CROP FUNCTIONAL GENOMICS

TRANSLATIONAL RESEARCH PROJECT

-POSITIONAL CLONING

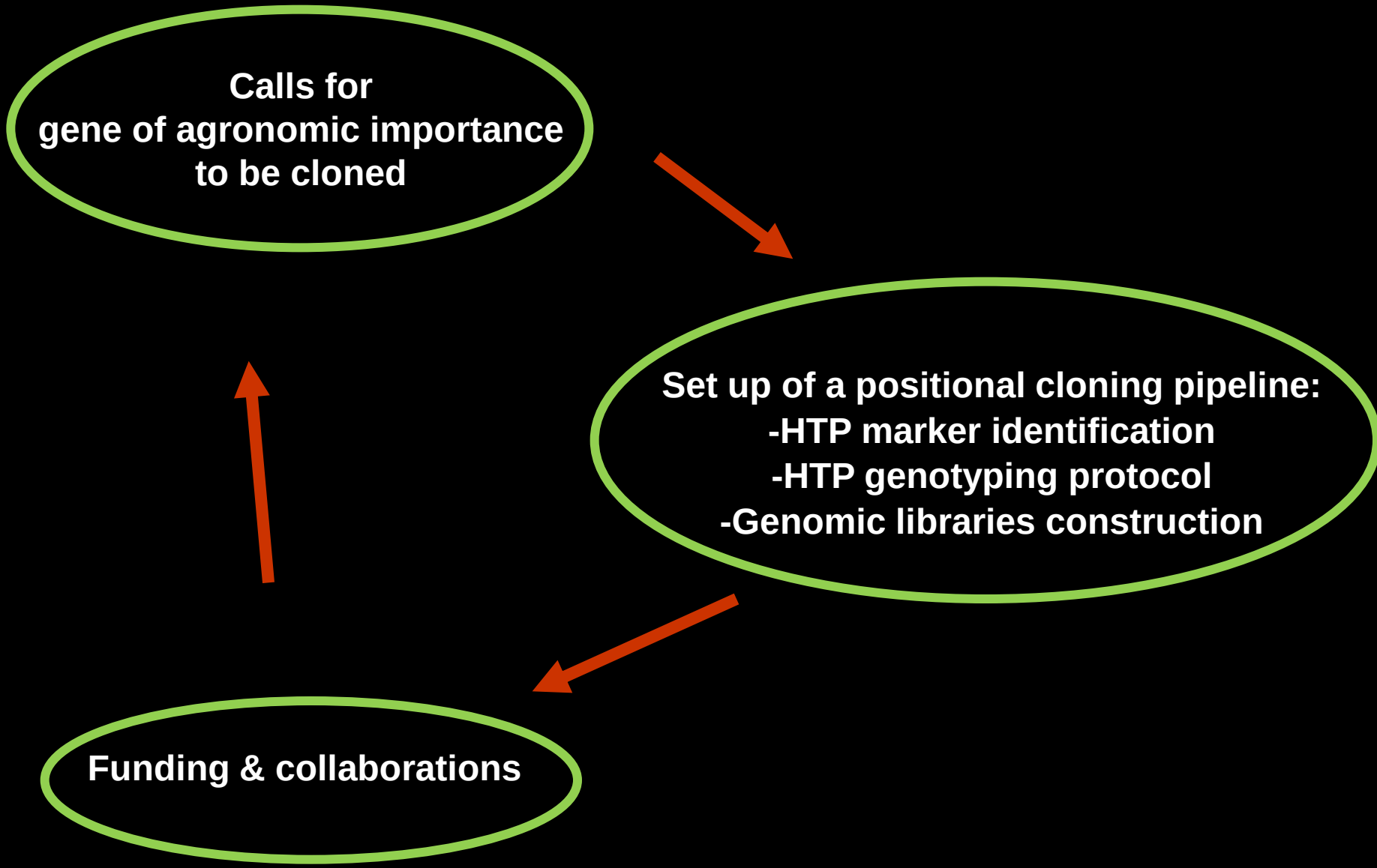
-TILLING

SEX DETERMINATION IN PLANT

Positional cloning project

-Cloning of Genes of Agronomic Importance from Crops
-Set up of Positional cloning platform
    -Marker identification
    -BAC library construction
    -Physical mapping and subcloning
    -Sequencing and annotation of BACS
    -Transfer of the tools to INRA partners

Positional cloning project



Achievements:

