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

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Protocol status: Working
We use this protocol and it's working

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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/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

IMAGE ATTRIBUTION

James Fellows Yates

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>.

FILES

Protocol

NAME

Dental Calculus Field-Sampling Protocol (Warinner Version)

VERSION 1

CREATED BY

James A Fellows YatesMax Planck Institute for Evolutionary Anthropology

OPEN →

Protocol

NAME

Dental Calculus Field-Sampling Protocol (Sabin version)

VERSION 2

CREATED BY

Zandra Fagnäs

[OPEN](#) →

Protocol

NAME

⌘ Ancient DNA Extraction from Dental Calculus with Consolidant Removal

VERSION 1

CREATED BY

Franziska AronFriedrich-Schiller Universität Jena

[OPEN](#) →

Protocol

NAME

DNA Extraction from Modern Dental Calculus

VERSION 1

CREATED BY

Franziska AronFriedrich-Schiller Universität Jena

[OPEN](#) →

Protocol

NAME

⌘ Non-UDG treated double-stranded DNA library preparation for Illumina sequencing of ancient dental calculus

VERSION 1

CREATED BY

James A Fellows YatesMax Planck Institute for Evolutionary Anthropology

[OPEN](#) →

Protocol

NAME

⌘ (Non-UDG treated) double-stranded modern dental calculus DNA library preparation for Illumina sequencing

VERSION 1

CREATED BY

James A Fellows YatesMax Planck Institute for Evolutionary Anthropology

[OPEN](#) →

Protocol

NAME

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

VERSION 1

CREATED BY

Franziska AronFriedrich-Schiller Universität Jena

[OPEN](#) →

Protocol

NAME

Illumina double-stranded DNA dual indexing for ancient DNA

VERSION 1

CREATED BY

Christina WarinnerMax Planck Institute for the Science of Human History

[OPEN](#) →

Protocol

NAME

Amplification and Pooling

VERSION 1

CREATED BY

Franziska AronFriedrich-Schiller Universität Jena

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