

July 20, 2018

Journal of Agronomy and Crop Sci... Content Alert (New Articles)

Grain yield of wheat (*Triticum aestivum* L.) under long-term heat stress is sink-limited with stronger inhibition of kernel setting than grain filling

Birgit W. Hütsch, Dana Jahn and Sven Schubert

Version of Record online: 12 JUL 2018 | DOI: 10.1111/jac.12298

Cell

mTORC1 Controls Phase Separation and the Biophysical Properties of the Cytoplasm by Tuning Crowding

[Volume 174, Issue 2](#), 12 July 2018, Pages 338-349.e20

<https://doi.org/10.1016/j.cell.2018.05.042> (2018)

-GEMs enable high-throughput microrheology in unperturbed living cells

-mTORC1 controls diffusion by tuning ribosome concentration

-Diffusion can be accurately predicted as a function of ribosome concentration

-Crowding of the cytoplasm by ribosomes increases phase separation

[Macromolecular crowding](#) has a profound impact on reaction rates and the physical properties of the cell interior, but the mechanisms that regulate crowding are poorly understood. We developed genetically encoded [multimeric](#) nanoparticles (GEMs) to dissect these mechanisms. [GEMs](#) are homomultimeric scaffolds fused to a [fluorescent protein](#) that self-assemble into bright, stable particles of defined size and shape. By combining tracking of GEMs with genetic and pharmacological approaches, we discovered that the mTORC1 pathway can modulate the effective diffusion coefficient of particles ≥ 20 nm in diameter more than 2-fold by tuning [ribosome](#) concentration, without any discernable effect on the motion of molecules ≤ 5 nm. This change in ribosome concentration affected phase separation both *in vitro* and *in vivo*. Together, these results establish a role for mTORC1 in controlling both the mesoscale biophysical properties of the cytoplasm and biomolecular condensation.

Plant, Cell & Environment Content Alert (New Articles)

Autophagy and its Role in Plant Abiotic Stress Management

Tamar Avin-Wittenberg

Accepted manuscript online: 11 JUL 2018 12:00AM EST | DOI: 10.1111/pce.13404

Hayes MH, Peuchen EH, Dovichi NJ, Weeks DL.

Dual roles for ATP in the regulation of phase separated protein aggregates in *Xenopus* oocyte nucleoli.

Elife. 2018 Jul 17;7. PMID: 30015615 [PubMed - in process]

Vidya SM, Kumar HSV, Bhatt RM, Laxman RH, Ravishankar KV.

Transcriptional profiling and genes involved in acquired thermotolerance in Banana: a non-model crop.

Sci Rep. 2018 Jul 16;8(1):10683. PMID: 30013168 [PubMed - in process]

Lu M, Hellmann HA, Liu Y, Wang W.

Editorial: Protein Quality Controlling Systems in Plant Responses to Environmental Stresses.

Front Plant Sci. 2018;9:908. PMID: 30008731 [PubMed]

Zhan N, Wang C, Chen L, Yang H, Feng J, Gong X, Ren B, Wu R, Mu J, Li Y, Liu Z, Zhou Y, Peng J, Wang K, Huang X, Xiao S, Zuo J.

S-Nitrosylation Targets GSNO Reductase for Selective Autophagy during Hypoxia Responses in Plants.

Mol Cell. 2018 Jul 5;71(1):142-154.e6. PMID: 30008318 [PubMed - in process]

Hao Y, Yang W, Ren J, Hall Q, Zhang Y, Kaplan JM.

Thioredoxin shapes the *C. elegans* sensory response to *Pseudomonas* produced nitric oxide.

Elife. 2018 Jul 17;7. [Epub ahead of print] PMID: 30014846

Sammaibashi S, Yamayoshi S, Kawaoka Y.

Strain-Specific Contribution of Eukaryotic Elongation Factor 1 Gamma to the Translation of Influenza A Virus Proteins.

Front Microbiol. 2018;9:1446. PMID: 30008712 [PubMed]

The FEBS Journal Content Alert (New Articles)

TAF7 is a heat-inducible unstable protein and is required for sustained expression of heat shock protein genes

Mayumi Nagashimada, Takumi Ueda, Yuichiro Ishita and Hiroshi Sakurai

Antioxidants & Redox Signaling Vol. 29, No. 7, September 1, 2018 is now available online

Mitochondrial Uncoupling Proteins: Subtle Regulators of Cellular Redox Signaling

Petr Jeřek, Blanka Holendova, Keith D. Garlid, and Martin Jaburek

Antioxidants & Redox Signaling, Vol. 29, No. 7, September 2018: 667-714.

