

# ARCH/PHYS LUNCH TALK

WEDNESDAY, JAN. 14, 12:30PM  
SOC SCI 1, 261

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### *PALEOGENETIC ANALYSIS OF PRE-COLUMBIAN TUBERCULOSIS FROM THE NEW WORLD*

The New World prior and subsequent to the Age of Exploration provides a unique context to explore the relationship between humans and infectious disease. Diseases present in the New World before European contact are inferred often from the paleopathological record, namely skeletal changes consistent with current clinical manifestations. Research on skeletal tuberculosis (TB) from bioarchaeological contexts has a long tradition of scholarship in anthropology, likely owing to its conspicuous skeletal signature. Twentieth century physicians initially did not accept the extra-pulmonary spinal lesions as evidence of TB in the ancient New World, and thus proposed that human TB was introduced post-contact, further supported by the observation that modern strains of *Mycobacterium tuberculosis* from the Americas are most closely related to those from Europe. This notion, however, is incompatible with the currently well-accepted archaeological evidence of pre-contact tuberculosis in the New World.

Genomic-scale analyses of ancient pathogens capable of addressing this debate have become possible following the application of “next-generation” sequencing techniques to archaeological samples. Following the use of these methods, we successfully isolated and sequenced three approximately 1000-year-old ancient mycobacterial genomes from human remains found in Peru, confirming a member of the *Mycobacterium tuberculosis* complex (MTBC) caused human infection in pre-Columbian South America. The ancient strains are distinct from any known human-adapted form and are most closely related to strains adapted to seals and sea lions. Today it appears that these lineages are extinct, replaced by European lineages after contact. Dating analyses controversially suggest an emergence of the most recent common ancestor of the MTBC less than 6,000 years ago, implying a Holocene dispersal of the pathogen where marine mammals may have played a central role.