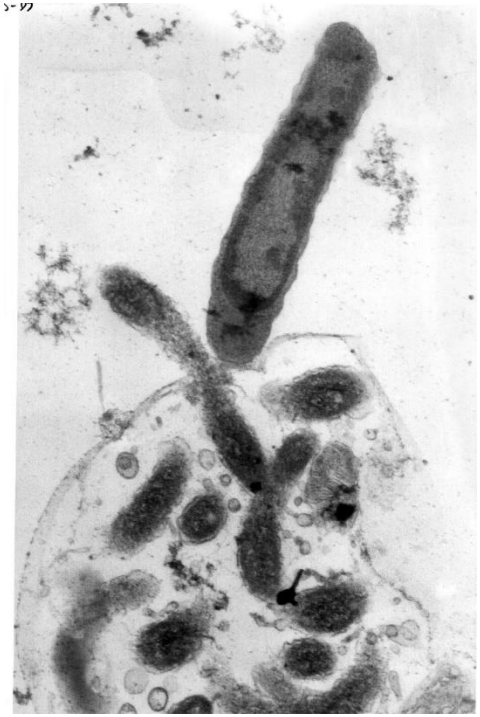
Maybe….2 bacteria

160616

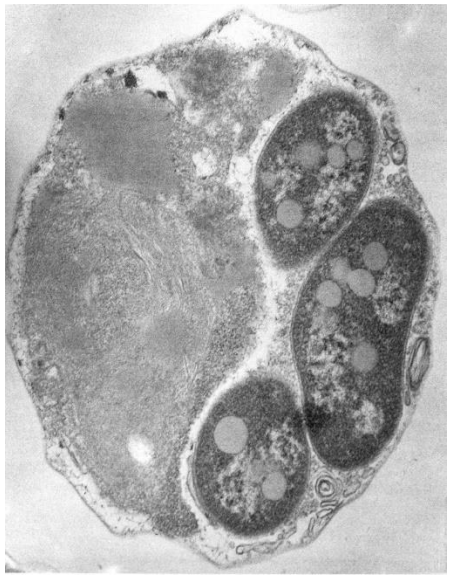
1st bacterium: larger (350-400 nm diam normally, larger [570 nm] in early infection; #2 image), rod-shaped, one big long bacterium when inside; may be the sausage

