

Evaluation of AmtDNA Database

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Outline

- AmtDB is a database of ancient human mitochondrial DNA
- AmtDB fills a crucial niche in the field of biological archaeology/anthropology
- AmtDB provides an easy-to-use, simple interface for scientists to be able to find the right sample(s) for their needs
- AmtDB contains high quality information, but may not be the most complete database

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AmtDB is a database of ancient human mitochondrial DNA

Ancient mtDNA Database (AmtDB)

- Database of ancient mitochondrial DNA
- Built with secondary sources
- Curated by a select group of researchers

AmtDB is a database of ancient human mitochondrial DNA

- Maintenance:
 - Dr. Ehler - Czech Academy of Sciences, Czech Republic
 - Anna Juras - Adam Mickiewicz University, Poland
- Funding:
 - The Ministry of Education, Youth and Sports of the Czech Republic
 - The Polish National Science Center



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AmtDB fills a niche in the field of biological archaeology/anthropology

- No other database exists specifically for ancient human mitochondrial DNA
 - Ancient genetic data from multiple populations and multiple points in time can allow for the study of populations in space and time using phylogenetic and population genetic methods (Ramakrishnan & Hadley, 2009)
- Mitochondrial DNA is particularly useful:
 - Often the only genetic material that can be recovered from samples
 - Particularly suited to population-level studies because of maternal inheritance, high mutation rate, and absence of recombination and population-level variability

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The AmtDB contains important information and links regarding the database

Welcome to Ancient mtDNA database!

This is the place where you can find an updated list of the published mitochondrial sequences coming from the ancient DNA samples (aDNA). The main interest of our database lies in the anatomically modern *Homo sapiens* samples, ranging from the late Paleolithic to roughly Iron Age times, focusing on an Euroasian geographical area. We provide both the *mtDNA sequences* (in FASTA format), and the *metadata* for the samples (IDs, dates, geolocation, site, culture, mtDNA haplogroup etc., available to download in a tab-delimited text file). You can:

- **Search and download** the database immediately.
- Display the selected samples on an interactive **map**.
- Read through the database **documentation**, **FAQs** or **cite us**.
- Check out **links** to other interesting (ancient) mtDNA tools and databases, or the list of **references**.
- **Contact** the authors if you have any more questions or maybe you want your samples to be included in AmtDB!
- Read our **Terms of Service**.

AmtDB in Czech media:

- sciencemag.cz
- novinky.cz
- eurozpravy.cz
- 24zpravy.com
- radio.cz

Links to other sites on AmtDB

- The ELIXIR Czech Republic
- The Institute of Molecular Genetics of the Czech Academy of Sciences
- An individual reference to each source of mitochondrial DNA



Search

[Advanced search](#) ▼ ?

Actions ?

Download FASTA [All](#) [Selected](#) [Separated](#) ?

Download metadata [All](#) [Selected](#)

Show on map [All](#) [Selected](#)

Table ?

Map ?

Select all
Deselect all

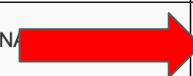
Show entries

[First](#)
[Previous](#)

[2](#)
[3](#)
[4](#)
[5](#)
[...](#)
[27](#)
[Next](#)
[Last](#)

Quick filter:

ID	Name	Group	Epoch	Country	Sex	Year from	Year to	Haplogroup	Sequence source ?	Avg. coverage ?	References	Download	Map
1	RISE509	BARu	Bronze Age	Russia	F	-2887	-2677	T2c1a2	bam	<NA>		FASTA metadata	
2	RISE510	BARu	Bronze Age	Russia	F	-2851	-2468	J2a2a	bam	<NA>		FASTA metadata	
3	RISE511	BARu	Bronze Age	Russia	F	-2909	-2679	J2a2a	bam	<NA>		FASTA metadata	
4	RISE507	BARu	Bronze Age	Russia	F	-3322	-2923	U5a1a1	bam	<NA>		FASTA metadata	
5	RISE508	BARu	Bronze Age	Russia	F	-2884	-2885	U5a1a1	bam	<NA>		FASTA metadata	



Search

Paleolithic Mesolithic Neolithic Copper Age Bronze Age Iron Age
Middle Ages
Advanced search 



Actions

- Download FASTA [All](#) [Selected](#) Separated 
- Download metadata 
- Show on map [All](#) [Selected](#)

Table

Map

Select all Deselect all Show 50 entries First Previous 1 2 3 4 5 ... 27 Next Last Quick filter:

ID	Name	Group	Epoch	Country	Sex	Year from	Year to	Haplogroup	Sequence source 	Avg. coverage 	References	Download	Map
1	RISE509	BARu	Bronze Age	Russia	F	-2887	-2677	T2c1a2	bam	<NA>		FASTA metadata	
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[Advanced search](#) ▼ ?