- Positional cloning of the fruit shape, ***fs2.2***, in melon (collaboration with M. Pitrat and C. Dogimont)
- Positional cloning of the sex determination loci, ***a*** and ***g***, in melon (collaboration with M. Pitrat and C. Dogimont)
- Positional cloning of the sex determination locus, ***M*** in cucumber (collaboration Rafi Perl-Treves, Israel)
- Positional cloning of the fertility restorer locus, ***Rfo***, in radish (collaboration with F. Budar, M. Renard and R. Delourme)
- Positional cloning of the PVY and TEV recessive R gene, ***Pvr2***, in pepper (collaboration with C. Caranta and A. Palloix)
- Positional cloning of the MNSV R gene, ***nsv***, in melon; ZYMV R gene,***zym***, in watermelon (collaboration with M. Pitrat and C. Dogimont; K. Shu Link, USDA)
- Positional cloning of powdey mildiou R gene,***Pmw***, A. gossypii R gene,***Vat***, in melon (collaboration with M. Pitrat and C. Dogimont)
- Positional cloning of the *Tendril-less* gene,***Tl***, in pea (collaboration with N. Ellis, JIC, UK)
- Positional cloning of **3 genes** from A. thaliana required for miRNA pathway function (collaboration with O. Voinnet, CNRS, Strasbourg)
- Positional cloning of the iron uptake gene, ***DGL***, in pea; acidity locus, ***D***, in peach, P. capsici resistance QTL, ***PhyP5***; Embryo transfer cells, ***E2748*** , Androecy, locus *A*, in cucumber.

