



Version 2

Jan 06, 2021

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

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1 Works for me dx.doi.org/10.17504/protocols.io.bq7wmzpe

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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

COLLECTION CITATION

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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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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
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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
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Amplification and Pooling
Version 1
by Franziska Aron