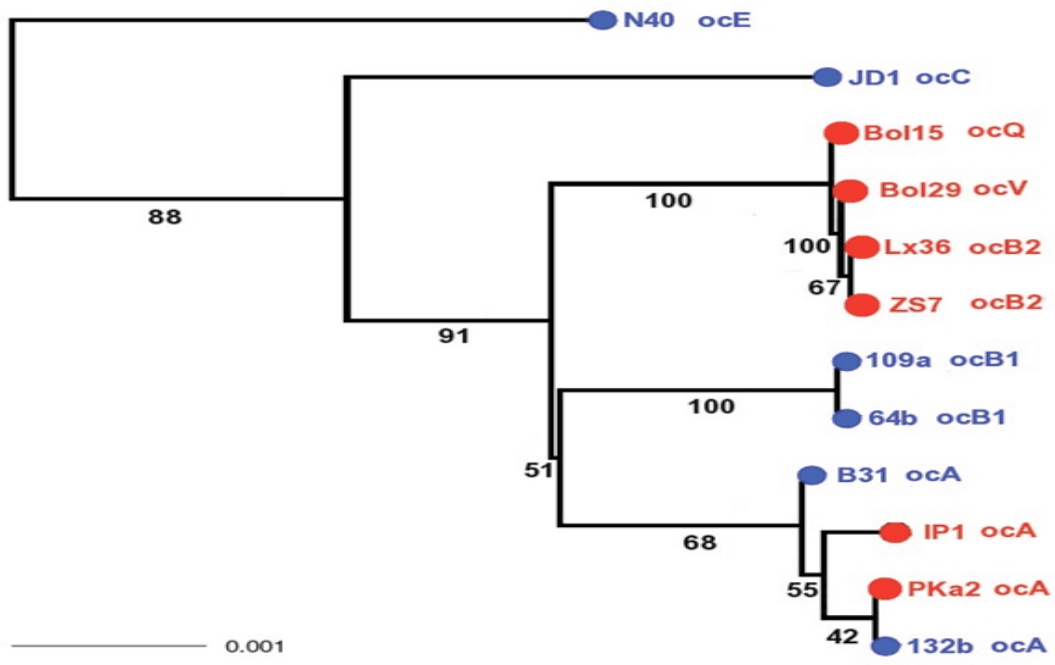
Evolution, Bioinformatics, & Microbial Diversity: A Graphic Summary

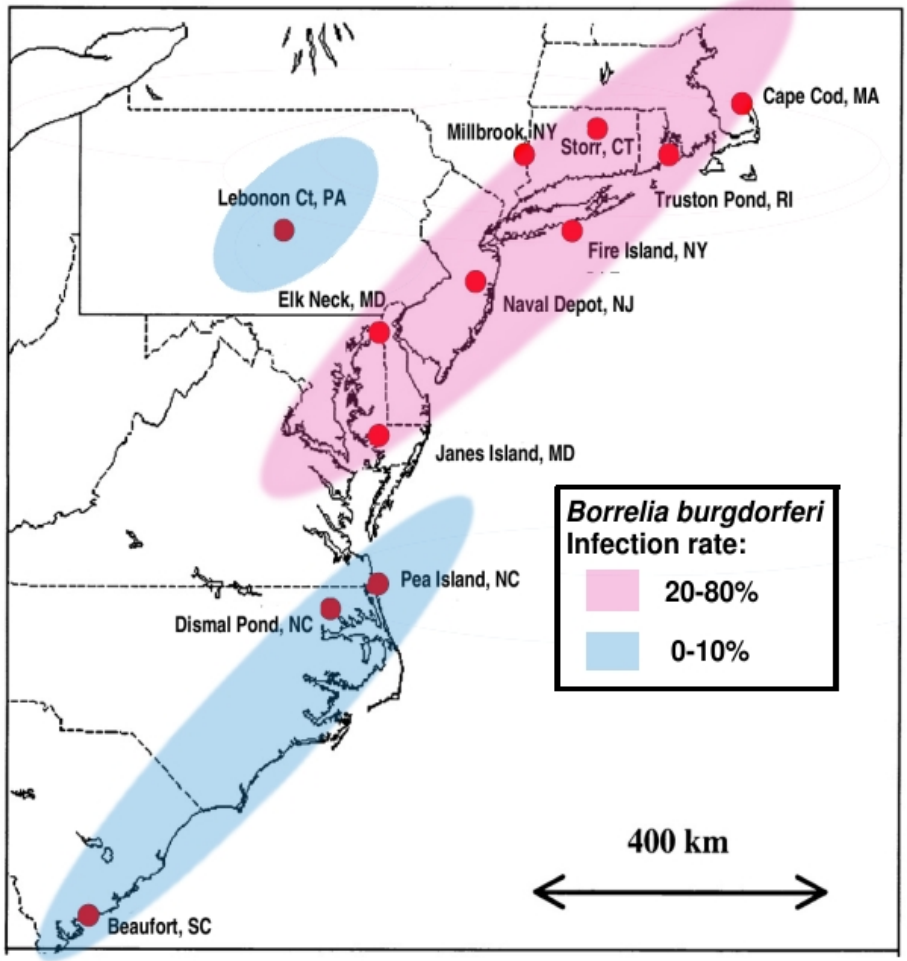
Trans-Atlantic Migration of a High-Virulence *Borrel burgdorferi* Clone

