

Encontram-se abertas 2 candidaturas a estágios de Mestrado em *Biologia Celular e Biotecnologia* (ano lectivo 2009/2010), no Grupo Forest Biotech (ITQB/IBET, Oeiras). Pretendem-se candidatos com uma forte motivação e interesse em Investigação nas áreas de Biologia Molecular e Biotecnologia em Plantas.

Os Projectos de Mestrado (ver em baixo) terão a duração máxima de um ano. Os candidatos deverão enviar uma carta de apresentação, acompanhada de *Cv*, do qual deverão constar grau académico, classificação final e ano de conclusão, classificação em disciplinas pertinentes à área de candidatura, bem como quaisquer outros elementos que o candidato julgue valorizar a sua candidatura. Deverá acompanhar a candidatura 1 carta de recomendação. Dá-se preferência a alunos com média igual ou superior a 15 valores, bons conhecimentos de inglês e com interesse em prosseguir para doutoramento .

Projectos de Mestrado em *Biologia Celular e Biotecnologia* (ano lectivo 2009/2010)

Projecto 1

Tema do Projecto: Molecular Analysis of Class III HD-Zip transcription factors and role in plant vascular development

Sumário do projecto: In eukaryotes, transcription of protein-coding genes is controlled by complex networks of transcription factors. In *Arabidopsis* model plant, the transcription factors family Class III homeodomain-leucine zipper (HD-Zip III) genes have been reported to regulate vascular development. In trees, the role of these transcription factors is still largely unknown. The aim of this project is to functionally characterize the provascular and vascular organization in the woody poplar plants by the use of fluorescent markers. We propose as part of the project the cloning of poplar HD-Zip III orthologs genes and the heterologous expression in *Arabidopsis* will also be pursued. The transcriptional regulation of vascular development in plants is a competitive area of study, and we aim to contribute to the molecular understanding of the plant vascular patterning, development and wood formation processes.

The experimental work will involve:

- *In vitro* and greenhouse growth of poplar and *Arabidopsis* plants;
- Molecular cloning of HD-Zip III genes;
- Over-expression and silencing of HD-Zip III genes in poplar and *Arabidopsis* plants;
- Confocal microscopy for analysis of vascular development

Duração e carga horária - 6 meses a 1 ano, 35 horas semanais

Local de realização – Forest Biotech Laboratory, ITQB/IBET, Oeiras
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Projecto 2

Tema do Projecto: Functional studies of genes involved in maritime pine embryogenesis

Sumário do projecto: Most studies of plant embryogenesis have been conducted in angiosperms like the model plant *Arabidopsis* (Willemson e Scheres 2004, *Annu Rev Genet* 38:587–614). Despite the similarities in the embryogenesis of angiosperms and gymnosperms, the evolutionary divergence resulted in unique characteristics in the development of the embryo in both groups of plants. However, comparative molecular studies of embryo development in angiosperms and gymnosperms are still scarce (Cairney et al. 2006, *Plant Mol Biol* 62:485-501). In this project, the previously initiated functional characterization of genes involved in the embryogenesis of the gymnosperm species *Pinus pinaster* will be continued using somatic embryogenesis as an experimental system.

The experimental work will involve:

- Preparation of constructs for modulation of gene expression in somatic embryos;
- Genetic transformation of embryogenic cultures;
- Phenotype characterization and molecular analyses of transformants

Duração e carga horária - 6 meses a 1 ano, 35 horas semanais

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Número de estagiários – 1