[Abstract](#) | [Full Text](#) | [PDF \(2876 KB\)](#) | [PDF Plus \(2074 KB\)](#)

Ueda M, Matsui A, Nakamura T, Abe T, Sunaoshi Y, Shimada H, Seki M.

Versatility of HDA19-deficiency in increasing the tolerance of Arabidopsis to different environmental stresses. *Plant Signal Behav.* 2018 Jul 26;:1-4. PMID: 30047814 [PubMed - as supplied by publisher]

Gomes E, Shorter J.

The molecular language of membraneless organelles.

J Biol Chem. 2018 Jul 25;. PMID: 30045872 [PubMed - as supplied by publisher]

Shatov VM, Weeks SD, Strelkov SV, Gusev NB.

The Role of the Arginine in the Conserved N-Terminal Domain RLFDQxFG Motif of Human Small Heat Shock Proteins HspB1, HspB4, HspB5, HspB6, and HspB8.

Int J Mol Sci. 2018 Jul 20;19(7). PMID: 30036999 [PubMed - in process]

Chakravarty AK, Jarosz DF.

More than Just a Phase: Prions at the Crossroads of Epigenetic Inheritance and Evolutionary Change.

J Mol Biol. 2018 Jul 18;. PMID: 30031007 [PubMed - as supplied by publisher]

Li B, Gao K, Ren H, Tang W.

Molecular mechanisms governing plant responses to high temperatures.

J Integr Plant Biol. 2018 Jul 20;. PMID: 30030890 [PubMed - as supplied by publisher]

Hamada T, Yako M, Minegishi M, Sato M, Kamei Y, Yanagawa Y, Toyooka K, Watanabe Y, Hara-Nishimura I.

Stress granule formation is induced by a threshold temperature rather than a temperature difference in Arabidopsis.

J Cell Sci. 2018 Jul 20;. PMID: 30030372 [PubMed - as supplied by publisher]

Ghezzi D, Zeviani M.

Human diseases associated with defects in assembly of OXPHOS complexes.

Essays Biochem. 2018 Jul 20;62(3):271-286. PMID: 30030362 [PubMed - in process]

He Y, Xue H, Li Y, Wang X.

NO alleviated cell death through protein S-nitrosylation and transcriptional regulation during the ageing of elm seeds.

J Exp Bot. 2018 Jul 25;. PMID: 30053069 [PubMed - as supplied by publisher]

Adavi SB, Sathee L.

Elevated CO₂-induced production of nitric oxide differentially modulates nitrate assimilation and root growth of wheat seedlings in a nitrate dose-dependent manner.

Protoplasma. 2018 Jul 21;. PMID: 30032354 [PubMed - as supplied by publisher]

Iglesias MJ, Terrile MC, Correa-Aragunde N, Colman SL, Izquierdo-lvarez A, Fiol DF, Pars R, Snchez-Lpez N, Marina A, Caldern Villalobos LIA, Estelle M, Lamattina L, Martnez-Ruiz A, Casalongu CA.

Regulation of SCF^{TIR1/AFBs}; E3 ligase assembly by S-nitrosylation of Arabidopsis SKP1-like1 impacts on auxin signaling.

Redox Biol. 2018 Jul 6;18:200-210. PMID: 30031268 [PubMed - as supplied by publisher]

Ruiz-May E, Segura-Cabrera A, Elizalde-Contreras JM, Shannon LM, Loyola-Vargas VM.

A recent advance in the intracellular and extracellular redox post-translational modification of proteins in plants.

J Mol Recognit. 2018 Jul 23;:e2754. PMID: 30033658 [PubMed - as supplied by publisher]

Ingolia NT, Hussmann JA, Weissman JS.
Ribosome Profiling: Global Views of Translation.
Cold Spring Harb Perspect Biol. 2018 Jul 23;PMID: 30037969

Mol. Cell 10.1016/j.molcel.2018.06.001 (2018).

Transfer RNAs (tRNAs), the adaptor molecules between messenger RNAs (mRNAs) and ribosomes during translation, are subjected to various types of chemical modifications, one of which is *N*⁷-methylguanosine (m⁷G). Mutations in the human m⁷G methyltransferase complex lead to developmental disorders such as microcephalic primordial dwarfism and Down syndrome. Lin *et al.* mapped the m⁷G tRNA methylome at single-nucleotide resolution and demonstrated its essential role in mouse embryonic stem cells. Depletion of members of the m⁷G methyltransferase complex resulted in increased ribosome pausing on, and inefficient translation of, mRNAs involved in the cell cycle and brain development, thereby disrupting differentiation to neural lineages. This study is an important step toward a fuller understanding of how defects in tRNA methylation cause neurodevelopmental disorders.

