Hands-on course on multiple gene assembly technologies for metabolic engineering and fruit biotechnology
Valencia, Spain, 9-13 September 2013

Jointly organized by COST Actions FA1006 (PlantEngine) and FA1106 (QualityFruit)

Abstract:

Understanding the processes underlying fruit development (COST 1106) and conducting complex metabolic engineering (COST 1006) projects benefit from the construction of increasingly complex multigenic constructs. The range of application of the assembly technologies ranges from engineering novel biosynthetic pathways to transcriptional regulatory

complexes. The assembly of several genes is still a challenge in many labs but the situation has changed recently with the improvements in gene synthesis and DNA assembly technologies.

Modular DNA construction technologies provide speed, versatility, lab autonomy, combinatorial potential and reduced costs. As any standardized methodology its maximum potential is achieved when it is used as a community resource as parts can be freely shared and exchanged. Recently two Modular Cloning strategies that facilitate multigene design in plants have been developed, namely MoClo and GoldenBraid.

The objective of this training school is to familiarize students from COST Actions FA1006 and FA1106 in the use of multigene assembly technologies. The course will provide hands on experience and will include (i) wet lab sessions aimed to guide the students through the different steps in the assembly technology, (ii) computer sessions for in silico assembly and computer-assisted design, and (iii) case-study lectures to exemplify applications of the technology for Plant Metabolic engineer and Fruit Biotechnology. Besides, trainees will receive a set of destination plasmids and laboratory protocols for training their multigene engineering skills back in their home laboratories.

Trainees will be supported by a grant of either of the COST Actions involved, covering travel and subsistence.

Course Coordinator:

Dr Diego Orzaez

Training School organizers

Heribert WARZECHA ……(COST Action FA1006)

Antonio GRANELL........... (COST Action FA1106)

Venue

Centro de Formación Permanente (CFP)

Universidad Politécnica de Valencia

Avda Tarongers SN

46022 Valencia

Spain

Dates

9.-13. September 2013

Capacity

20 Trainees (10 aprox from each FA1006 and FA1106 COST Actions)

Application procedure for Trainees:

Young researchers from countries which are member of **Cost Action QualityFruit (FA1106)** Actions willing to attend the training schools are invited to fill the online application form that will be sent toToni Granell : agranell@ibmcp.upv.es

Young researchers from countries which are members of the **COST Action PlantEngine (FA1006)** are invited to send a letter of intent (application) to COST Action FA1006: Heribert Warzecha: warzecha@bio.tu-darmstadt.de including:

*   CV
*   1 page of how their project would benefit from this TS
*   Letter of recommendation of head of the lab

Selection of participants will be made by each COST Action on the basis of the submitted information.

Preliminary Program

Aims and objectives of the course:

*   Promote the use of standard DNA assembly techniques in Plant Biotechnology.
*   Promote the exchange of genetic parts and information among European laboratories.
*   Train plant researchers in EU in advanced DNA assembly techniques
*   Foster applied research in Plant Metabolic Engineering and Fruit Biotechnology in Europe.

Preliminary Program

Monday, 9.9.			
Time? Noon?	Lecture room	Welcome address and introduction to PlantEngine and Fruit COSTs	
		Introduction to technique	

		Goldengate and MoClo	
		GoldenBraid	
Tuesday. 10.9.			
		In silico assembly design (I): Domestication	
		ISAD (II): Multipartite	
		ISAD (III): Binary	
		Lab assembly (I): Domestication	
		Lab assembly (I): Mulitpartite	
		Lab assembly (I): Binary	
Wednesday, 11.9.			
		Lab	
		ISAD: Free design options and dataset structure	
		FIELD Trip: IBMCP and Sightseen	
Thursday, 12.9.			
		Lab results	

		Application Lecture 1: Fruit Biotech	
		Application Lecture 2: TAL effectors	
		Application Lecture 3: Combinatorial SIIgA	
Friday, 13.9.			
		Application Lecture 4: Metabolic Engineering	
		Application lecture 5: Plastids	
		Farewell and departure	