PRE-DOCTORAL FELLOWSHIP OFFERED

We offer a pre-doctoral fellowship to carry out a PhD on **"Cap-independent translation of plant viral RNAs: dissection of the experimental model MNSV/melon and biotechnological applications".** This research line is part of a program developed at the Plant Pathology group of the CEBAS-CSIC (Murcia, Spain).

Specific sequences in viral RNAs must interact with each other and/or with viral and/or host factors for efficient translation, replication, RNA packaging and other processes that take place during the viral cycle. Often, these RNA elements reside in the 5´- and 3´-untranslated regions (UTRs) of viral RNAs. Their characterisation, as well as characterisation of the cellular factors interacting with them, has an obvious fundamental interest and, in addition, it may provide information on potential antiviral targets. In the present project, we propose the use of the experimental model constituted by *Melon necrotic spot virus* (MNSV) and melon to generate fundamental information on the mechanisms of cap-independent translation in plants. Using this model, our group has already shown than the eukaryotic translation initiation factor 4E (eIF4E) is a susceptibility factor for MNSV in melon, and that a short sequence in the 3´-UTR of the genomic viral RNA constitutes a cap-independent translational enhancer that confers host specificity to the virus. Thus, in the present project we propose to characterise the structural RNA elements which have a critical role in translation initiation and how these elements interact with each other and with host factors. More specifically, in this project we will test first whether efficient translation of MNSV RNAs depends or not on RNA circularisation and if a long distance RNA:RNA interaction among elements at the 5´- and 3´-UTRs of viral RNAs is required for this. Secondly, we will test if a direct interaction between viral RNA termini and translation initiation factors (eIF4E in the MNSV case) is also required for efficient translation of viral RNAs. Three dimensional models for these interactions will be proposed and tested. In addition, we pretend to use the available knowledge to generate melon transgenic plants potentially resistant to a broad range of viruses. This last objective has the additional purpose of setting up a critical tool for melon functional genomics in our laboratory.

Recent papers related to the project:

V. TRUNIGER, C. NIETO, D. GONZÁLEZ-IBEAS and M. A. ARANDA (2008). Mechanism of plant eIF4E-mediated resistance against a Carmovirus (*Tombusviridae*): cap-independent translation of a viral RNA controlled *in cis* by an (a)virulence determinant. ***The Plant Journal*** **56**(5): 716-727.

C. NIETO, M. MORALES, G. ORJEDA, C. CLEPET, A. MONFORT, B. STURBOIS, P. PUIGDOMENECH, M. PITRAT, M. CABOCHE, C. DOGIMONT, J. GARCIA-MAS, M. A. ARANDA and A. BENDAHMANE (2006). An eIF4E allele confers resistance to an uncapped and non-polyadenylated RNA virus in melon. ***The Plant Journal*** **48**(3): 452-462.

J. A. DÍAZ, C. NIETO, E. MORIONES, V. TRUNIGER and M. A. ARANDA (2004). Molecular Characterization of a Melon necrotic spot virus Strain That Overcomes the Resistance in Melon and Nonhost Plants. ***Molecular Plant-Microbe Interactions*** **17**(6): 668-675.

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Deadline: 30th January 2010.