

Nature

□ Article | 27 May 2019

[CAT tails drive degradation of stalled polypeptides on and off the ribosome](#)

Alanine and threonine residues added to the C terminus of stalled nascent chains (CAT tails) increase degradation of such polypeptides by promoting their ubiquitylation by Ltn1 or by acting as degrons off the ribosome.

Cole S. Sitron, & Onn Brandman, □

□ Article | 27 May 2019

[The structure of the stress-induced photosystem I–IsiA antenna supercomplex](#)

Cyanobacteria express IsiA, a photosystem I antenna, in response to stress. The structure of the photosystem I–IsiA complex reveals flexibility of the interactions within the complex and suggests the mechanism of energy transfer.

Hila Toporik, Jin Li & Yuval Mazor

Victor P. Bulgakov et al, Coordination of ABA and Chaperone Signaling in Plant Stress Responses, *Trends in Plant Science* (2019). [DOI: 10.1016/j.tplants.2019.04.004](https://doi.org/10.1016/j.tplants.2019.04.004)

Lost' book of exquisite scientific drawings rediscovered after 190 years



National Geographic

Decades of searching have uncovered brilliantly illustrated plants and detailed notes made by a U.S. woman living in Cuba in the 1800s. [READ MORE](#)

Early View Alert: Plant, Cell & Environment

[Neighbour signals perceived by phytochrome B increase thermotolerance in *Arabidopsis*](#)

Denise Arico, Martina Legris, Luciana Castro, Carlos Fernando Garcia, Aldana Laino, Jorge José Casal, Maria Agustina Mazzella

Version of Record online: 28 May 2019

Non acclimated *Arabidopsis thaliana* plants grown under low-red/far-red ratios typical of neighbouring vegetation are more tolerant to heat stress than plants grown under simulated sunlight. Thermotolerance under low red/far-red ratios is mediated by phyB. Lowering phyB activity reduced the levels of fatty acid desaturase transcripts and the levels of unsaturated fatty acids and increase thermotolerance. In young, etiolated seedlings, thermotolerance is also increased in *phyB* mutants of dark-grown seedlings but by different mechanisms. The reduced photosynthetic capacity linked to thermotolerant membranes would be less costly under shade environments.

[Interactions between hydrogen sulphide and nitric oxide regulate two soybean citrate transporters during the alleviation of aluminium toxicity](#)

Huahua Wang, Fang Ji, Yangyang Zhang, Junjie Hou, Wenwen Liu, Junjun Huang, Weihong Liang

Version of Record online: 26 May 2019

Here, we identified and characterized two soybean citrate transporters mediating Al-induced citrate exudation. Furthermore, this study revealed the crosstalk between NO and H₂S in the regulation of citrate transporters, thereby conferring citrate efflux and Al resistance.

Molecular & Cellular Proteomics March 27, 2019, mcp.RA119.001378; <https://doi.org/10.1074/mcp.RA119.001378>

[Quantitative early auxin root proteomics](#)

The cover of the June issue of MCP features work by Dior Kelley's lab at Iowa State University. Their proteomic analyses identified hundreds of root proteins that display dynamic responses following auxin signaling. They also uncovered a novel protein required for root stem cell maintenance.

Auxin induces rapid gene expression changes throughout root development. How auxin induced transcriptional responses relate to changes in protein abundance is not well characterized. This report identifies early auxin responsive proteins in roots at 30 minutes and 2 hours after hormone treatment using a quantitative proteomics approach in which 3,514 proteins were reliably quantified. A comparison of the >100 differentially expressed proteins at each the time point showed limited overlap suggesting a dynamic and transient response to exogenous auxin. Several proteins with established roles in auxin mediated root development exhibited altered abundance, providing support for this approach. While novel targeted proteomics assays demonstrate that all six auxin receptors remain stable in response to hormone. Additionally, 15 of the top responsive proteins display root and/or auxin response phenotypes, demonstrating the validity of these differentially

expressed proteins. Auxin signaling in roots dictates proteome reprogramming of proteins enriched for several gene ontology terms, including transcription, translation, protein localization, thigmotropism, and cell wall modification. In addition, we identified auxin-regulated proteins that had not previously been implicated in auxin response. For example, genetic studies of the auxin responsive protein GALACTURONOSYLTRANSFERASE 10 demonstrate that this enzyme plays a key role in root development. Altogether these data complement and extend our understanding of auxin response beyond that provided by transcriptome studies and can be used to uncover novel proteins that may mediate root developmental programs.

