

### Dissecting MreB's cellular functions

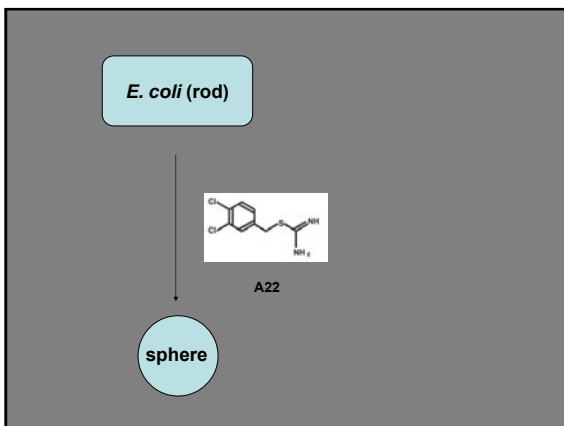
For better temporal specificity – pharmacology

Novel S-Benzylisothiourea Compound That Induces Spherical Cells in *Escherichia coli* Probably by Acting on a Rod-shape-determining Protein(s) Other Than Penicillin-binding Protein 2

Noritaka Imai,<sup>1\*</sup> Kazuo Nakai,<sup>2</sup> and Masaki Wachi<sup>1†</sup>

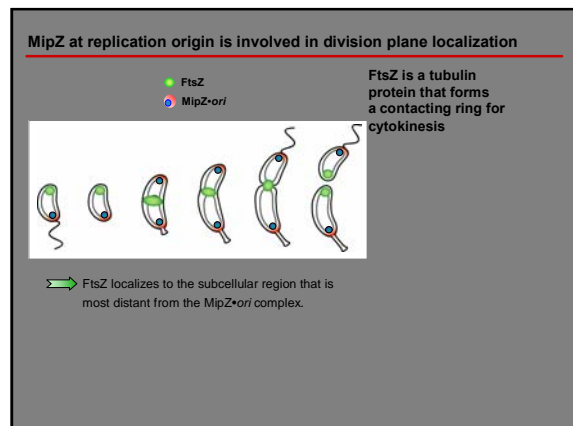
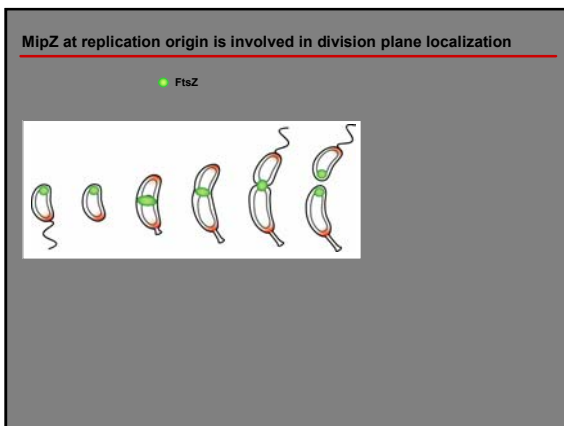
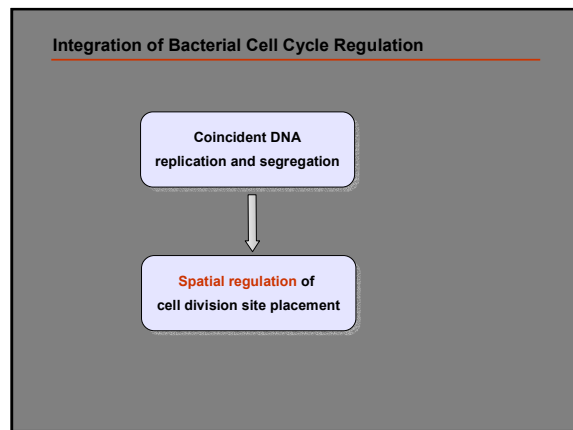
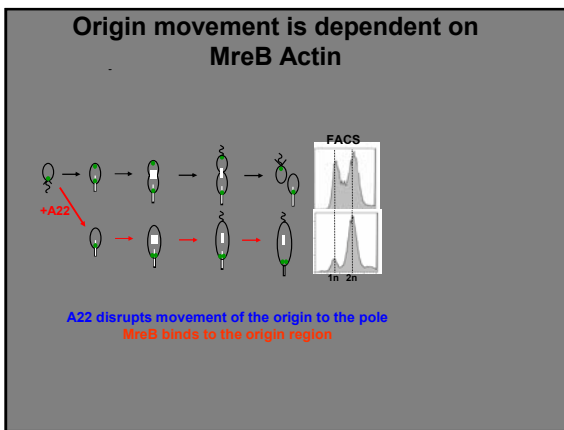
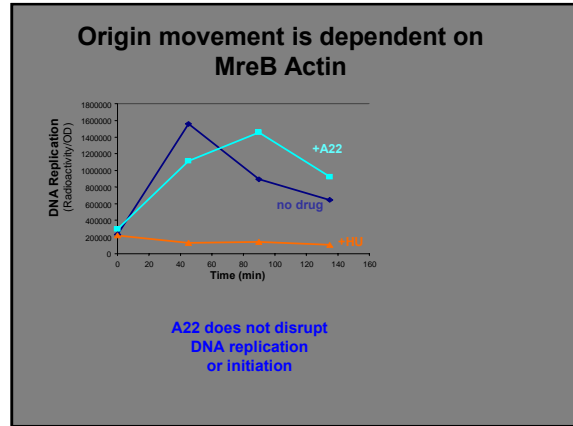
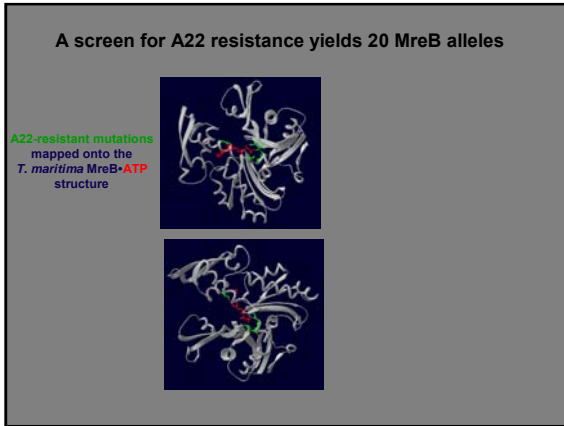
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### A screen for A22 resistance yields 20 MreB alleles