TILLING in crop species

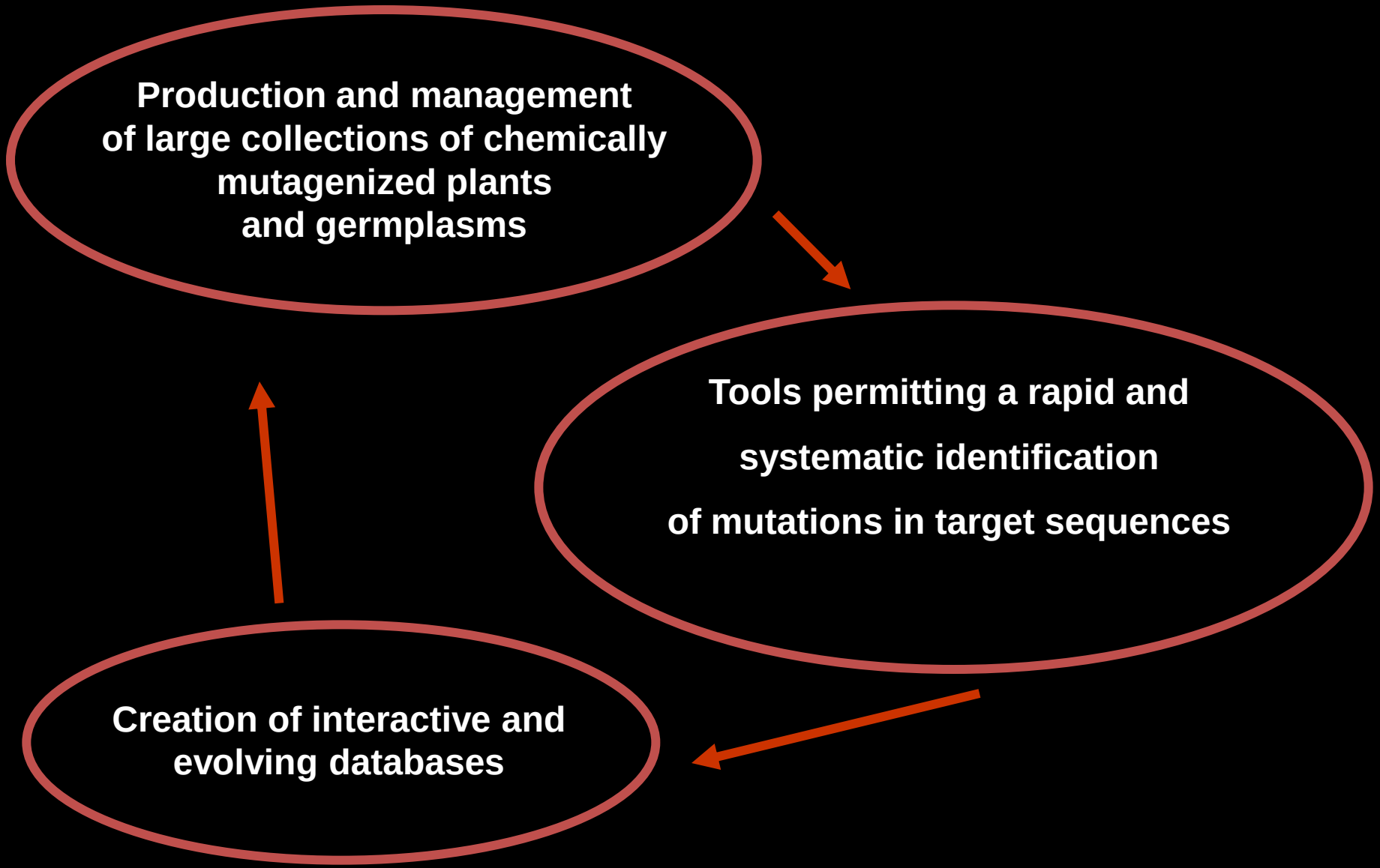
*Mutation diagnostic

*Mutant collections

*Integration

*Ambition

TILLING project



Achievements

CROPTILLING tool

***Mutation diagnostic**

The Endo1 system was set and is currently used by a number of INRA labs and Platforms.

An alternative system is required (The NGS to be tested).

***Mutant collections**

Collaborative network to create and manage mutant collections was set.

***Integration**

UTILLdb

Calls for genes to till/mutants to phenotypes

*Future developement

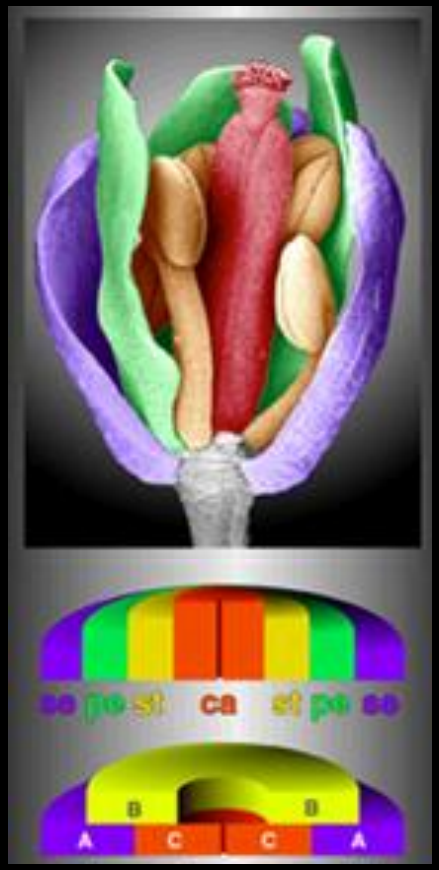
Saturation mutagenesis: Exploitation of large mutant collections to engineer leader alleles in planta gene engineering

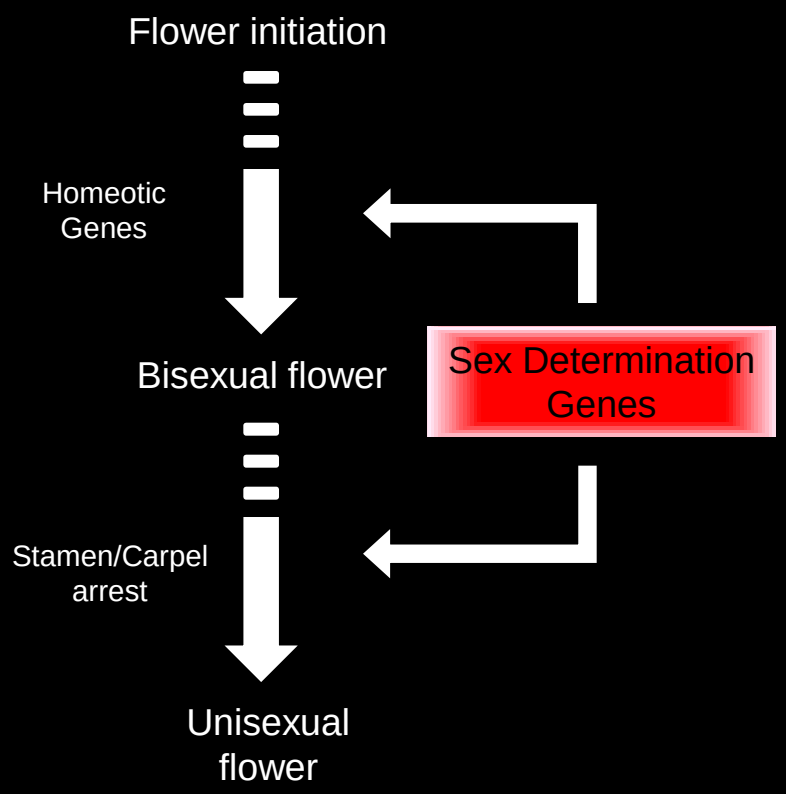
Plant sex determination:

