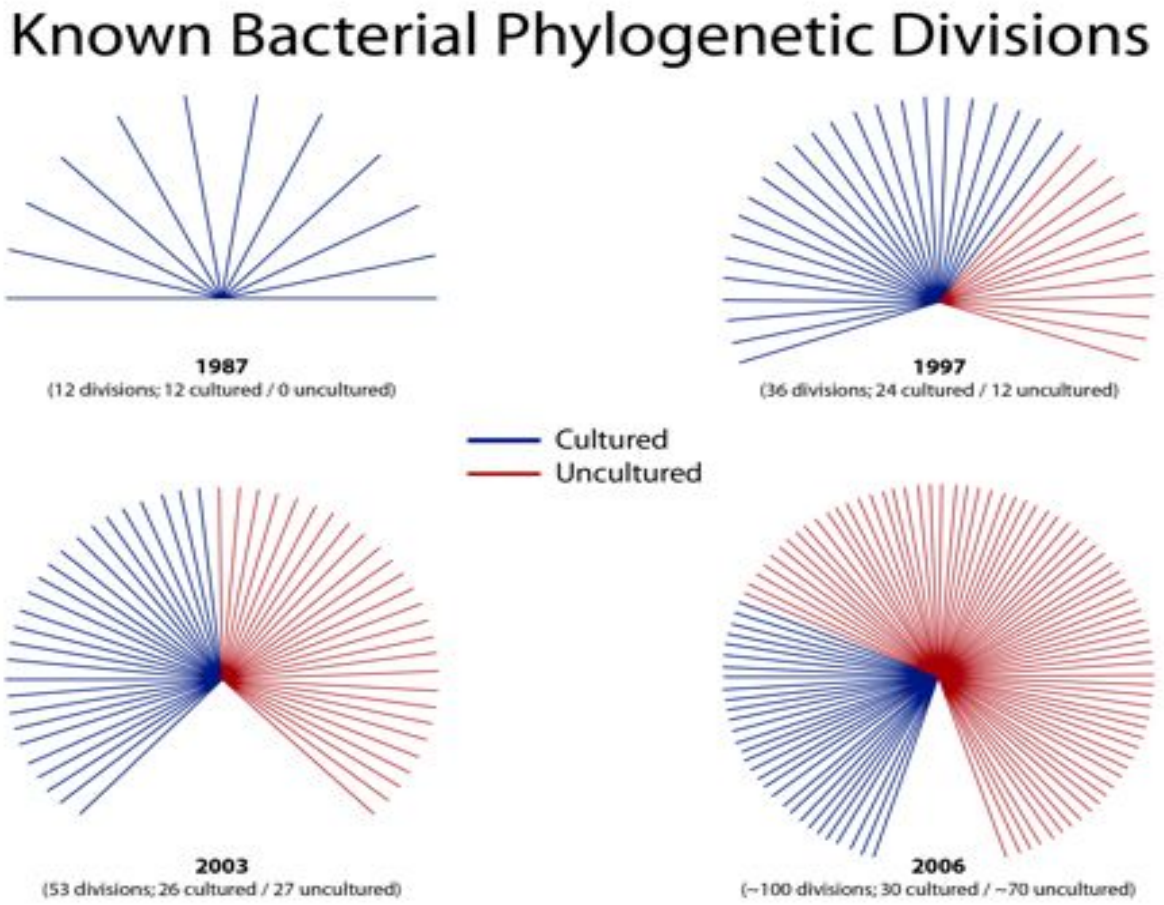
# The Microbiome: host-associated microbial communities and the host-microbiome interaction

# Microbiome 1.0

The invisible universe of the human microbiome

# Characterization of microbial communities is enabled by culture independent techniques




Courtesy Ed Delong (MIT)

# 16S rRNA



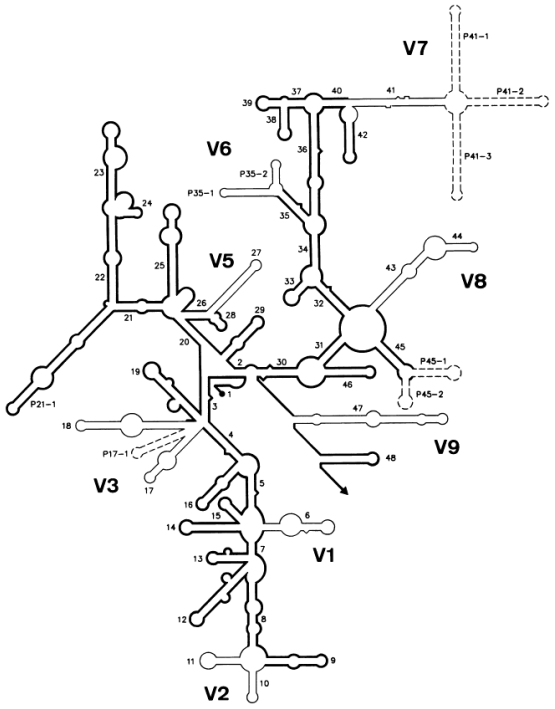



**Fig. 1.** Secondary structure model for prokaryotic srRNAs.
The 5'-terminus is symbolized by a filled circle and the 3'-terminus by an arrowhead. Helices are numbered in the order of occurrence from 5'- to 3'-terminus. Helices bearing a single number are common to the prokaryotic and eukaryotic (Fig. 2) models. A composite number preceded by P points to a prokaryote-specific helix. Relatively conserved areas are drawn in bold lines, areas of sequence- and length variability in thin lines. Eight variable areas, numbered V1 to V9, are distinguished, V4 being absent in prokaryotic srRNAs. Helices drawn in broken lines are present in a small number of known structures only. Archaebacterial sequences follow the prokaryotic pattern except for helix 35, which is unbranched as in eukaryotes.

