






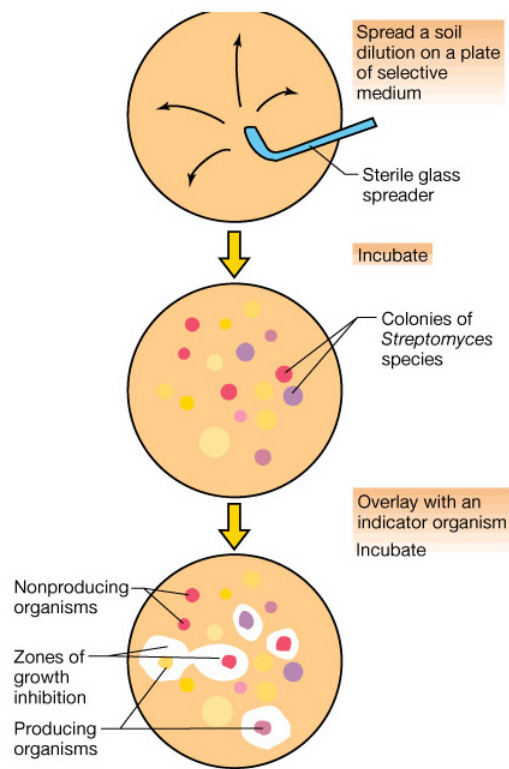
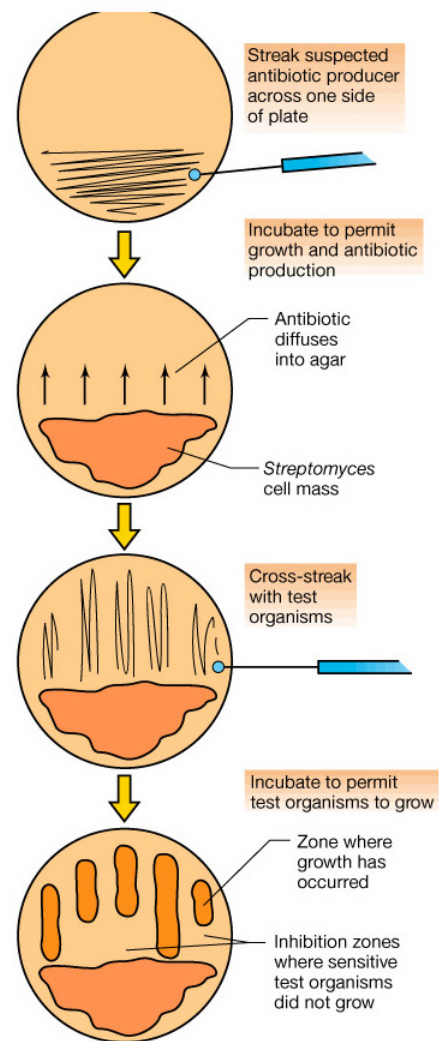


-  Cephalosporins
-  Macrolides
-  Quinolones
-  Penicillins
-  Aminoglycosides
-  Tetracyclines
-  Other



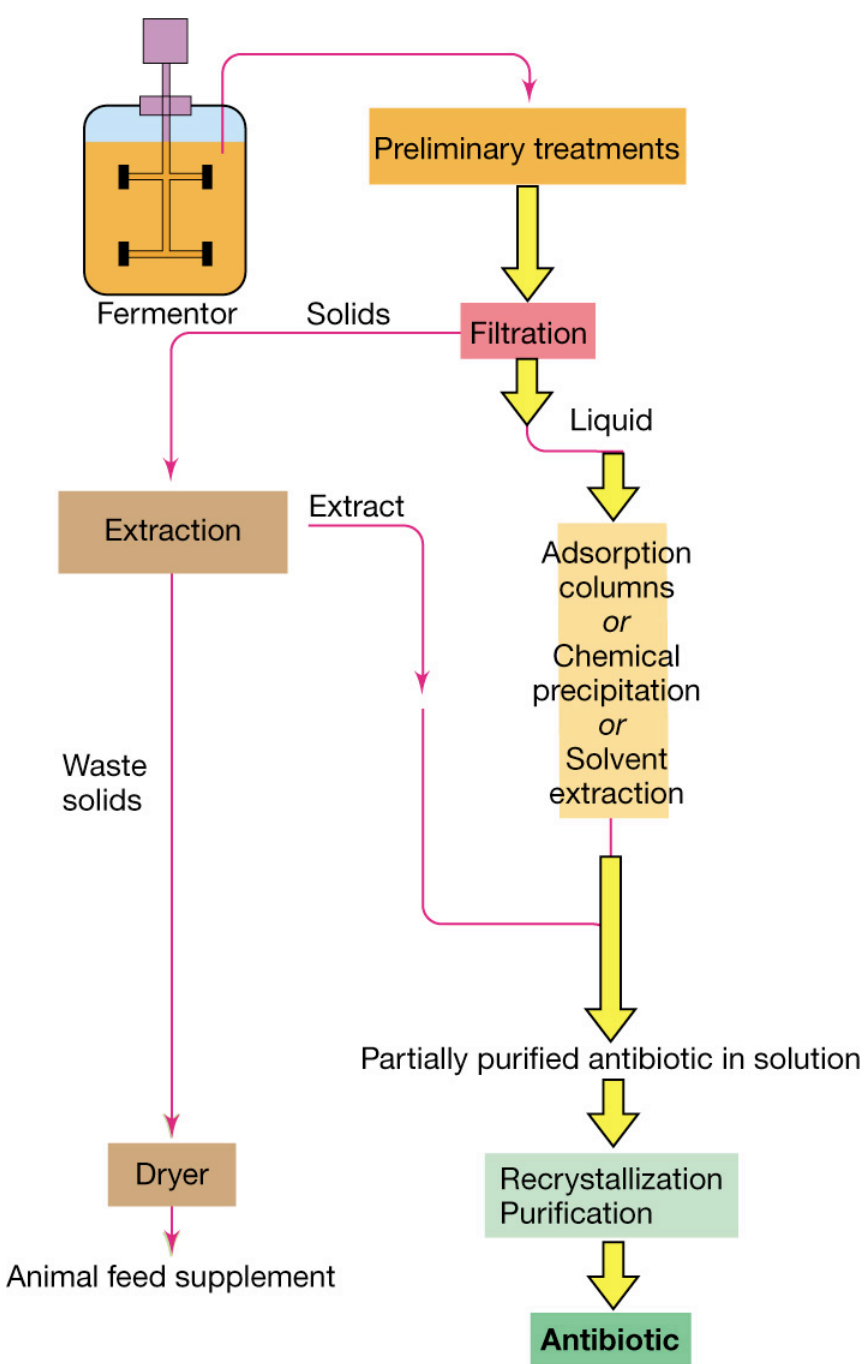
(a)

M. T. Madigan



(b)

T. D. Brock



(a)

