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IN BRIEF

RECOMBINATION

mRNAs repair double-strand breaks

Homologous recombination is a DNA double-strand break (DSB) repair mechanism that usually uses homologous DNA as template. Keskin *et al.* now report that *Saccharomyces cerevisiae* uses mRNAs as template for homologous recombination. The authors designed a system to monitor DSB repair through the restoration of a prototrophic marker (His^+) by homologous mRNAs. In cells deficient in reverse transcription, deleting the genes encoding the RNases H1 and H2, which cleave RNA hybridized to DNA and thus could potentially inhibit RNA reccombination with DNA, resulted in a marked increase in His^+ colonies with precisely repaired loci. Successful repair required also transcription and splicing. The data demonstrate that mRNAs can be templates for homologous recombination in yeast. This mechanism could be important, for example, in non-dividing cells, which lack sister chromatids, or in individuals in which RNA–DNA heteroduplexes are more stable owing to mutations.

ORIGINAL RESEARCH PAPER Keskin, H. *et al.* Transcript-RNA-templated DNA recombination and repair. *Nature* http://dx.doi.org/10.1038/nature13682 (2014)

PLANT CELL BIOLOGY

SUMOylation mediates brassinosteroid effects

In plants, developmental programmes are regulated by brassinosteroids, which activate transcriptional effectors that drive plant growth. This study shows that in *Arabidopisis thaliana*, brassinosteroid signalling leads to the accumulation of the transcription factor CES, which has been implicated in brassinosteroid responses, in nuclear bodies and that this is dependent on CES sumoylation in a novel sumoylation motif. Furthermore, phosphorylation at specific residues in that motif antagonized sumoylation and CES nuclear body formation; abolishing these phosphorylation sites promoted CES sumoylation and, moreover, increased its stability and transcriptional activity. Thus, the authors propose that brassinosteroid signalling controls CES protein fate, subnuclear localization and activity.

ORIGINAL RESEARCH PAPER Khan, M. *et al.* Interplay between phosphorylation and SUMOylation events determines CESTA protein fate in brassinosteroid signalling. *Nature Commun.* http://dx.doi.org/10.1038/ncomms5687 (2014)

RNA METABOLISM

The fates of mRNAs in P bodies

Following translational stress, mRNAs colocalize with mRNA decay factors in cytoplasmic processing (P) bodies. Tracking fluorescently tagged mRNAs in human cells and using fluorescence *in situ* hybridization, the authors found that following amino acid starvation, mRNAs that lack poly(A)-tails accumulated in the P bodies; they quantified that up to 43% of cytoplasmic β-actin transcripts were P bodies-associated in starved cells compared with up to 13% in untreated cells. Inhibition of mRNA decay increased the P bodies-associated fraction to 80%, indicating that decay is responsible for mRNA turnover in P bodies. However, most of the fluorescent signal was cleared out of the P bodies after cells were released from starvation, suggesting that some deadenylated mRNAs are stored in the P bodies during stress. Thus, deadenylation does not necessarily lead to mRNA degradation, and P bodies have a role in both decay and storage of deadenylated mRNAs.

ORIGINAL RESEARCH PAPER Aizer, A. *et al.* Quantifying mRNA targeting to P bodies in living human cells reveals a dual role in mRNA decay and storage. *J. Cell Sci.* http://dx.doi.org/ 10.1242/jcs.152975 (2014)