



Version 1

Jan 06, 2021

# Laboratory Protocols for Ancient and Modern Dental Calculus DNA Processing (Fellows Yates et al. 2021) V.1

James A Fellows Yates<sup>1</sup>, Irina Velsko<sup>1</sup>, Franziska Aron<sup>1</sup>, Courtney Hofman<sup>2</sup>, Christina Warinner<sup>1</sup>

<sup>1</sup>Max Planck Institute for the Science of Human History;

<sup>2</sup>Laboratories of Molecular Anthropology and Microbiome Research, University of Oklahoma

1 Works for me dx.doi.org/10.17504/protocols.io.bqzemx3e

WarinnerGroup



James Fellows Yates

Max Planck Institute for the Science of Human History

## 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/Anthropoid\\_Calculus\\_Microbiome\\_Evolution/](https://github.com/jfy133/Anthropoid_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.bqzemx3e](https://dx.doi.org/10.17504/protocols.io.bqzemx3e)

## COLLECTION CITATION

James A Fellows Yates, Irina Velsko, Franziska Aron, Courtney Hofman, Christina Warinner 2021. Laboratory Protocols for Ancient and Modern Dental Calculus DNA Processing (Fellows Yates et al. 2021). **protocols.io** <https://dx.doi.org/10.17504/protocols.io.bqzemx3e>

#### KEYWORDS

ancient DNA, palaeogenetics, dental calculus, microbiome, oral microbiome, oral, tooth, DNA, illumina, extraction, sampling, library construction

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#### IMAGE ATTRIBUTION

James Fellows Yates

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#### 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:

Llamas, B. et al., 2017. From the field to the laboratory: Controlling DNA contamination in human ancient DNA research in the high-throughput sequencing era. STAR: Science & Technology of Archaeological Research, 3(1), pp.1–14. Available at: <https://doi.org/10.1080/20548923.2016.1258824>.

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### **Indexing**



- Illumina double-stranded DNA dual indexing for ancient DNA



### **Preparation for Sequencing**



- Amplification and Pooling



## FILES



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