1



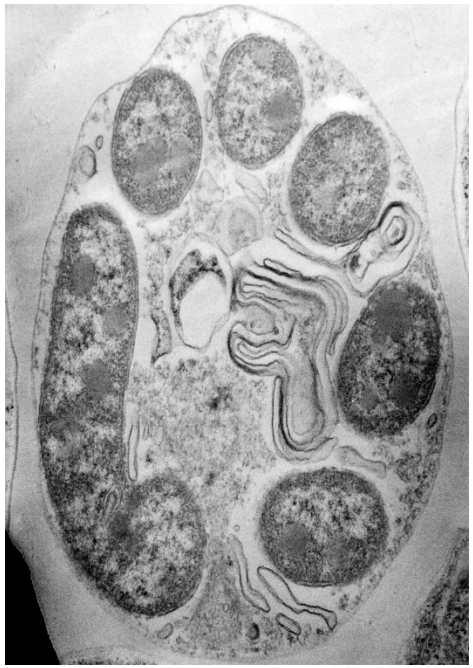
350 nm diam

2



570 nm diam

3

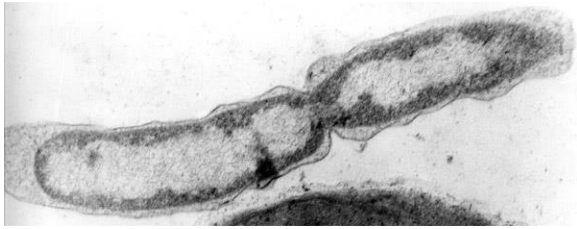


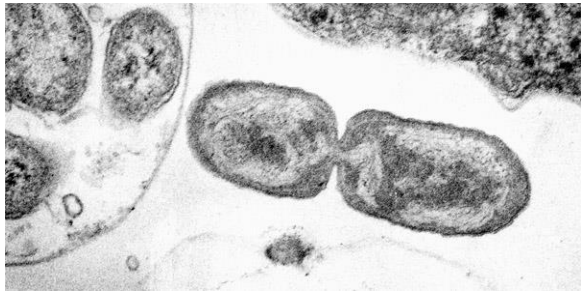
400 nm diam

4

340 nm diam

Divides outside



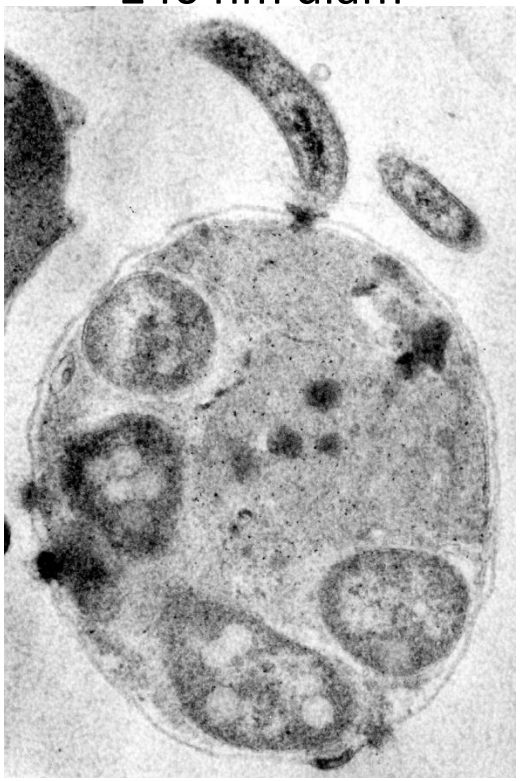


2nd bacterium: curved, flagellated, 200-250 nm diam

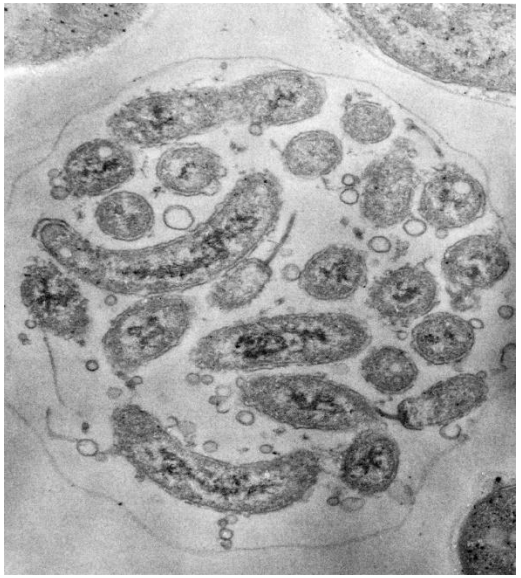
250 nm diam

240 nm diam

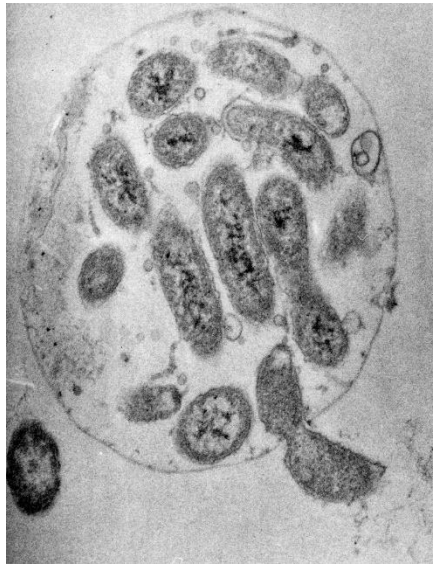
240 nm diam



This has larger one inside and smaller one attached



205-250 nm diam, 2 flagellar profiles here; indicates division inside



220-240 nm diam

Troublesome

- 1. Do these represent one, or two bacterium species?
- 2. Do these represent two stages of the same organism, like Caulobacter, with a vegetative dispersal stage (flagellated) and a non-motile reproductive stage. Curved could be dispersal stage; rod could be reproductive stage.
- 3. Both seem to do the same thing, in the same way (maybe): penetrate the host and consume the contents.
- 4. This is why we need outside advice: are we dealing with two organisms and one sequence, or are we dealing with one organism with two stages, and the sequence represents the one organism.

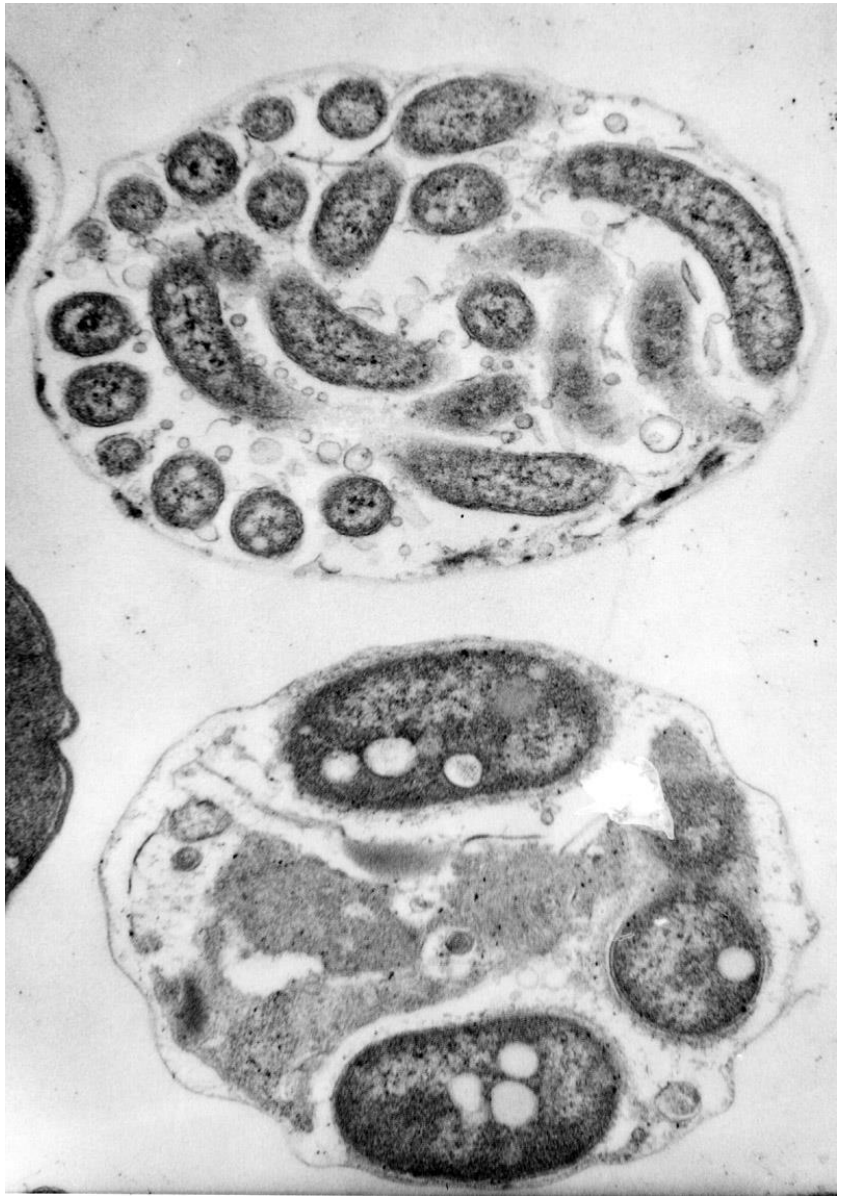
TEM plates

- Since we don't know if this is one or two organisms, what I am going to do with TEM plates is make a plate for each morphology, like the first two slides in this ppt. I don't want to mix the two morphologies together, if indeed this is two organisms, as representative of one organism.
- We just report what we have, and see where it goes.

Two bacteria, continued

160620

Two bacteria

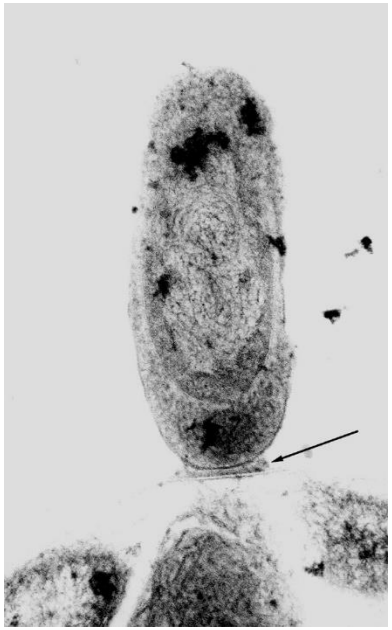


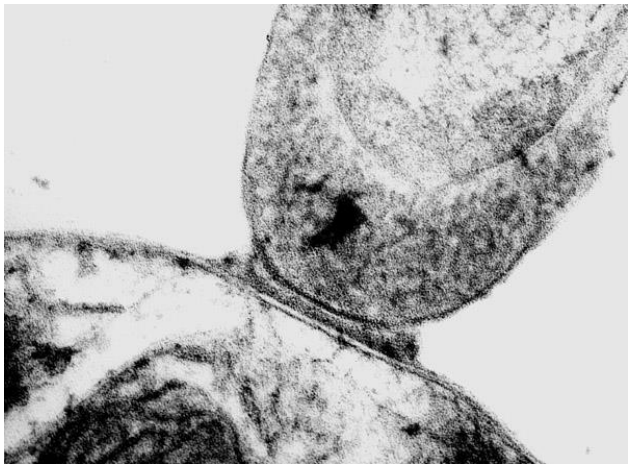
This is the beginning of my argument for two organisms: UPPER is the crescent-shaped (vibriose), smaller (~250 nm diam), fewer lipids in the bacterium body.