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 All
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Advanced search  

Actions 

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Download metadata All Selected

Show on map All Selected

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Advance Search

- Allows the data to be narrowed down very specifically
- You can just download the data you need

AmtDB [About](#) **Database** [FAQ & Help](#) [Contact](#)

Search

Paleolithic Mesolithic Neolithic Copper Age Bronze Age Iron Age
Middle Ages

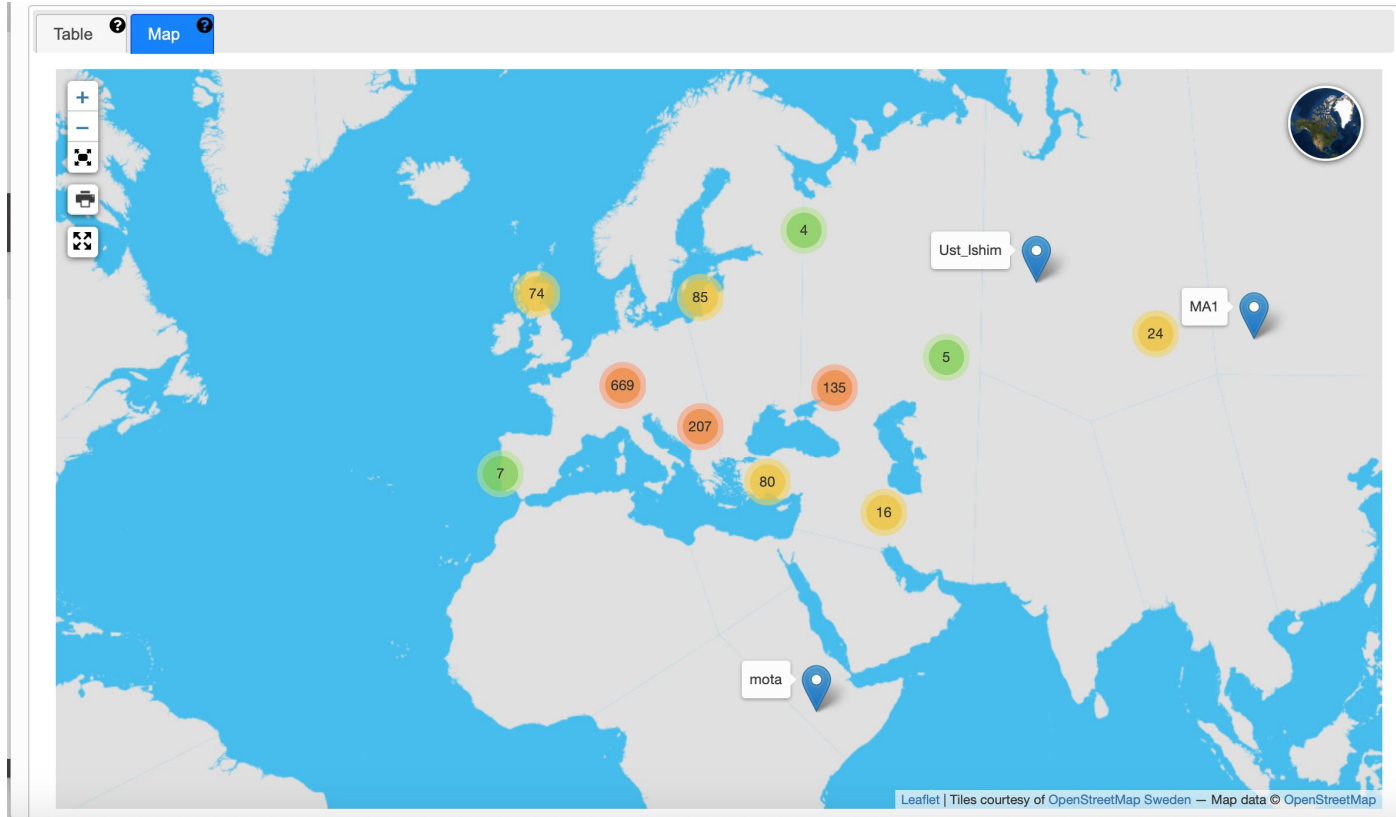
[Advanced search](#) ^ ?

