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IN BRIEF

DNA REPAIR

RNA–DNA hybrids: a double-edged sword in genomic stability

The formation of RNA–DNA hybrids results in replicative stress and, as a consequence, the emergence of DNA double-strand breaks (DSBs). Thus, RNA–DNA hybrid formation has been primarily associated with genomic instability. The findings of Ohle *et al.* now change this view, implicating RNA–DNA hybrids in the maintainance of genome integrity. The authors used *Schizosaccharomyces pombe* to study the role of RNase H — an enzyme which, among other functions, removes RNA–DNA hybrids. They showed that either removal or overexpression of RNase H reduced the viability of yeast in which DNA DSBs were induced. They then showed that RNA–DNA hybrids form as a result of active transcription at the DSB sites and that their formation, followed by their removal by RNase H, are both important for the proper execution of DSB repair by the homologous recombination pathway.

ORIGINAL ARTICLE Ohle, C. *et al.* Transient RNA–DNA hybrids are required for efficient double-strand break repair. *Cell* **167**, 1001–1013 (2016)

STEM CELLS

Coordinated expansion of cells in the skin

Coordination between different cell types that comprise an organ is essential to ensure proper organ growth and remodelling during homeostasis, but how this is achieved is poorly understood. Zhang *et al.* used mouse skin to study how the growth of the hair follicle is coordinated with the expansion of the underlying dermal adipose tissue — events that accompany each physiological cycle of hair shedding and regrowth in mammals. They revealed that the emergence of new adipocytes is tightly coupled with the establishment of a population of progenitor hair follicle transit-amplifying cells (HF-TACs) that support follicle growth. They further showed that HF-TACs are essential for the concomitant expansion of the adipose tissue, as they directly stimulate — through sonic hedgehog signalling — the proliferation and adipogenic cell fate commitment of adipocyte precursors.

ORIGINAL ARTICLE Zhang, B. *et al.* Hair follicles' transit-amplifying cells govern concurrent dermal adipocyte production through Sonic Hedgehog. *Genes Dev.* http://dx.doi.org/10.1101/gad.285429.116 **(2016)**

CELL SENESCENCE

Controlling the senescence-associated secretory phenotype

Cell entry into senescence is typically irreversible and is associated with heterochromatization of the genome, which is marked by the establishment of senescence-associated heterochromatin foci (SAHF). However, in contrast to many genes that are silenced on senescence entry (including pro-proliferative genes), the expression of factors such as cytokines and chemokines is induced in senescent cells and can promote oncogenic transformation of neighbouring cells through the senescence-associated secretory phenotype (SASP). Aird *et al.* now show that the chromatin-binding protein high mobility group box 2 (HMGB2) is an important regulator of the SASP, and that by binding to SASP gene loci it prevents their incorporation into SAHF and silencing. Thus, removal of HMGB2 could potentially be used to reduce the SASP and to restrain cancer-promoting effects associated with senescence.

ORIGINAL ARTICLE Aird, K. M. *et al.* HMGB2 orchestrates the chromatin landscape of senescence-associated secretory phenotype gene loci. *J. Cell Biol.* **215,** 325–334 (2016)