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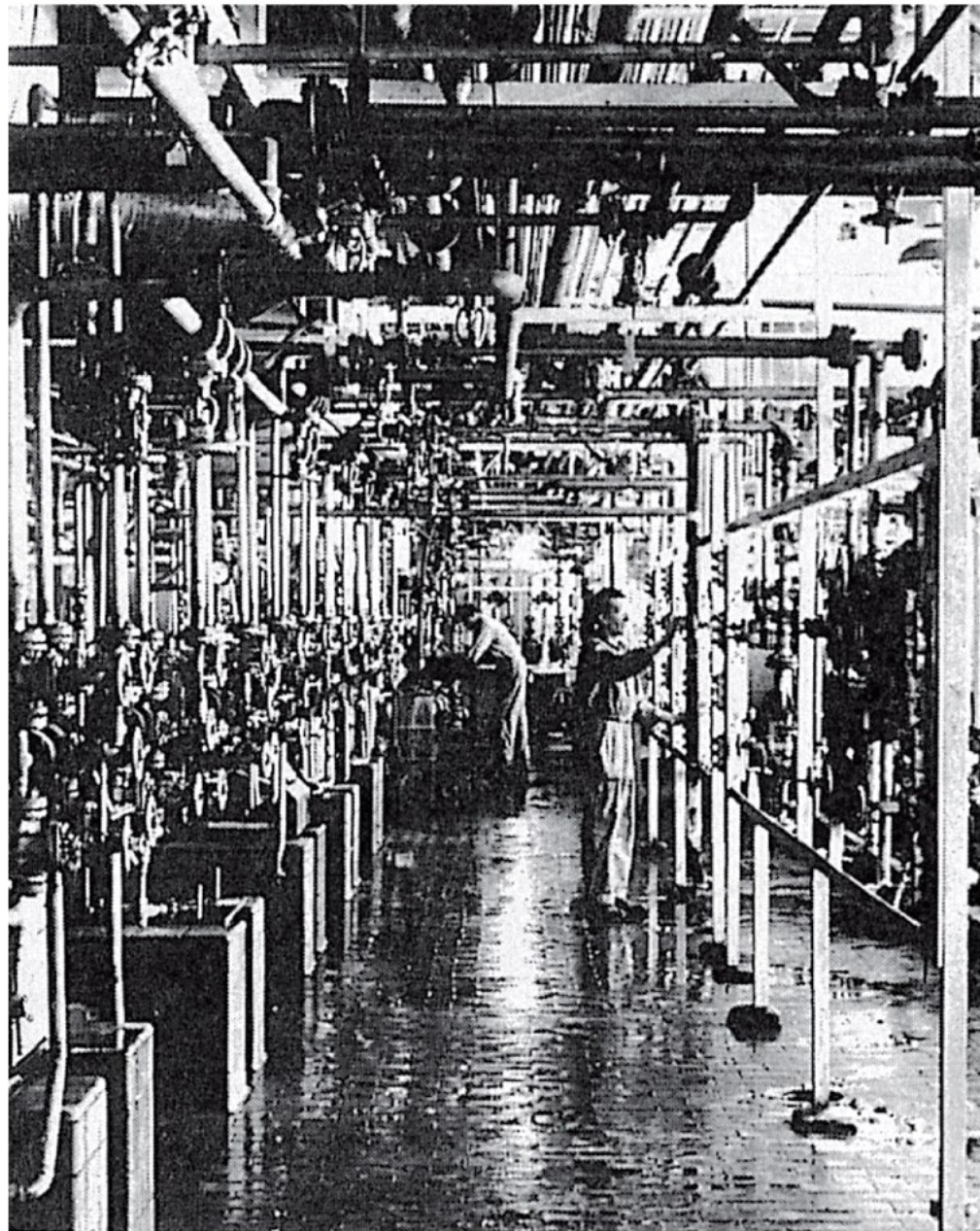
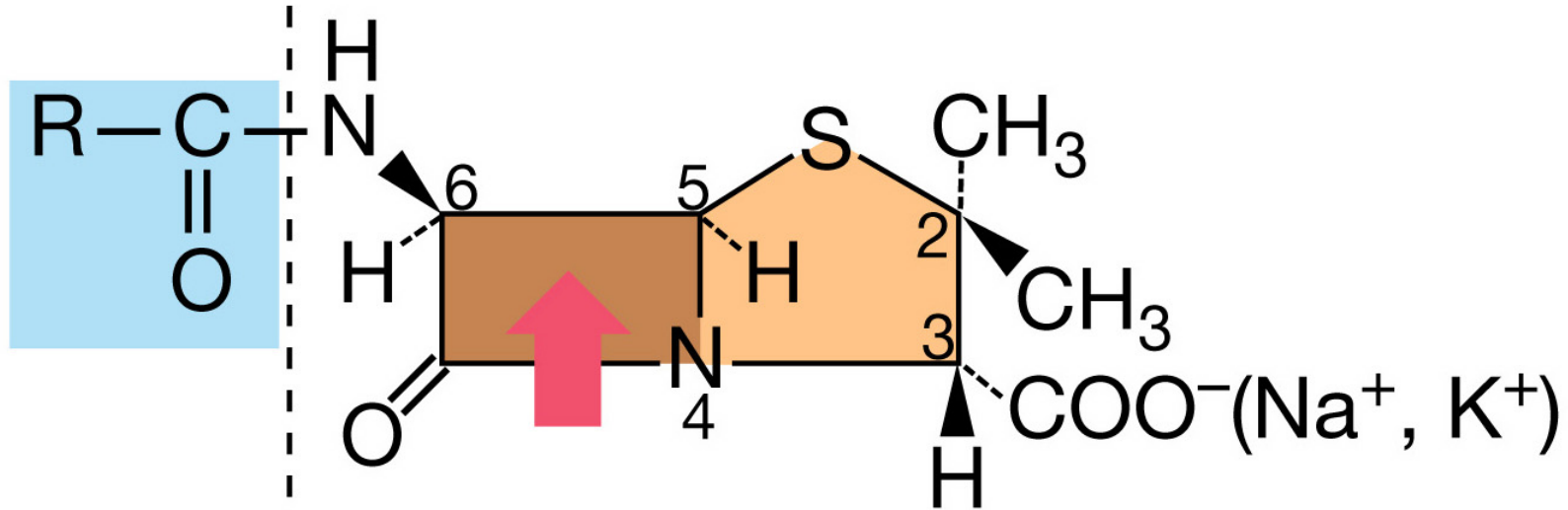


Figure 30-8b Brock Biology of Microorganisms 11/e  
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β-Lactam  
ring

Thiazolidine  
ring

*N*-Acyl group

6-Aminopenicillanic acid



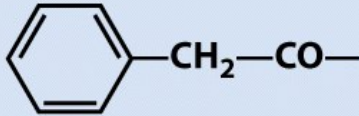
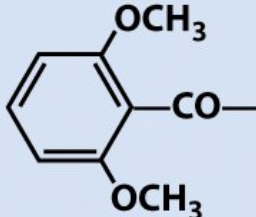
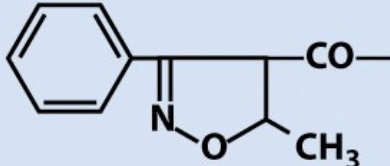
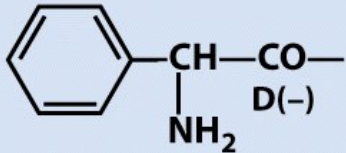
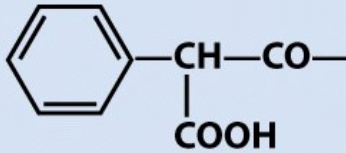
Designation	N-Acyl group
<p><b>NATURAL PENICILLIN</b></p> <p><b>Benzylpenicillin (penicillin G)</b> Gram-positive activity <math>\beta</math>-lactamase-sensitive</p>	
<p><b>SEMISYNTHETIC PENICILLINS</b></p> <p><b>Methicillin</b> acid-stable, <math>\beta</math>-lactamase-resistant</p> <p><b>Oxacillin</b> acid-stable, <math>\beta</math>-lactamase-resistant</p> <p><b>Ampicillin</b> broadened spectrum of activity (especially against gram-negative <i>Bacteria</i>), acid-stable, <math>\beta</math>-lactamase-resistant</p> <p><b>Carbenicillin</b> broadened spectrum of activity (especially against <i>Pseudomonas aeruginosa</i>), acid-stable but ineffective orally, <math>\beta</math>-lactamase-sensitive</p>	   

Figure 20-20 part 2 Brock Biology of Microorganisms 11/e  
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# Penicillin fermentation

Biosynthetic penicillin I

Add precursor I

Biosynthetic penicillin II

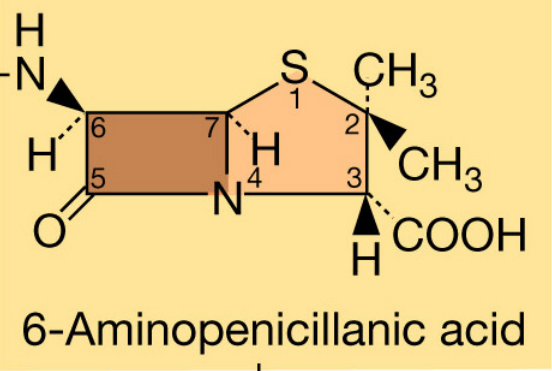
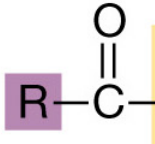
Add precursor II

