

PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

Phage tropism

ArticleInfo		
ArticleID	:	4426
ArticleDOI	:	10.1186/gb-spotlight-20020320-01
ArticleCitationID	:	spotlight-20020320-01
ArticleSequenceNumber	:	92
ArticleCategory	:	Research news
ArticleFirstPage	:	1
ArticleLastPage	:	2
ArticleHistory	:	RegistrationDate : 2002-3-20 OnlineDate : 2002-3-20
ArticleCopyright	:	BioMed Central Ltd2002
ArticleGrants	:	
ArticleContext	:	130593311

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Certain *Bordetella* bacteria exist in two phases - Bvg⁺ is characterized by the expression of virulence genes and respiratory tract colonization, while the Bvg⁻ phase is adapted for *ex vivo* growth when virulence genes are silenced. In the March 15 *Science* Liu *et al.* from the University of California in Los Angeles, describe how bacteriophages target specific bacterial phases (*Science* 2002, **295**:2091-2094). They found that the bacteriophage BPP-1 (for Bvg plus tropic phage-1) had a tropism for the Bvg⁺ phase bacteria. They identified the *prn* gene, encoding the adhesin pertactin, as essential for tropism, and were able to isolate bacteriophage variants with different tropisms, implying a mechanism of tropic switching. They then looked at tropic variants and noticed a 134 bp repeat sequence within the *mtd* (major tropism determinant) locus, which is repeated in an adjacent *brt* locus encoding a *Bordetella* reverse transcriptase enzyme. The *brt* repeat and the *brt* enzyme affected sequence variation of the *mtd* repeat. It will be interesting to figure out how variations in these repeat sequences, and the reverse transcriptase, regulate tropic switching, and whether similar scenarios exist for generating genetic variation in other biological systems.

References

1. *In vivo* and *ex vivo* regulation of bacterial virulence gene expression.
2. *Science*, [<http://www.sciencemag.org>]
3. University of California in Los Angeles, [<http://www.ucla.edu>]