## **Pre-Columbian Origins for North American Anthrax**

Leo J. Kenefic<sup>1#</sup>, Talima Pearson<sup>1#</sup>, Richard T. Okinaka<sup>1</sup>, James M. Schupp<sup>1</sup>, David M. Wagner<sup>1</sup>, Alex R. Hoffmaster<sup>3</sup>, Carla B. Trim<sup>1</sup>, Wai-Kwan Chung<sup>1</sup>, Jodi A. Beaudry<sup>1</sup>, Lingxia Jiang<sup>2</sup>, Pawel Gajer<sup>2</sup>, Jeffrey T. Foster<sup>1</sup>. James I. Mead<sup>1</sup>, Jacques Ravel<sup>2</sup>, Paul Keim<sup>1,4\*</sup>

**1** Department of Biological Sciences, Northern Arizona University, Flagstaff, Arizona, United States of America, **2** The Institute for Genome Sciences, University of Maryland School of Medicine, Baltimore, Maryland, United States of America, **3** Bacterial Zoonoses Branch, Centers for Disease Control and Prevention, Atlanta, Georgia, United States of America, **4** Pathogen Genomics Division, Translational Genomics Research Institute, Phoenix, Arizona, United States of America

\* E-mail: Paul.Keim@nau.edu

# These authors contributed equally to this work.

## **Author Contributions**

Conceived and designed the experiments: LJK PK. Performed the experiments: LJK CPT JAB WKC. Analyzed the data: LJK TP CPT JAB WKC PK. Contributed reagents/materials/analysis tools: TP DMW JR AH. Wrote the paper: LJK TP JF JM PK. Directed the study and edited the manuscript: PK. Provided managerial support for data generation: JS. Provided GIS analysis: DMW. Developed the B. anthracis microarray genotyping assay and screened the initial (128) isolates: JR. Provided the DNA of isolates from an historical collection: AH. Optimized the Affymetrix tiling chip protocol, processed all the Affymetrix tiling GeneChips (>125), and contributed to the analysis of the GeneChip data: LJ. Developed the algorithm to extract SNP data from the microbial Affymetrix whole genome tiling GeneChip, processed the GeneChip and extracted SNP data: PG. Provided valuable insights into phylogenetic analyses and helped edit the manuscript: RO JF. Provided insights into Beringian ecosystems: JM. Edited the manuscript: JM.