Plant Journal

Natural Genetic Variation Shapes Root System Responses to Phytohormones in Arabidopsis

Daniela Ristova, Marco Giovannetti, Kristina Metesch and Wolfgang Busch
Accepted manuscript online: 21 JUL 2018 12:00AM EST | DOI: 10.1111/tjp.14034

Physiologia Plantarum Content Alert: 163, 4 (August 2018)

Changes in the mitochondrial proteome of developing maize seed embryos (pages 552–572)

Wei-Qing Wang, Yue Wang, Qi Zhang, Ian M. Møller and Song-Quan Song
Version of Record online: 27 APR 2018 | DOI: 10.1111/ppl.12725

Cell

What Is the Next Frontier in Plant Engineering?

Pages 499-500

A Molecular Grammar Governing the Driving Forces for Phase Separation of Prion-like RNA Binding Proteins Original

Research Article

Pages 688-699.e16

Jie Wang, Jeong-Mo Choi, Alex S. Holehouse, Hyun O. Lee, Xiaojie Zhang, Marcus Jahnel, Shovamayee Maharana, Régis Lemaitre, Andrei Pozniakovsky, David Drechsel, Ina Poser, Rohit V. Pappu, Simon Alberti, Anthony A. Hyman
Current Opinion in Chemical Biology: Alert 20 July-27 July

Targeted protein degradation and the enzymology of degraders Review Article

Pages 47-55

Stewart L Fisher, Andrew J Phillips

Physiologia Plantarum Content Alert (New Articles)

DNA repair in plant mitochondria – A complete base excision repair pathway in potato tuber mitochondria

Beatriz Ferrando, Ana Luiza Dorigan de Matos Furlanetto, Ricardo Gredilla, Jesper F. Havelund, Kim H. Hebelstrup, Ian Max Møller and Tinna Stevnsner

Accepted manuscript online: 23 JUL 2018 12:00AM EST | DOI: 10.1111/ppl.12801

PLOS Biology Volume 16(7) July 2018

Highly diverged novel subunit composition of apicomplexan F-type ATP synthase identified from *Toxoplasma gondii*

Rahul Salunke, Tobias Mourier, Manidipa Banerjee, Arnab Pain, Dhanasekaran Shanmugam

The mitochondrial F-type ATP synthase from the human pathogen *Toxoplasma gondii* consists of many novel subunits, evolutionarily conserved in related parasitic and free-living apicomplexan, chromerid and dinoflagellate species.

CellProfiler 3.0: Next-generation image processing for biology

Claire McQuin, Allen Goodman, Vasilij Chernyshev, Lee Kametsky, Beth A. Cimini, Kyle W. Karhohs, Minh Doan, Liya Ding, Susanne M. Rafelski, Derek Thirstrup, Winfried Wiegraabe, Shantanu Singh, Tim Becker, Juan C. Caicedo, Anne E. Carpenter

The release of CellProfiler version 3.0 adds the ability to analyze images in three dimensions; this article describes the technological improvements that will make you want to upgrade.

PLOS Genetics Volume 14(7) July 2018

[Sequence features governing aggregation or degradation of prion-like proteins](#)

Plant, Cell & Environment Content Alert (New Articles)

Sean M. Cascarina, Kacy R. Paul, Satoshi Machihara, Eric D. Ross

Modulation of auxin signaling through *DIAGETROPICA* and *ENTIRE* differentially affects tomato plant growth via changes in photosynthetic and mitochondrial metabolism

William Batista Silva, David B. Medeiros, Acácio Rodrigues-Salvador, Danilo M. Daloso, Rebeca P. Omena-Garcia, Franciele Santos Oliveira, Lilian Ellen Pino, Lázaro Eustáquio Pereira Peres, Adriano Nunes-Nesi, Alisdair R. Fernie, Agustín Zsögön and Wagner L. Araújo

Accepted manuscript online: 31 JUL 2018 12:00AM EST | DOI: 10.1111/pce.13413

By using tomato mutants with either increased (*entire*) or reduced (*diageotropica - dgt*) auxin signaling, we show that these mutations differentially compromise photosynthetic capacity and alter primary metabolism, modulating growth through significant alterations in the mitochondrial respiratory process.