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J Exp Bot. 2019 Jun 6;. [Epub ahead of print] PMID: 31173086 [PubMed - as supplied by publisher]

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Mol Biol Cell. 2019 Jun 5;. mbcE19010069. PMID: 31166830 [PubMed - as supplied by publisher]

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Nitrite and nitric oxide are important in the adjustment of primary metabolism during the hypersensitive response in tobacco.
J Exp Bot. 2019 Apr 10;. PMID: 31173640 [PubMed - as supplied by publisher]

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Ammonium regulates Fe deficiency responses by enhancing nitric oxide signaling in *Arabidopsis thaliana*.
Planta. 2019 Jun 5;. PMID: 31168664 [PubMed - as supplied by publisher]

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Nitric oxide accelerates germination via the regulation of respiration in chickpea.
J Exp Bot. 2019 Apr 24;. [Epub ahead of print] PMID: 31162578 [PubMed - as supplied by publisher]

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Author Correction: Mitochondrial metabolism promotes adaptation to proteotoxic stress.
Nat Chem Biol. 2019 Jun 4;. PMID: 31164776 [PubMed - as supplied by publisher]

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Late steps in bacterial translation initiation visualized using time-resolved cryo-EM.
Nature. 2019 May 20;. [Epub ahead of print] PMID: 31108498 [PubMed - as supplied by publisher]

Molecular Cell : Volume 74, Issue 5

[ER and Nutrient Stress Promote Assembly of Respiratory Chain Supercomplexes through the PERK-eIF2 \$\alpha\$ Axis](#)

Pages 877-890.e6

Available Online 2019-04-22

Eduardo Balsa, Meghan S. Soustek, Ajith Thomas, Sara Cogliati, Carolina García-Poyatos, Elena Martín-García, Mark Jedrychowski, Steve P. Gygi, José Antonio Enriquez, Pere Puigserver

Nature Biotech

[NRT1.1B is associated with root microbiota composition and nitrogen use in field-grown rice](#)

Rice coordinates recruitment of the root microbiota to optimize nitrogen acquisition from soil.

Jingying Zhang, Yong-Xin Liu[...] & Yang Bai

Plant Cell

Tomato MYB21 Acts in Ovules to Mediate Jasmonate-Regulated Fertility

Ramona Schubert, Susanne Dobritzsch, Cornelia Gruber, Gerd Hause, Benedikt Athmer, Tom Schreiber, Sylvestre Marillonnet, Yoshihiro Okabe, Hiroshi Ezura, Ivan F. Acosta, Danuse Tarkowska and Bettina Hause

Plant Cell 2019 31: 1043-1062. First Published on March 20, 2019; doi:10.1105/tpc.18.00978 **OPEN**

<http://www.plantcell.org/content/31/5/1043.abstract>

Jasmonate function is necessary for proper development of ovules in tomato and is at least partially mediated by SIMYB21 as revealed by analyses of different mutants, transcriptomics, and hormone measurements.

Journal of Plant Physiology : Volume 238

[Enhanced nitric oxide generation mitigates cadmium toxicity via superoxide scavenging leading to the formation of peroxynitrite in barley root tip](#)

Pages 20-28

Available Online 2019-05-16

Loriana Demecsová, Beáta Bočová, Veronika Zelinová, Ladislav Tamás

The Plant Journal, Vol. 98, No. 6, June 2019

[Hybrid sequencing reveals insight into heat sensing and signaling of bread wheat](#)

Xiaoming Wang, Siyuan Chen, Xue Shi, Danni Liu, Peng Zhao, Yunze Lu, Yanbing Cheng, Zhenshan Liu, Xiaojun Nie, Weining Song, Qixin Sun, Shengbao Xu, Chuang Ma

Pages: 1015-1032 | First Published: 19 March 2019

Hybrid sequencing illustrates the spatio-temporal landscape of heat adaptations in wheat filling grain and flag leaves at isoform resolution, providing the most comprehensive heat-responsive transcripts to date. These data demonstrate that heat sensing and signaling are more rapid than previously assumed, they uncover the earliest heat-responsive events, and highlight the evolutionary divergence and advantages of the polyploid nature of wheat in environmental adaptations.