Biosynthetic penicillin III

Add precursor III

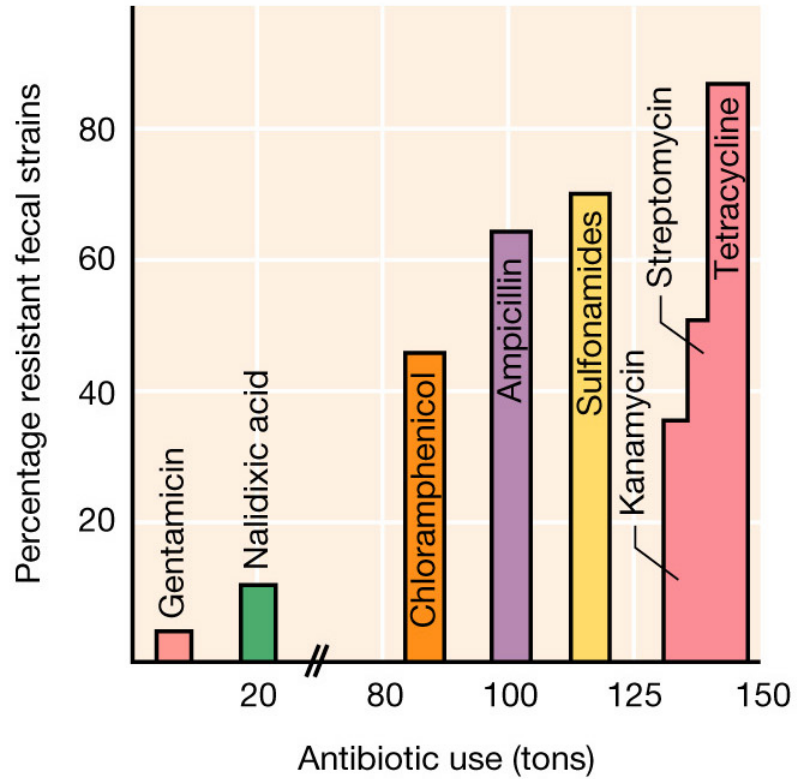
Natural penicillins  
(for example, penicillin G)

Chemical or enzymatic treatment of penicillin G

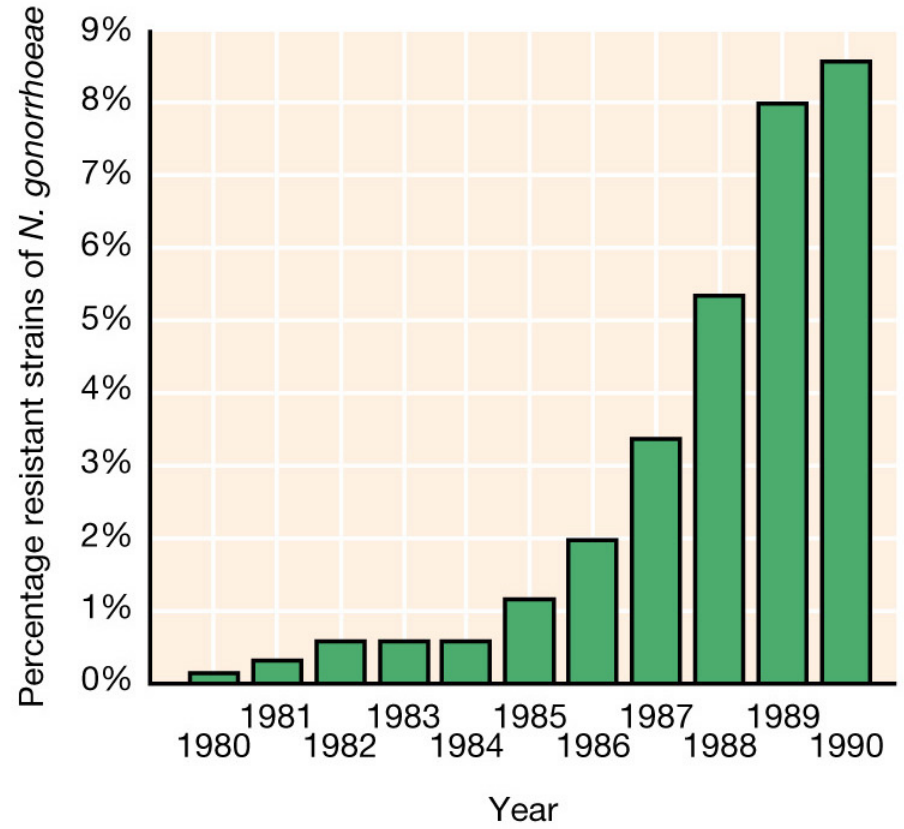


Add side chains chemically

Semisynthetic penicillins  
(for example, ampicillin, amoxycillin, methicillin)



(a)

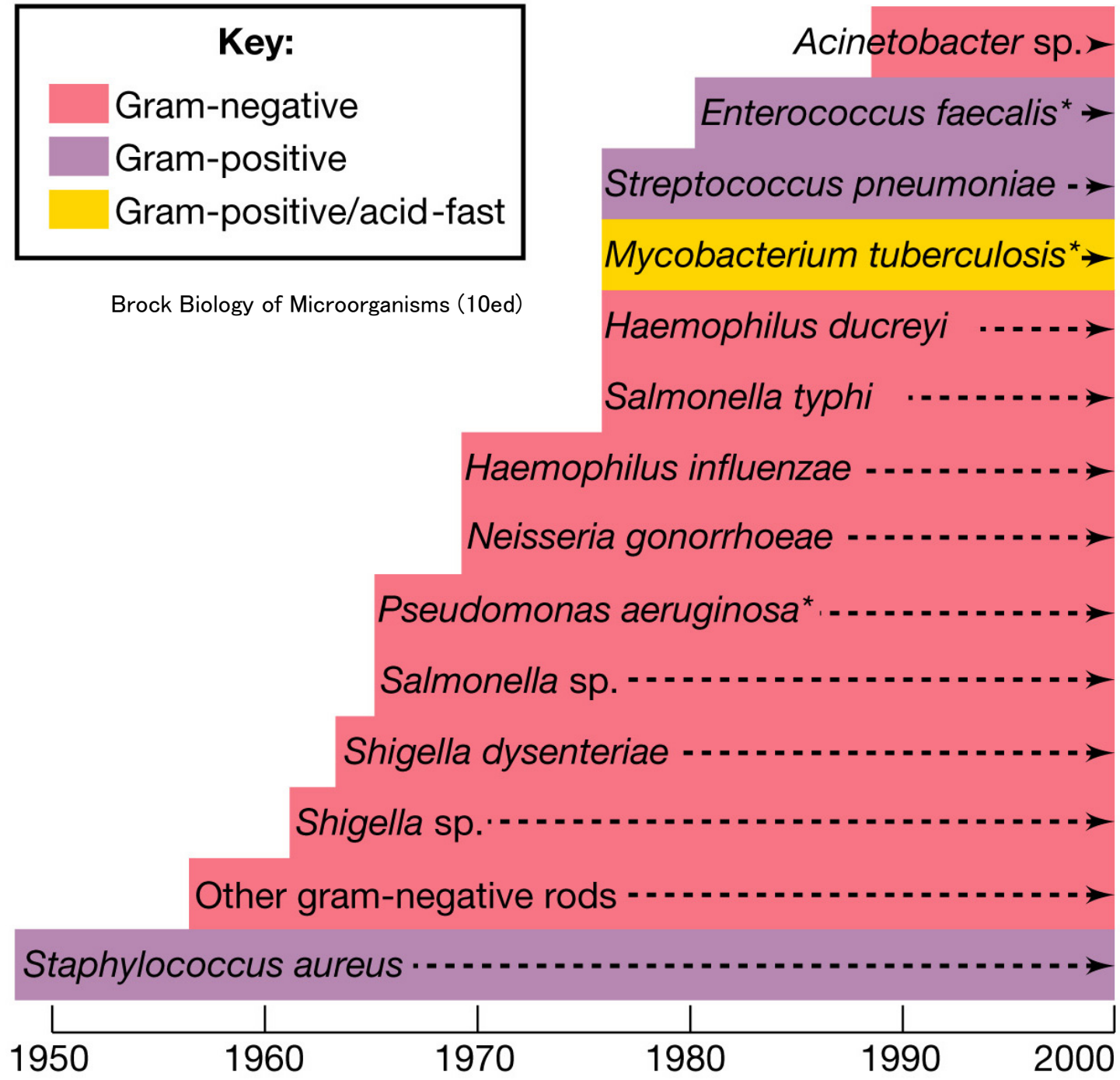


(b)