Nature Structural & Molecular Biology Contents: 2018 Volume #25 pp 641 – 744

[Structure of a mitochondrial fission dynamin in the closed conformation](#)

The mitochondrial fission dynamin (Dnm1) from an algae is captured in a closed conformation, with the GTPase domain compacted against the stalk. This work indicates that formation of the closed conformation may contribute to membrane fission. Olga Bohuszewicz & Harry H. Low

Nature Plants

[Commonalities and differences of chloroplast translation in a green alga and land plants](#)

Chloroplast translation is critical for chloroplast biogenesis. The degree of conservation and divergence of chloroplast translation among different plant species is still enigmatic. Now, a targeted ribosome-profiling approach was applied in three model plants to tackle this problem. Raphael Trösch, Rouhollah Barahimpour [...] & Felix Willmund

[Maternal auxin supply contributes to early embryo patterning in *Arabidopsis*](#)

In *Arabidopsis*, the pattern of auxin in the early embryo and surrounding tissues before and after pollination suggests that the auxin needed for embryo development comes from the adjacent maternal integument tissue. Hélène S. Robert,, Chulmin Park[...] & Thomas Laux

[The dynamics of root cap sloughing in *Arabidopsis* is regulated by peptide signalling](#)

Two opposite processes control the size of the protective root cap in *Arabidopsis* during growth: cell division and shedding of old cells layers (sloughing). Here, the authors show the role of a receptor–ligand pair in this regulation. Chun-Lin Shi, Daniel von Wangenheim[...] & Reidunn B. Aalen

Current Opinion in Biotechnology: Alert 29 July-05 August

[Proteomics of cyanobacteria: current horizons](#) Review article Pages 65-71

Natalia Battchikova, Dorota Muth-Pawlak, Eva-Mari Aro

[The promise of targeted proteomics for quantitative network biology](#) R eview article Pages 88-97

Masaki Matsumoto, Keiichi I Nakayama

Rousseau A, Bertolotti A.

Regulation of proteasome assembly and activity in health and disease.

Nat Rev Mol Cell Biol. 2018 Jul 31;.PMID: 30065390 [PubMed - as supplied by publisher]

Cohen SE, McKnight BM, Golden SS.

Roles for ClpXP in regulating the circadian clock in <i>Synechococcus elongatus</i>.

Proc Natl Acad Sci U S A. 2018 Jul 30;.PMID: 30061418 [PubMed - as supplied by publisher]

Hwang J, Qi L.

Quality Control in the Endoplasmic Reticulum: Crosstalk between ERAD and UPR pathways.

Trends Biochem Sci. 2018 Aug;43(8):593-605.PMID: 30056836 [PubMed - in process]

Lee HY, Chao JC, Cheng KY, Leu JY.

Misfolding-prone proteins are reversibly sequestered to an Hsp42-associated granule upon chronological aging. J Cell Sci. 2018 Jul 27;. PMID: 30054385 [PubMed - as supplied by publisher]

Yin Y, Li G, Yang J, Yang C, Zhu M, Jin Y, McNutt MA.

PTEN[±] Regulates Mitophagy and Maintains Mitochondrial Quality Control. Autophagy. 2018 Jul 4;. PMID: 29969932 [PubMed - as supplied by publisher]

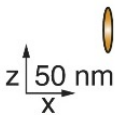
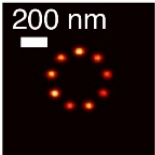
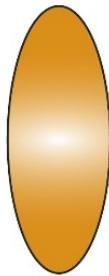
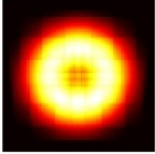

Current Opinion in Structural Biology: Alert 28 July-04 August

[High-resolution structures of mitochondrial ribosomes and their functional implications](#)

Review article Pages 44-53 Philipp Bieri, Basil J Greber, Nenad Ban

[Super-resolution microscopy to decipher multi-molecular assemblies](#)

Review article Pages 169-176 Christian Sieben, Kyle M Douglass, Paul Guichard, Suliana Manley

	Principle	Resolution	Comments	Example
Single-molecule localization microscopy (SMLM) PALM, STORM, PAINT	localization (centroid) of stochastically activated subset of molecules		<ul style="list-style-type: none"> - highest lateral resolution - good multiplexing (PAINT) - mostly fixed samples - depends on labelling density 	
Structured Illumination Microscopy (SIM)	reconstruction of an image after acquiring several images with shifted patterned illumination		<ul style="list-style-type: none"> - compatible with common organic dyes and fluorescent proteins - live cell imaging - low photodamage 	
Stimulated Emission Depletion Microscopy (STED)	confocal volume is reduced with a doughnut-shaped depletion beam around the excitation volume		<ul style="list-style-type: none"> - high illumination intensity requires photostable fluorescent probes - high temporal at high spatial resolution 	