Laboratory Protocols for Ancient and Modern Dental Calculus DNA Processing (Fellows Yates et al. 2021) V.2

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ABSTRACT

Collection of protocols used for Fellows Yates et al. "The evolution and changing ecology of the hominid primate oral microbiome". Bioinformatics analysis can be found on GitHub at https://github.com/jfy133/Hominid_Calculus_Microbiome_Evolution/.

This collection describes the laboratory procedures used for sampling, (ancient) DNA extraction, library construction and preparation for Illumina sequencing of ancient and modern dental calculus samples.

Sampling

- Dental calculus Field-Sampling Protocol (Warinner Version)
- Dental Calculus Field-Sampling Protocol (Sabin version)

Extraction

- Ancient DNA Extraction from Dental Calculus with Consolidant Removal
- DNA Extraction from Modern Dental Calculus

Library preparation

- Non-UDG treated double-stranded DNA library preparation for Illumina sequencing of ancient dental calculus
- (Non-UDG treated) double-stranded modern dental calculus DNA library preparation for Illumina sequencing
- Full-UDG treated double-stranded ancient DNA library preparation for Illumina sequencing of ancient dental calculus (reduced input DNA)

Indexing

- Illumina double-stranded DNA dual indexing for ancient DNA

Preparation for Sequencing

- Amplification and Pooling

DOI

dx.doi.org/10.17504/protocols.io.bq7wmzpe
GUIDELINES

Working in an Ancient DNA Laboratory

Some of the protocols in this collection require working in dedicated ancient DNA laboratories to limit modern DNA contamination.

- All steps of the protocol should take place in a clean room facility specifically designed for ancient DNA.
- The researcher performing lab work should wear correspondingly suitable lab-wear, such as:
  - full-body suit with hood (e.g., Tyvek)
  - hairnet
  - face mask
  - two pairs of clean gloves
  - clean shoes
  - protective glasses
- Sample processing should be carried out in separated work benches with integrated UV irradiation (e.g. Dead Air PCR work bench)
- Surfaces and equipment should be regularly decontaminated with e.g. bleach solution or Thermofisher's DNA AWAY (or similar) and irradiated with UV.

Please see the following for more detailed guidance:


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FILES

- Dental Calculus Field-Sampling Protocol (Warinner Version)
  
  Version 1
  
  by James Fellows Yates, Max Planck Institute for the Science of Human History

- Dental Calculus Field-Sampling Protocol (Sabin version)
  
  Version 2
  
  by Zandra Fagernäs

- Ancient DNA Extraction from Dental Calculus with Consolidant Removal
  
  Version 1
  
  by Franziska Aron

- DNA Extraction from Modern Dental Calculus
  
  Version 1
  
  by Franziska Aron

- Non-UDG treated double-stranded DNA library preparation for Illumina sequencing of ancient dental calculus
  
  Version 1
  
  by James Fellows Yates, Max Planck Institute for the Science of Human History

- (Non-UDG treated) double-stranded modern dental calculus DNA library preparation for Illumina sequencing
  
  Version 1
  
  by James Fellows Yates, Max Planck Institute for the Science of Human History

- Full-UDG treated double-stranded ancient DNA library preparation for Illumina sequencing of ancient dental calculus (reduced input DNA)
  
  Version 1
  
  by Franziska Aron

- Illumina double-stranded DNA dual indexing for ancient DNA
  
  Version 1
  
  by Christina Warinner, Max Planck Institute for the Science of Human History

- Amplification and Pooling
  
  Version 1
  
  by Franziska Aron

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