Continent Country Culture Epoch
Group Region Sex Site
Reference Sequence source Identifier ? ...
Haplogroup ? ... C14 dated ? Has FASTA ?

Year from-to (exact ↻)
-48 000 1 000

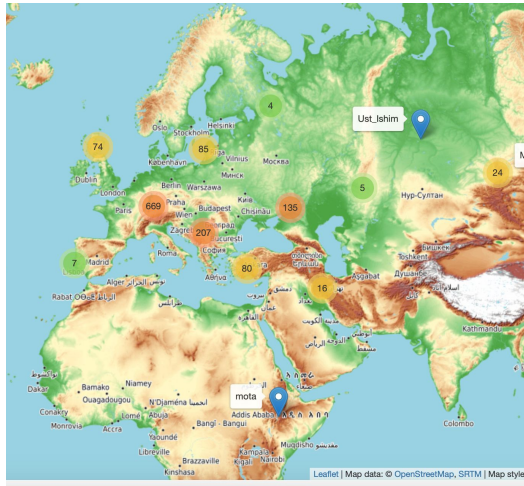
Avg. coverage from-to (exact ↻)
<NA> 2 028

A user may also search for an entry via a map



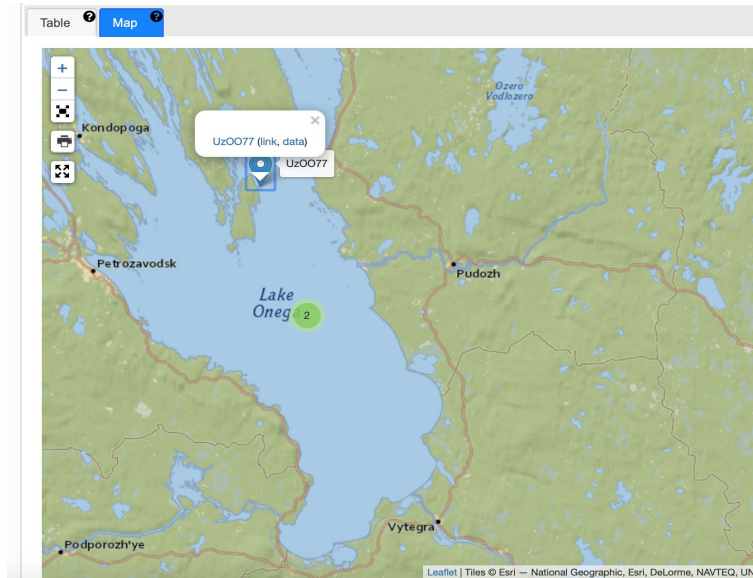
Maps can be easily modulated to display in different formats