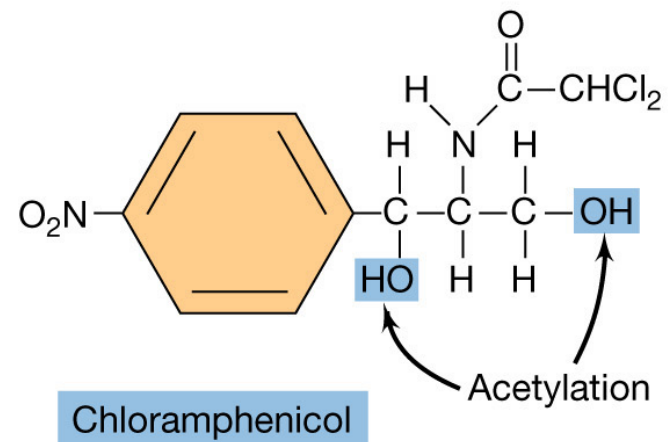
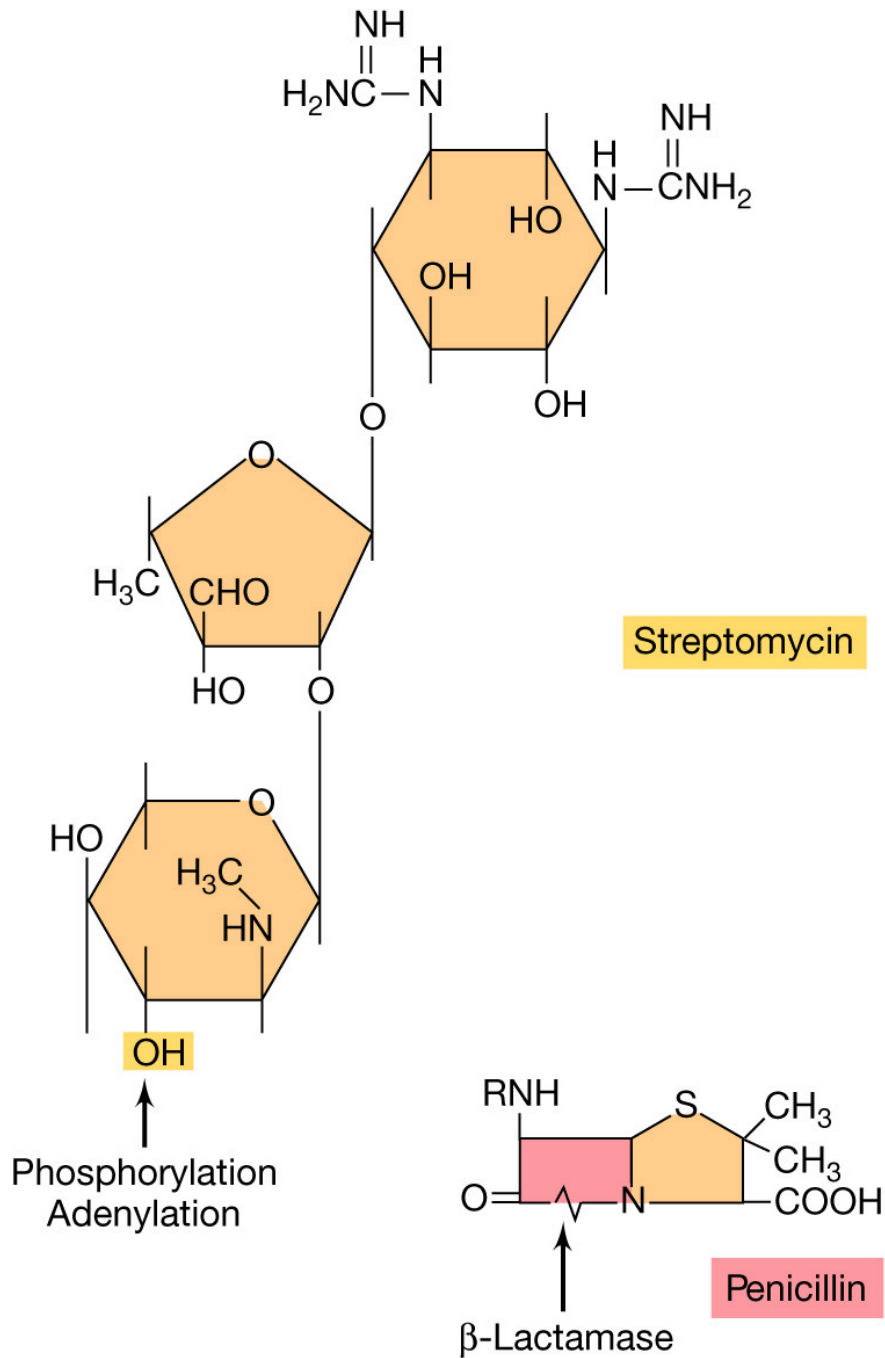
**Key:**

- Gram-negative
- Gram-positive
- Gram-positive/acid-fast

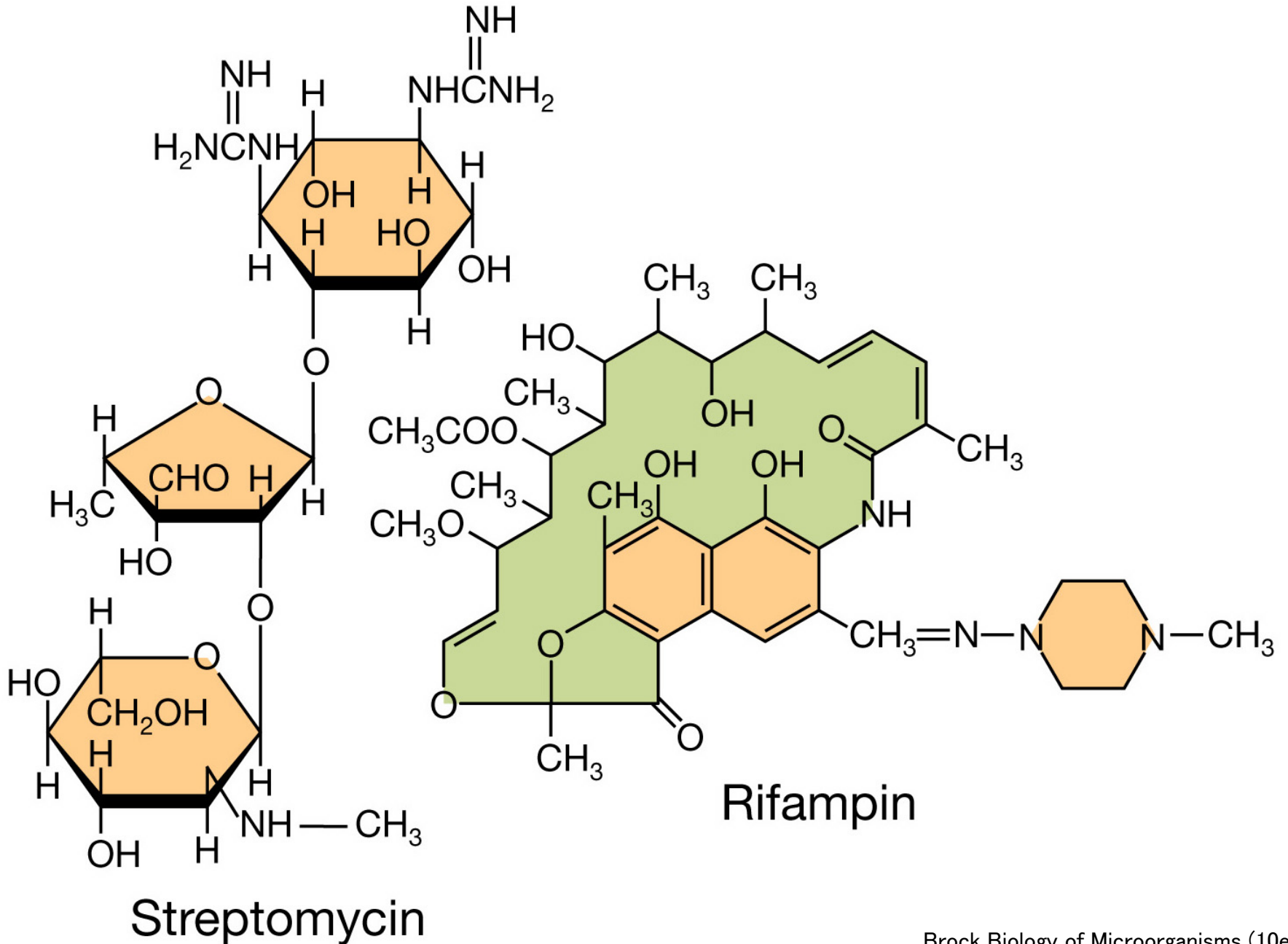
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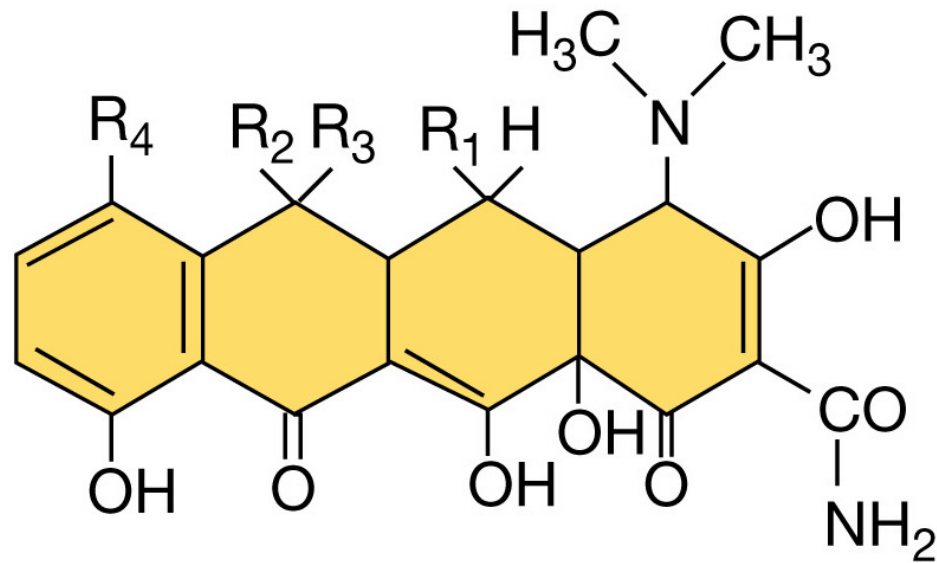






