

IN BRIEF

HUMAN EVOLUTION**Tandem repeats and divergent gene expression**

A recent study explored the genome-wide variation of tandem repeats (TRs) within and across natural populations of humans and five other primate species. Analysis of 83 genomes and gene expression data revealed an association between the presence of TRs in the promoters, 3' untranslated regions (UTRs), introns or exons of genes and increased gene expression divergence. Furthermore, genes with promoters that contained polymorphic small repeats exhibited more divergent expression than those that contained fixed or no TRs. These studies highlight the potential contribution of TRs to primate evolution.

ORIGINAL RESEARCH PAPER Bilgin Sonay, T. *et al.* Tandem repeat variation in human and great ape populations and its impact on gene expression divergence. *Genome Res.* <http://dx.doi.org/10.1101/gr.190868.115> (2015)

SMALL RNAS**One precursor, one siRNA**

RNA-directed DNA methylation in *Arabidopsis thaliana* is triggered by 24-nt small interfering RNAs (siRNAs), which are derived from RNA polymerase IV (Pol IV)-dependent precursor RNAs (P4RNAs). It was assumed that each P4RNA gives rise to multiple siRNAs; however, Zhai *et al.* now propose a 'one precursor one siRNA' model, based on the characterization of P4RNAs using parallel analysis of tail and head (PATH) RNA sequencing. These analyses revealed that P4RNAs are 30–40 nt in length and mirror 24-nt siRNAs in their distribution, abundance, strand bias and 5'-adenine preference, which suggests that P4RNAs are the direct precursors of, and determine the start position and strandedness of, Pol IV-dependent siRNAs.

ORIGINAL RESEARCH PAPER Zhai, J. *et al.* A one precursor one siRNA model for Pol IV-dependent siRNA biogenesis. *Cell* **163**, 445–455 (2015)

TECHNIQUES**Porcine endogenous retroviruses get the chop**

Concerns over the transmission of porcine endogenous retroviruses (PERVs) to humans are a major barrier to the use of porcine organs in transplantation. In a new study, Yang *et al.* used the CRISPR–Cas9 system to simultaneously inactivate the *pol* genes of all 62 PERVs identified within a porcine kidney epithelial cell line. Remarkably, co-culturing of porcine and human cell lines revealed a greater than 1,000-fold decrease in the transmission of PERVs to human cells from engineered cells, compared to wild-type porcine cells.

ORIGINAL RESEARCH PAPER Yang, L. *et al.* Genome-wide inactivation of porcine endogenous retroviruses (PERVs). *Science* <http://dx.doi.org/10.1126/science.aad1191> (2015)

PLANT GENETICS**A clever TrAP circumvents host defence**

Transcriptional gene silencing (TGS) serves as an antiviral defence in plants but is inhibited by the geminivirus protein TrAP via an unknown mechanism. Castillo-González *et al.* now show that TrAP targets the H3K9me2 histone methyltransferase KRYPTONITE (KYP) in *Arabidopsis thaliana* to subvert host immunity. TrAP inhibited the methyltransferase activity of KYP *in vitro* and reduced levels of the H3K9me2 mark *in vivo*. Notably, KYP was observed to bind to and methylate viral chromatin, and geminivirus that lacked the TrAP protein could only establish systemic infection in a *kyp* mutant.

ORIGINAL RESEARCH PAPER Castillo-González, C. *et al.* Geminivirus-encoded TrAP suppressor inhibits the histone methyltransferase SUVH4/KYP to counter host defense. *eLife* <http://dx.doi.org/10.7554/eLife.06671> (2015)