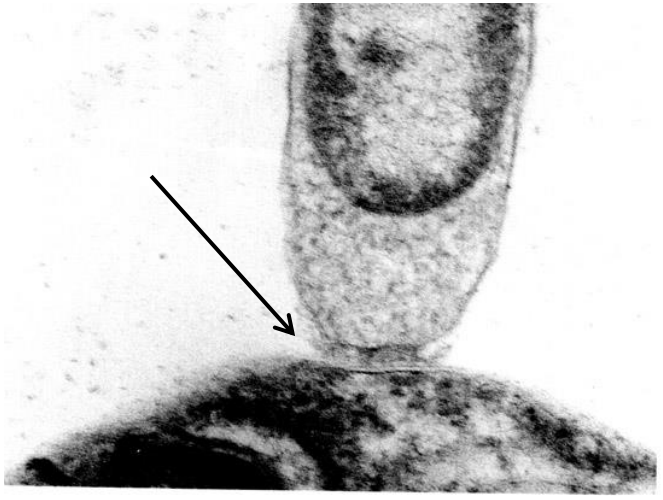
LOWER is the rod-shaped, larger (~400-500 nm diam), more lipids in bacterium body

Two bacteria: arrows indicate lipid globules

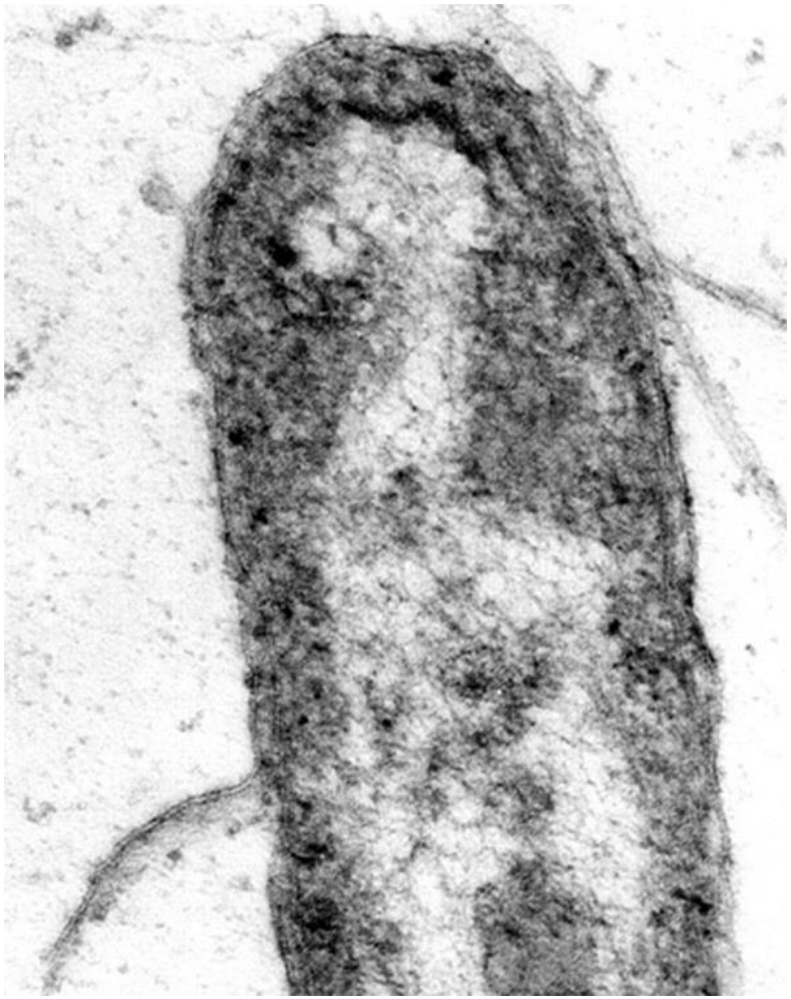
First: Larger, rod-shaped bacterium features: attachment via a “mucus” (poor descriptive choice) layer