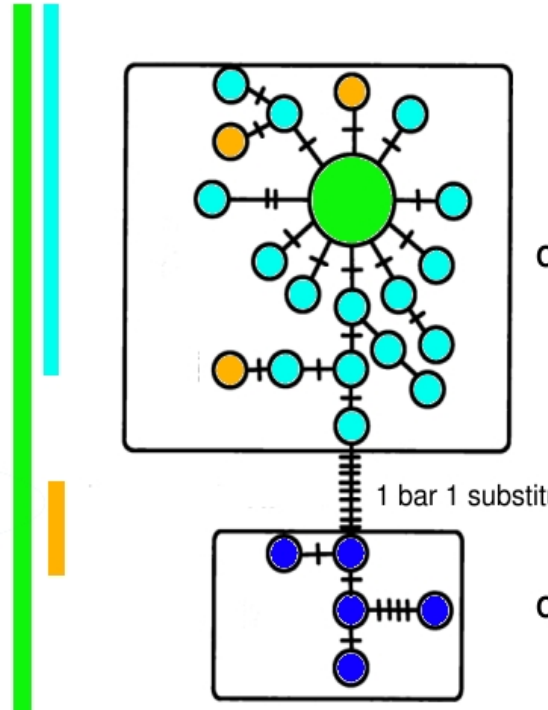


Group A ("ocA") strains from European (red) and North America (blue) are nearly ide main chromosomal loci (over 7,000 bases), suggesting evolutionarily recent tra migration of this virulence clone. In contrast, Group B ("ocB1" and "ocB2") s geographically distinct, indicating long periods of geographic isolation.

Qiu et al. *Emerging Infectious Diseases* 14 (7), 2008.