[Pooled CRISPR/Cas9 reveals redundant roles of plastidial phosphoglycerate kinases in carbon fixation and metabolism](#)

Ruizi Li, Zhimin Qiu, Xiaoguo Wang, Pingping Gong, Qinzhen Xu, Qing-bo Yu, Yuefeng Guan

Pages: 1078-1089 | First Published: 04 March 2019

There have been debates on whether different plastidial PGK isoforms play specialized or redundant roles in plastidial glycolysis and the Calvin cycle. Utilizing CRISPR/Cas9 and biochemical, metabolomic and lipidomic approaches, we found that Arabidopsis PGKp isozymes serve redundant, but essential, functions in carbon fixation, metabolism and galactoglycerolipids biosynthesis in chloroplasts.

MyROOT: a method and software for the semiautomatic measurement of primary root length in Arabidopsis seedlings

Isabel Betegón-Putze, Alejandro González, Xavier Sevillano, David Blasco-Escámez, Ana I. Caño-Delgado

Pages: 1145-1156 | First Published: 27 February 2019

MyROOT fills an existing gap in the root phenotyping field. This software performs a highly accurate root length measurement of seedlings growing directly on agar plates, while significantly minimizing the user intervention required during the process.

Plant Cell

Auxin-Mediated Cell Cycle Activation during Early Lateral Root Initiation

Siobhan M. Brady

Plant Cell 2019 31: 1188-1189. First Published on May 2, 2019; doi:10.1105/tpc.19.00322 **OPEN**

<http://www.plantcell.org/content/31/6/1188>

Too Close to the Flame: Duplicated *ICARUS* Genes and Growth at Higher Temperatures

Patrice A. Salomé

Plant Cell 2019 31: 1216-1217. First Published on May 2, 2019; doi:10.1105/tpc.19.00323 **OPEN**

<http://www.plantcell.org/content/31/6/1216>

Genetic Interactions and Molecular Evolution of the Duplicated Genes *ICARUS2* and *ICARUS1* Help Arabidopsis Plants Adapt to Different Ambient Temperatures

Belén Méndez-Vigo, Israel Ausín, Wangsheng Zhu, Almudena Mollá-Morales, Sureshkumar Balasubramanian and Carlos Alonso-Blanco

Plant Cell 2019 31: 1222-1237. First Published on April 16, 2019; doi:10.1105/tpc.18.00938

<http://www.plantcell.org/content/31/6/1222.abstract>

Genetic and functional analyses of the duplicated genes *ICARUS2* and *ICARUS1* in Arabidopsis demonstrate that their natural variation interacts to regulate thermal developmental plasticity.

An RNA Chaperone-Like Protein Plays Critical Roles in Chloroplast mRNA Stability and Translation in Arabidopsis and Maize

Jingjing Jiang, Xin Chai, Nikolay Manavski, Rosalind Williams-Carrier, Baoye He, Andreas Brachmann, Daili Ji, Min Ouyang, Yini Liu, Alice Barkan, Jörg Meurer, Lixin Zhang and Wei Chi

Plant Cell 2019 31: 1308-1327. First Published on April 8, 2019; doi:10.1105/tpc.18.00946

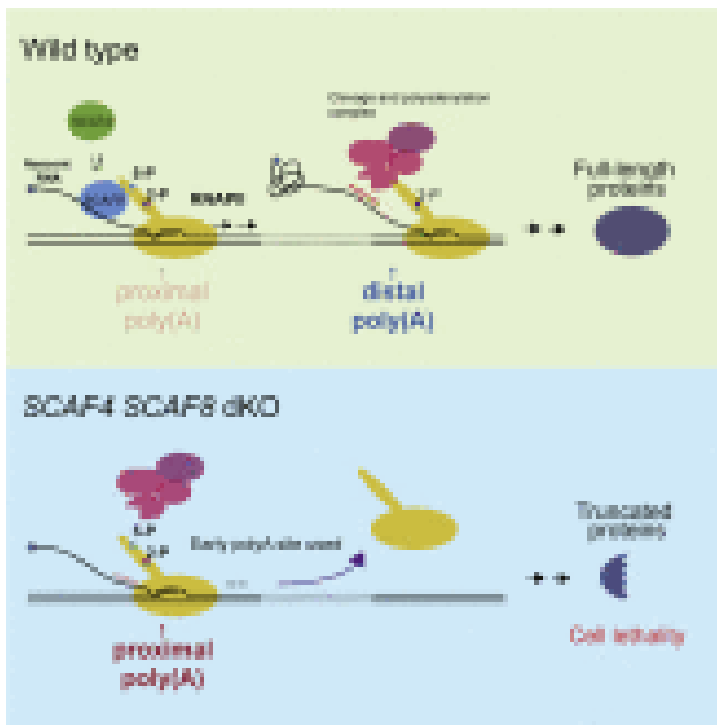
<http://www.plantcell.org/content/31/6/1308.abstract>

