# The Mab005 data product

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|---|---|
| **Original number of samples** | 1,250 |
| **Number of samples (per 06.10.2023)** | 1,237 |
| **Number of unique participants** | 1,137 |
| **Biological sample type** | Plasma |
| **Participant type(s)** | MoBa mothers |
| **Collection timepoint** | Gestational week ~17 |
| **Selection criteria** | Preeclampsia |
| **Metabolite type(s)** | Environmental chemicals (perfluorinated compounds) |
| **Original reference article** | Starling *et al*. 2014 |
| **Analytical method(s)** | LC-MS |
| **Related MoBaBIO product(s)** | Pro002 |
| **FHI Project number(s)** | PDB1169 |

## The project that generated these data

### Perfluorinated alkyl levels in plasma in relation to preeclampsia, and validation of physiologically-based pharmacokinetic model of perfluorinated compounds in pregnancy

*Project lead: Merethe Eggesbø*

The purpose of this study was to study the association between perfluorinated compounds (PFC) in mid-pregnancy, and the risk of preeclampsia, using a nested case-control study design within the Norwegian Mother and Child Cohort (MoBa) study. A secondary aim was to use data on perfluorinated compounds to validate a physiologically-based pharmacokinetic model of PFC levels during pregnancy.

## Study population

The original Mab005 metabolomics data source is based on plasma samples from **1,150 mothers** and comprises a case-control study design. Cases consist of 500 MoBa mothers with validated preeclampsia, while controls were comprised of 550 randomly-selected controls. MoBa mothers were eligible for inclusion based on a single pregnancy, no previous live or stillborn children, the absence of any hypertension prior to the pregnancy, the availability of plasma samples collected in the second trimester (ca. 17-18 weeks gestation), and who enrolled in MoBa between 2003-2007. Eligibility was restricted to mothers who enrolled during 2003 or after, because PFAS analyses requires ethylenediaminetetraacetic acid anticoagulation, which wasn't implemented in MoBa until 2003.

In addition to the primary case-control study sample, an additional 100 mothers were included who have participated with several pregnancies in MoBa (with plasma samples from two separate pregnancies, meaning these comprise 200 samples of the total sample set for this data product).

## Available metabolic measures (variable names in bold)

Perfluorodecanoic acid (**PFDA**)
Perfluorododecanoic acid (**PFDoDA**)
Perfluorohepane sulfonic acid (**PFHpS**)
Perfluoroheptanoic acid (**PFHpA**)
Perfluorohexan sulfonic acid (**PFHxS**)
Perfluorononanoic acid (**PFNA**)
Perfluorooctane sulfonic acid (**PFOS**)
Perfluorooctanoic acid (**PFOA**)
Perfluorotridecanoic acid (**PFTrDA**)
Perfluoroundecanoic acid (**PFUnDA**)

## Definition of cases and controls in the dataset

The variable *CaseControlGrp* that is provided with the Mab005 dataset defines cases by "**Case**" and controls by "**Control**". In addition to the core case-control group, an additional randomly-selected 100 mothers were included with duplicate samples from two separate pregnancies, and characterized based on self-reported breastfeeding. These mothers are defined as as "**Serial_Pregnancy_Exclsv_Breastfed**" (serial pregnancy, child exclusively breastfed) or "**Serial_Pregnancy_Never_Breastfed**" (serial pregnancy, child never breastfed).

## Biological sampling and processing

Non-fasting blood samples were collected from mothers at 17-18 weeks' gestation into ethylenediaminetetraacetic acid (EDTA) tubes, centrifuged within 30 minutes, and temporarily placed in a refrigerator at 4 °C. They were shipped from the collecting hospital overnight to MoBa's biobank at the Norwegian Institute of Public Health (NIPH). The samples most often arrived at the biobank within 1–2 days of blood donation, where EDTA plasma were aliquoted onto polypropylene microtiter plates (96-well format, 300 µL per well), sealed with the use of heat-sealing foil sheets, and placed in long-term storage at −80 °C.

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

The environmental chemicals included in this study were measured from plasma using **column switching liquid chromatography (LC) coupled to a triple quadrupole mass spectrometer (MS)**. For more information, refer to the original methodology reference article by Haug *et al*. 2009.

### Measurement units:

Concentration in **ng/mL** for all included variables.

### Limit of quantification (LOQ):

The LOQ for all included measures: **0.05 ng/mL**

## Published articles using Mab005

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


- Impinen A, Longnecker MP, Nygaard UC, et al. Maternal levels of perfluoroalkyl substances (PFASs) during pregnancy and childhood allergy and asthma related outcomes and infections in the Norwegian Mother and Child (MoBa) cohort. Environ Int. 2019 Mar;124:462-472.

- Rosen EM, Brantsæter AL, Carroll R, et al. Maternal Plasma Concentrations of Per- and polyfluoroalkyl Substances and Breastfeeding Duration in the Norwegian Mother and Child Cohort. Environ Epidemiol. 2018 Sep;2(3):e027.
- Singer AB, Whitworth KW, Haug LS, et al. Menstrual cycle characteristics as determinants of plasma concentrations of perfluoroalkyl substances (PFASs) in the Norwegian Mother and Child Cohort (MoBa study). Environ Res. 2018 Oct;166:78-85.
- Rush EL, Singer AB, Longnecker MP, et al. Oral contraceptive use as a determinant of plasma concentrations of perfluoroalkyl substances among women in the Norwegian Mother and Child Cohort (MoBa) study. Environ Int. 2018 Mar;112:156-164.
- Verner MA, Ngueta G, Jensen ET, et al. A Simple Pharmacokinetic Model of Prenatal and Postnatal Exposure to Perfluoroalkyl Substances (PFASs). Environ Sci Technol. 2016 Jan 19;50(2):978-86.
- Verner MA, Loccisano AE, Morken NH, et al. Associations of Perfluoroalkyl Substances (PFAS) with Lower Birth Weight: An Evaluation of Potential Confounding by Glomerular Filtration Rate Using a Physiologically Based Pharmacokinetic Model (PBPK). Environ Health Perspect. 2015 Dec;123(12):1317-24.
- Verner MA, Longnecker MP. Comment on "enhanced elimination of PFAS by menstruating women: evidence from PBPK modeling" Envir Sci Technol. 2015 May 5;49(9):5836-7.
- Papadopoulou E, Haug LS, Sabaredzovic A, Eggesbø M, Longnecker MP. Reliability of perfluoroalkyl substances in plasma of 100 women in two consecutive pregnancies. Environ Res. 2015 Jul;140:421-9.
- Starling AP, Engel SM, Richardson DB, et al. Perfluoroalkyl substances during pregnancy and validated preeclampsia among nulliparous women in the Norwegian Mother and Child Cohort Study. Am J Epidemiol. 2014 Apr 1;179(7):824-33.


## 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 article describing sampling and data collection:

Starling AP, Engel SM, Richardson DB, et al. Perfluoroalkyl substances during pregnancy and validated preeclampsia among nulliparous women in the Norwegian Mother and Child Cohort Study. Am J Epidemiol. 2014 Apr 1;179(7):824-33.

## Disclaimer

The data in Mab005 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.