

CHARLA

“Genetic and epigenetic aspects of flowering time regulation in plants and its relevance in crop improvement”

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Fecha: Lunes 4 de diciembre de 2017

Lugar: Mini Auditorio, Agronomía, UCR.

Hora: 1:30 p. m. a 3:00 p. m.

**Además se invita a tres charlas complementarias al tema que se llevarán a cabo del 5 al 7 de diciembre de 8:30 a. m. a 12:00 m. d. en el aula del CIGRAS.*

Todas las charlas serán en **inglés y no habrá traducción simultánea.*

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**CONFIRMAR
PARTICIPACIÓN**
hasta el 1 de diciembre

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Lecture 1 (Aula CIGRAS, 8:30-10:00)

Definition of flowering time

Different measures to measure flowering time: Developmental time vs temporal or seasonal measurements

Flowering/Inflorescences Typology

Annual/perennial/polycarpic/monocarpic

Why flowering time needs to be regulated

Reproductive success needs coordination of flowering with the environment

Avoidance of extreme temperature

Avoidance of water penury

Coordination with predators and pollinators

A little brush-up on the ABC model – making a flower vs making it flower

Pathways that regulate flowering time

Age

Photoperiod

Temperature as ambient temperature or as integrated temperature

Other signals such as water availability, abiotic and biotic stress

CHARLAS COMPLEMENTARIAS MARTES 5 DE DICIEMBRE

Lecture 2 (Aula CIGRAS, 10:00-12:00)

The age-dependent pathway

Summary of knowledge from the genetic model
Arabidopsis thaliana

Developmental transitions of the
sporophyte

Juvenile to adult and adult vegetative to
adult reproductive transition

Arabidopsis thaliana transition mutants: juvenile
to adult and adult reproductive

Cascade of miRNAs and Transcription factors

What are microRNAs and how do they act

SPL transcription factor gene family

AP2 transcription factor family

Sugar and epigenetic regulation of MIR157

The Polycomb Group pathway and gradual
epigenetic gene repression

What is the PcG pathway?

Discovery of the PcG pathway

Accessible versus inaccessible chromatin and
transcriptional control

Sugar levels and gradual MIR157 repression

The age-dependent pathway is "the oldest" pathway
regulation developmental transitions in plants

Moss *Physcomitrella patens* switches from
protonema to caulinema growth stage by

MIR156-pathway

Non-*Arabidopsis* examples illustrating why the
age-dependent pathway is relevant for breeding

Maize *Corngrass1* locus

Maize *Vgt1* and *ZmRap2.7* locus

more?

CHARLAS COMPLEMENTARIAS
MIÉRCOLES 6 DE DICIEMBRE

Lecture 3 (Aula CIGRAS, 8:30-12:00)

The photoperiod pathway

Summary of knowledge from the genetic model *Arabidopsis thaliana*

GIGANTEA, CONSTANS and FLOWERING LOCUS T

FT is florigen

Transcriptional regulation of FT (redundancy with lecture?)

FT moves center stage and then what?

FT as co-factor of bZIP transcription factors

Flowering time genes and flowering genes

When did plants start to use FT as florigen?

FT and TFL1 clades of FT-like genes originate in angiosperms

Non-*Arabidopsis* examples illustrating why the photoperiod pathway is relevant for breeding

Out of America: potato, tomato and maize

The journey of cereals from the Fertile Crescent into the world



JUEVES 7 DE DICIEMBRE

Lecture 4 (Aula CIGRAS, 8:30-12:00)

The temperature pathways regulating flowering in *Arabidopsis thaliana*

Regulation/Modulation of flowering by ambient temperature

SVP

MAFs

Chromatin fluidity

Regulation of flowering by vernalization

FLC (and co-factors)

Epigenetic regulation of FLOWERING LOCUS C

Short repeat PcG complexes

Chromatin-mediated regulation as binary switch

Vernalization pathways are recent inventions and differ between families

Vernalization pathways in other plants

Other Brassicaceae

Sugar beet

Cereals/barley

