

P025 New targets for the *Escherichia coli* cAMP receptor protein identified in whole-genome studies

Kerry Hollands, Georgina S. Lloyd and Stephen J.W. Busby

School of Biosciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT

The *Escherichia coli* cAMP receptor protein (CRP) is a global transcription factor which controls expression of over 100 genes. Many studies have attempted to define the CRP regulon using whole-genome approaches, such as transcriptomics and ChIP-chip, and these have predicted dozens of new candidate targets for CRP. We have investigated the role of CRP in the regulation of 12 of these target promoters.

Six of the new candidate promoters bind CRP *in vitro* and are activated by CRP *in vivo*. Although CRP binds another three promoters with high affinity *in vitro*, we observed no effect of CRP on transcription from these promoters *in vivo* under the conditions tested. At three promoters, we were unable to detect binding of CRP *in vitro* or CRP-dependent effects on expression *in vivo*.

The role of CRP in regulation of the *aer* promoter has been investigated further. We have shown that expression from this promoter requires both CRP and the flagellar sigma factor, σ^{28} , and that transcription of *aer* is driven by a single σ^{28} -dependent promoter. CRP activates transcription from the *aer* promoter via a Class I mechanism. This activation requires binding of CRP to a single site centred at position -50 relative to the transcript start site. This position is atypical of Class I CRP-dependent promoters. To our knowledge, this is the first example of direct activation of a σ^{28} -dependent promoter by CRP.