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Tudor P Toma

Email: t.toma@ic.ac.uk

In the food-borne pathogen *Listeria monocytogenes*, virulence genes are expressed at 37°C but not at 30°C. This process is under the control of PrfA - a transcriptional activator thermoregulated by a mechanism that has remained unclear. In the September 6 *Cell*, Jörgen Johansson and colleagues from Institut Pasteur, Paris, show that an untranslated mRNA (UTR) preceding prfA acts as a thermosensor and controls *Listeria monocytogenes* expression of virulence genes at 37°C (*Cell* 2002, **110**:551-561).

Johansson *et al.* observed that the UTR preceding prfA formed a secondary structure, masking the ribosome-binding region. This structure could switch between an active form at high temperatures, and an inactive form at low temperatures. Mutations predicted to destabilize this structure led to virulence gene expression and invasion of mammalian cells at 30°C. In addition, when DNA corresponding to the UTR was fused to a fluorescent marker in *E. coli*, the bacteria became fluorescent at 37°C but not at 30°C.

"The prfA-UTR structure could be used to control the expression of other open reading frames and have several useful applications, among which are the cloning of toxic genes, the rapid production of enzymes not required before a critical moment, or the specific isotope labeling of proteins," conclude the authors.

References

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