allele	mutation	# times isolated	Growth in A22	Growth in A22 when replaced by WT <i>mreB</i>	Growth in A22 in clean genetic background
Wild type	-	-	-	-	-
<i>mreB</i> ( <i>Are1</i> )	T167A	10	+++	-	+++
<i>mreB</i> ( <i>Are2</i> )	V324A	5	+++	-	+++
<i>mreB</i> ( <i>Are3</i> )	D192G	1	+++	-	+++
<i>mreB</i> ( <i>Are4</i> )	A325P	1	+++	-	+++
<i>mreB</i> ( <i>Are5</i> )	D16G	1	+++	-	+++
<i>mreB</i> ( <i>Are6</i> )	P112S	1	+++	-	+++
<i>mreB</i> ( <i>Are7</i> )	L23R	1	+++	-	+++



**MipZ at replication origin is involved in division plane localization**

FtsZ is a tubulin protein that forms a ring at mid cell for cytokinesis

● FtsZ  
● MipZ-ori

→ FtsZ localizes to the subcellular region that is most distant from the MipZ-ori complex.

**MipZ might directly inhibit FtsZ assembly.**

A protein complex coordinates DNA segregation and the positioning of the cell division site (dependent on MreB actin)

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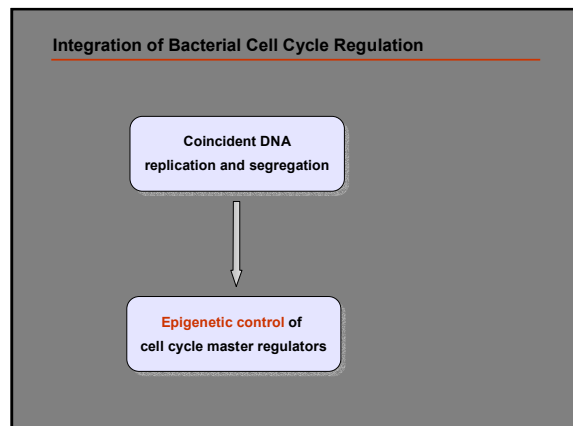
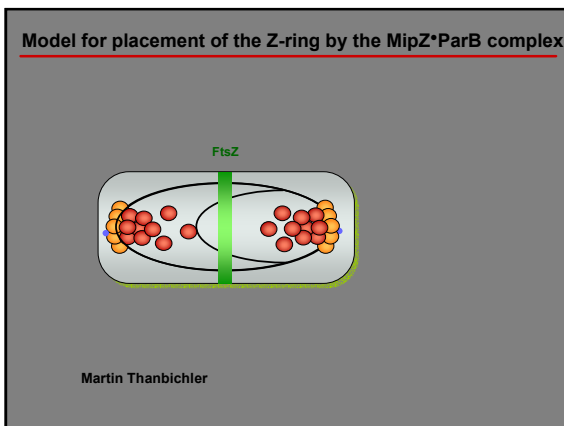
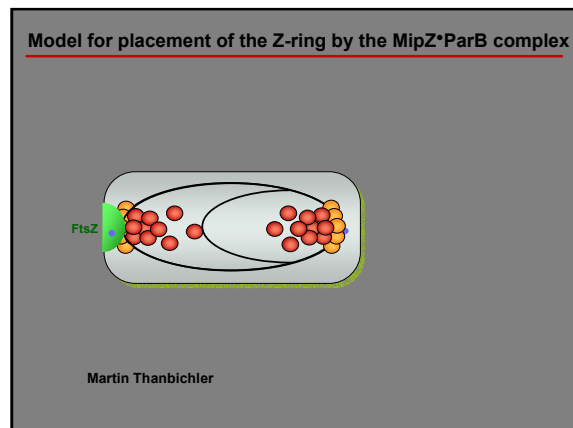
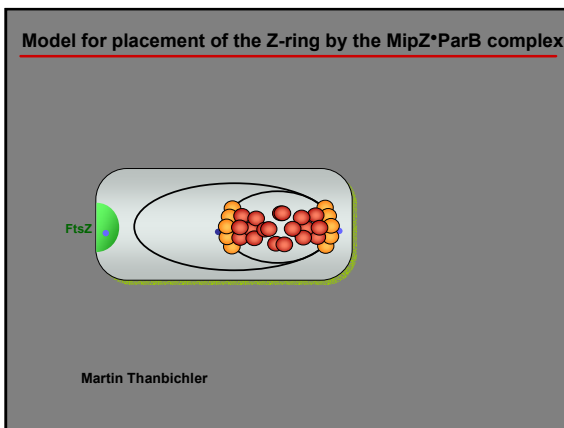
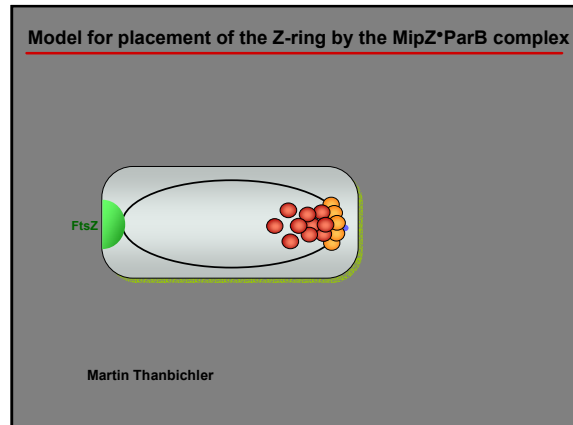
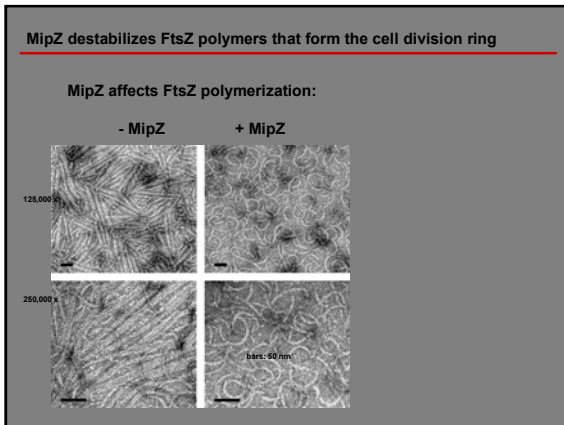
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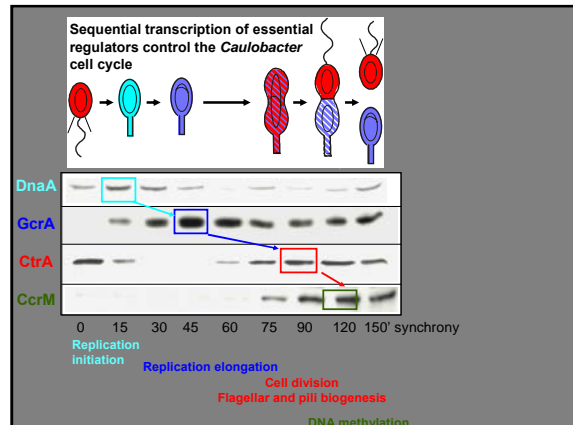
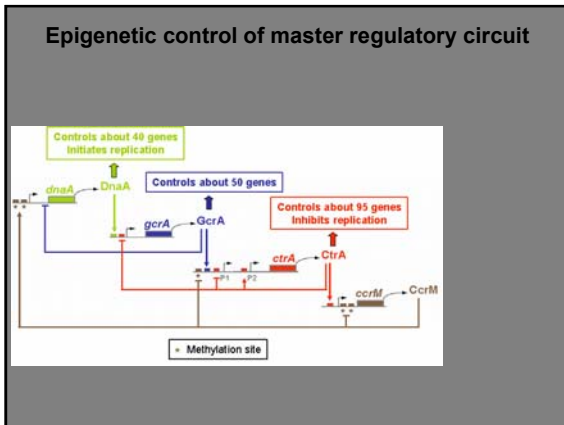
**Quantitation of the fluorescent signal:**

