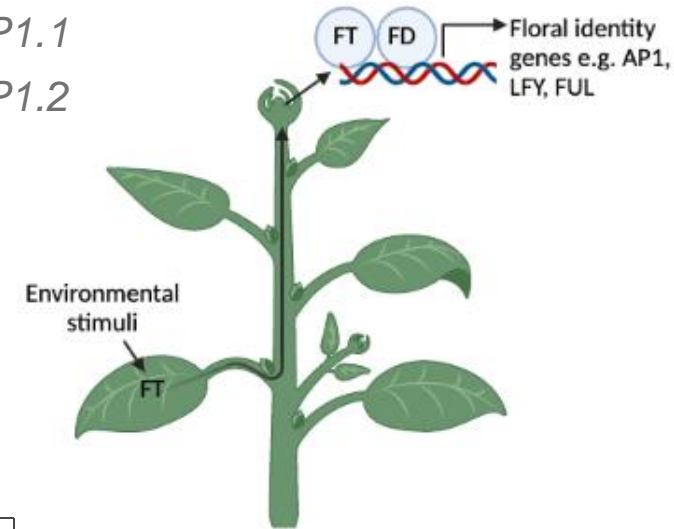
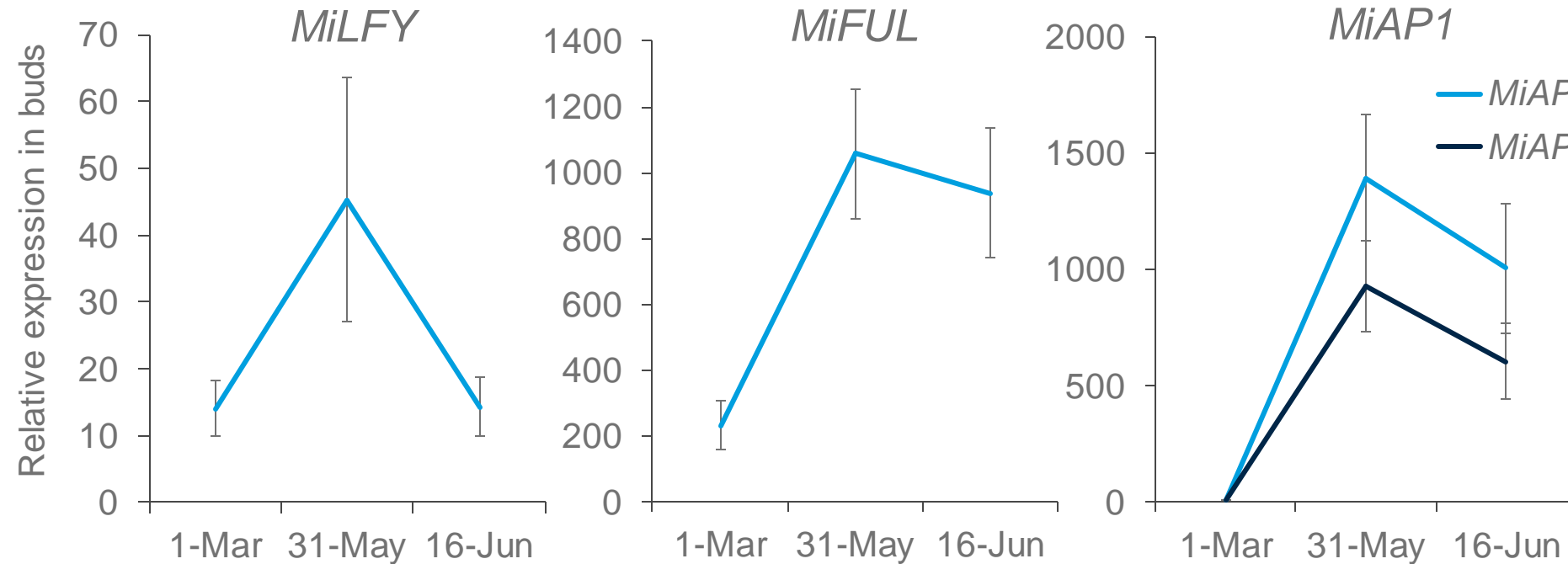


2. Transcriptomics

Floral identity genes increase in expression in mango terminal buds during floral development



