

## PROGRAMME 02E4: BIOTECHNOLOGY AND GENETIC RESOURCES OF PLANTS AND ASSOCIATED MICROORGANISMS

### TRAINING ACTIVITIES

The proposed training activities are intended to be a coherent and coordinated proposal that includes both transversal and specific training in the field of Biotechnology and Genetic Resources of Plants and Associated Microorganisms. Each one of the training activities is related to the specific competences to be acquired by the students proposed in section 2 of this report. The offer of activities is aimed at all doctoral students, whether they are full-time or part-time students. The training activities carried out by each student, as well as the reports and certificates related to them, will be collected in the Doctoral Student Notebook of Activities.

<b>TRAINING ACTIVITY 1 (AF1)</b>	
<b>TITLE:</b> Research Seminars	
<b>DURATIONN:</b> 45 hours during the entire doctoral period (15 hours per year)	
<b>PLANNING:</b>	
<b>Justification</b>	The training of doctoral students should not be restricted solely to the specific field of their thesis topic. Therefore, it is necessary to provide them with a broader training in which they make contact with other methodologies and experimental approaches that may be useful for their current work or in their future as researchers. In addition, they must know what is the current state of research both in the field of Biotechnology and Genetic Resources, as well as in other related areas of knowledge. The development of this activity is related to the acquisition of the basic competence CB01 and with the specific competences CE01 and CE03 of the doctoral program.
<b>Content</b>	In the Research Centers attached to the Program and where the doctoral students carry out their work (CBGP, ETSIAAB), and in the collaborating centers (INIA) training seminars are given on specific topics within the field of Biotechnology and Genetic Resources, and in other associated areas. Other centers located in Madrid, such as the CNB, the CIB or the CBM (CSIC), also organize series of seminars that doctoral students can attend. These seminars, taught by visiting professors from Spanish and foreign universities or research centers, include theoretical concepts and advanced research methodologies. This activity is mandatory for all doctoral students, who must attend these seminars with a certain frequency to complete their training
<b>Temporal planning</b>	The seminars are offered within the academic year, between October and June, with a weekly or biweekly frequency..

<b>Training results</b>	With the completion of this activity, doctoral students will learn about different experimental techniques, including the most recent and innovative ones, applicable in Plant Biotechnology and in the management of Genetic Resources. In addition, they will become familiar with complex theoretical concepts, and will acquire an overview and current view of the state of the art of research in the area covered by this doctoral program.
<b>Language</b>	Spanish and English
<b>CONTROL PROCEDURES:</b> The control of this activity will be carried out by the tutor / director of the doctoral student, which will be reflected in a document that will be sent together with the annual report to the Doctoral Academic Committee. The Doctoral Student Follow-up Notebook. Attendance at a minimum of 10 seminars per academic year is required to consider this training activity passed, 1 or 2 of which could be held at collaborating centers (INIA). In the case of part-time students, they must attend 15 seminars during the entire training period.	

<b>TRAINING ACTIVITY 2 (AF2)</b>	
<b>TITL:</b> Participation in congresses	
<b>DURATION:</b> 50 hours	
<b>TRAINING ACTIVITY</b>	
<b>Justification</b>	The main objective of this activity is for the student to acquire the ability to function in scientific forums and to know how to transfer the knowledge generated in their research tasks to other researchers. The development of this activity is related to the acquisition of the basic competence CB05 and with the specific competences CE03 and CE06 of the doctoral program.
<b>Content</b>	During the doctoral period, doctoral students must attend at least one national and / or international scientific congress, and present an oral or written communication.
<b>Temporal planning</b>	At least once during the doctoral period, from the 2nd year.
<b>Training results</b>	This activity is essential in the training of the doctoral student and has the result of stimulating and fostering the capacity to communicate with the international scientific community in the ways and languages of habitual use. Like training seminars, attending congresses contributes to the scientific training of doctoral students, and facilitates their access to the most innovative methodologies and the most recently developed theoretical concepts. Finally, this activity is intended to help doctoral students establish links with other research groups, which is vital for the development of their scientific career.
<b>Justification</b>	Spanish and English
<b>CONTROL PROCEDURES:</b> The doctoral student must properly accredit attendance at the congress and the presentation of the communication by means of the corresponding certificate of attendance and the book of abstracts published at the congress. This information will be reflected in the Doctoral Student Follow-up Notebook.	