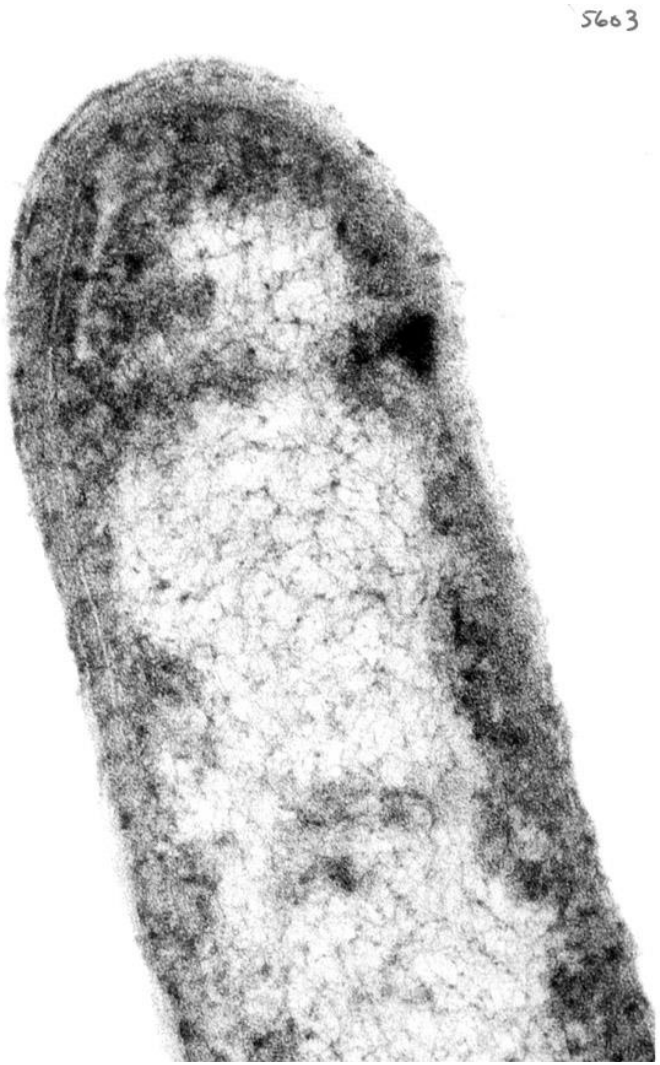




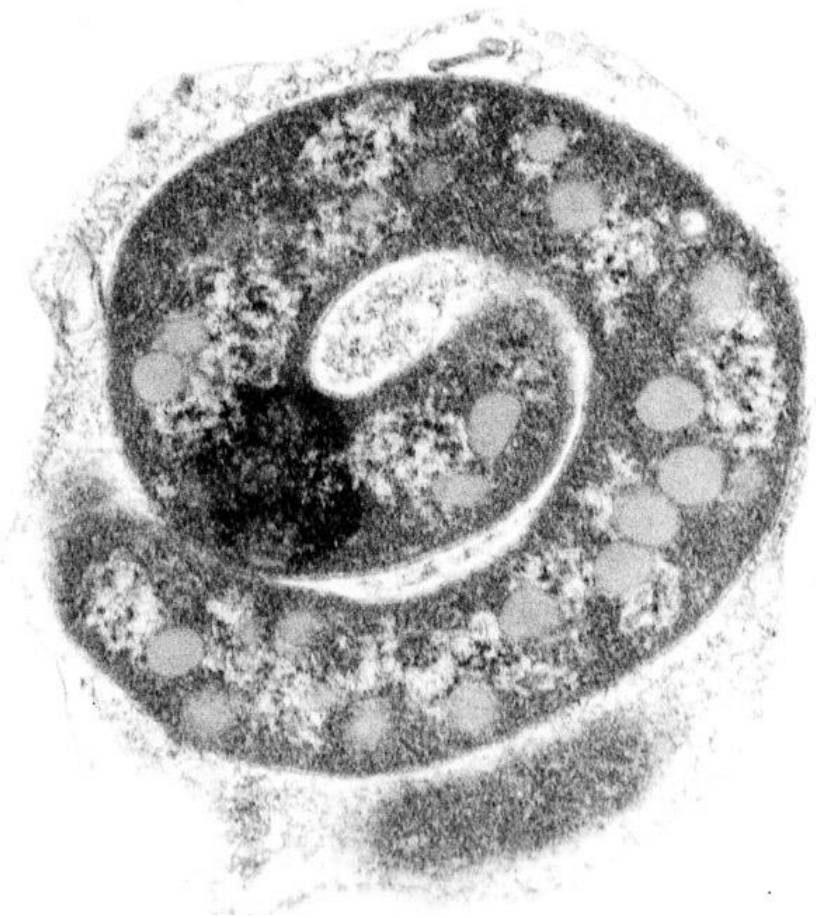


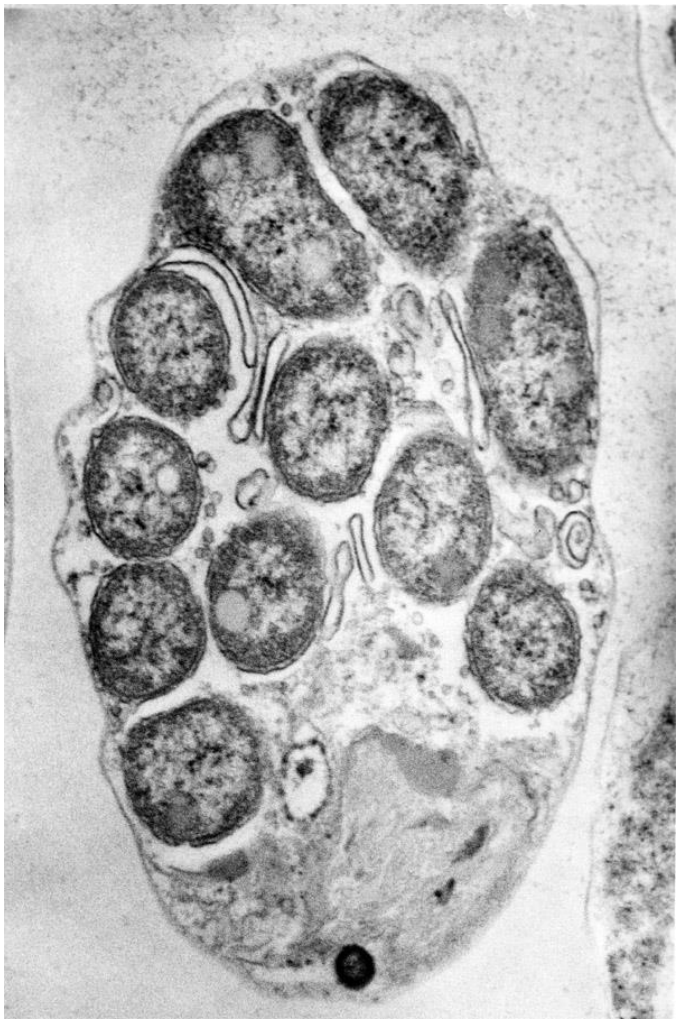
First: Larger, rod-shaped bacterium features: cell wall is “fibrous”, composed of protein fibers called “fimbriae”





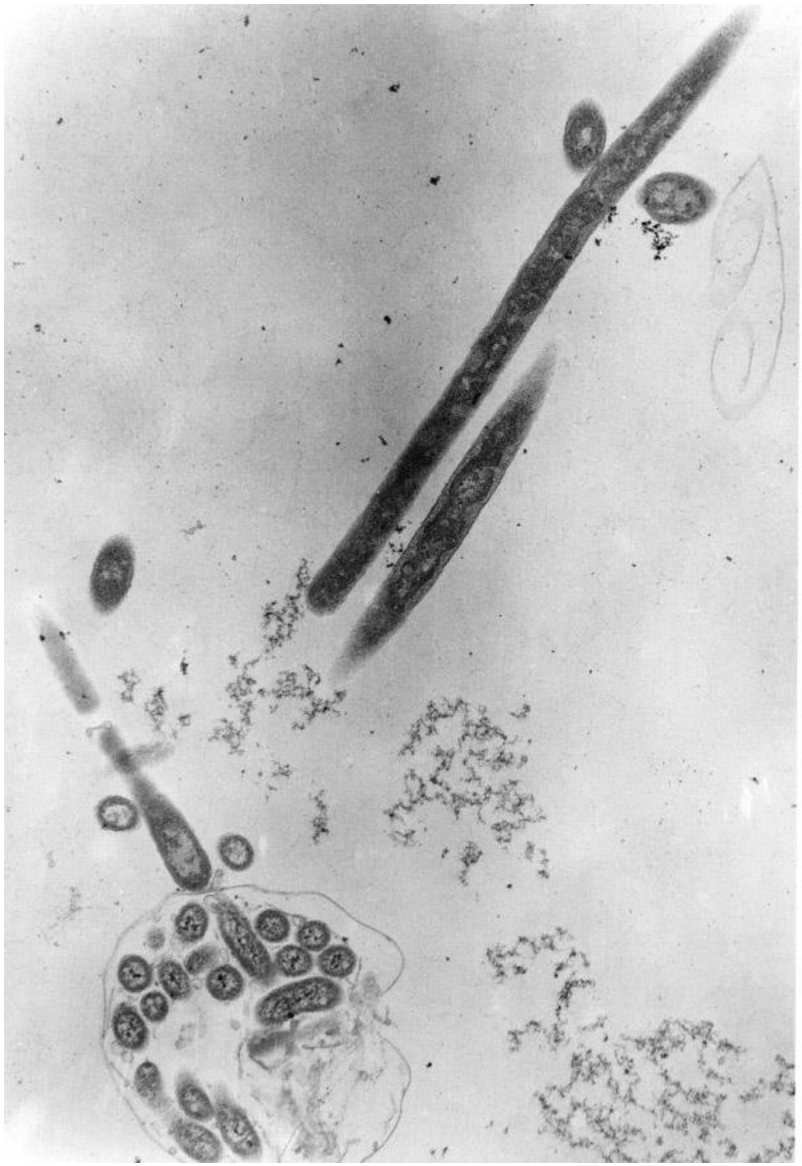
First: Larger, rod-shaped bacterium features: coiled inside