Lyme Disease Phylogeography



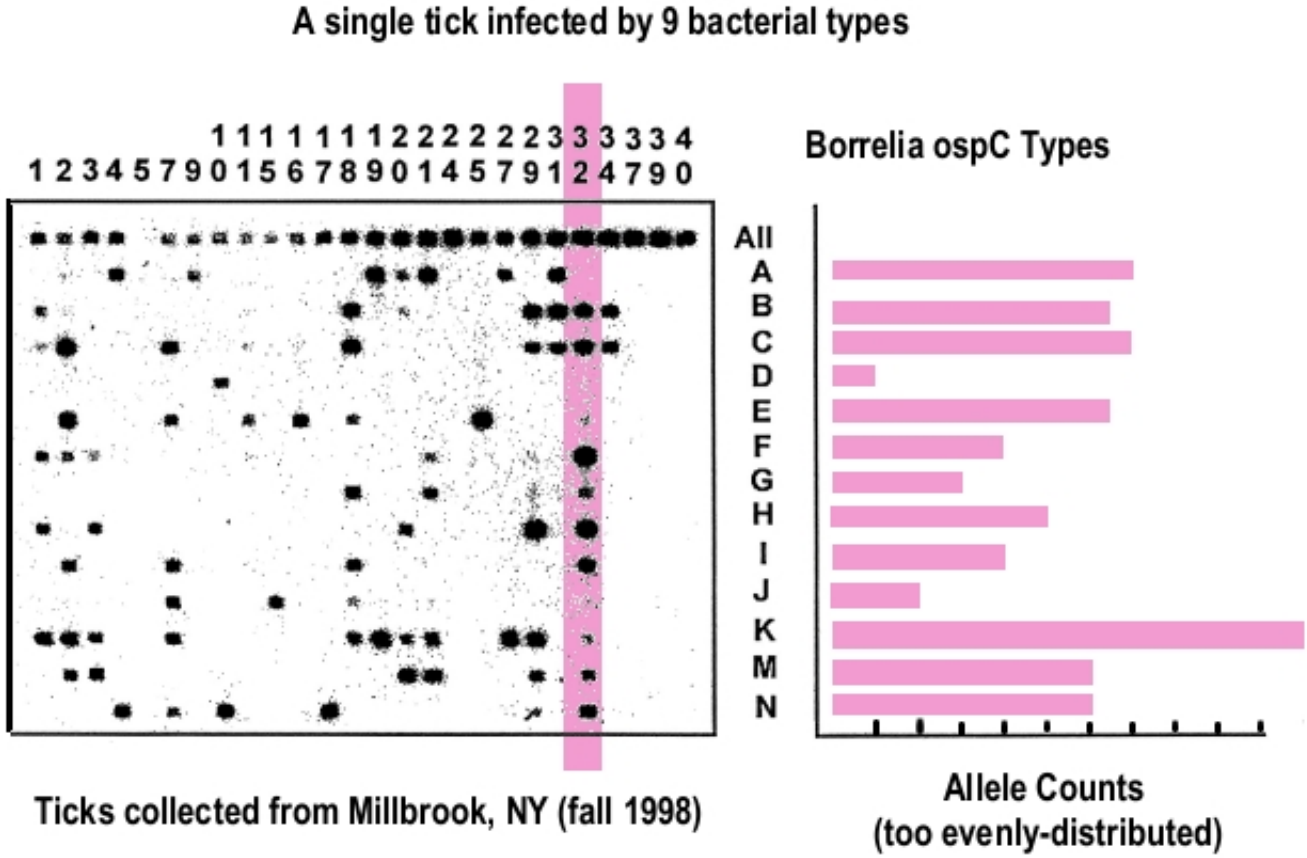


Collection Sites (1997-1998)

Ixodes scapularis
Mitochondrial 16S rDNA haploty

Adapted from:
Qiu, W. G.; Dykhuizen, D. E.; Acosta, M. S.; Luft, B. J. 2002. Genetics 160:833-49.
Geographic Uniformity of the Lyme Disease Spirochete (Borrelia burgdorferi) and Its Shared History With Tick Vector (Ixodes scapularis) in the Northeastern United States.