<b>TRAINING ACTIVITY 3 (AF3)</b>	
<b>TITLE:</b> Annual meeting of doctoral students	
<b>DURATION:</b> 30 hours (18 hours in person and 12 hours of preparation)	
<b>PLANNING :</b>	
<b>Justification</b>	It is important that throughout the doctoral training period, students critically review their work and present their experimental results to other students and researchers in the program. The development of this activity is related to the acquisition of the basic competences CB01 and CB02 and the specific competences CE02, CE05 and CE06 of the doctoral program
<b>Content</b>	Annually, all doctoral students will make a public presentation in which they will review the work carried out during the year and a proposal of the activities to be carried out in the following year. It will be an event in which all the doctoral students of the program and researchers who are part of it will attend, and it will be organized by thematic blocks. The number and duration of the blocks will depend on the number of students enrolled. The presentations of the research seminars will last 10-15 minutes. First year students may attend as listeners, and it will be in the 2nd and 3rd year when they present their results.
<b>Temporal planning</b>	This activity is mandatory and will have an annual periodicity, being held as a general rule at the end of the academic year (July).
<b>Training results</b>	The student will acquire the ability to summarize and assess the status of their research project. Discussing it with other researchers will allow the doctoral student to learn to make a critical judgment of their work, as well as to detect problems and propose short-term solutions.
<b>Language</b>	Spanish and English
<b>CONTROL PROCEDURES:</b> It will be necessary to attend each annual session until the year the thesis is presented. The information regarding the participation of the doctoral student will be included in the Doctoral Student Follow-up Notebook.	

<b>TRAINING ACTIVITY 4 (AF4)</b>	
<b>TITLE:</b> Publication of research articles	
<b>DURATION:</b> Variable	
<b>PLANNING :</b>	
<b>Justification</b>	The main mode of transmission of scientific knowledge generated by the doctorate both during their thesis and throughout their scientific career will be the publication of research articles. Therefore, during the completion of the doctorate it is considered essential that the doctoral student familiarizes himself with the procedure and structure of publication of a scientific article. The development of this activity is related to the acquisition of the basic competences CB03, CB04 and CB05, and with the specific competence CE09 of the doctoral program.
<b>Content</b>	The doctoral student will prepare a scientific article on some specific aspect

	of their thesis work.
<b>Temporal planning</b>	This activity is mandatory for all doctoral students and will be carried out throughout the doctorate period, usually in its final period.
<b>Training results</b>	Learning to prepare a research manuscript is essential as part of the training process of a doctoral student, since it allows developing the ability to synthesize, evaluate and discuss research results. In addition, the student becomes familiar with the process of publishing an article, including contact with editors, and reviewers for editing, review, and discussion of the work
<b>Language</b>	English
<b>CONTROL PROCEDURES:</b> The control will be the acceptance of the publication in a journal included in the JCR.	