Control of sex types for plant breeding

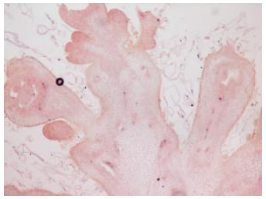
Flower architecture

The "ABC" model

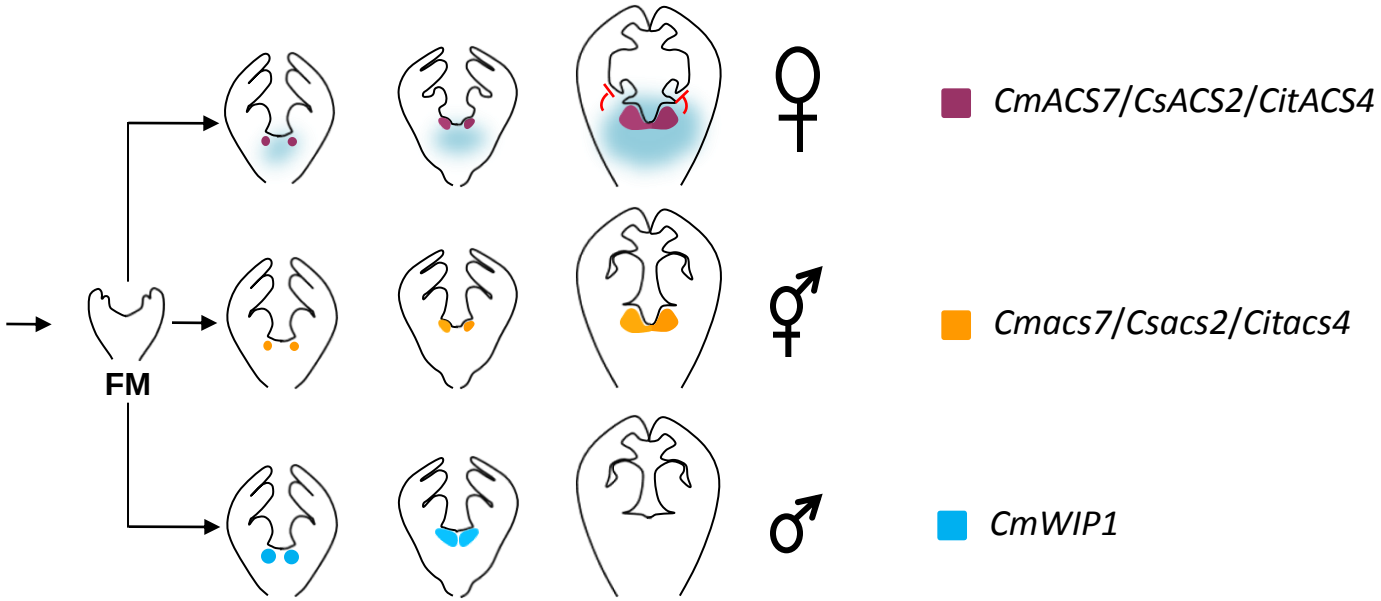