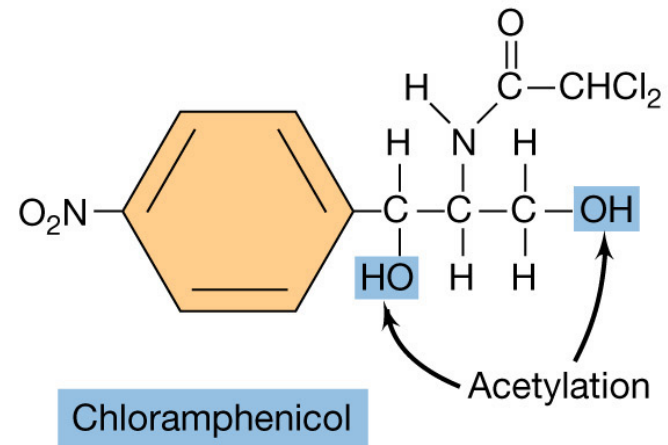
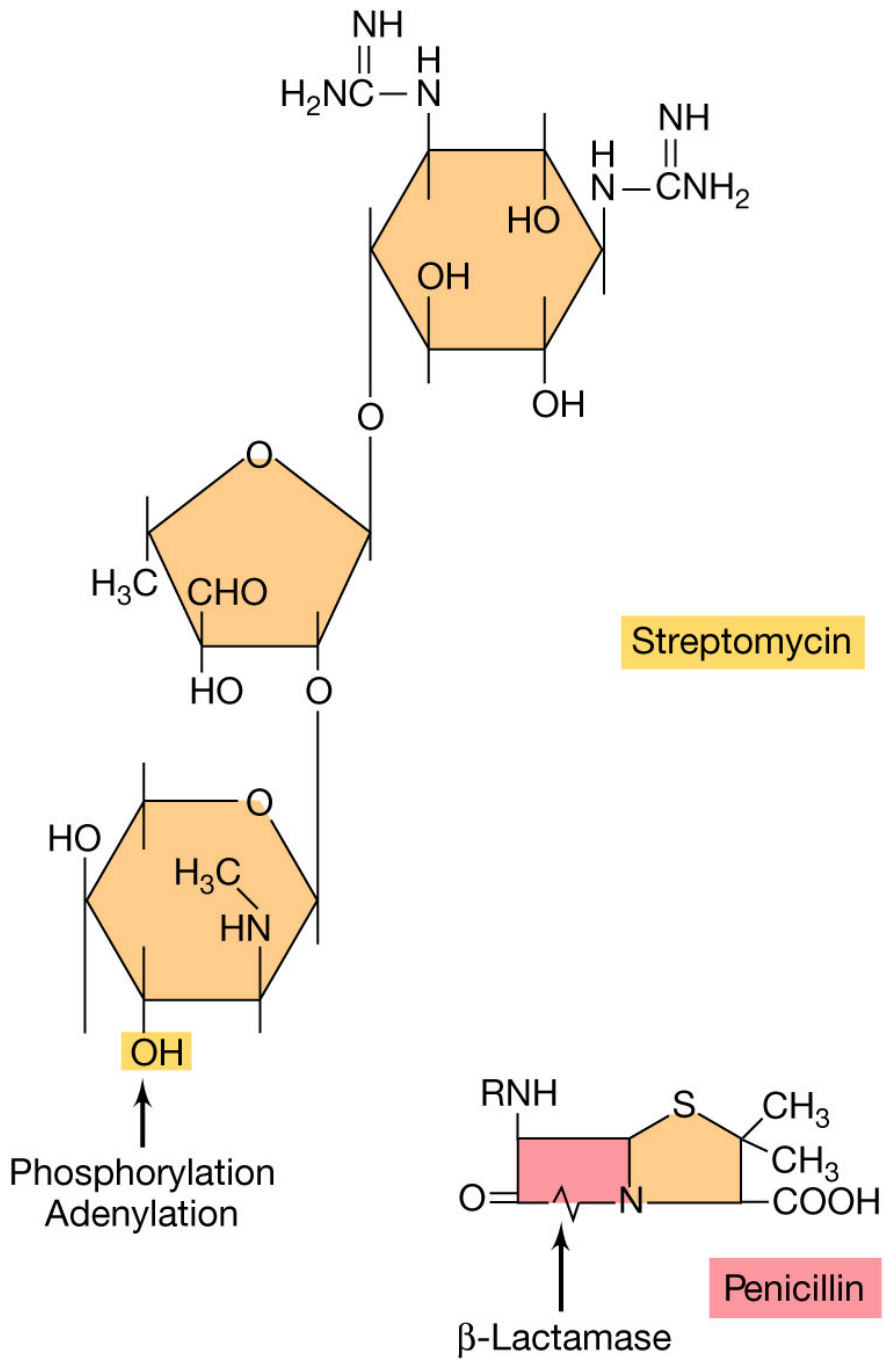
# Representative structure



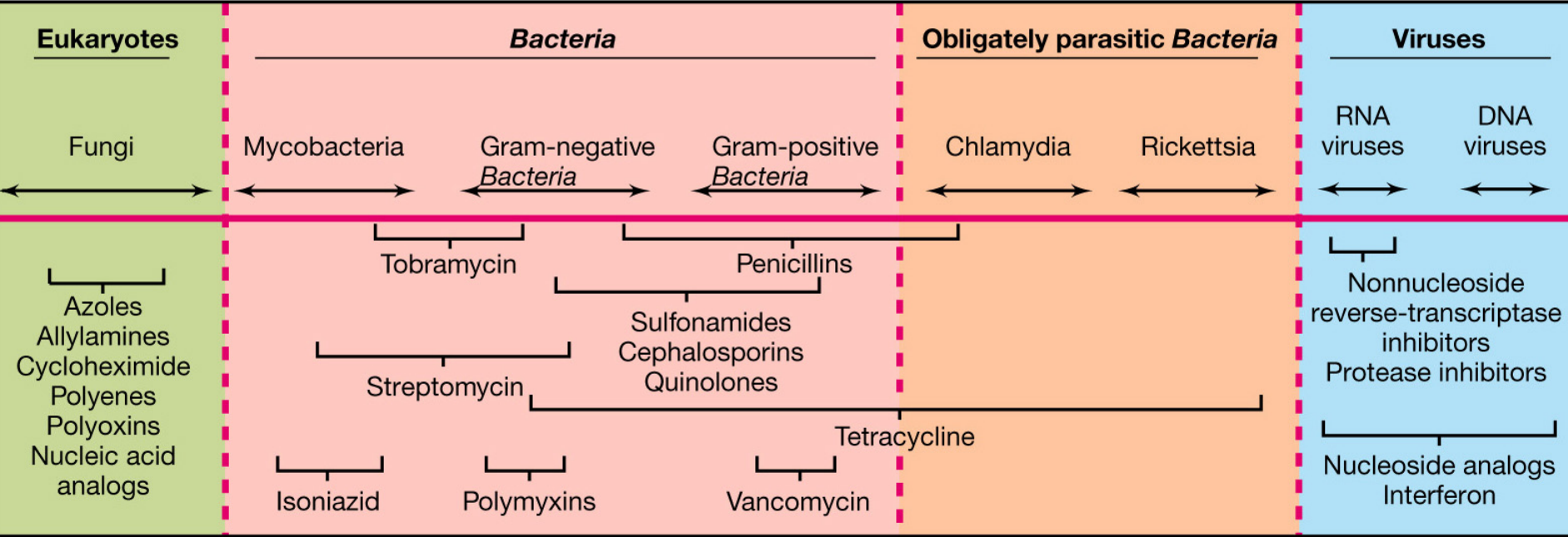


**Tetracycline analog**

	<b>R<sub>1</sub></b>	<b>R<sub>2</sub></b>	<b>R<sub>3</sub></b>	<b>R<sub>4</sub></b>
Tetracycline	H	OH	CH <sub>3</sub>	H
7-Chlortetracycline (aureomycin)	H	OH	CH <sub>3</sub>	Cl
5-Oxytetracycline (terramycin)	OH	OH	CH <sub>3</sub>	H