An RNA-chaperone-like protein stabilizes 3' processed transcripts of *photosynthetic electron transfer B* (*petB*) and stimulates the translation of *petD* and *petA* in the chloroplasts of vascular plants.

CELL

[SCAF4 and SCAF8, mRNA Anti-Terminator Proteins](#)

Pages 1797-1813.e18 Available Online 2019-05-16



A Growth-Based Framework for Leaf Shape Development and Diversity

Lea H. Gregersen, Richard Mitter, Alejandro P. Ugalde, Takayuki Nojima, Nicholas J. Proudfoot, Reuven Agami, Aengus Stewart, Jesper Q. Svejstrup

During development, complex shapes are elaborated from simple origins. Studying plant leaves, Kierzkowski *et al.* use live imaging and computational modeling to deconstruct the growth patterns of a simple leaf compared with those of a complex dissected leaf. Both sorts of leaf use the same tools for growth. The differing outcomes result from shifts in deployment of growth and differentiation programs. Delayed differentiation allows small protrusions to elaborate. Interspersed sites of growth inhibition accentuate protrusions. Thus, diversity in leaf shape is achieved by shifting the regulation of overall differentiation and local growth. The regulatory logic, resembling an incomplete feed-forward loop, might allow fine-tuning of shape without changing overall size.

Cell **177**, 1405 (2019).

Drug development

Top CRISPR researchers at two University of California (UC) campuses have teamed up with pharmaceutical giant GlaxoSmithKline (GSK) to form a new laboratory in San Francisco that will jointly exploit the genome editor to find new drugs. UC Berkeley's Jennifer Doudna, a co-inventor of the powerful CRISPR tool, and UC San Francisco's Jonathan Weisman will select the academic talent to work in the new Laboratory for Genomics Research, which will identify new drug targets by using CRISPR to probe genome function. In all, GSK will fund 24 full-time UC researchers and contribute as many as 14 of its own employees. GSK has committed up to \$67 million over 5 years for the unusual drug-screening effort. UC will own the intellectual property behind any new tools invented in the lab, while GSK will own the patents on the new drug targets.

Science

[Cryo-EM structure of the mammalian ATP synthase tetramer bound with inhibitory protein IF1](#)

Science 14 Jun 2019:

Vol. 364, Issue 6445, pp. 1068-1075 DOI: 10.1126/science.aaw4852

[Mutation of a bHLH transcription factor allowed almond domestication](#)

R. Sánchez-Pérez, S. Pavan, R. Mazzeo, C. Moldovan, R. Aiese Cigliano, J. Del Cueto, F. Ricciardi, C. Lotti, L. Ricciardi, F. Dicenta, R. L. López-Marqués, B. Lindberg Møller

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MicroRNA-guided regulation of heat stress response in wheat.
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J Exp Bot. 2019 Jun 13;. [Epub ahead of print] PMID: 31197351 [PubMed - as supplied by publisher]

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Plant Physiol Biochem. 2019 May 29;141:225-230. PMID: 31185367 [PubMed - as supplied by publisher]

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Gasotransmitters in Action: Nitric Oxide-Ethylene Crosstalk during Plant Growth and Abiotic Stress Responses.

Antioxidants (Basel). 2019 Jun 8;8(6). PMID: 31181724 [PubMed]

Current Opinion in Chemical Biology : Volume 50 Next Generation Therapeutics

[Using chemical inhibitors to probe AAA protein conformational dynamics and cellular functions](#)

Pages 45-54 Available Online 2019-03-23

Jonathan B Steinman, Tarun M Kapoor