- The maps can be changed the samples can be viewed geographically or topically

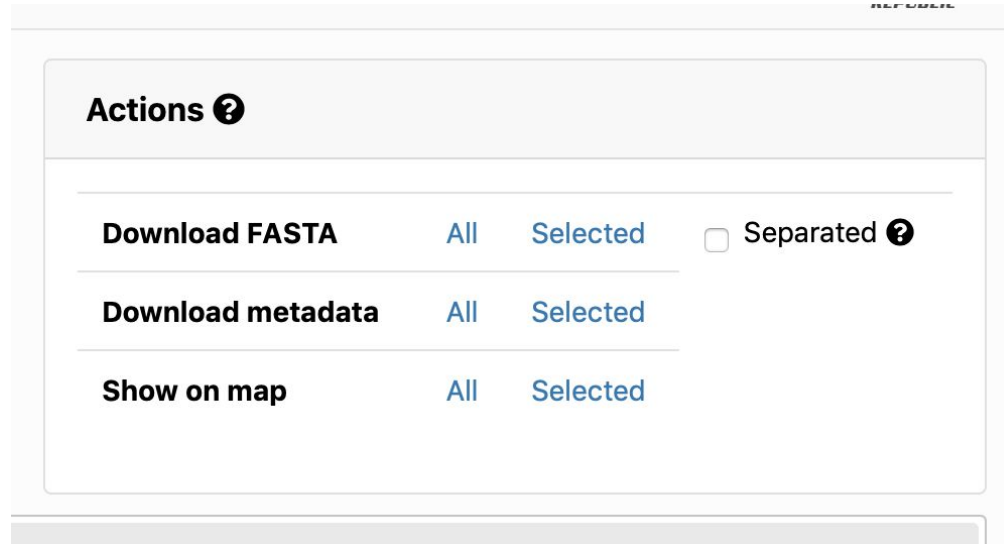


Individual samples can be pinpointed and accessed

You could even select a single mitochondrial DNA sample off the map and access its profile on the site, link to primary data and its journal article



Easily download individual entries or the entire database



The screenshot shows a web interface with a section titled "Actions" containing three rows of options for downloading data. Each row has a main action label, two radio button options ("All" and "Selected"), and a "Separated" checkbox with a help icon.

Actions ?			
Download FASTA	All	Selected	<input type="checkbox"/> Separated ?
Download metadata	All	Selected	
Show on map	All	Selected	

There are no license agreement or restrictions, simply a disclaimer

AmtDB Terms of Service

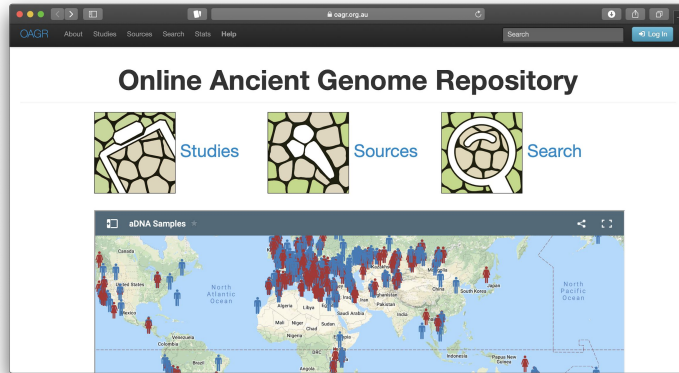
The content of the AmtDB is the sole responsibility of researchers at the Institute of Molecular Genetics, Academy of Sciences of the Czech Republic. Authors make no representations or warranties of any kind, express or implied, concerning the content of the database, including, without limitation, warranties of merchantability, fitness for a particular purpose, non-infringement, validity of any intellectual property rights or claims, whether issued or pending, and the absence of latent or other defects, whether or not discoverable.

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Competitors:



Online Ancient Genome Repository - ancient human genome database maintained by University of Adelaide, Australia



mtDB: Human Mitochondrial Genome Database - maintained by Uppsala University, Sweden

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Lack of data:



In conclusion, AmtDB is a fairly new, but thorough and easy to use database

- The database fills a particular thus-far unfilled niche in its particular area of usage
- The clean and modern interface, along with host of options make it an easy to use database
- Manual curation is to the benefit of the database because of the relatively small size of total samples

Acknowledgements

This week, the two partners for this project are [Mihir Samdarshi](#) and [Emma Young](#). Both partners worked with each other outside of class to assist each other in finding and synthesizing the necessary information required to complete this assignment.

We would like to acknowledge Dr. Dahlquist for her instruction on this topic and how to give a presentation.

References

1. Ehler, E., Novotný, J., Juras, A., Chyleński, M., Moravčík, O., & Pačes, J. (2018). AmtDB: a database of ancient human mitochondrial genomes. *Nucleic acids research*, 47(D1), D29-D32.
2. Ramakrishnan, U., & Hadly, E. A. (2009). Using phylochronology to reveal cryptic population histories: review and synthesis of 29 ancient DNA studies. *Molecular Ecology*, 18(7), 1310-1330.