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Amplifying the signal

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Non-invasive imaging of reporter gene expression offers a powerful tool for monitoring spatial and temporal expression in live animals (or people). One limitation of such techniques is the low expression of genes driven by tissue-specific promoters. In the December 4 Proceedings of the National Academy of Sciences, Iyer *et al.* describe using a two-step transcriptional amplification (TSTA) approach to amplify the signal for non-invasive detection (*Proc Natl Acad Sci USA* 2001, **98:**14595-14600). They designed a system in which the prostate-specific antigen (PSA) promoter drives the expression of GAL4-VP16 fusion proteins with strong transactivating properties. In the second step, GAL4-VP16 controls the expression of a marker gene, such as firefly luciferase, placed downstream of GAL4-response elements. They tested the system in LNCaP prostate cancer cells and could demonstrate tissue-specific, androgen-responsive marker gene regulation. Iyer *et al.* also showed that the system could be used to detect luciferase expression *in vivo*.

References

1. Monitoring gene therapy with reporter gene imaging.

2. *Proceedings of the National Academy of Sciences*, [http://www.pnas.org]

3. Gene therapy: designer promoters for tumour targeting.