nuclear-cytoplasmic partitioning is sufficient to regulate auxin transcriptional responsiveness in different tissues of the plant.

700-021 *Dissecting a New Connection between Cytokinin and Jasmonic Acid in Control of Leaf Growth*
Michael Muszynski – University of Hawai'i at Mānoa
Angel Del Valle-Echevarria – University of Hawai'i at Mānoa, Aimee Uyehara – University of Hawai'i at Mānoa, James Cahill – Iowa State University, Hilde Nelissen – VIB-UGhent Center for Plant Systems Biology, Charles Hunter – Chemistry Research Unit, CMAV-USDA, Georg Jander – Boyce Thompson Institute

Plant growth is mediated by two cellular processes: division and elongation. The maize leaf is an excellent model to study plant growth since these processes are spatially separated into discreet zones - a division zone (DZ), transition zone (TZ), and elongation zone (EZ) - at the base of the leaf. We are studying a semi-dominant maize mutant named Hairy Sheath Frayed1 (Hsf1) that displays reduced leaf growth caused by cytokinin hypersignaling. Cytokinin (CK) is a well-studied hormone which typically functions to promote cell proliferation but, depending on cellular context, it can also repress growth; although how repression is mediated is not well-defined. During our analysis of Hsf1, we discovered that the mutant over accumulates jasmonic acid (JA), a hormone previously shown to repress cell division and growth. This result suggested CK may crosstalk with JA in the control of leaf growth, which is a previously unrecognized connection and may explain one route by which CK can repress growth in certain tissues. We evaluated JA pathway gene expression levels in the division and elongation zones of the emerging leaf #4 of Hsf1/+ and wild type (WT) sibs by qRT-PCR. Several JA biosynthesis genes were significantly upregulated in the growth zone of mutants compared to WT sibs. In parallel, we used a bioinformatics approach to identify candidate transcription factors associated in gene regulatory networks (GRNs) with JA pathway genes. Based on this survey, we identified a transcription factor that was also CK responsive, as its expression level in the Hsf1 leaf growth zone was also significantly upregulated. Additional molecular and genetic studies will be presented suggesting that this proposed interaction contributes to leaf growth control.

700-022 *Salicylic Acid Biosynthesis Linked to the Cyanogenic Glycoside Pathway in Peach Plants*
Pedro Diaz-Vivancos – CEBAS-CSIC
Agustina Bernal-Vicente – CEBAS-CSIC, Daniel Cantabella – CEBAS-CSIC, Cesar Petri – UPCT, José Antonio Hernández – CEBAS-CSIC

Despite the long-established importance of salicylic acid (SA) in plant stress responses and other biological processes, the biosynthetic pathway of SA has not been fully characterized. The proposed SA synthesis originates from chorismate by two distinct pathways: isochorismate and penhylalanine (Phe) ammonia-lyase (PAL) pathways. Cyanogenesis is the process related to the release of toxic hydrogen cyanide from endogenous cyanogenic glycosides (CNglcs), and it has been linked to plant plasticity improvement. To date, however, no relationship has been suggested between both pathways. In this work, by different approaches, including a metabolomics approach using [13C]-labelled compounds, we provide strong evidence showing that CNglcs turnover is involved, at least in part, in SA biosynthesis in peach plants. The main CNglcs in peach are prunasin and amygdalin, with mandelonitrile (MD), synthesized from Phe, controlling their turnover. In peach plants MD is at the hub of SA biosynthetic and CNglcs pathways, regulating both the amygdalin and SA biosynthesis. MD-treated peach plants displayed increased SA levels via benzoic acid (SA precursor). In addition, MD also provides partial protection against Plum pox virus infection. Thus, we proposed a third pathway for SA synthesis in peach plants. This pathway is an alternative to the PAL pathway for SA biosynthesis from Phe.