# This is not a new science!



## SOME OBSERVATIONS ON THE STUDY OF THE INTESTINAL BACTERIA.

By ARTHUR I. KENDALL.

*(From the Laboratory of Dr. C. A. Herter, New York.)*

(Received for publication, September 14, 1909.)

The alimentary canal may be regarded from the point of view of bacterial processes within it, as a singularly perfect incubator; an incubator in which there is provided at different levels such a range of reaction and diversity of food that not only are the conditions suitable for the growth of the normal habituated intestinal bacteria but often also for those organisms, capable of developing at body temperature, which are ingested with the food of the host.

An idea of the truly enormous daily bacterial proliferation which takes place in the intestinal tract may be obtained if one remembers that a considerable portion of the fecal mass is made up of the bodies of bacteria, dead and living. At the same time the multiplicity of types and variety of physiological requirements of this intestinal flora are indications of the excellence of the incubator and a strong reminder of the influence which the unrestrained activity of these organisms might conceivably exercise upon the general condition of the host.

The possibilities of bacterial invasion through the intestinal portal of entry have not been overlooked by investigators, and, indeed, among the most brilliant chapters of medicine are those concerning the etiological relationships which have been demonstrated between certain pathogenic bacteria of exogenous origin and specific diseases of the intestinal tract, for example, typhoid, cholera and dysentery.

The very importance of these discoveries has been a potent factor in diverting attention from the studies of the normal intestinal flora with its wealth of problems relating to the principles which govern the activity of these bacteria. Even at the present time the sequence of events which permits the establishment of





