capable of activating mammalian genes of diverse kinds; but failed to activate the snRNA promoter, suggesting that indeed promoters containing PEs require an activator of a different kind.

This however presents a paradox, because Oct-1 can also activate the H2B promoter which has a TATA box. To explain this, Tanaka *et al.* postulate an interaction between Oct-1 and a second protein that provides the necessary TATA activating region; from which they reason that it should be possible to enable Oct-1 to activate the β -globin TATA by supplying it with an appropriate activating domain.

The means for achieving this conversion lay to hand in the viral protein VP16, a powerful activator which does not bind DNA itself²⁴ but acts via cellular DNA-binding proteins that have recently been shown to include Oct-1²⁵. In the presence of VP16, the β -globin promoter could be activated through the SV40 octamer in HeLa cells. If, however, as this implies, Oct-1 has no TATA activator of its own, the LeBowitz *et al.* experiment should not have worked, and can be explained only by some adventitious interaction made possible by the particular conditions *in vitro*; and in any case parsimony seems a lost cause.

Further evidence for the critical importance of differential protein interactions in determining the behaviour of transcriptional activators comes from investigations by Müller *et al.*⁴ on the actions of Oct-2 bound to the two conserved octamers in the control region of the immunoglobulin heavy-chain gene. One of these octamers is in the promoter, about 20 base-pairs from the TATA box, the other is in the enhancer, some 2,000 base pairs distant. Müller *et al.* have been able to show that cloned Oct-2 is sufficient to activate a co-transfectant reporter gene from the promoter octamer, which is consistent with earlier evidence that Oct-2 is responsible for cell-type specific transcription from that promoter^{26,27}; but surprisingly, it will not activate from the immunoglobulin enhancer element in similar experiments.

This may be because the two octamers are bound *in vivo* by two different Oct-2 proteins generated by alternative splicing from the Oct-2 gene: one, Oct-2A, seems to operate from the immunoglobulin promoter⁴, while the other, Oct-2B, may mediate activation from the enhancer²⁸. It is unlikely that the difference between the two proteins lies simply in the strength of their activating regions — Oct-2A being too weak to act from the enhancer site — because Oct-2A is inactive even from a synthetic multimeric enhancer (Patrick Matthias and Walter Schaffner, personal communication) whose multiplicity might be expected to overcome the weakness of the individual activating regions. The distinction thus seems likely to lie in different

protein-protein interactions that may be a function partly of the differences between the Oct-2A and Oct-2B proteins, and partly of the different context of the octamer in the promoter and the enhancer, which may contribute to the cooperative binding of other regulatory proteins.

Further clues and conundra may lurk in the non-POU regions of the Oct-2 protein sequence. There is for example a leucine-rich region with the heptad repeat characteristic of the (still) putative leucine zipper implicated in the formation of DNA-binding dimers²⁹ and which suggests, therefore, the possibility of interactions that foster cooperative binding with other proteins that might modify the activity of the Oct-2 monomer.

More curiously, Clerc *et al.* draw attention to a 278-amino-acid open reading frame overlapping with the coding region for the carboxy terminus of Oct-2. They cryptically remark that the sequence has features in common with the adenoviral activator protein E1A, which like VP16 seems to be a freelance activating domain. Is it conceivable that as B lymphocytes enter terminal differentiation as plasma cells committed to spewing thousands of immunoglobulin molecules into the bloodstream, they switch on the synthesis of a 278-amino-acid activator that empowers Oct-2 to monopolize the cell's transcriptional machinery for the task? □

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Daedalus

Let the money talk

THE capitalist mode of technical development is very persuasive. In an uncertain world, the shrewdest technical forecasts are probably made by informed investors risking their own money. So the promoters of a new scheme issue a prospectus appealing for funds, and the market decides.

But these days, says Daedalus, almost every technological project has drawbacks. For every British exporter longing for the Channel Tunnel, for example, there may be some landowner facing the ruin of his land by its approach roads. Capitalism is therefore imperfect. The exporter's money can talk in the market: he can buy shares in the Tunnel. But the landowner's money cannot talk for him. He must appeal to environmental-protection or social-audit agencies, or stir up political protests.

In this connection, Daedalus recalls that brilliant social invention, the protection racket. If our landowner had the chance to buy protection against the Channel Tunnel, his real opposition to it would soon become apparent: and in sound financial terms, too. So Daedalus proposes that a company should be able to issue not merely positive shares to promote a project, but negative ones purchased as 'protection' against it.

This appealing scheme has an immediate snag. A classic protection racket is self-perpetuating. Once you have paid up for protection, the same (or even another) gang can come back and ask to be paid again. To prevent this unfair trick, Daedalus's negative shares are formally an investment, not merely in abandoning the project, but actually making it illegal. So, sadly but inevitably, the Government must be brought in. Daedalus envisages a 'Government Obstruction Agency' (a natural home for ardent bureaucrats) with the job of overseeing the issuing of negative shares.

This technological decision-making will acquire a pleasing symmetry. Any new promoter will probably issue both positive and negative shares, and judge from their uptake whether to set up the project in earnest, or run it as a protection racket and hope to be bought off. On the one hand is costly and uncertain development, with any ultimate profit delayed maybe for years; on the other is a swift pay-off in protection money, smaller but immediate. The investing public, voting with its wallet, will decide. Costs and benefits will both be judged by the public in sound financial terms. The major flaw in modern capitalism, its insensitivity to social and environmental drawbacks, will be healed. And when at last every new technical idea turns out to be more profitable as a protection racket than a project, why, the world will have enough technology, and progress will automatically stop. David Jones