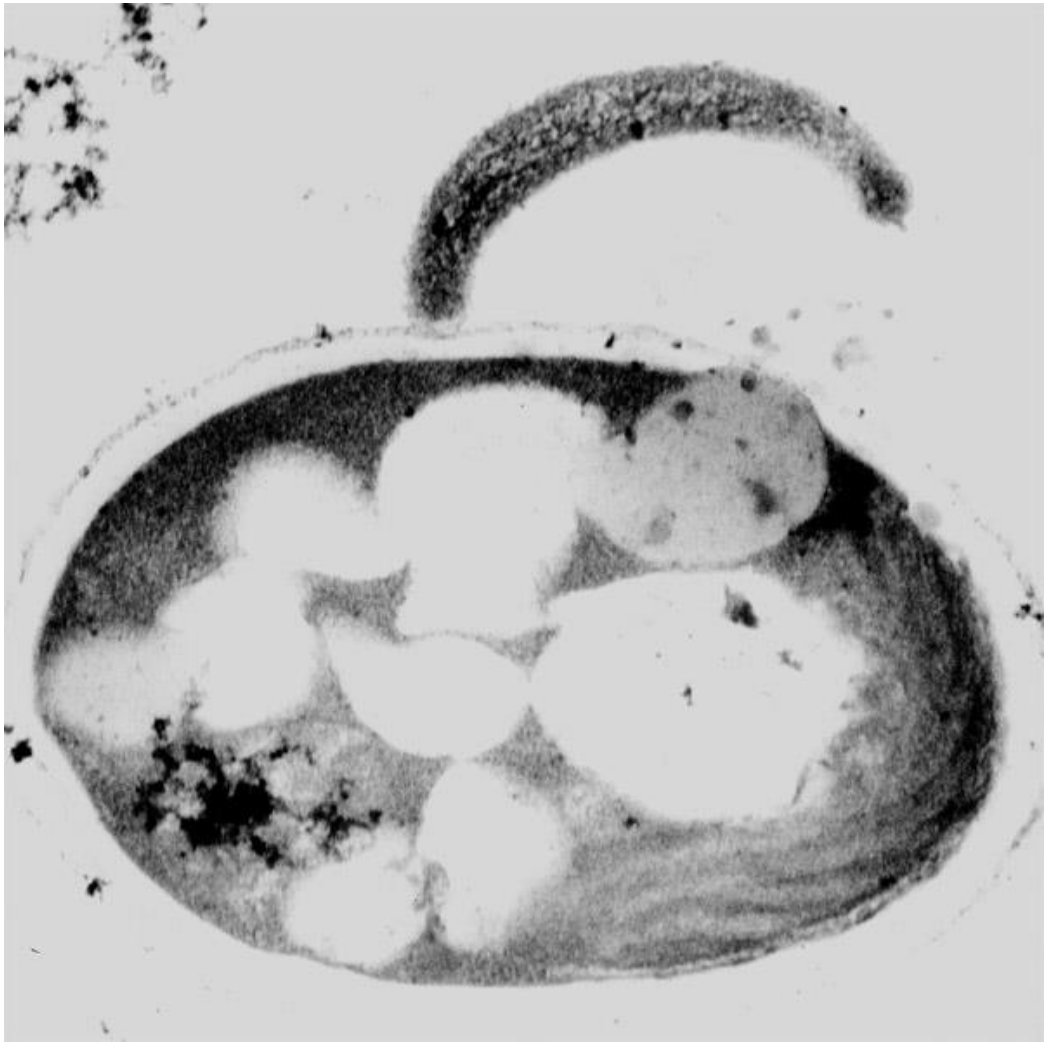
First: Larger, rod-shaped bacterium features: coil release: entire undivided organism breaks out of host cell wall

First: Larger, rod-shaped bacterium features: coil release: this might be the bacterium after release

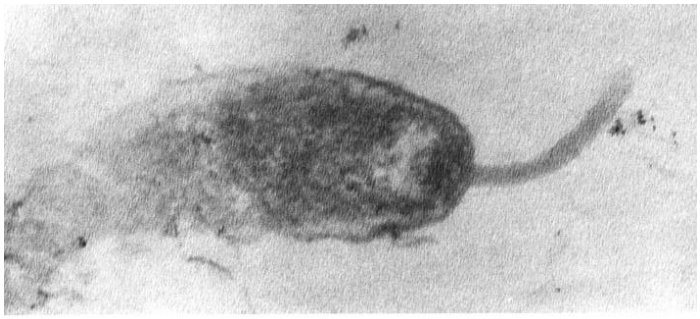


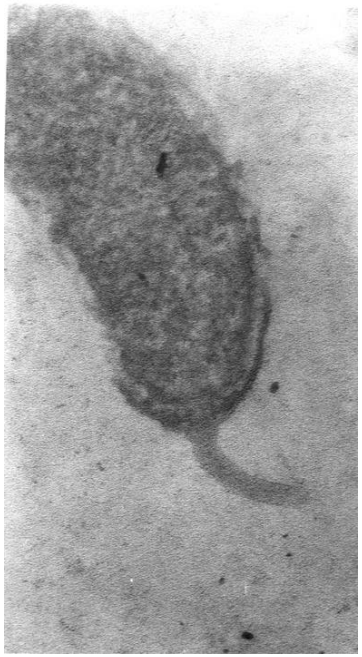
First: Larger, rod-shaped bacterium features: cell division outside of host, after release

