

Ten Categories of Evolutionary Applications in Medicine

2 kinds of questions x 5 different objects of explanation

From: Nesse, R. M., & Stearns, S. C. (2008).
 The great opportunity: Evolutionary applications to
 medicine and public health.
Evolutionary Applications 1(1), 28-48.

FIVE KINDS OF OBJECTS OF EXPLANATION	TWO KINDS OF EVOLUTIONARY QUESTIONS	
	PHYLOGENY <i>(Macroevolution: History & relationships)</i>	ADAPTIVE SIGNIFICANCE <i>(Macroevolution: Selection and Drift)</i>
Human trait	Phylogeny of traits Lactase persistence, Ethanol sensitivity, Blood types, HLA types Skin color, Malaria resistance	Adaptive significance of traits Aging, Bilirubin Narrow birth canal, Fever, Cough, Anxiety Stress response
Human gene	Tracing the phylogeny of alleles that cause disease Sickle cell disease Cystic fibrosis, ApoE Asthma vulnerability alleles	Possible adaptive significance of alleles that cause disease Sickle cell disease Cystic fibrosis, ApoE Asthma vulnerability alleles
	Population genetics, Evolutionary genetics, Signals of selection	
Pathogen trait	Evolutionary history of pathogen traits Virulence, Antibiotic resistance, Ability to survive outside the body, Biofilm formation	Possible adaptive significance of pathogen traits Virulence, Antibiotic resistance, Ability to survive outside the body, Biofilm formation
Pathogen gene	Tracing the phylogeny of pathogen alleles Tracing and predicting influenza subtypes, Source of food poisoning, HIV evolution	Possible adaptive significance of pathogen alleles Alleles that influence virulence, Antibiotic resistance, Biofilm formation, Spore formation
Cell lines	Cancer	Immune system cells