→ **gradient of MipZ concentration:**

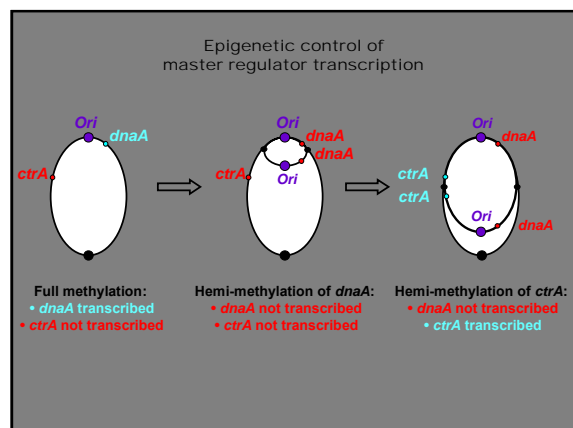
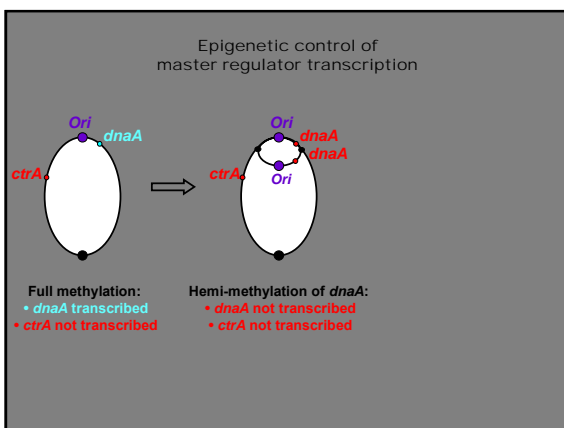
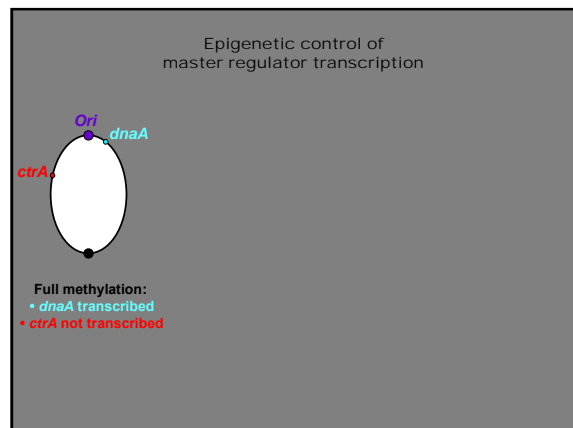
- highest at the position of the origin region(s)
- lowest at the mid-cell