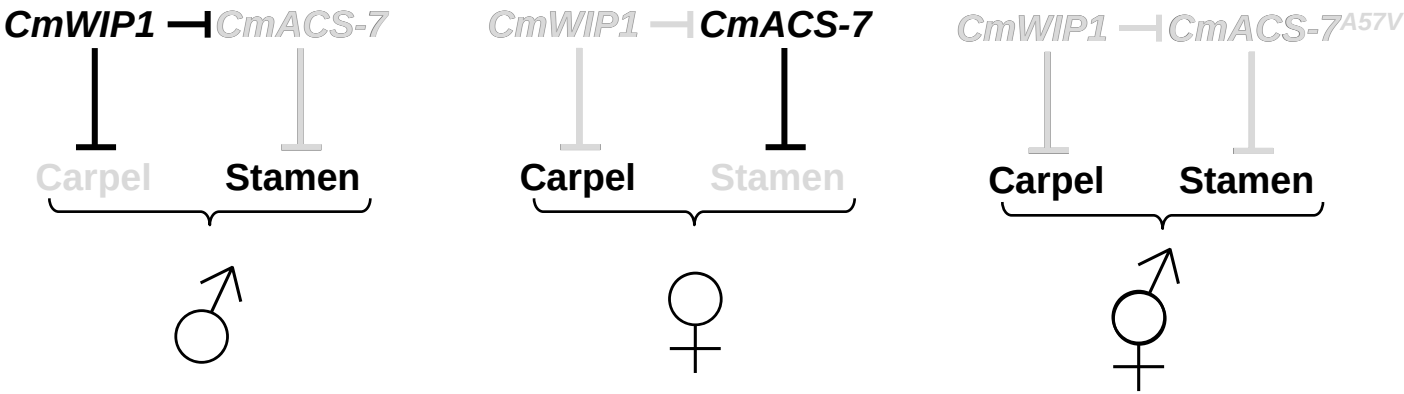


A model to explain sexual morphs in melon



SAM





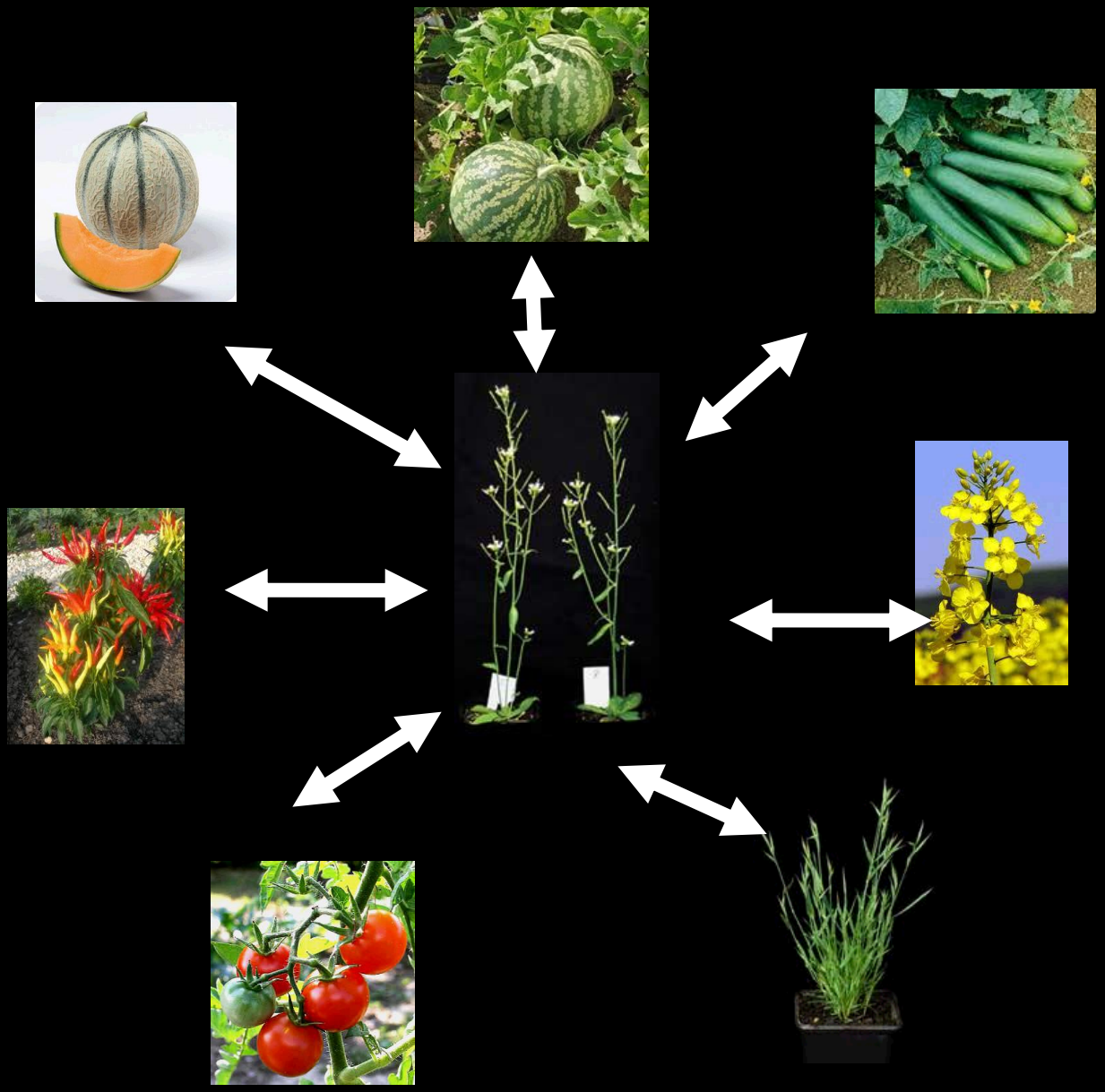
Conclusions:

- **Des plantes cultivées sont utilisées comme plantes modèles**
- **Plusieurs projets multidisciplinaires**

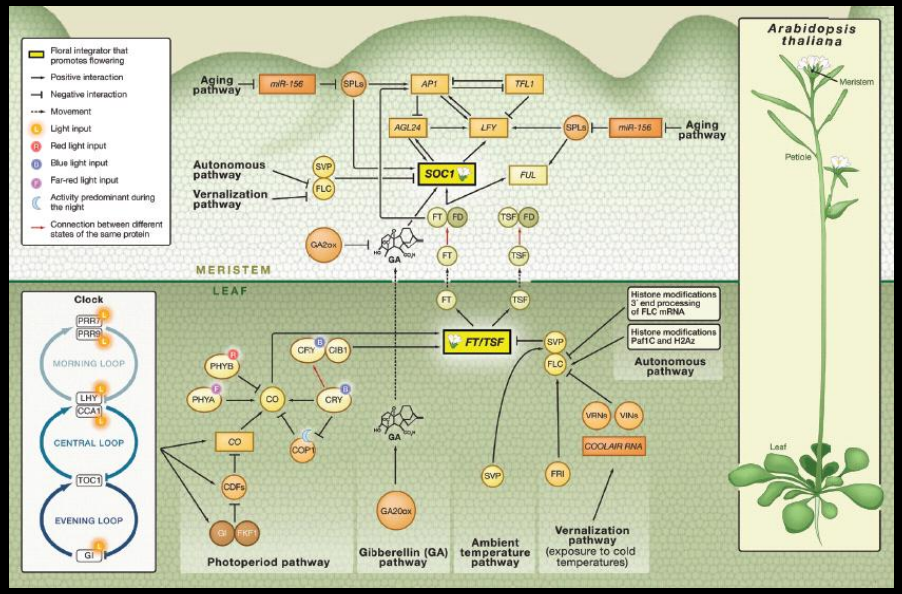
Points à améliorer

- Les modules de signalisation entre espèces: identification et transposabilité
- L'introgression de caractères d' intérêt agronomique à partir des espèces apparentées et nettoyage des génomes: NGS dans tout cela