700-023 *Progressive Alterations in Ultraviolet-B Induced Phototropism during Arabidopsis Development*
Lucas Pieter-Jan. Vanhaelewyn – Ghent University

Alejandro Serrano – CONICET IADIZA, Andras Viczian – Biological Research Centre of the Hungarian Academy of Sciences, Péter Bernula – Biological Research Centre of the Hungarian Academy of Sciences, Els Prinsen – University of Antwerp, Verónica Arana – CONICET INTA, Carlos Ballaré – CONICET, University of Buenos Aires and Universidad Nacional de San Martín, Dominique Van Der Straeten – Ghent University, Filip Vandenbussche – Ghent University

Low fluence rate ultraviolet-B radiation (280-315 nm) substantially affects plant morphology. Numerous UV-B induced morphological adaptations in Arabidopsis are ascribed to the UV-B specific photoreceptor UV RESISTANCE LOCUS 8 (UVR8). Well documented examples are shorter petioles and shorter stems. Alterations are also observed at the cellular level such as changes in cell elongation, division and differentiation. Notwithstanding this extensive knowledge of UV-B responses, the mechanisms by which UV-B radiation controls plant architecture are poorly understood.

Our recent research in Arabidopsis revealed that unilateral narrow-band UV-B radiation can induce reorientation of etiolated hypocotyls through UVR8 mediated signaling. This response is triggered by unilateral radiation of wavelengths shorter than 340 nm and is temporally distinct from phototropin-mediated phototropic bending. Analysis of the kinetics of plant reorientation allowed us to quantify the relative contribution of UVR8 and phototropins in steering this UV-B induced phototropic movement of etiolated hypocotyls. These data indicate that in etiolated seedlings, phototropins are more sensitive to UV-B for regulating phototropism than UVR8 and therefore mask the effect of UVR8. Phototropin signaling under UV-B is mechanistically similar to that in blue light, involving phototropin autophosphorylation and NPH3 dephosphorylation. Furthermore, the negative feedback controlled by REPRESSOR OF UV-B PHOTOMORPHOGENESIS prevents UVR8-mediated fast phototropin-dependent bending.

The UVR8-phototropin relationship described for etiolated seedlings is not universally applicable. We found that the main photoreceptor for UV-B-induced phototropism in inflorescence stems is UVR8, with a less significant role for phototropins. The contribution of UVR8 expressed in different cell layers to this response is currently being examined. Based on pharmacological assays, mutant analysis and reporter lines, this shifting role of UVR8 and phototropins during plant development will be presented and discussed.

700-024 *A Kinetic Analysis of Auxin Metabolic Network in Arabidopsis*

Qian Tang – University of Minnesota
Jerry Cohen – University of Minnesota, Peng Yu – Technische Universität München, Yuan Xu – University of Minnesota, Dana Freund – University of Minnesota, Molly Tillmann – University of Minnesota

The phytohormone auxin plays a critical role in plant growth and development. Maintenance of auxin homeostasis involves multi-pathways for biosynthesis of indole-3-acetic acid (IAA), the primary bioactive auxin in plants, and its subsequent catabolic processes including deactivation and conjugation. With the advance of analytical and computational capacities, significant progress in elucidating IAA metabolic pathways has been made. However, key components such as intermediates and enzymes involved in IAA metabolic pathways have not been fully characterized, and the dynamic regulation of IAA metabolism in response of endogenous and environmental signals has not been completely revealed. We are developing methods to survey Arabidopsis seedlings for their changing indolic profile under different growth conditions. A rapid stable isotope labeling approach will allow for tracing the turnover rates of essentially all IAA precursors with a time scale of seconds to minutes. The path of carbon from precursor to intermediate pools are then followed and analyzed. With this approach, all indolic compounds involved in IAA biosynthesis will be identified and quantified concurrently using high resolution and accurate mass (HR/AM) mass spectrometry. This kinetic labeling method, coupled with sensitive analytical instrumentation, will not only help to depict the relative contributions