TOOLS IN BRIEF

MODEL ORGANISMS

Expanding GFP utility beyond imaging

Mouse lines expressing GFP are a valuable resource that is mainly used for imaging or labeling purposes. Tang *et al*. have now developed a tool called CRE-DOG to expand the utility of these GFP lines. CRE-DOG consists of a split Cre recombinase, the two parts of which are fused to GFP-binding nanobodies. Cre can be brought together in the presence of GFP, resulting in an active recombinase. The researchers generated recombinant adeno-associated virus vectors encoding this tool and showed that CRE-DOG can be used to recombine *Lox* sites in both transgenic and viral constructs. They used the system to control reporter gene or channelrhodopsin expression in GFP-positive cells in various regions in the mouse brain.

Tang, J.C.Y. *et al*. *Nat. Neurosci.* **18**, 1334–1341 (2015).

BIOINFORMATICS

How good are those RNA-seq data?

The enormous number of public gene expression data sets can turn into research gold when mined for any number of biological questions. But digging into the data of other researchers is often fraught by a lack of metadata. In particular, missing electrophoresis-based RNA quality scores make it impossible to cull poor-quality samples from analysis or to take computational steps to account for RNA degradation. Feng *et al*. developed the mRNA integrity number (mRIN), a metric based on quantitative modeling of the degradation-dependent 3' bias in read coverage, to assess mRNA integrity for transcriptomes or individual transcripts directly from sequence data. The authors used mRIN to quantify degradation in large-scale RNA-seq data from postmortem brain tissue in the BrainSpan and Genotype-Tissue Expression (GTEx) projects and found that degradation has a reproducible gene-specific component.

Feng, H. *et al*. *Nat. Commun*. **6**, 7816 (2015).

MICROBIOLOGY

Ancestral AAVs put to new use

Adeno-associated virus vectors (AAVs) have been widely used for gene delivery in basic research, and they have also been explored for therapeutic purposes. However, their utility depends on target-tissue specificity and tolerance by the immune system. To expand the potential pool of AAV types, Zinn *et al*. used an *in silico* approach to determine putative ancestral AAVs. Using ancestral sequence reconstruction, they were able to predict AAV variants that adhered to the strict structural and functional requirements of AAVs. The researchers synthesized one of the ancestral AAVs, Anc80L65, and showed that it could infect mouse liver, muscle and retina, without eliciting a major immune response. In addition, Anc80L65 was able to mediate efficient gene transfer into macaque liver.

Zinn, E. *et al*. *Cell Rep*. **12**, 1056–1068 (2015).

MOLECULAR ENGINEERING

A suite of oligomeric GFP variants

Leibly *et al*. report a series of 11 engineered variants of GFP that may find applications in protein crystallography and synthetic biology. These variants oligomerize in distinct forms upon disulfide-bond formation or upon the addition of a metal ion and are based on a version of GFP that is split into a large and a small fragment. The small GFP fragment can be incorporated into a protein of interest. GFP can then be functionally reconstituted from the small and large fragments, and oligomerization results in the formation of stable, rigid structures that may facilitate the crystallization of recalcitrant proteins; such studies are currently in progress. The authors also suggest potential applications for their GFP oligomeric forms in synthetic biology, such as utilizing them as a scaffold to couple metabolic enzymes together or for constructing protein-based materials.

Leibly, D.J. *et al*. *Structure* **23**, 1754–1768 (2015).

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