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IN BRIEF

SMALL RNAs

New microRNA-like molecules

Hansen *et al.* describe a new class of short regulatory RNAs, which associate with Argonaute (AGO) proteins and derive from short introns, hence are termed agotrons. The authors annotated 87 agotrons in human and 18 in mouse, and found that they are conserved across mammalian species. Agotrons are ~80–100 nucleotides long, CG-rich and potentially form strong secondary structures. Vectors encoding three different agotrons (and their flanking exons) were transfected into human cells; the agotrons were expressed but were almost undetectable without co-expression of AGO1 or AGO2, indicating that AGO proteins stabilize spliced agotrons. Similarly to microRNAs, agotrons suppressed the expression of reporter transcripts based on seed-mediated complementarity, but their biogenesis is independent of Dicer: they associate with AGO as spliced but otherwise unprocessed introns. Agotrons potentially have a limited target repertoire compared with microRNAs but are possibly less prone to off-target effects.

ORIGINAL ARTICLE Hansen, T. B. *et al.* Argonaute-associated short introns are a novel class of gene regulators. *Nat. Commun.* **7**, 11538 (2016)

AUTOPHAGY

Shrinking through cilia-induced self-eating

Epithelial cells of the kidney proximal tubules, which reabsorb water and nutrients from the forming urine, shrink in response to fluid flow through mechanisms that involve mechanosensing by primary cilia. Orhon *et al.* demonstrated that the application of fluid flow induced autophagy in cultured mammalian kidney epithelial cells. This autophagic response to flow depended on the presence of functional cilia and was necessary for cell shrinkage. Similarly, inhibition of autophagy or interference with cilia formation increased the size of epithelial cells in mouse kidneys *in vivo*. Together, this study shows that autophagy can be induced by mechanical signals transduced by primary cilia and can function in regulating cell volume. It would be interesting to uncover the precise mechanisms of autophagy-mediated cell volume regulation.

ORIGINAL ARTICLE Orhon, I. *et al.* Primary-cilium-dependent autophagy controls epithelial cell volume in response to fluid flow. *Nat. Cell Biol.* **18**, 657–667 (2016)

DNA DAMAGE RESPONSE

Cell thriving despite DNA damage

DNA damage response (DDR) pathways prevent genomic instability by inducing cell-cycle arrest, DNA repair or apoptosis following DNA damage, and are known to be inactivated in polyploid cells as well as in many cancers. Bretscher and Fox used the developing fly papillar cells — a naturally polyploid, cycling cell population — to explore how proliferating cells without an active DDR manage genomic instability. They revealed that, despite the accumulation of chromosome breaks, these cells continued to cycle and successfully segregated broken chromosomes into daughter nuclei. The Fanconi anaemia protein FANCD2 was then found to act independently of the core Fanconi anaemia pathway and other core DDR components to prevent missegregation of chromosome fragments into micronuclei and to sustain unperturbed papillar organogenesis. The mechanism by which FANCD2 ensures proper segregation of broken chromosomes, thereby allowing propagation of cells with unstable genomes, remains to be elucidated.

ORIGINAL ARTICLE Bretscher, H. S. & Fox, D. T. Proliferation of double-strand break-resistant polyploid cells requires *Drosophila* FANCD2. *Dev. Cell* **37**, 444–457 (2016)