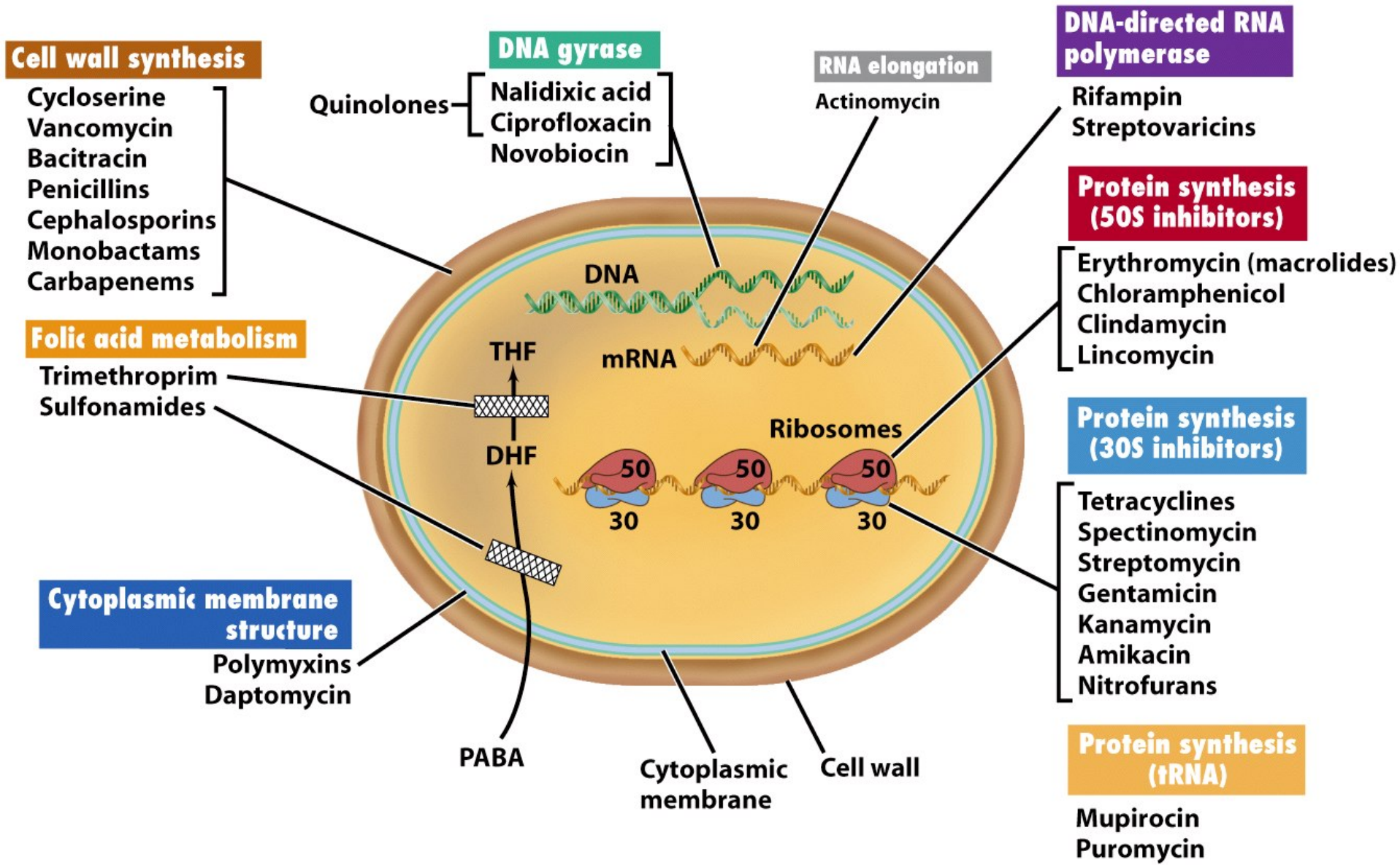
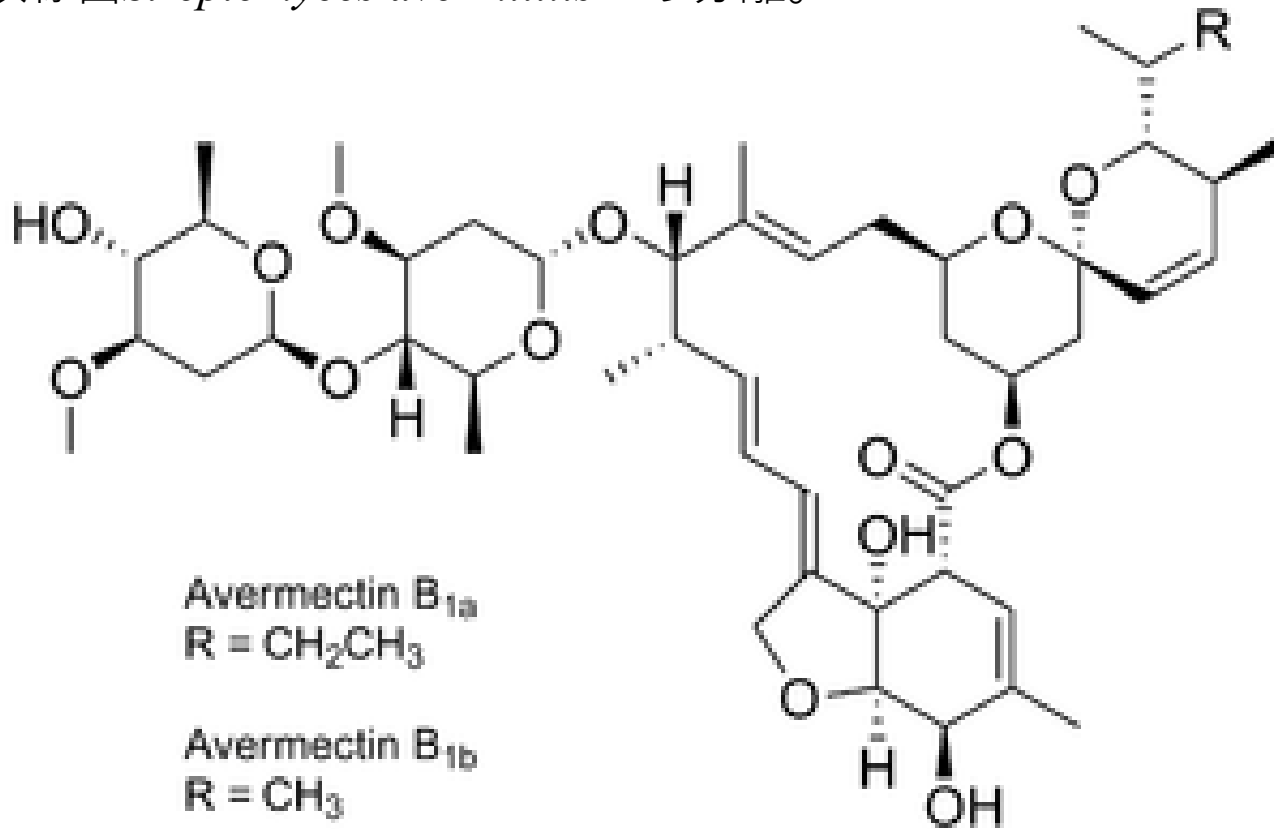


Figure 20-14 Brock Biology of Microorganisms 11/e  
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# エバーメクチン (アベルメクチン)

