

# Séminaire de Biologie des Plantes

Les séminaires ont lieu sur le Campus Montpellier SupAgro/INRA de La Gaillarde  
(2, place P. Viala Montpellier)

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**Jeudi 27 mai 2010**  
**Salle 106 (Cœur d'Ecole) à 14h00**

**Andreas Weber**

(Dusseldorf, Allemagne)

## **Towards a blueprint for C4 photosynthesis derived from comparative transcriptomics of closely related C3 and C4 species**

C4 photosynthesis involves alterations to the biochemistry, cell biology, and development of leaves. Together these modifications increase the efficiency of photosynthesis, and despite the apparent complexity of the pathway, it has evolved at least 45 times independently within the angiosperms. To provide insight into the extent to which gene expression is altered between C3 and C4 leaves, and to identify candidates associated with the C4 pathway we used massively-parallel mRNA sequencing of closely related C3 (*Cleome spinosa*) and C4 (*Cleome gynandra*) species. This analysis shows that 818 transcripts differ in abundance between these C3 and C4 leaves. This includes twenty transcription factors, putative transport proteins, as well as genes that in *A. thaliana* are implicated in chloroplast movement and expansion, plasmodesmatal connectivity, and suberin deposition. These are all characteristics known to alter in a C4 leaf, but which previously had remained undefined at the molecular level. Unexpectedly, we document a large reduction in transcripts encoding ribosomal subunits. Our approach defines the extent to which transcript abundance in these C3 and C4 leaves differs, provides a blueprint for the NAD-ME C4 pathway operating in a dicotyledon, and furthermore identifies potential regulators. We anticipate that comparative transcriptomics of closely related species will provide real insight into the evolution of other complex traits.

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Séminaires à venir :

- Jeudi 03 juin : Alain Vavasseur, Cadarache (contact Rémy Gibrat, [gibrat@supagro.inra.fr](mailto:gibrat@supagro.inra.fr))
- Jeudi 24 juin : Jerzy Paszkowski, (contact Claire Corratgé, [corratge@supagro.inra.fr](mailto:corratge@supagro.inra.fr))
- Jeudi 01 juillet : Dirk Becker, (contact Tou Cheu Xiong, [xiong@supagro.inra.fr](mailto:xiong@supagro.inra.fr))