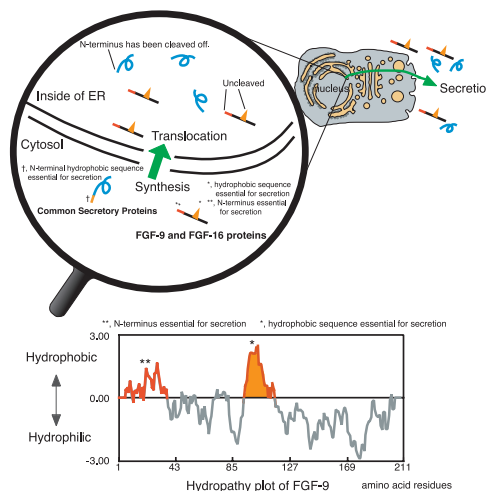


Identification of Uncleaved Bipartite Signal Sequences for Protein Secretion

Fibroblast growth factor (FGF)-9 and FGF-16 are rare secreted proteins that do not possess cleavable signal sequences. Inhibition of FGF-16 secretion from COS-1 transfectants by brefeldin A and identification of an N-glycan on the secreted form confirmed that FGF-16 is secreted via the endoplasmic reticulum and Golgi apparatus, like secreted proteins having a conventional cleavable signal sequence. Analysis of various mutants of FGF-9 and -16 have revealed that these proteins employ similar unique bipartite signal sequences – i.e., both the N-terminal region and central hydrophobic region – that is not cleaved, though it shares the same secretory machinery used by secreted proteins with cleavable signal sequences.



Secretion of FGF-9 and FGF-16 proteins by uncleaved bipartite signal sequences

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A proposal of the New Bacterial Phylum, Gemmatimonadetes

A phylogenetically novel aerobic bacterium was isolated from activated sludge in a wastewater treatment system. The isolate, named *Gemmatimonas aurantiaca* gen. and sp. nov., was a Gram-negative, rod-shaped aerobe. Cells often appeared to divide by budding replication. Comparative analyses of 16S rRNA gene sequences indicated that the new bacterium should be classified a brand-new phylum-level lineage in the bacterial domain. Based on the phylogenetic and phenotypic findings, we proposed a new phylum with the name of *Gemmatimonadetes* phyl. nov. for the new organism, and the proposal was validated on September, 2003.



Transmission electron micrograph of *Gemmatimonas aurantiaca* showing a Gram-negative cell envelope structure (Bar: 0.5 μ m)

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