<b>TRAINING ACTIVITY 5 (AF5)</b>	
<b>TITLE:</b> Complementary training in R&D	
<b>DURATION:</b> 20h	
<b>PLANNING :</b>	
<b>Justification</b>	Training in the field of technology transfer is essential for the professional future of doctoral students, so within the doctoral program they will be provided with a course on this topic. In addition, attendance at other training courses organized externally to the doctoral program will be recommended, in many cases at an international level, and which may involve training complements for the doctoral student in other very high-level subjects. The development of this activity is related to the acquisition of the basic competence CB01 and the specific competences CE02, CE03 and CE04 of the doctoral program.
<b>Content</b>	Within this activity, the completion of a course that will deal with the transfer of research to the business production sector is compulsory. Furthermore, other specialized technical training courses that deal in depth with a specific topic or courses of a general nature related to research or teaching activity are recommended. The courses may be taught by national or international Universities or Research Centers.
<b>Temporal planning</b>	The technology transfer course will be held annually at the CBGP, and all doctoral students who are in the 2nd or 3rd year of thesis may attend. Attendance to other external courses will be optional and may be done at any time during the doctorate, depending on the particular needs and availability of the doctoral student.
<b>Training results</b>	With this activity, the doctoral student completes their training in a basic aspect of their training, such as the transfer of knowledge generated for its practical application. It also helps to train him/her in other aspects, either in specific experimental techniques or in knowledge about a topic that can be applied in his/her thesis work or in his/her future as a researcher or teacher. It will also allow you to receive training in areas that are transversal to his/her research.
<b>Language</b>	Spanish and English

**CONTROL PROCEDURES:** The inclusion of a certain course as part of the curriculum will be done case by case in the academic committee. The student must present a brief report on the course and a certificate proving attendance.

<b>TRAINING ACTIVITY 6 (AF6)</b>	
<b>TITLE:</b> Formative stays	
<b>DURAION:</b> Variable	
<b>PLANNING :</b>	
<b>Justification</b>	In the training of researchers, it is essential to carry out stays in other research centers through which to develop their ability to communicate and integrate into another research group in addition to learning new methodologies. The completion of a stay is a mandatory requirement to opt for the International Doctorate, which will be encouraged in the students of the Program. The objective of the doctoral program is that at least 30% of the students complete a minimum stay of 3 months during the doctoral period. The development of this activity is related to the acquisition of the basic competences CB02 and CB05, and with the specific competences COE4, CE08 and CE10 of the doctoral program.
<b>Content</b>	Doctoral students will be encouraged to carry out research stays in foreign centers, but they will also be able to do them in national centers as long as it is duly justified and provides specific training for the student in the field of research of their doctoral thesis. The execution of this activity will depend on the particular circumstances of each doctoral student and their research, although it would be considered optimal to carry out at least a one-quarter stay abroad during the doctoral period. In the case of part-time students, shorter stays may be considered, depending on individual cases. Financing will be provided by the mobility grants of research grants or UPM own grants.
<b>Temporal planning</b>	At least once during the doctoral period, between the second year of enrollment in the program and before the thesis is submitted for processing.
<b>Training results</b>	With this activity, the ability of doctoral students to work both independently and as a team is developed in a scientific environment different from the usual one, both nationally and internationally. It also contributes to enhancing the autonomy, initiative and decision-making capacity of the doctoral student.
<b>Language</b>	English
<b>CONTROL PROCEDURES:</b> The stay must be approved by the Thesis Director and the Doctoral Academic Committee. After completing this stay, the doctoral student must submit a report on activities signed and stamped by the person responsible for the receiving center, who must also have the VºBº of the tutor and the thesis supervisor.	

<b>TRAINING ACTIVITY 7 (AF7)</b>	
<b>TITLE:</b> Science outreach activities	

<b>DURATION:</b> 5h	
<b>PLANNING :</b>	
<b>Justification</b>	One of the most important objectives of scientific knowledge is its transmission to society to contribute to its progress. Therefore, it is important for the doctoral student to exercise their ability to explain their work in a simple and easily understandable way for people unfamiliar with the subject. The development of this activity is related to the acquisition of the basic competence CB06 and the specific competence CE07 of the doctoral program.
<b>Content</b>	The participation of the doctoral student in the open days organized in their research center is recommended.
<b>Temporal planning</b>	This activity is optional and can be done at any time during the doctorate.
<b>Training results</b>	Learning to transmit the results of a research work in a simple and understandable way for those people who are not familiar with the field of Biotechnology and the management of Genetic Resources.
<b>Language</b>	Spanish and English
<b>CONTROL PROCEDURES:</b> The supervisor must submit a report specifying the role played by the Ph.D. in the scientific dissemination sessions.	