

The Root of the Problem: Unlike zoology and botany, microbiology developed without the knowledge of phylogenetic relationships among the organisms studied (e.g., absence of an evolutionary framework).

- Microbes function at the core of the global ecology.
 - Base of the food chain
 - Recycle organic matter
 - Agents of mineral deposition
 - Source of our oxygen atmosphere

- Milestone #1: Emile Zuckerkandl and Linus Pauling; 1965 - “Semantides” or DNA, RNA, and proteins as documents of evolutionary history (i.e., descriptors of genealogy).

- Milestone #2: Norman Pace; 1986 - Applied phylogeny concept to microbial ecology's need to take a census.

- Milestone #3: Carl Woese; 1987 - Applied phylogeny concept to redefine microbial systematics or the need to understand microbial genealogy.