ıur I. Kendall

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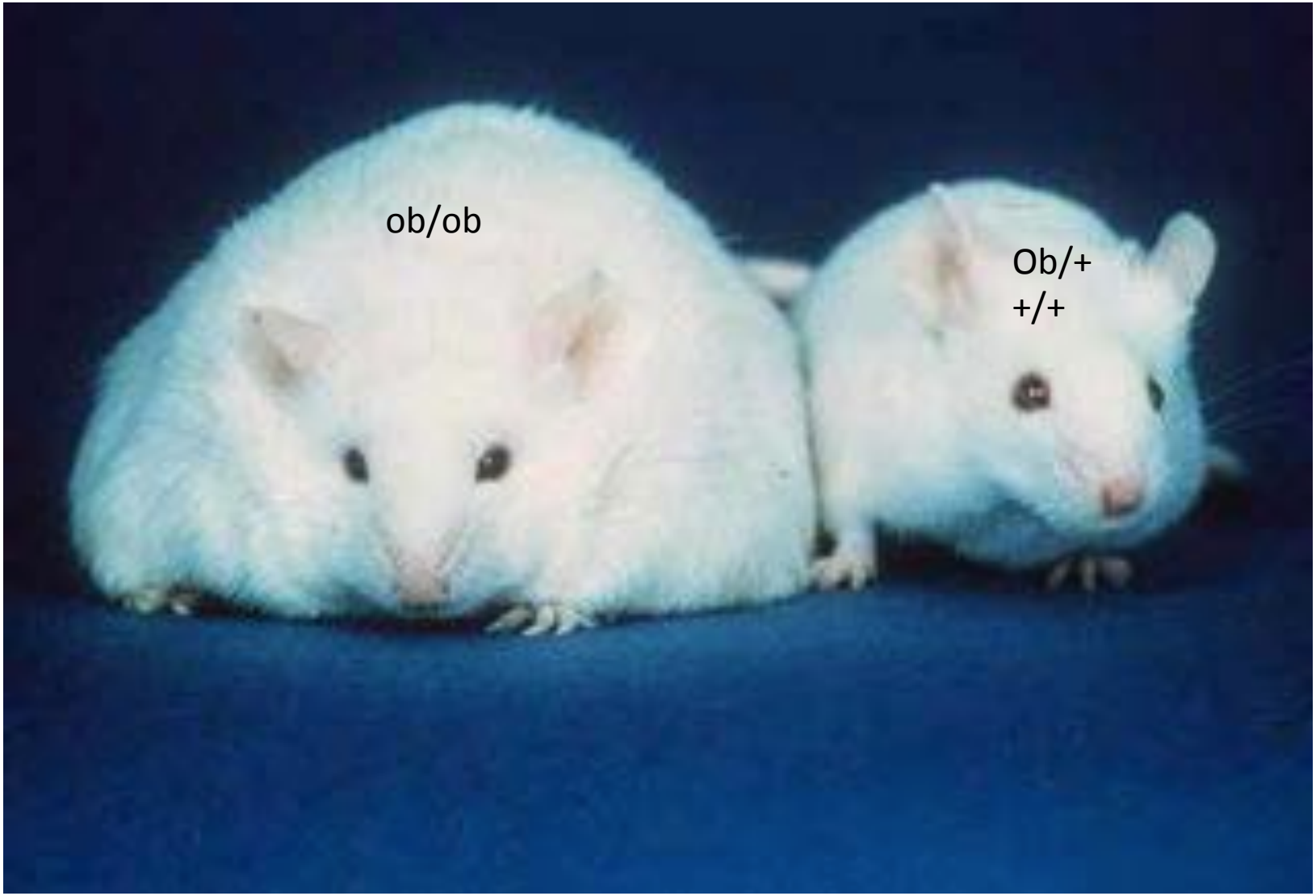
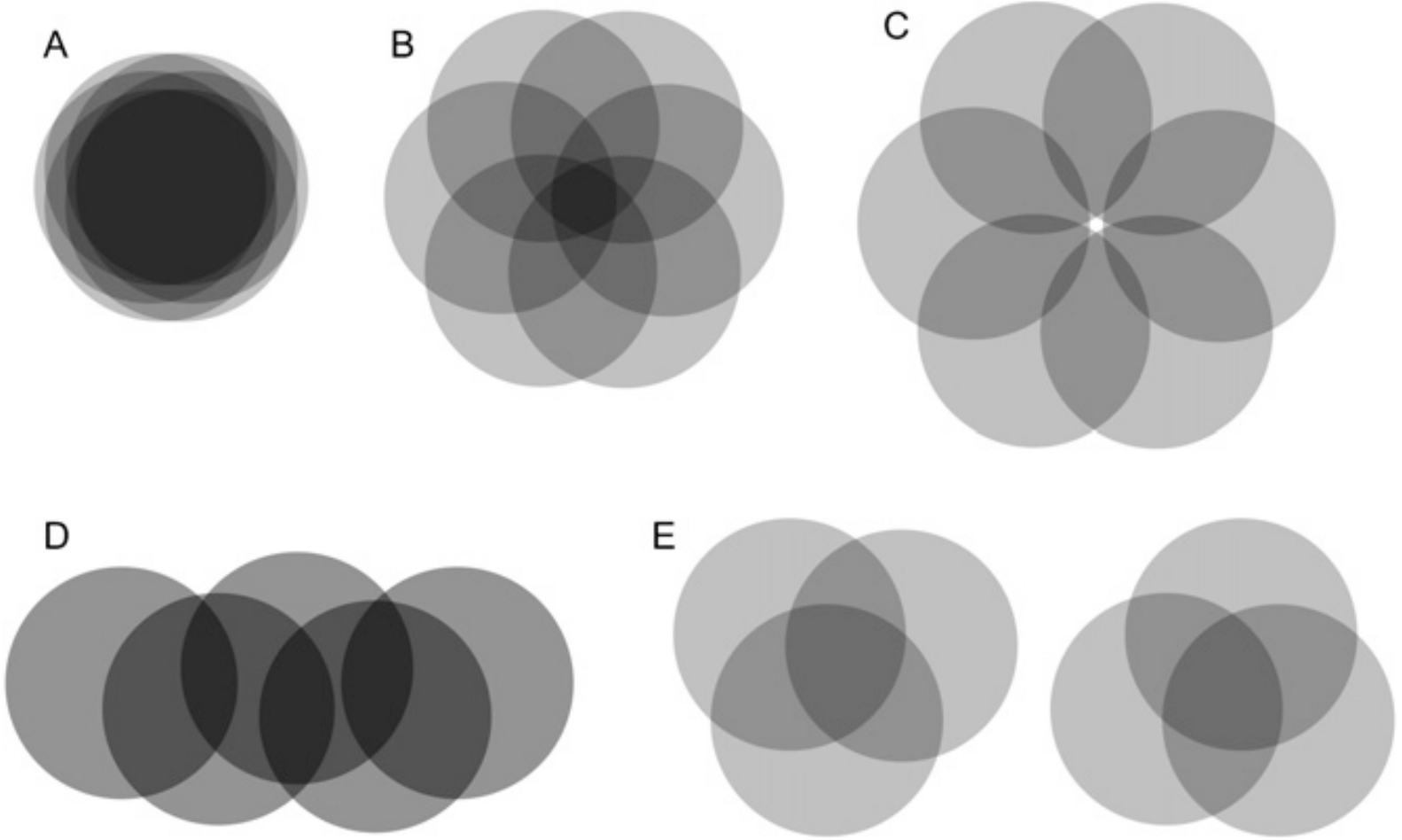
J. Biol. Chem. 1909 6: 499–507.

# Lean vs Obese: Can you tell the difference?



# Models of a core microbiome




Hamady and Knight, 2009