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Slam protein dictates subcellular localization and translation of its own mRNA
Shuling Yan, Sreemukta Acharya, Stephanie Gröning, Jörg Großhans
During the cellularization process in Drosophila, slam mRNA and Slam protein form a complex and colocalize at the basal domain of the developing epithelium; these functional interactions between the protein and its mRNA are important for the spatiotemporal control of translation.

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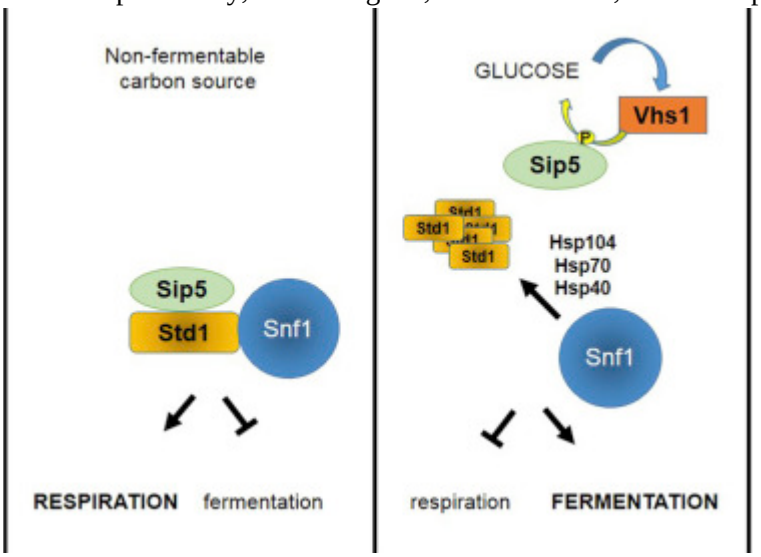
Leaf shedding as an anti-bacterial defense in Arabidopsis cauline leaves
O. Rahul Patharkar, Walter Gassmann, John C. Walker

Molecular Cell: Alert 15 December-22 December

Cell Cycle Control by Nuclear Sequestration of *CDC20* and *CDH1* mRNA in Plant Stem Cells *Pages 1108-1119.e3*
Weibing Yang, Raymond Wightman, Elliot M. Meyerowitz

The Std1 Activator of the Snf1/AMPK Kinase Controls Glucose Response in Yeast by a Regulated Protein Aggregation *Pages 1120-1133.e3*

Kobi Simpson-Lavy, Tianchang Xu, Mark Johnston, Martin Kupiec



Science
21 December 2017; Vol. 358, No. 6370

An integrated assessment of the vascular plant species of the Americas

Carmen Ulloa Ulloa[1],…..Peter M. Jørgensen[1]
Science 22 Dec 2017: Vol. 358, Issue 6370, pp. 1614-1617
The cataloging of the vascular plants of the Americas has a centuries-long history, but it is only in recent decades that an overview of the entire flora has become possible. We present an integrated assessment of all known native species of vascular plants in the Americas. Twelve regional and national checklists, prepared over the past 25 years and including two large ongoing flora projects, were merged into a single list. Our publicly searchable checklist includes 124,993 species, 6227 genera, and 355 families, which correspond to 33% of the 383,671 vascular plant species known worldwide. In the past 25 years, the rate at which new species descriptions are added has averaged 744 annually for the Americas, and we can expect the total to reach about 150,000.

Fungal effectors of wheat stem rust

The fungal pathogen Ug99 (named for its identification in Uganda in 1999) threatens wheat crops worldwide. Ug99 can kill entire fields of wheat and is undeterred by many of the disease-resistance genes that otherwise protect wheat crops. Two papers describe two peptides secreted by the fungus as it attacks the wheat (see the Perspective by Moscou and van Esse). Chen *et al.* show that fungal AvrSr50 binds to the plant's immune receptor Sr50, and Salcedo *et al.* show that fungal AvrSr35 binds to Sr35. Successful binding activates the plant's immune defenses. Removing or inactivating these Avr effectors leaves the plant defenseless and susceptible to disease.
Science, this issue p. 1607, p. 1604; see also p. 1541

Timing a switch in tissue integrity

In plants, sperm cells travel through the pollen tube as it grows toward the ovule. Successful fertilization depends on the pollen tube rupturing to release the sperm cells (see the Perspective by Stegmann and Zipfel). Ge *et al.* and Mecchia *et al.* elucidated the intercellular cross-talk that maintains pollen tube integrity during growth but destroys it at just the right moment. The signaling peptides RALF4 and RALF19, derived from the pollen tube, maintain its integrity as it grows. Once in reach of the ovule, a related signaling peptide, RALF34, which derives from female tissues, takes over and causes rupture of the pollen tube.
Science, this issue p. 1596, p. 1600; see also p. 1544 Alice Cheung is co-author on paper on page 1596.

Nature Plants

Speed breeding is a powerful tool to accelerate crop research and breeding

Amy Watson, Sreya Ghosh, Matthew J. Williams, William S. Cuddy, James Simmonds *et al.*
Nature Plants **4**, doi:10.1038/s41477-017-0083-8

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Nature Structural & Molecular Biology Contents: 2018 Volume #25 pp 1 - 114

Nucleotide exchange factors Fes1 and HspBP1 mimic substrate to release misfolded proteins from Hsp70 pp83 - 89
Naveen K. C. Gowda, Jayasankar M. Kaimal, Roman Kityk, Chammiran Daniel, Jobst Liebau *et al.*
doi:10.1038/s41594-017-0008-2

Nucleotide exchange factors (NEFs) trigger substrate release from molecular chaperone Hsp70. The authors found that armadillo-type NEFs (yeast Fes1, human HspBP1) competitively prevent rebinding of released substrate.

Bap (Sil1) regulates the molecular chaperone BiP by coupling release of nucleotide and substrate pp90 - 100
Mathias Rosam, Daniela Krader, Christina Nickels, Janine Hochmair, Katrin C. Back *et al.*
doi:10.1038/s41594-017-0012-6

The ER-resident Hsp70 BiP is regulated by NEF Bap. The interactions between BiP and Bap are now dissected using biochemistry, molecular modeling and smFRET approaches, revealing that Bap affects both domains of BiP, to coordinate release of substrate and nucleotide.