

PROKARYOTIC ANATOMY III: ENDOSPORES, SPORULATION

6/30/83, rvsd 8 July 1995, 25 June 99, 13 July 01, 7 July 03, 14 July 04, 11 July 05, 13 July 05, 5apr06, 9 July 07, 14 July 08, 13July09, 14July10, 15July11
 TFC, 7th p 77-99, Alcamo, p. 87-, Atlas, pp 111-139, TFC, 8th p 76-96, Black 6th: 90-95, Bauman 2nd, 65-92

ENDOSPORES: (p 547) specialized resting cells, survive extreme heat, toxins, chemicals, **xeroduric**.

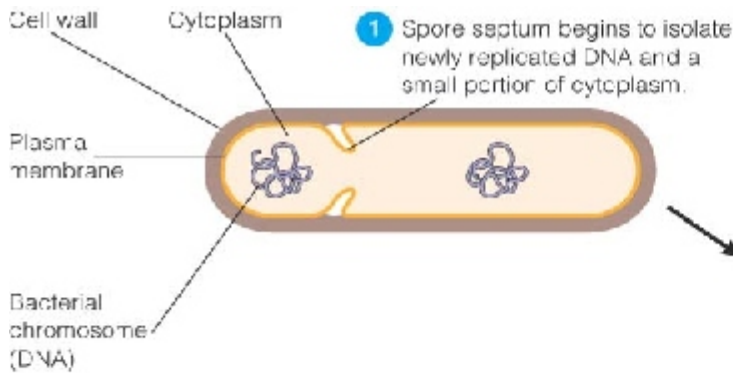
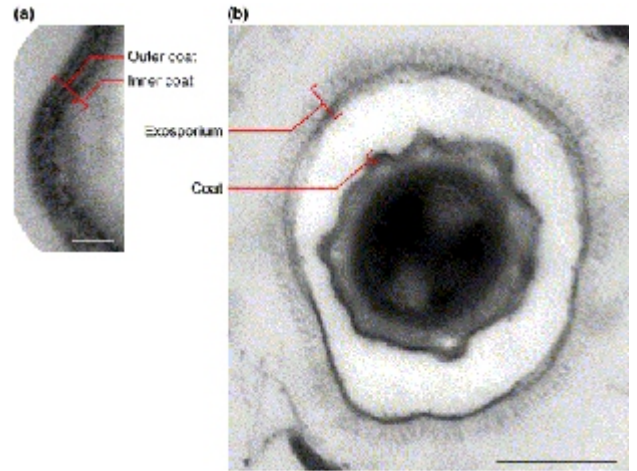
Survives 10,000 yr, possibly 25 mil in amber?

Five genera, only *Bacillus* and *Clostridium* are pathogenic

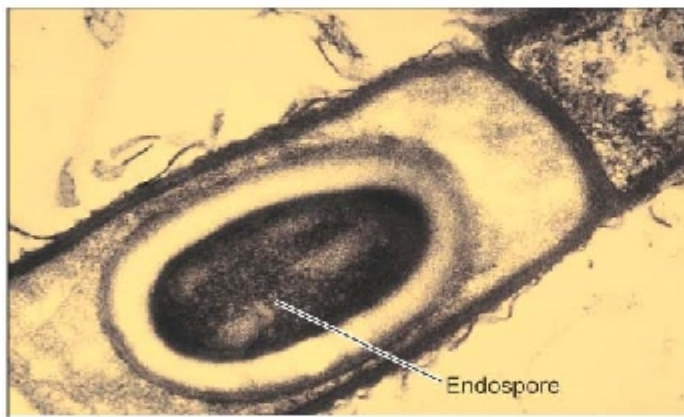
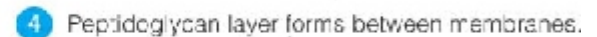
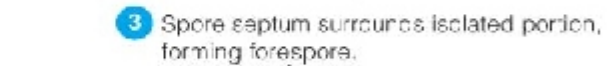
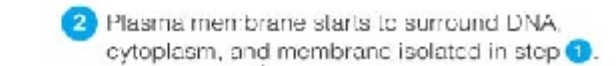
PROCESS OF SPORULATION Illustrate: (p. 76)

1. spore septum forms by **invagination of plasma membrane**
2. newly synth DNA surrounded ("forespore") by **double layer of membrane** (spore and cell membrane)
3. **Cortex** of peptidoglycan between two membranes
4. **spore coat** of protein synthesized on outside.

- Layers:**
- 1) spore coat (multiple layers of durable protein)
 - 2) outer membrane
 - 3) cortex (peptidoglycan)
 - 4) inner membrane
 - 5) inside: dipicolinic acid, stabilizes DNA (cytoplasm dramatically reduced)



(a) Sporulation, the process of endospore formation



TEM 1 μm

(b) An endospore in *Bacillus anthracis*

