The Tel001 data product

Original number of samples	5,280
Number of samples (per 15.02.2024)	5,019
Number of unique participants	4,788
Biological sample type	DNA
Participant type(s)	MoBa mothers, MoBa fathers, MoBa children
Collection timepoint	Birth (children), Gestational week ~17 (parents)
Case-control selection criteria	Artificial Reproductive Technologies (ART)
Biomarker measure(s)	Human terminal restriction fragment TRF1 and TRF2
Original reference article	Not yet available
Analytical method(s)	Southern blot
Related MoBaBIO product(s)	None
FHI Project number(s)	PDB2170

The project that generated these data

Telomeres and female fecundity

Project lead: Per Magnus

The main purpose of this project was to study the association between leukocyte telomere length and female fecundity. Using data collected on leukocyte telomere length (LTL) from mother-father-child trios, the study aimed to investigate whether women who give birth at an older age have constitutively longer telomeres, and whether women who give birth with the assistance of artificial reproductive technologies such as in vitro fertilization have constitutively shorter telomeres. The project also aimed to study whether the offspring of women who give birth at an older age inherit longer telomeres, and conversely, whether offspring of mothers who became pregnancy through the assistance of ART have shorter telomeres. Paternal LTL was used to study telomere length in MoBa fathers and to assess the paternal age at conception (PAC) effect on the offspring's telomere length.

Study population

The Tel001 telomere data source is based on DNA samples from **4788 MoBa participants** (**1609 children**, **1597 mothers**, and **1582 fathers**), and the study population comprises a case-control study design. Cases in this context were defined as mothers of children who had been conceived using Artificial Reproductive Technologies (ART), while controls were broadly defined as mothers of children who had been conceived naturally (non-ART). Mothers were eligible for inclusion if they had singleton pregnancies, had completed MoBa questionnaires administered during week 18 and week 30 of pregnancy (Q1 and Q3), and a parity of 0 (nulliparous women) at the time of sample collection. A further requirement was DNA samples from complete trios of mothers, fathers and children collected during the index pregnancy. Exclusion criteria included a history of cancer, diabetes, hypertension, preeclampsia, autoimmune disease, and intra-uterine infections, as well as mothers of children who were stillborn, had congenital malformations or were small/large for gestational age. Mothers of children born in 1999 and 2000 were also excluded. Pregnancies were subsequently randomly selected for inclusion from within ART and non-ART groups. Within the non-ART group, pregnancies were further categorized into non-ART-younger (18-31 years) and non-ART-older (32+) subgroups.

Available biomarker measures (variable names in bold)

Terminal restriction fragment 1 (**TRF1**)
Terminal restriction fragment 2 (**TRF2**)
Southern Blot gel number (**Gel**)
Gel line number (**Line**)
Reason for sample insufficiency (**Reason**)*

**The Reason variable defines sources of sample insufficiency according to six categories:*

0: No sample (no ID #) or DNA
1: Degradation (integrity)
2: Severe degradation (integrity)
3: Bad TRF smear
4: Not enough for 2
5: Technical problem

Definition of cases and controls

The variable *CaseControl* that is provided with the Tel001 dataset defines ART cases by "Case" and non-ART controls by "Control". In addition to the nonspecific case-control group classification, an additional variable called *CaseControlGrp* is provided that further characterizes non-ART controls into defined age subgroups:

non_ART_32+
non_ART_18_31

Biological sampling and processing

Cord blood samples were drawn at the time of delivery or, in cases where cord blood was unavailable, a capillary sample was taken from the newborn child simultaneous to phenylketonuria (PKU) screening (approximately 3–4 days after birth). Cord blood samples were collected in two 7-ml ethylenediaminetetraacetic acid (EDTA) tubes. These were shipped from the collecting hospital overnight to MoBa's biobank at the Norwegian Institute of Public Health (NIPH). The samples usually arrived at the biobank within 1–2 days of blood donation, where whole blood was aliquoted into two polypropylene deep-well plates (930 µl in each, ABgene, Surrey, UK).

Whole blood samples were collected from mothers and fathers at 17–18 weeks of gestation, or after birth. Samples were collected in two 7-ml ethylenediaminetetraacetic acid (EDTA) tubes. These were shipped from the collecting hospital overnight to MoBa's biobank at the Norwegian Institute of Public Health (NIPH). The samples usually arrived at the biobank within 1–2 days of blood donation, where whole blood was aliquoted into two polypropylene deep-well plates (930 µl in each, ABgene, Surrey, UK).

DNA extraction was performed manually using a FlexiGene DNA extraction kit (Qiagen, Hilden, Germany), and DNA content was quality controlled using a spectrophotometer (Spectramax 190, Molecular Devices, Sunnyvale, CA). DNA is stored at −20 °C at NIPH's biobank.

For more information on biological sampling, processing and storage, please refer to the original reference articles for NIPH's biobank by Rønningen *et al*. 2006 and Paltiel *et al*. 2014.

Analytical methodology

Terminal restriction fragment (TRF) length analysis of TRF1 and TRF2 was performed using **Southern blot**. For more information, refer to the original methodology reference article by Kimura *et al.* 2010.

Measurement units:

Kilobase (kb)

Published articles using Tel001

This section also includes articles related to study design, sampling, and data collection.

- Not yet available

Restrictions for use

None currently known.

Acknowledgements recommended for use

We recommend that any use of these data in analyses that are presented in peer-review publications acknowledges the original articles describing sampling and data collection:

Not yet available

Disclaimer

The data in Tel001 that are available for use are provided by MoBa on an *as is* basis as they were received from the generating laboratory and have not been curated or quality controlled prior to release. FHI does not provide any guarantees related to data quality and assurance of the original dataset. We reserve the right to periodically remove samples from the dataset belonging to participants who have retracted their consent to participate in this cohort study, and may alter the contents of the associated documentation accordingly.