

P13**EFFECT OF POLYAMINES AND SYNTHETIC POLYAMINE-ANALOGUES ON THE EXPRESSION OF THE *E. coli* *ato* OPERON AND ITS REGULATORY GENES**

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In bacteria, the biosynthesis of polyamines is modulated both at the level of transcription as well as post-translationally. In *E. coli*, a non-competitive protein inhibitor was identified, named Antizyme (Az), which is the gene product of *atoC*. The cloning and sequencing of the *E. coli* antizyme gene revealed that Az also have a second function as a transcriptional regulator AtoC, belonging to the two-component system family and Az was identical as the gene product of *atoC*. AtoC, is a positive transcriptional regulator of the *atoDAEB* operon genes, encoding enzymes involved in short chain fatty acid metabolism. The antizyme is referred to as AtoC/Az, to indicate its dual function as both a transcriptional and post-translational regulator. The role of polyamines at the transcriptional level of *atoS* and *atoC* genes as well as that of *atoDAEB(ato)* operon is studied. Polyamine-mediated induction was measured in *atoSC* positive or negative *E. coli* backgrounds by using β -galactosidase reporter constructs carrying the appropriate promoters (i.e. *patoDAEB*, *patoS*, *patoC*). In addition, a selection of synthetic polyamine analogues have been tested for their effectiveness in inducing the expression of *atoC/Az*, whose product is a key protein in feedback inhibition of putrescine biosynthesis as well as the transcriptional regulator of the *ato* operon. The effects of these compounds were also measured on the *ato* operon expression. The polyamine analogues were tested for their effect on the growth of *E. coli* strain MA255 (ODC⁻, ADC⁻) which lack polyamines and grow only when exogenous polyamines are present. Polyamines, which have been reported to induce AtoC in *E. coli*, act at the transcriptional level, since activation of the transcription of AtoC/Az in three isogenic *E. coli* strains was observed. In addition, some of the polyamine analogues tested to activate the transcription of the *atoC* gene and the *atoDAEB* operon promoter.