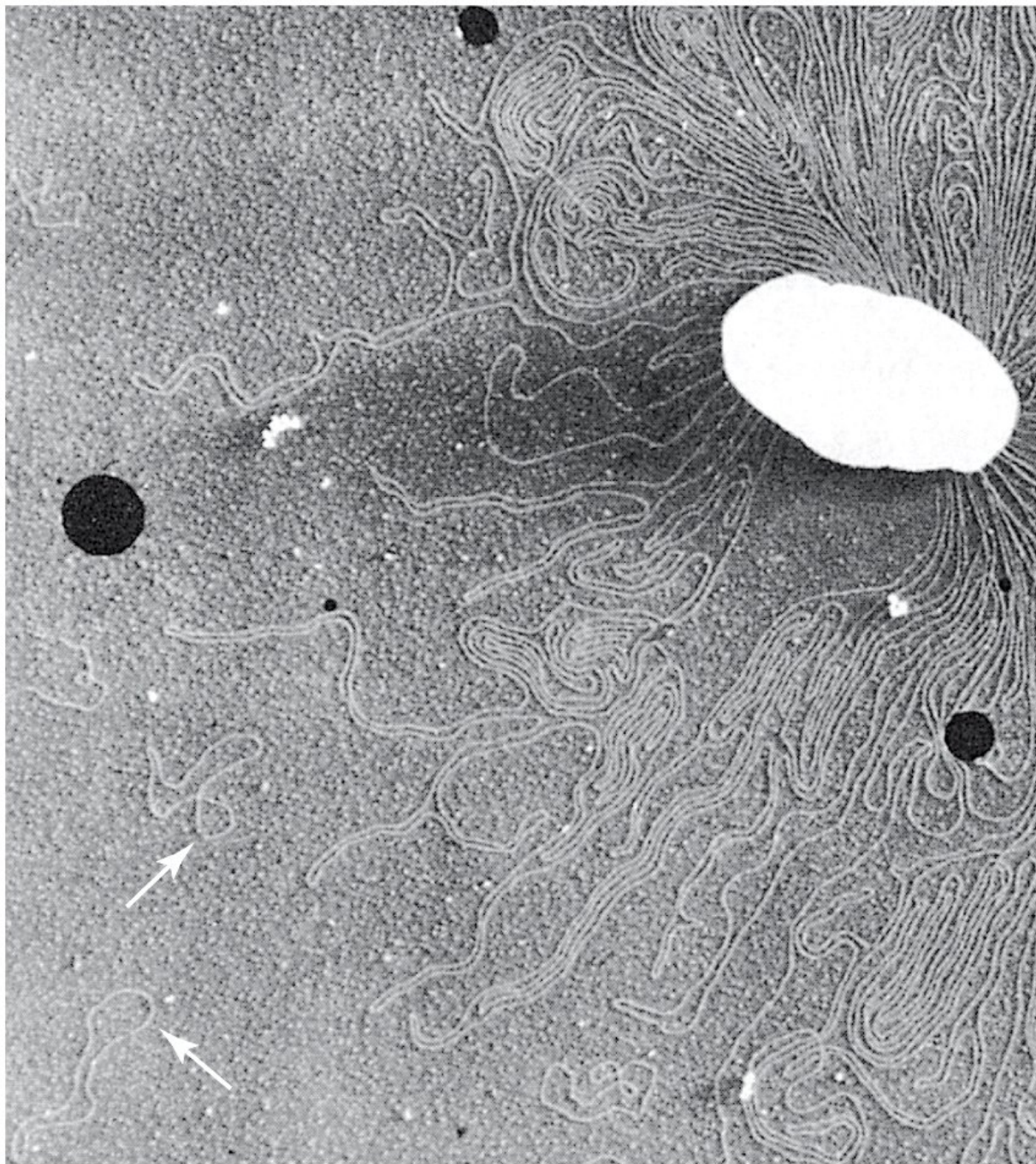
放線菌 *Streptomyces avermitilis* から分離。



ウィキペディアより

イベルメクチンはエバーメクチンから化学合成された寄生性線虫やダニなどの駆虫薬

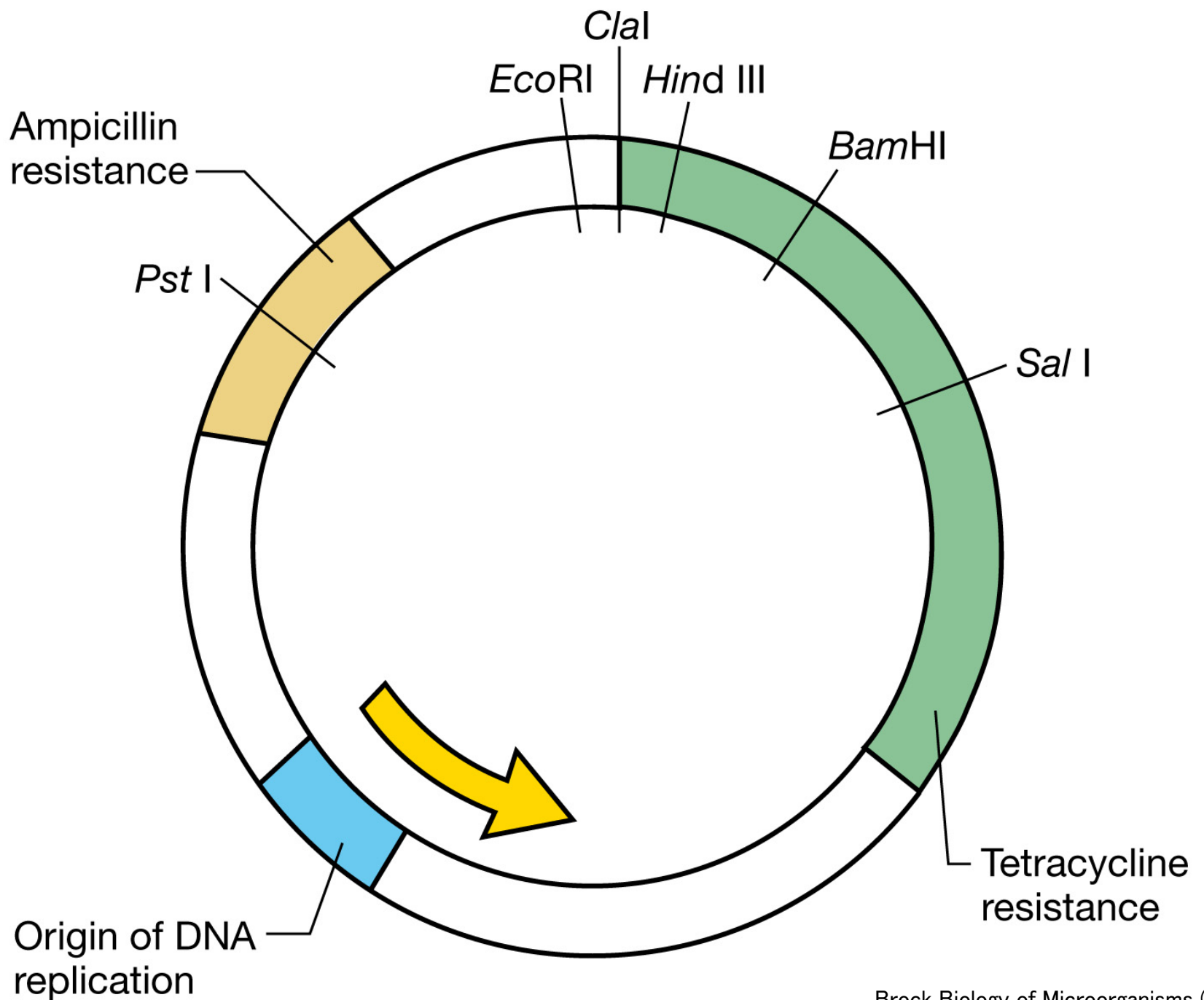


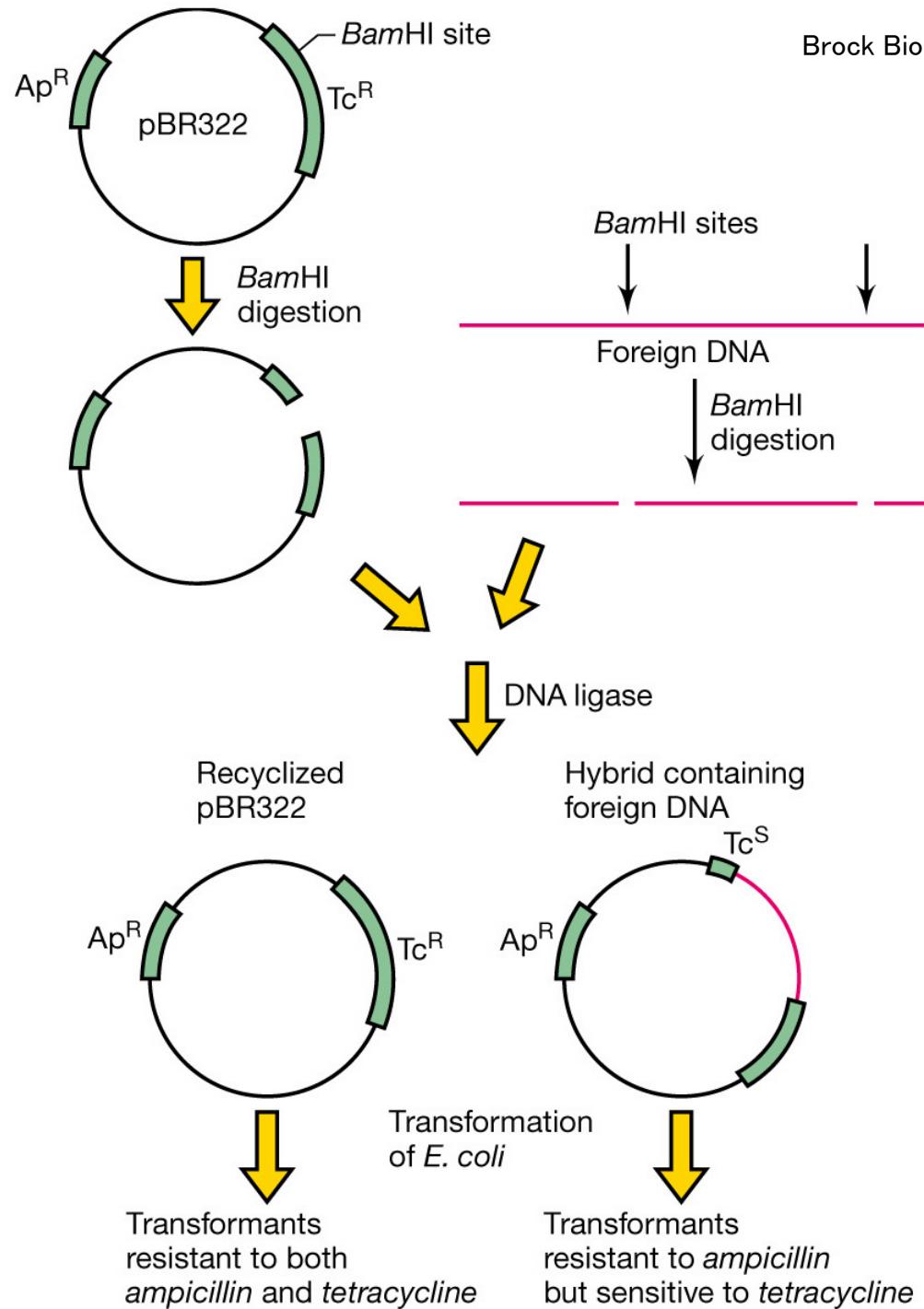


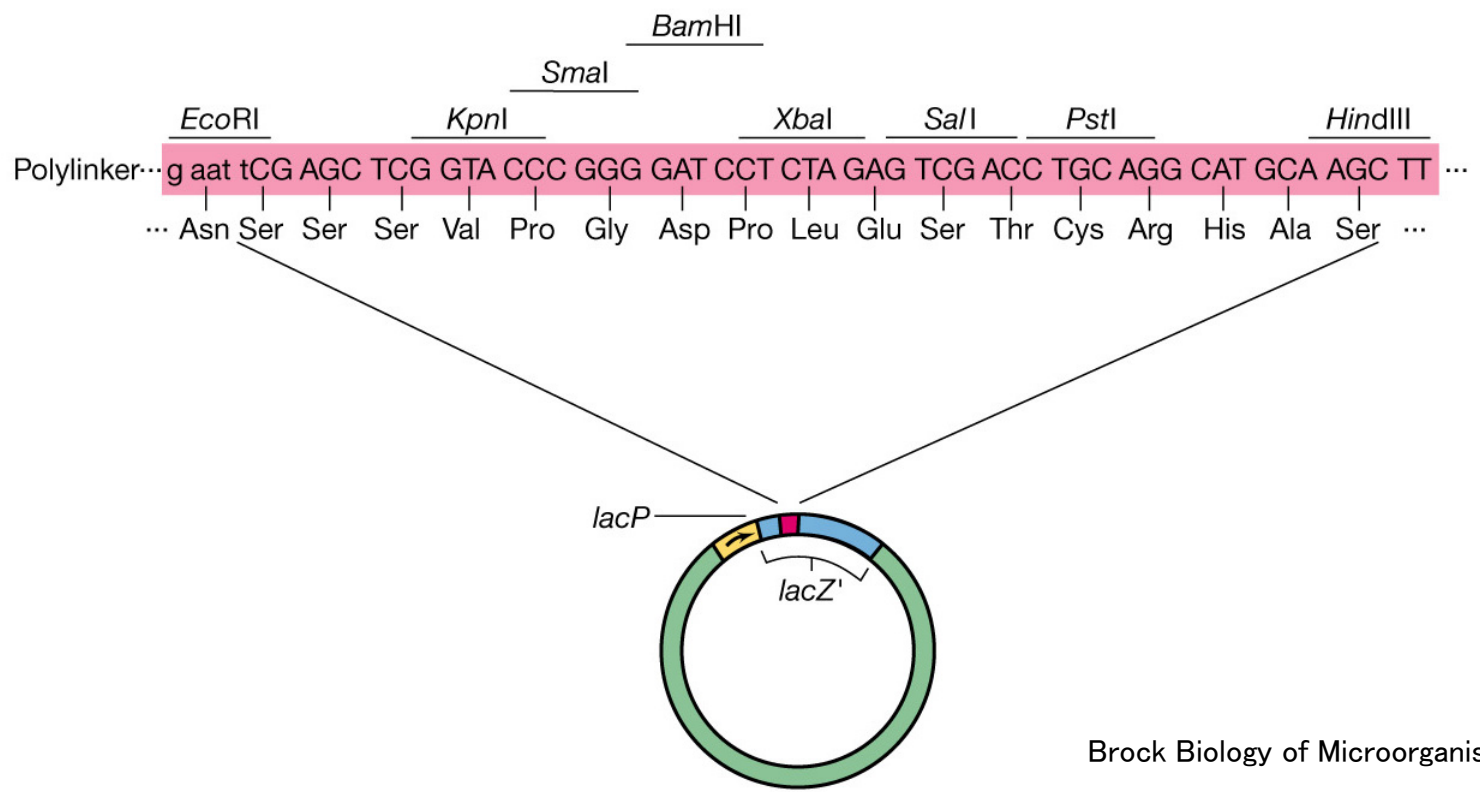
Huntington Potter and David Dressler

