

## Gram Staining

Bacterial species are often distinguished from one another by **Gram staining**.

- In this process, a bacterial smear is heat fixed on glass slide, stained with crystal violet and mordanted with iodine and finally rinsed with ethanol.
- When the bacteria retain the crystal violet stain after rinsing, the bacteria are called **gram positive**; and those which do not retain the stain are called **gram negative**.
- The later are then counter stained with pink colour safranin.
- The ability of bacteria to retain crystal violet stain or not, depends upon fundamental structure of cell wall.

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## Gram positive vs Gram negative bacteria

Gram Positive bacteria	Gram Negative bacteria
<ol style="list-style-type: none"> <li>1. Cell wall is thicker and homogemous.</li> <li>2. Contains lower content of lipids (5-10%)</li> <li>3. Peptidoglycan comprises up to 90% of the cell wall and hence maximum lipid.</li> <li>4. Techoic acid present.</li> <li>5. Cell wall has higher amino sugar content (10-20%)</li> <li>6. Cell wall is simple in shape and is single layered.</li> <li>7. Mesosomes more prominent.</li> <li>8. Retains violet dye</li> <li>9. Examples: <i>Bacillus</i>, <i>Clavibacter</i>, <i>Streptomyces</i></li> </ol>	<p>Cell wall is thinner and usually thin layered. Contains higher content of lipids (up to 40%) Peptidoglycan comprises only 10%.</p> <p>Techoic acid absent. Low content of amino sugars</p> <p>Varying cell wall shape and is tripartite (3-layered). Mesosomes less prominent. Retains red dye Examples: <i>Erwinia</i>, <i>Pseudomonas</i>, <i>Xanthomonas</i>, <i>Agrobacterium</i>, <i>Xylella</i></p>

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Lecture 9

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