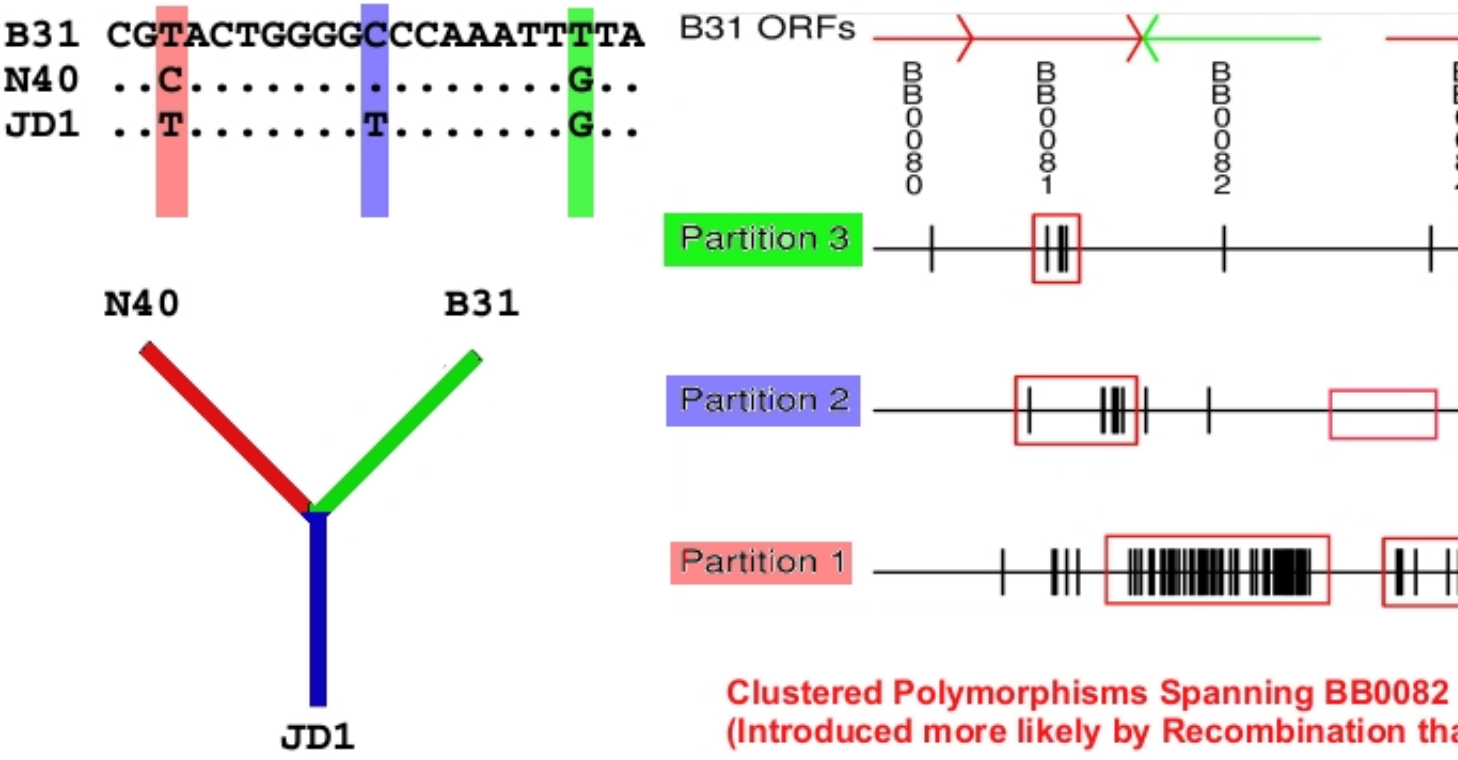
Mixed Bacterial Infection & Diversifying Natural Selection



Adapted from:
1. Qiu, Dykhuizen, Acosta, Luft. 2002. Geographic Uniformity of the Lyme disease spirochete and its shared history with tick vector in the northeastern US. Genetics 160: 833-849.
2. Rannala, Qiu, Dykhuizen. 2000. Methods for estimating gene frequencies and detecting selection in bacterial populations. Genetics 155: 499-508.

