



# INTENSIVE STUDY PROGRAMME IN VALENCIA ON VEGETABLE BREEDING

## EUROPEAN PLANT BREEDING COLLEGE

The course was followed by 25 students, nine of them came from other EPBC Universities (5 Ghent, 2 Ege, 1 SLU and 1 LaSalle). Below are indicated the activities performed and the learning outcomes. The students were very engaged.

The course was granted with 7.5 ECTS with a UPV certificate.

Their level of knowledge and skills acquisition was assessed through the presentation of a breeding programme in which they were working of groups using the information provided by the course. The following topics were addressed in the joint work:

- Introduction and adaptation of new crops
- Development of a variety resistant to a virus
- Utilization of underutilized crops
- Development of a variety resistant to climate change
- Development of a variety with added nutraceutical value

### List of sessions and learning outcomes

<b>Activity</b>	<b>Professor</b>	<b>Learning outcomes</b>
Opportunities and challenges at vegetable breeding industry	Jaime Prohens	Recognize the horticulture breeding stakeholders Have a general view of the plant breeding industry
Breeding vegetables for apparent, organoleptic, nutritional and functional quality	Jaime Prohens	Identify aspects important in breeding for quality Understand methods used for breeding for quality
Breeding for nutraceutic properties practice lab	M <sup>a</sup> Pilar Lopez/Purificación Lisón	Use standard protocols for analyzing flavonoids, carotenoids etc
Visit to the IBMCP metabolomics, omics lab	M <sup>a</sup> Pilar Lopez/Purificación Lisón	Understand the work in a research lab



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Breeding for abiotic stresses: improving efficiency and adaptation to climate change	Oscar Vicente/Mónica Boscaiu	Identify aspects important in abiotic stress breeding Understand methods used for abiotic stress breeding
Omics and marker assisted selection in vegetable crops breeding	Santiago Vilanova	Identify the applications of the omics tools in vegetable breeding Identify the applications of molecular markers in vegetable breeding
Joint work by groups for preparing specific breeding programme	Ana Fita	Locate, analyse, evaluate and synthesise information relevant to plant breeding.
Practical lab session (inoculation, phenotyping, etc.)	Salva Soler/ Mariola Plazas	Carry out specific phenotyping activities within the resistance breeding (inoculations, stress experiments, stress response measurements...)
Hybridization and development of hybrids in vegetables	M <sup>a</sup> José Díez	Describe methods that are used in production of hybrids Use jointly conventional breeding methods and new biotechnologies to produce hybrids
Visit to research greenhouses and practical session of hybridization	Mariola Plazas	Use hybridization techniques in vegetables
Breeding vegetables for biotic stresses for a more sustainable agriculture	M <sup>a</sup> José Díez	Carry out specific breeding activities, such as selection of parental germplasm, observation and recording of phenotypic variation and selection among progeny Use jointly conventional breeding methods and new biotechnologies to breed for resistance to biotic stresses
Visit to Instituto Valenciano de Investigaciones Agrarias/Rose nursery	Jaime Prohens	Understand the activities performed in a public centre of research and in a nursery company



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Travel to Murcia Almeria	Adrián Rodriguez	Compare the way of organize the breeding process in big seed company (Rijk Zwaan), and medium and small companies (Meridiem and Ramiro Arnedo)
Bioinformatics in vegetable crop breeding	Pietro/Santi	Use basic bioinformatic tolos in plant breeding
Breeding new vegetable crops for diversification	Jaime Prohens	Carry out specific breeding activities, for increase crop diversification
Seed production and regulations in the vegetable crops industry	Ana Fita/Salva Soler	Recognize the basic European directives for IP protection and basic regulations for seed production
Lab practice molecular markers	Ana Fita	Design microsatellite markers and CAPs to use in marker assisted selection
Visit to germplasm bank	M <sup>a</sup> José	Identify and describe methods to preserve plant genetic resources
Presentations of breeding programmes by groups	Ana Fita/M <sup>a</sup> José Diez/Adrián Rodriguez	Communicate background and processes in a plant breeding programme, and reasons that support them, to specialized audiences in a clear and unambiguous way
Round table: trends in vegetable breeding	Ana Fita/Jaime Prohens	Identify the factors and stakeholders which influence the breeding industry