Second: smaller, crescent-shaped bacterium features: shape



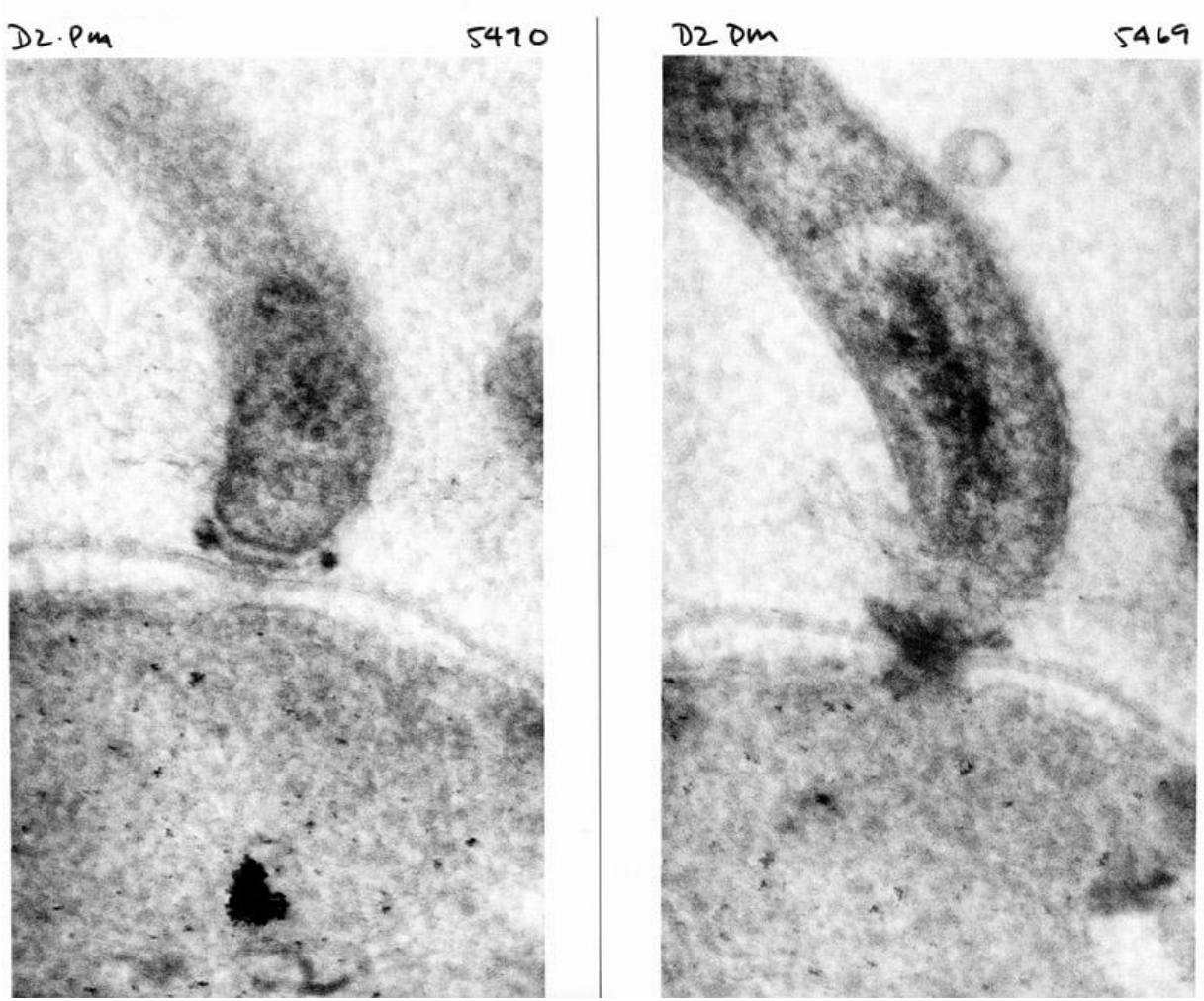
Second: smaller, crescent-shaped bacterium features: flagellated