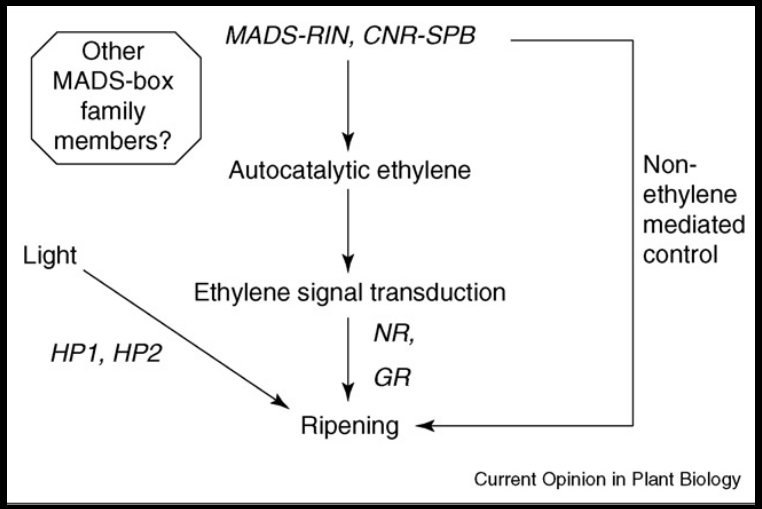
TRANSLATIONAL RESEARCH in the CFG group



Les modules de signalisation entre espèces



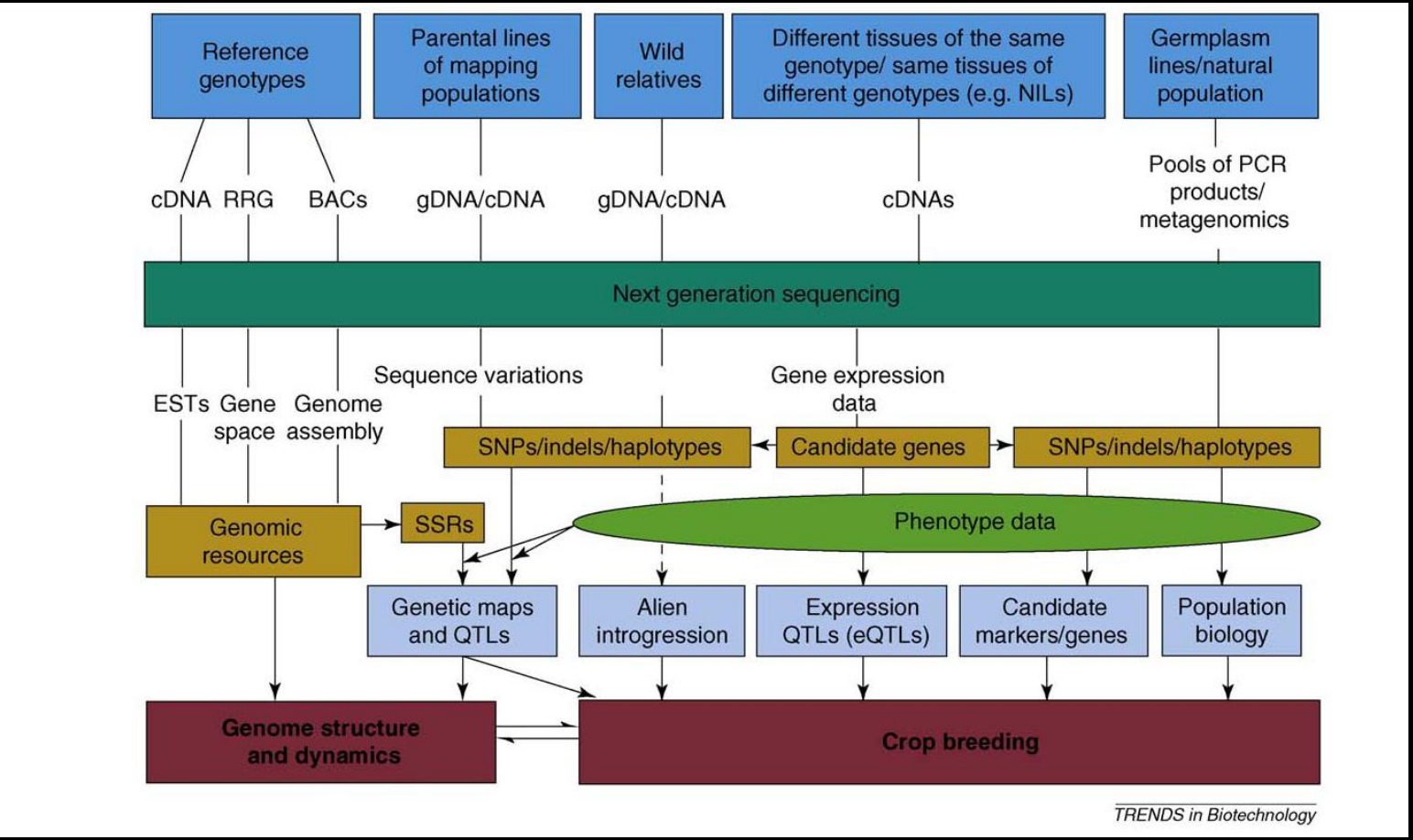
Cell 141, April 3, 2010 ©2010 Elsevier Inc. DOI 10.1016/j.cell.2010.04.024



Comment tester efficacement ces modules de signalisation dans un contexte génétique donné?