Zac Stewart

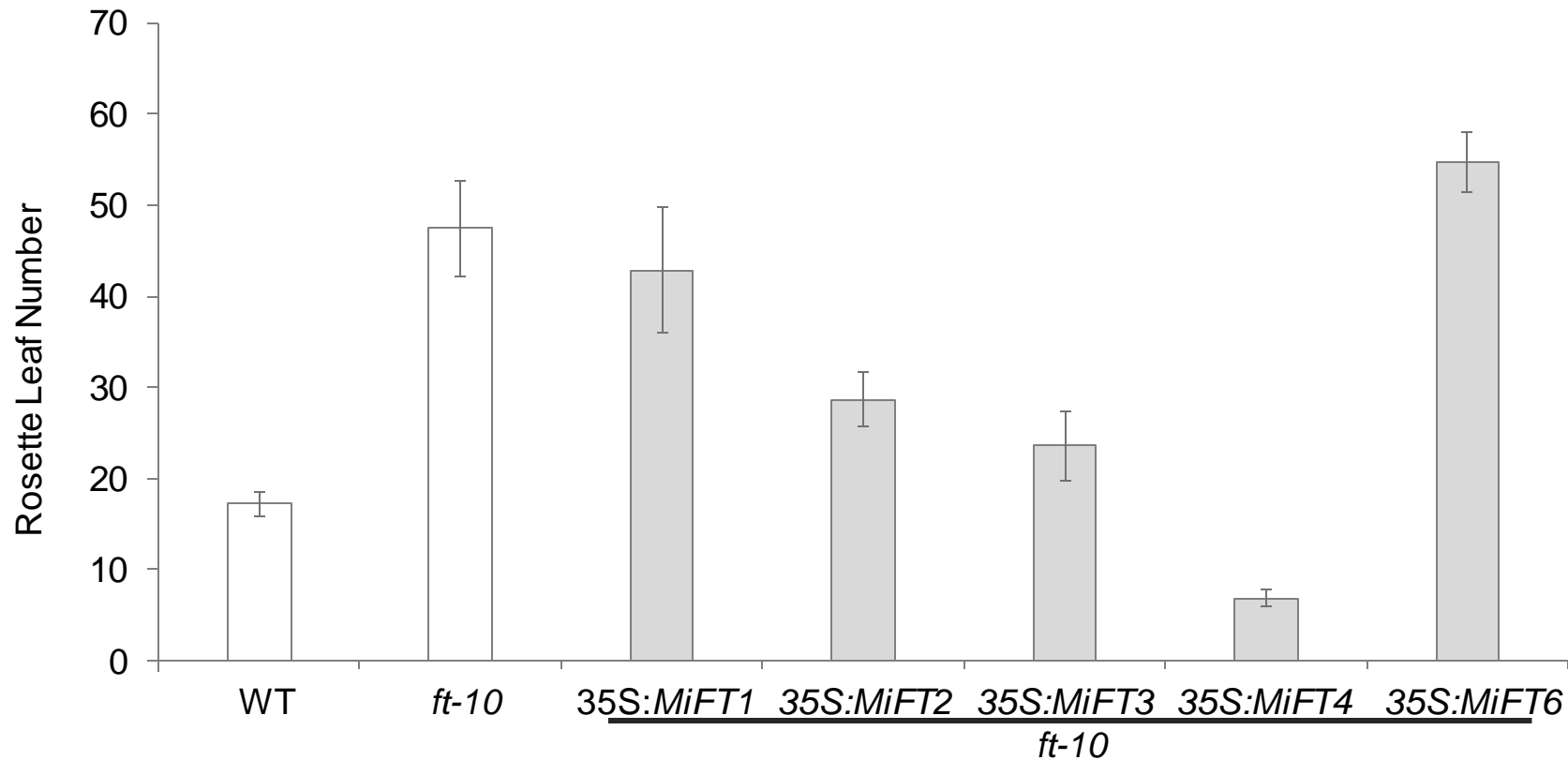


3. Complementation assays in model plants

Some *MiFT* genes (but not all) can promote flowering in *Arabidopsis*



Amanda Johnson



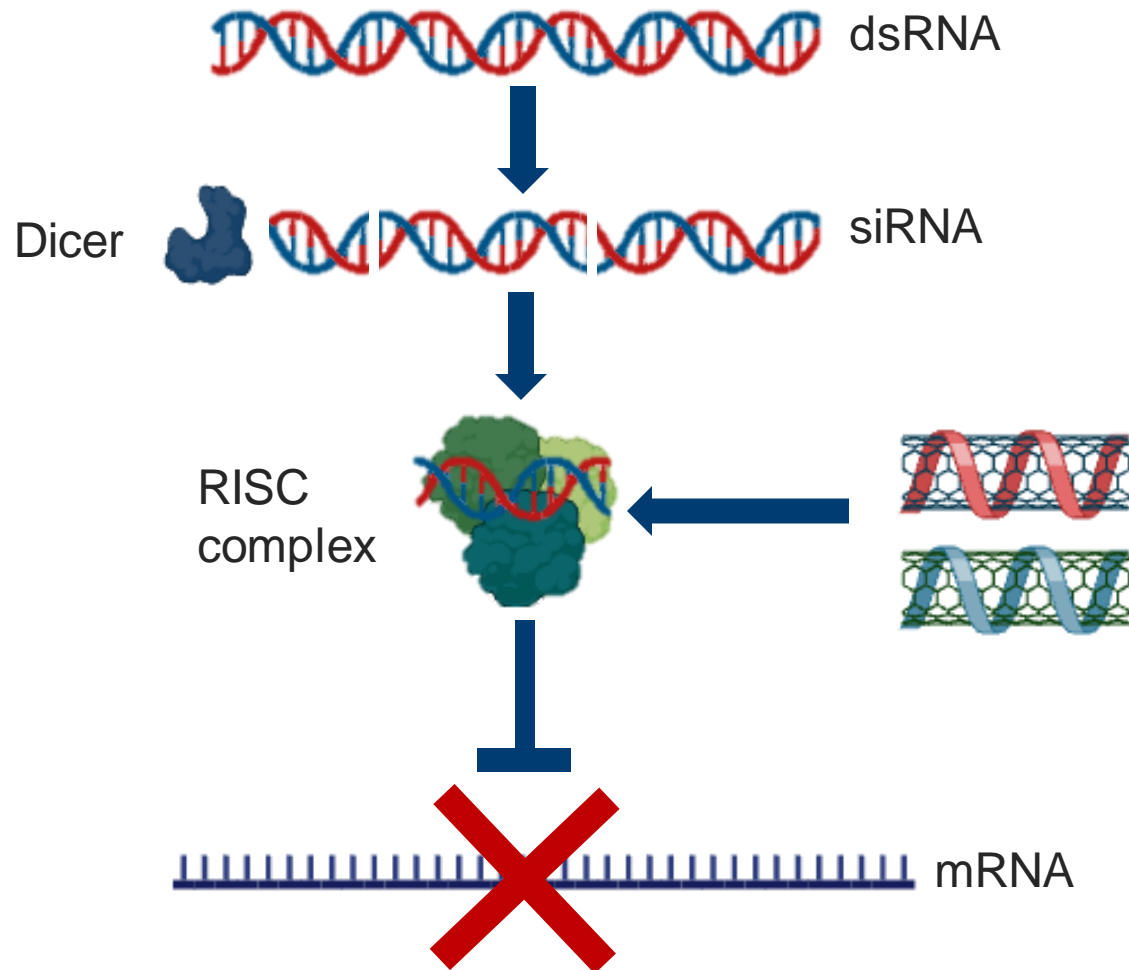
35S::MiFT1/ft-10



35S::MiFT2/ft-10

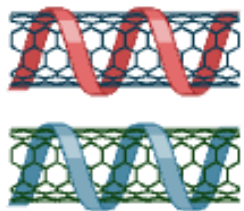
4. Nanoparticle-mediated gene silencing

RNAi pathway in plants



4. Nanoparticle-mediated gene silencing

Can we use nanoparticle-siRNA constructs to induce flowering in tree crops?



Floral repressor genes
e.g. *TFL1*



Thank you!



Pete Prentis

Amanda Johnson

Zac Stewart

Stacey Cook

Jess Curry

Jazmine Humphreys (now UTas)



Markita Landry

Francis Cunningham

Sophia Tomatz



Erika Varkonyi-Gasic



Rebecca Fieth

John Griffin

Victoria Coyne



stephanie.kerr@qut.edu.au



[@DrStephKerr](https://twitter.com/DrStephKerr)

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