

Schwerpunkt 3

„Molekulare Physiologie“

Gemeinsames Kolloquium

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Thema: *Evolution of C4 Photosynthesis –
Lessons from the Genus Flaveria*

C4 photosynthesis is characterised by a division of labour between two different leaf cell types, mesophyll and bundle sheath cells. The photosynthetic, but also other metabolic activities of these two cells are highly integrated and based on differential gene expression. The cell-type specific expression of genes is mostly controlled by transcription; however, post-transcriptional regulation has been reported, too. The C4 photosynthetic process concentrates CO₂ at the site of Rubisco in the bundle-sheath cells and due to this CO₂ pumping photorespiration is largely abolished. It follows that C4 plants achieve high rates of photosynthesis and are among the most effective producers of plant biomass. The C4 photosynthetic pathway is of polyphyletic origin indicating that in genetic terms it must have been relatively easy to evolve a C4 from a C3 ancestral species.

To understand the evolutionary genomics of C4 photosynthesis and to develop strategies for the introduction of the C4 photosynthetic pathway into C3 species, we are using the Asteracean genus Flaveria as a model system. Flaveria contains C3 and C4 species and, in addition, a large number of C3-C4 intermediates. This genus is therefore a playground of C4 evolution. To gain insight into C3-C4 associated changes in gene expression, the leaf transcriptomes from C3, C3-C4 and C4 Flaveria species were compared by using RNA seq technology. To identify the molecular changes in the cis-regulatory modules for mesophyll and bundle-sheath specific gene expression, respectively, the phosphoenolpyruvate carboxylase and glycine decarboxylase P protein gene families are currently being investigated. The implications of these findings for understanding C4 leaf anatomy will be discussed.

Ort: HS 18, Zoologie
Johann-Joachim-Becher-Weg 9

Zeit: Montag, 27. Januar 2014, 16.00 Uhr

Info: <http://iabserv.biologie.uni-mainz.de/167.php>