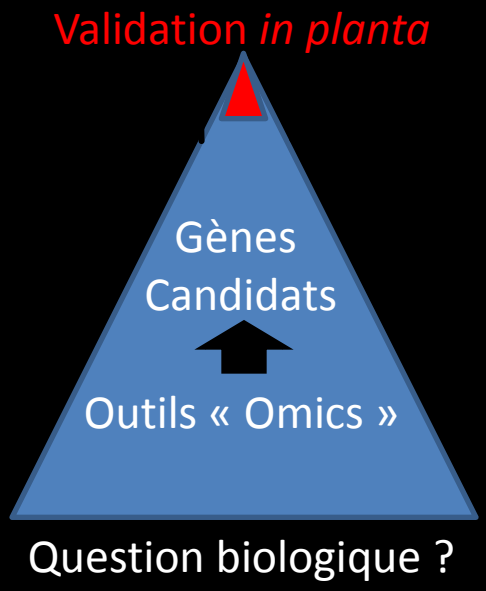
Points à discuter

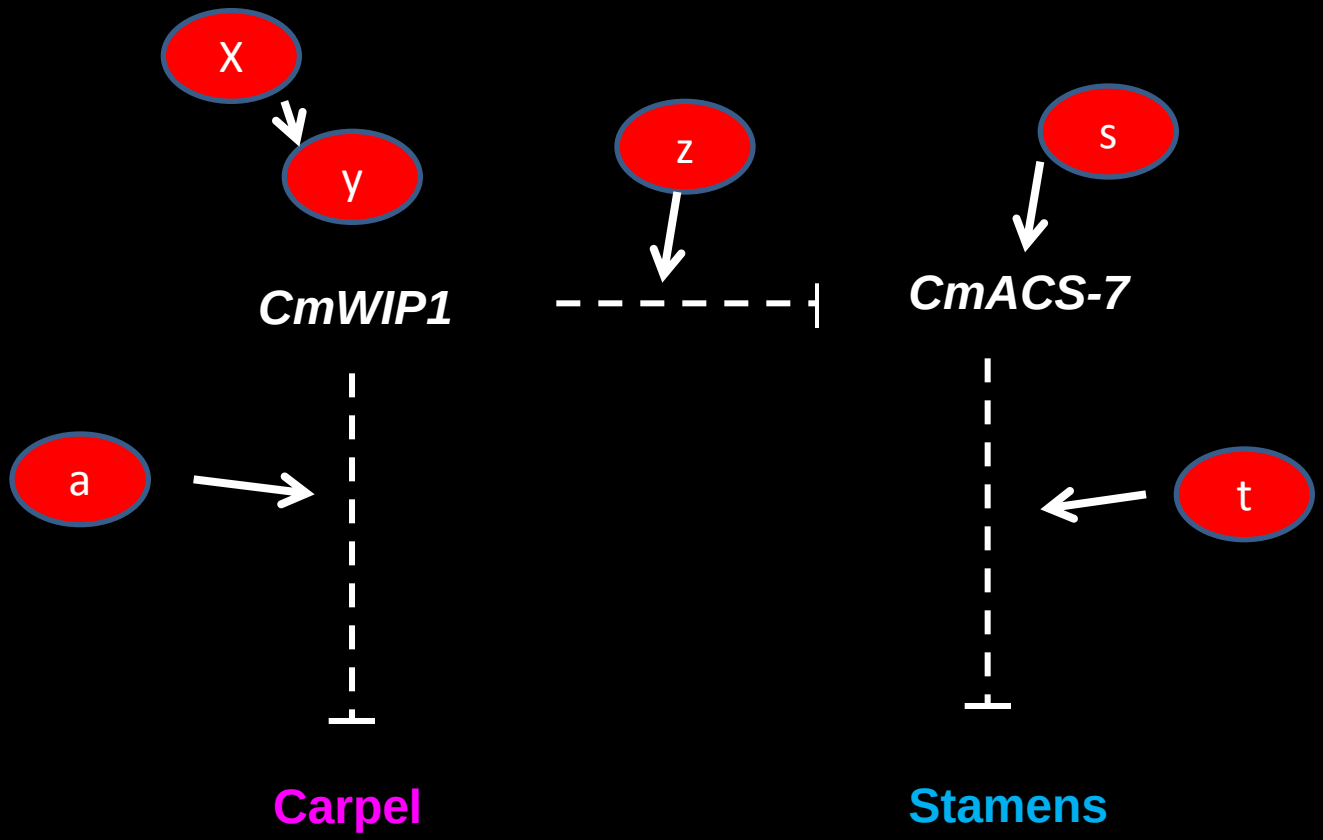
- L'introgression de caractères d' intérêt agronomique à partir des espèces apparentées et nettoyage des génomes: NGS dans tout cela



Points à discuter

- La validation des données: (par TILLING/OGM, par dissection génétique….etc.)
- « Recherche translationnelle»: applications aux plantes d'intérêts




X
y
z
s
CmWIP1
CmACS-7
a
t
Carpel
Stamens