






The name	Name root	size	types	notes
spherical/ Cocci	greek word kokkos Grain/Kernal	0.5 - 1.25 μ in diameter	<ul style="list-style-type: none"> * Micrococci \rightarrow appears singly. * Diplococci \rightarrow appear in pairs * streptococci \rightarrow appear in row * staphylococci \rightarrow irregular cluster (grapes) * Tetrads \rightarrow sequence of four. * Sarcinae \rightarrow cuboidal or geometrical or packet arrangement. 	<ul style="list-style-type: none"> * Their ends are rounded flat or sharp pointed * flagellated or non-flagellated.
Rod/ Bacillus	greek word rod / stick	0.5 μ - 1.2 μ in diameter & 3 - 7 μ in length	<ul style="list-style-type: none"> * Monobacillus \rightarrow arranged singly * Diplobacilli \rightarrow group of two * streptobacilli \rightarrow chain * Palisade \rightarrow very rarely 	<p>eg. rod shape they are flagellated</p>
Spiral/ Helical	greek word spiral/coiled	0.5 - 3 μ in diameter & 10 - 50 μ in length	<ul style="list-style-type: none"> * single spirillum has more than one turn of helix. 	vibrio Cholera.
Vibro/ Cocci		1.5 - 1.7 μ in diameter & up to 10 μ in length.	<ul style="list-style-type: none"> * they bear flagella at their end * appears like a corkscrew 	Their body is more flexible.
Spirochaeta		length is more than diameter		

2 // I structure external to cell wall.

A. Flagella

- ↳ flexible (like appendage)
- ↳ typical measures 4-5 μ long
- ↳ made up of flagellin ptn.
- ↳ bacteria which lack flagella (Atrichous)
- ↳ types based on the location of flagella.
 - ↳ monotrichous 
 - ↳ peritrichous 
 - ↳ amphitrichous 
 - ↳ lophotrichous 

B. pili

- ↳ hair like appendage (on surface of gram -ve bacteria)
- ↳ smaller than flagella.
- ↳ no role in the motility.
- ↳ single bacteria 100-500 pili \rightarrow peritrichously 
- ↳ made up of pili ptn.
 - I. Somatic pili \rightarrow 100, help for attachment to a substratum
 - II. sex pili or conjugate pili \rightarrow F pili, 1-10 \rightarrow in male
 - ↳ + factor = Male = donor
 - ↳ - factor = female = recipient.

C. Fimbriae (Attachment pili)

- ↳ short pili
- ↳ located at the poles or spread over its entire surface

D. capsule

- ↳ network \rightarrow di or polysaccharide, polypeptides covering layer around the bacterial cell wall.

- ↳ protection against temporary drying (binding H₂O molecules)
- ↳ antiphagocytic inhibit engulfment.

3 E- Cell wall

- ↳ located below E. structures & above C. Membrane
- ↳ very rigid structure (define shape to the cell)
- ↳ prevent the cell from expanding & bursting
- ↳ 10-40% of the dry weight of bacterial cell.
- ↳ made up of large number of layers

Streptococcus pneumoniae
↳ retains the stain after washing with alcohol
Klebsiella pneumoniae
↳ did not

thickness of cell wall

- ↳ +ve → peptidoglycan layer.
- ↳ -ve → outer membrane + peptidoglycan layer

LPS →

- ↳ protection from O antigen
- ↳ contribute to -ve charge
- ↳ lipid A → help stabilize outer membrane
↳ endotoxin
- ↳ pathogenic effect
↳ may cause uncontrolled activation of immune system
↳ septic shock.

2 Structure internal to cell wall.

A - Inclusion Bodies

- ↳ organic or inorganic material → for future use
- ↳ some are enclosed by single layered
↳ some made of ptn or contain lipid

Hierarchical classification

Kingdom ← phylum ← class ← order ← family ← Genus ← species
King Philip Came over for Good Spaghetti
ica ales aceae

★ Taxonomy the science of classification of organisms

- ★ each microbe 2 names
 - ↳ Genus → always capitalized
 - ↳ species → lower case
- ↳ both italicized or underlined