

**MAD
ONLINE POSTGRADUATE COURSE ON**

Functional Genomics of Plant Reproduction

FIRST SEMESTER 2022

registration and enquiries: spessino@unr.edu.ar

ORGANIZING COMMITTEE

Prof. Silvina Pessino (National University of Rosario, IICAR, CONICET-UNR, Argentina)
Prof. Emidio Albertini (University of Perugia, Italy),
Prof. Ueli Grossniklaus (Zurich University, Switzerland)
Prof. Mathew Tucker (University of Adelaide, Australia)
Prof. Gianni Barcaccia (University of Padova, Italy)
Prof. Stewart Gillmor (UGA, Langebio, México)

OBJECTIVE

The overall aim of the course is to allow students to develop theoretical skills and critical judgement on topics concerning the genomic control of plant reproduction. A combination of lectures and project-based research will be used for studying genetic and epigenetic factors that modulate developmental pathways leading to vegetative, sexual and asexual reproduction. Examples on how reproduction strategies can be managed to sustainably satisfy the increasing global demand for food will be provided.

Program

UNIT 1: PLANT REPRODUCTIVE MODES

JOHN CARMAN (UTAH STATE UNIVERSITY, LOGAN, USA)

GENERAL ASPECTS ON PLANT REPRODUCTION EVOLUTION: VEGETATIVE PROPAGATION, SEXUALITY, APOMIXIS

VIVIANA ECHENIQUE (CERZOS-CONICET-UNS, BAHÍA BLANCA, ARGENTINA)

THE INFLUENCE OF STRESS ON SEED PLANT REPRODUCTION

SILVINA PESSINO (IICAR-CONICET-UNR, ROSARIO, ARGENTINA)

THE GENOME RESPONSE TO PLOIDY CHANGES AND ITS IMPACT ON REPRODUCTIVE STRATEGIES

LUCIANA DELGADO (IICAR-CONICET-UNR, ROSARIO, ARGENTINA)

CASE STUDY: THE INFLUENCE OF THE PLOIDY LEVEL ON THE PASPALUM RUFUM REPRODUCTIVE DEVELOPMENT

UNIT 2: STRATEGIES TO IDENTIFY REPRODUCTIVE CANDIDATE GENES

UELI GROSSNIKLUS (ZURICH UNIVERSITY, SWITZERLAND)

IDENTIFICATION OF CANDIDATE GENES CONTROLLING SEXUAL REPRODUCTION BY FUNCTIONAL ANALYSIS OF MUTANTS

JUAN PABLO ORTIZ (IICAR-CONICET-UNR, ROSARIO, ARGENTINA)

IDENTIFICATION OF CANDIDATE GENES CONTROLLING APOMIXIS: POSITIONAL MAPPING, GENOME SEQUENCING AND TRANSCRIPTOME CHARACTERIZATION STRATEGIES

OLIVIER LEBLANC (IRD, MONTPELLIER, FRANCE)

SEQUENCING DIPLOID AND POLYPLOID GENOMES AND IDENTIFYING REPRODUCTIVE CANDIDATE GENES

LUCIANO MARTELOTTO (HARVARD MEDICAL SCHOOL, BOSTON, USA)

SEQUENCING FULL ORGAN/SINGLE CELL PLANT TRANSCRIPTOMES

EMIDIO ALBERTINI (UNIVERSITY OF PERUGIA, ITALY)

REPRODUCTIVE EPIGENOME CHARACTERIZATION (MCSEED)

MARICEL PODIO (IICAR-CONICET-UNR, ROSARIO, ARGENTINA)

CASE STUDY: THE IDENTIFICATION OF REPRODUCTIVE CANDIDATE GENES IN PASPALUM NOTATUM THROUGH A MAPPING/GENOME SEQUENCING/TRANSCRIPTOMIC/EPIGENOMIC INTEGRATED STRATEGY

UNIT 3: FUNCTIONAL ANALYSIS OF REPRODUCTIVE CANDIDATES

DAPHNÉ AUTRAN (IRD, MONTPELLIER, FRANCE)

OVULE ARCHITECTURE AND REPRODUCTIVE DEVELOPMENT

MARTA MENDES (UNIVERSITY OF MILANO, ITALY)

HORMONAL CONTROL OF PLANT REPRODUCTION

MATTHEW TUCKER (UNIVERSITY OF ADELAIDE, AUSTRALIA)

HOW DO SIGNALS FROM SOMATIC CELLS IN THE OVULE PROMOTE THE DEVELOPMENT OF FEMALE REPRODUCTIVE CELLS

LORENA SIENA/CAROLINA COLONO (IICAR-CONICET-UNR, ROSARIO, ARGENTINA)

CASE STUDY: TGS1 CONTROL OF PLANT SEXUAL AND ASEXUAL REPRODUCTION

FULVIO PUPILLI (IBBR, CNR, ITALY)

CASE STUDY: ORC3 CONTROL OF ENDOSPERM FORMATION

UNIT 4: EPIGENETIC REGULATION OF SEXUALITY AND APOMIXIS

UELI GROSSNIKLUS (ZURICH UNIVERSITY, SWITZERLAND)

EPIGENETIC CONTROL OF SEED DEVELOPMENT

CÉLIA BAROUX (ZURICH UNIVERSITY, SWITZERLAND)

CHROMATIN DYNAMICS DURING SPORO- AND GAMETOGENESIS IN ARABIDOPSIS

STEWART GILLMOR (UNIDAD DE GENÓMICA AVANZADA, LANGE BIO, MÉXICO)

SRNA CONTROL OF PLANT REPRODUCTION

UNIT 5: PLANT BREEDING STRATEGIES

GIANNI BARCACCIA (UNIVERSITY OF PADOVA, ITALY)

HOW PLANT REPRODUCTION BARRIERS AND GENOMIC RESOURCES AFFECT NEXT GENERATION PLANT BREEDING METHODS

CARLOS ACUÑA (IBONE-CONICET-UNNE, CORRIENTES, ARGENTINA)

CASE STUDY: HARNESSING APOMIXIS INTO PLANT BREEDING IN PASPALUM

Learning resources

Videos (lectures)
Papers (list of references)

Teaching activities

Video watching
Online discussions
Problem resolution sessions

Assessment

Student seminars
Final open book exam resolution.

