

- Hans Christian Gram developed a staining technique involving applying a series of dyes, leaving some microbes purple, others pink.

13. Describe the contributions of the following: Semmelweis, Lister, Nightingale, Snow, Jenner, and Erlich.

- **Semmelweis** required med students to wash hands with chlorinated lime water.
- **Lister** advanced antiseptics on wounds and surgical incisions.
- **Nightingale** introduced cleanliness in nursing practice. Ordered for scrubbing and clean clothes, and statistics to show poor food and unsanitary conditions were responsible factors for death.
- **Snow** demanded for adequate sewage and pure water supply.
- **Jenner** coined the procedure called vaccination.
- **Erlich** surveyed for 'magic bullet' that would kill pathogens while remaining nontoxic to humans.

14. In what way are microbial communities essential to the environment? What is this branch of microbiology called?

- Play a role in **production of vitamins** and **bioremediation** (use of living bacteria, fungi, or algae to detoxify polluted environments).
- Also, they contribute to **decay of dead organisms** and recycling carbon, nitrogen, and sulfur.

This branch is **environmental microbiology**.

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