Recombination in Borrelia burgdorferi (I):

Phylogenetic Partitioning of Nucleotide Polymorphisms

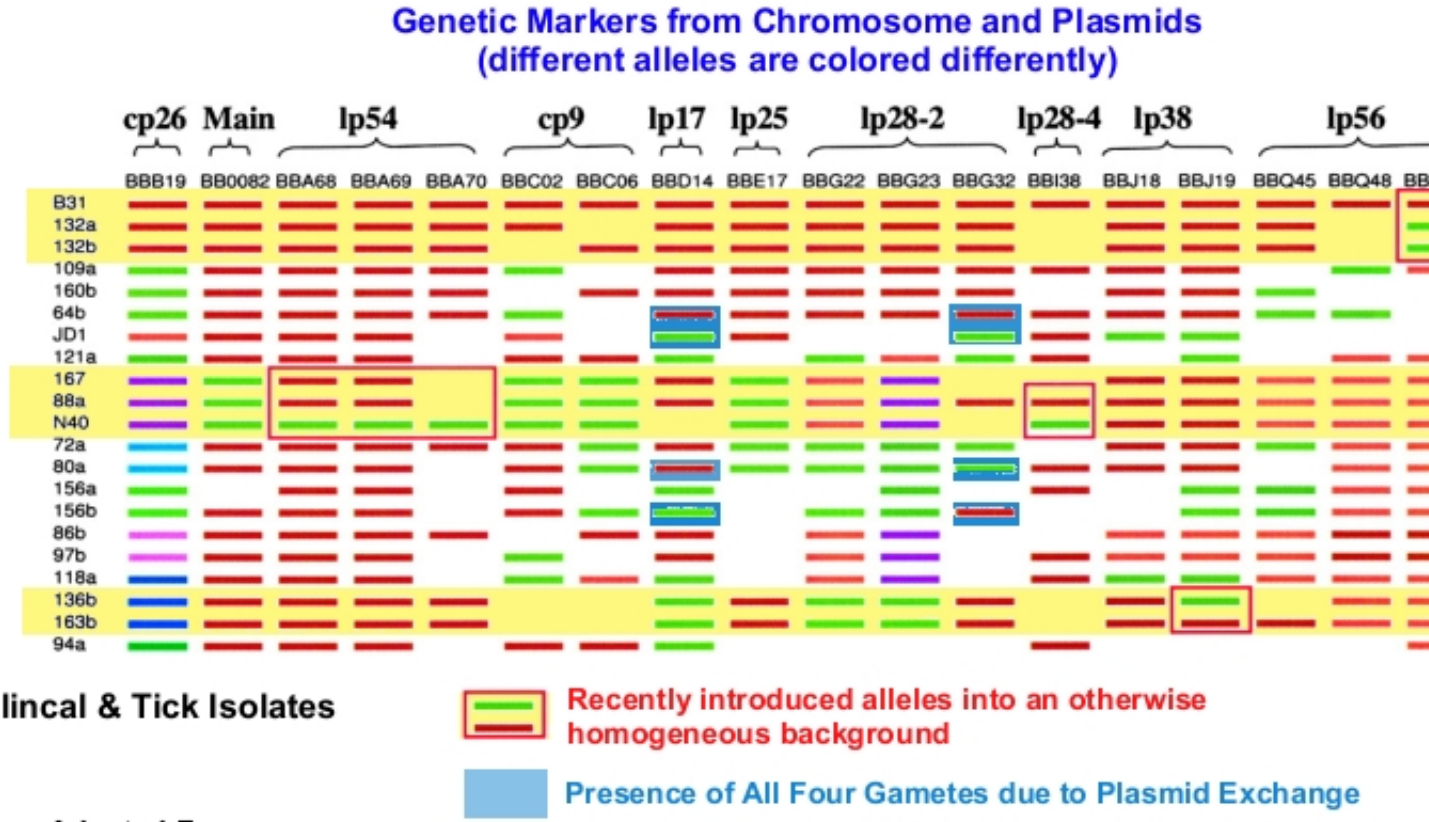


Clustered Polymorphisms Spanning BB0082
(Introduced more likely by Recombination tha

Adapted From:
Qiu, Schutzer, Bruno, Attie, Xu, Dunn, Fraser, Casjens, and Luft. 2004. Genetic exchange and plasmid transfers in Borrelia burgdorferi sensu stricto revealed by three-way genome comparisons and multilocus sequence typing. PNAS 101 (39): 14150-14155.

Recombination in Borrelia burgdorferi (II):

Multilocus Sequence Typing (MLST)



Adapted From:
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