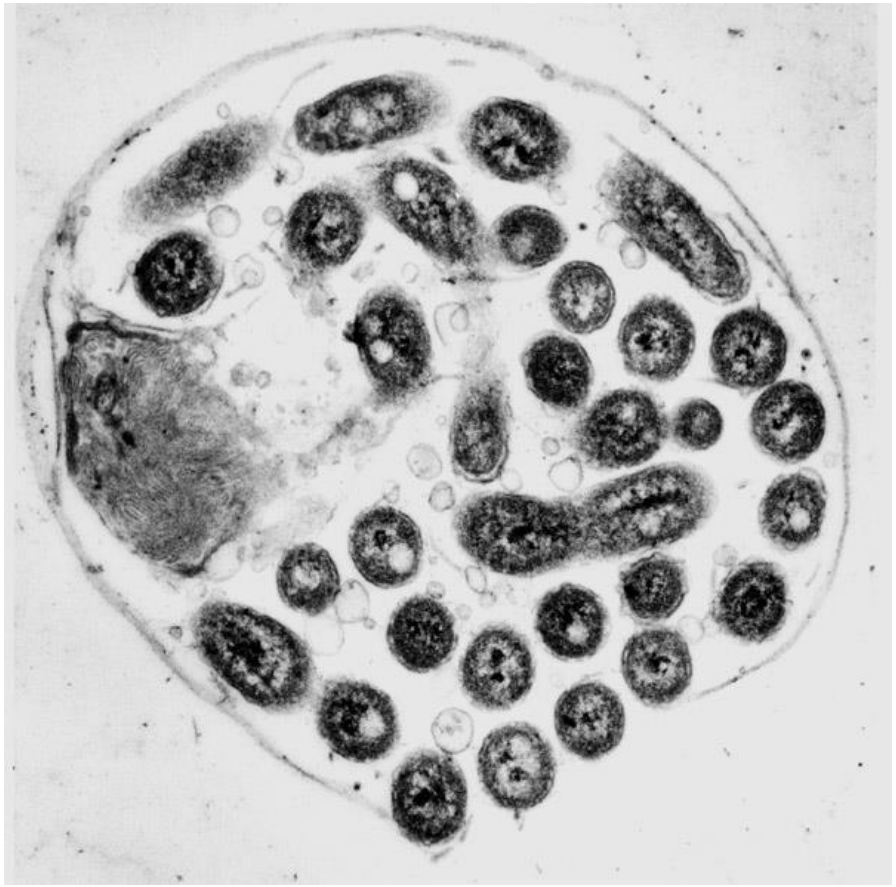


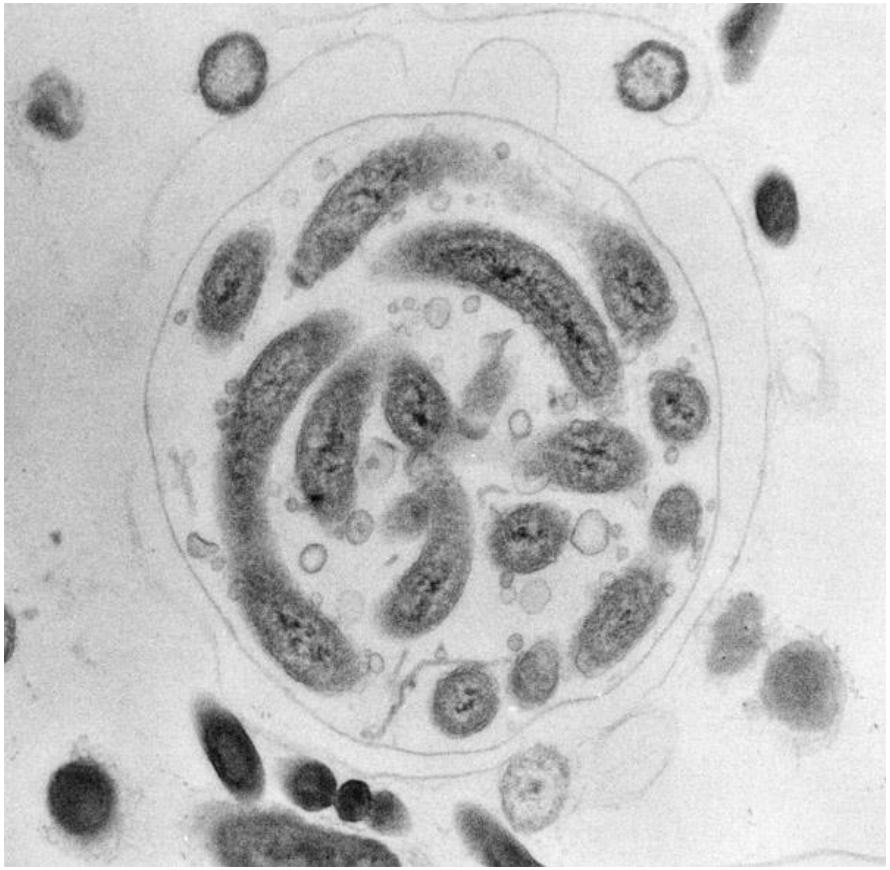
May be finding prey, chemotaxis

Second: smaller, crescent-shaped bacterium features: attachment via a plate-like structure

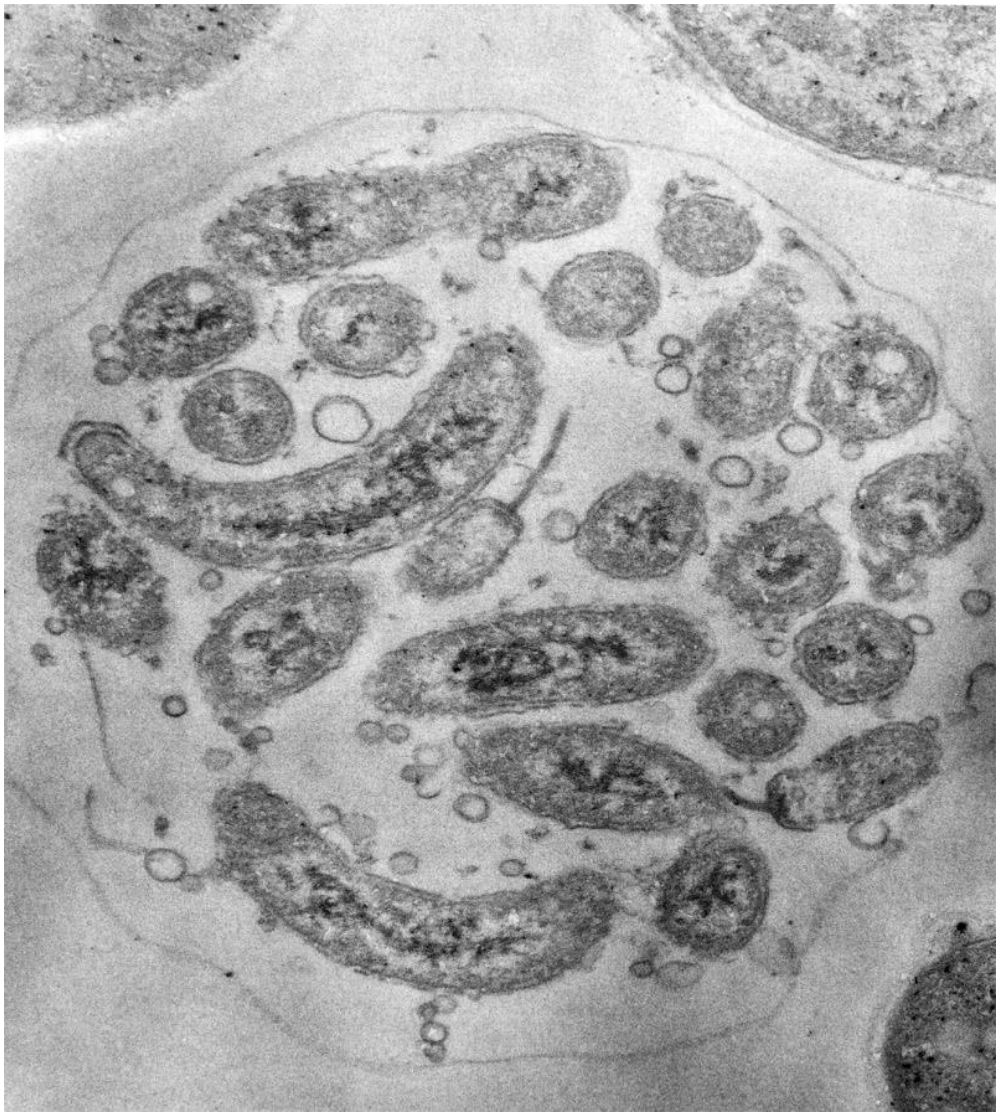


Second: smaller, crescent-shaped bacterium features: coiled inside

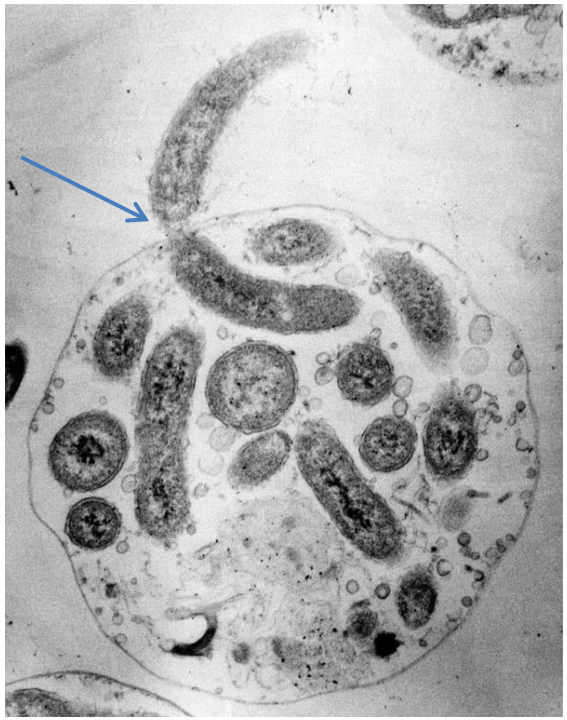


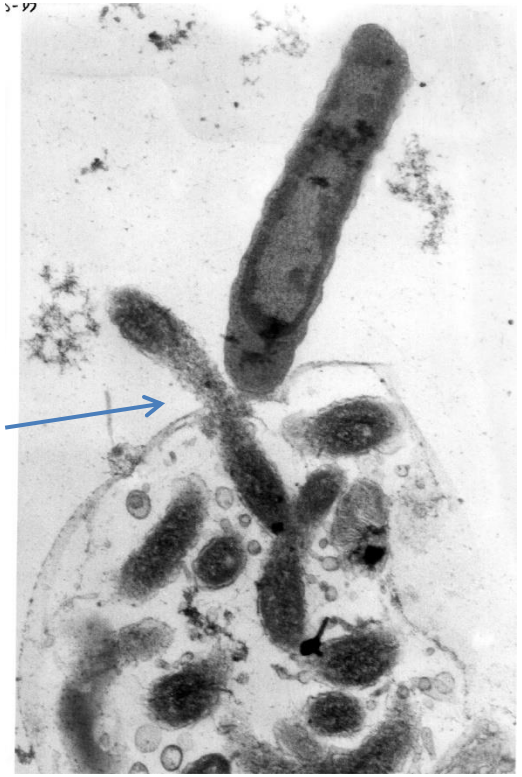


Second: smaller, crescent-shaped bacterium features: cell division inside; multiple flagellar profiles