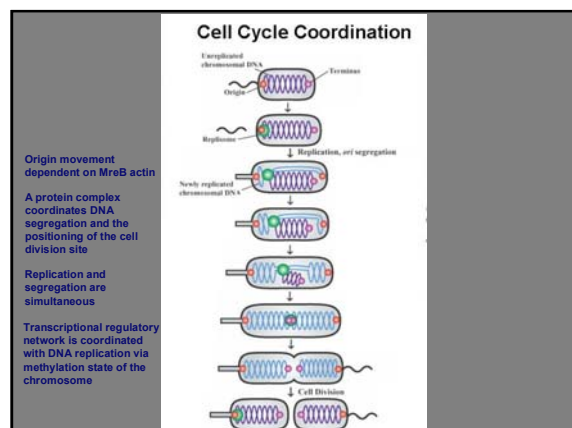
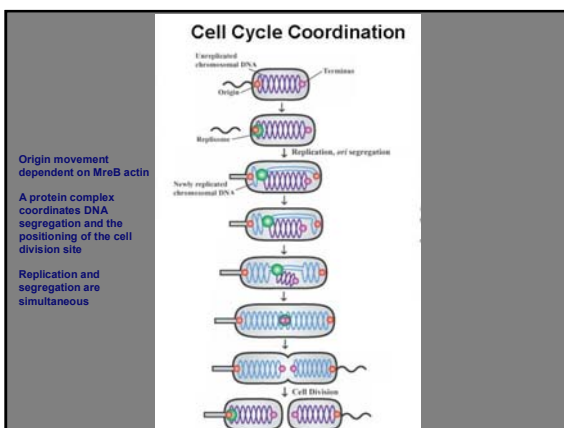
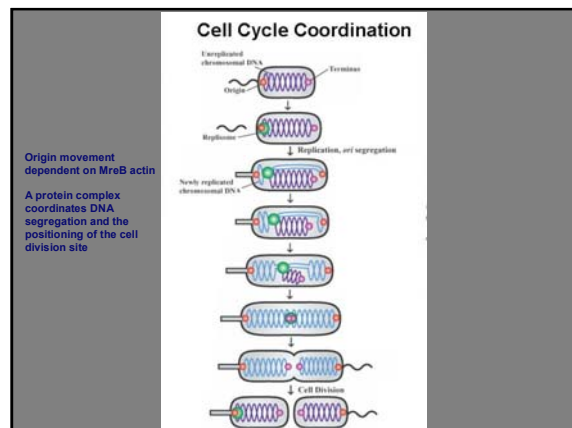
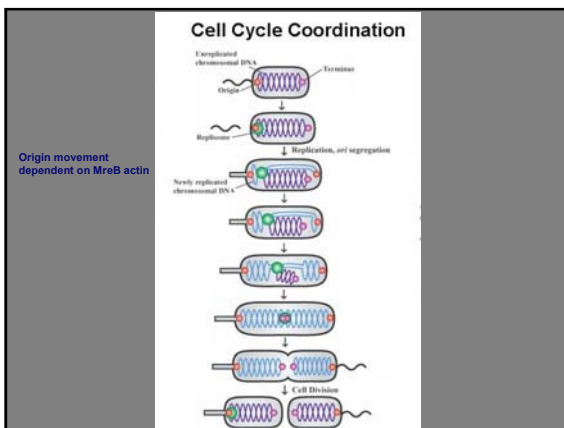
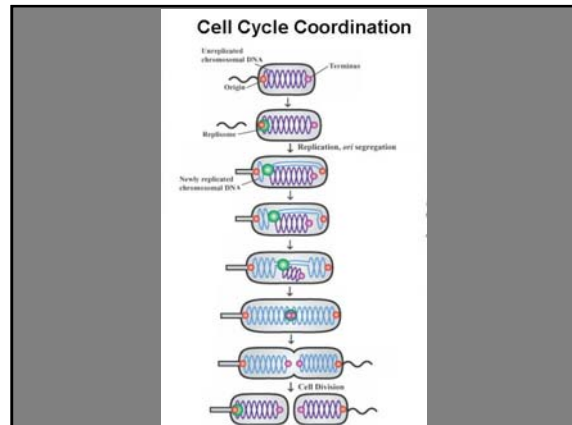
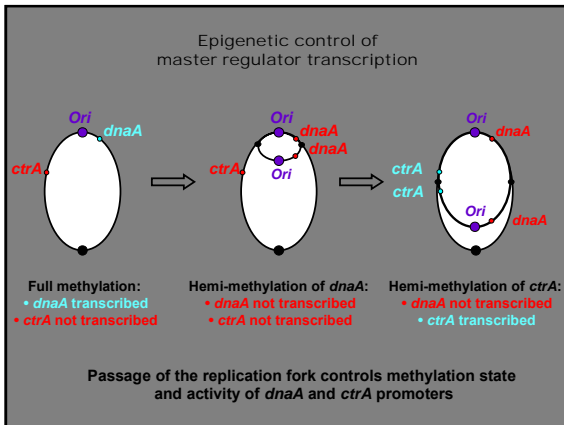






## What turns on this cascade?





### Acknowledgments

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