Figure 10-17 Brock Biology of Microorganisms 11/e  
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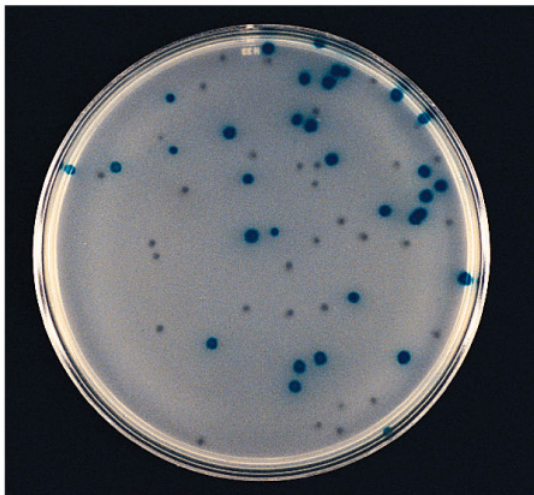






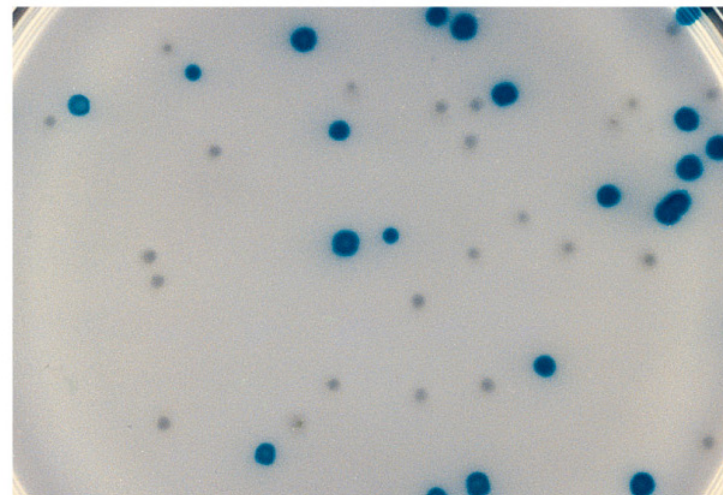
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(a) M13mp18



J. Parker

(b)



J. Parker

(c)