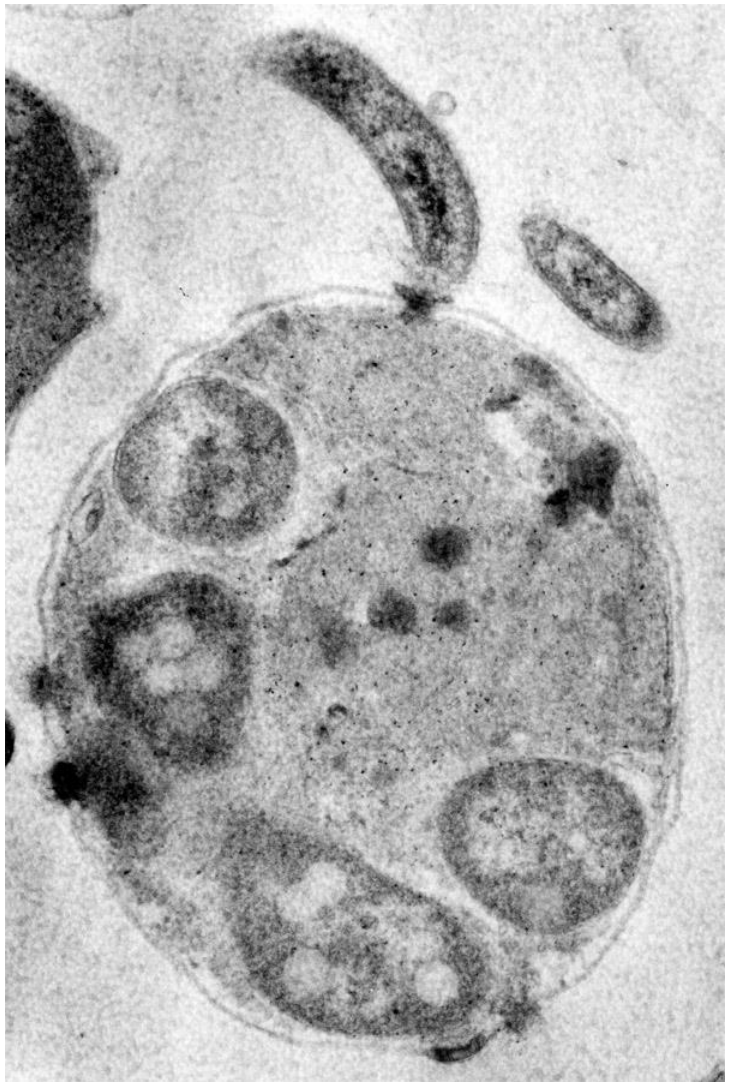


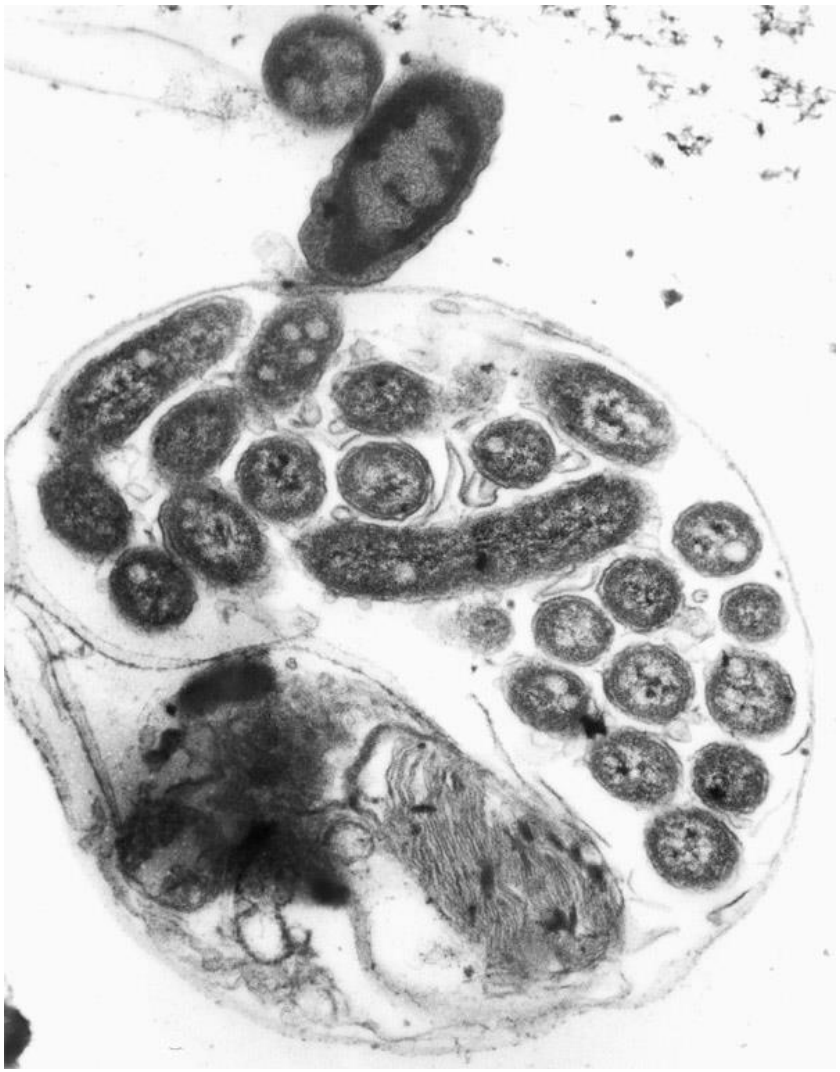
Second: smaller, crescent-shaped bacterium features: possible escape by bridging the wall





Co-existence: LEFT: Bigger inside, smaller outside; RIGHT: Bigger outside, smaller inside





Summary

- Rod:
- Larger diam (450-500 nm)
- Not flagellated
- “mucus” attachment
- Entire, coiled inside host
- More and larger lipids when in host
- Entire upon exit via ruptured host cell wall; “sausage” or long rod
- Cell division external to host
- Cell wall complex, frbrous, different from Crescent wall

- Crescent:
- Smaller diam (240-250 nm)
- Flagellated
- “plate” attachment
- Entire, coiled inside host initially
- Fewer and smaller lipids when in host
- Not sure how it exits, but maybe cross the wall
- Cell division within host
- Cell wall not as complex as that of Rod