# Changes in fetal DNA modification associated with maternal blood sugar during pregnancy

Submission date 06/09/2017	<b>Recruitment status</b> No longer recruiting	[X] Prospectively registered [_] Protocol
Registration date 13/09/2017	<b>Overall study status</b> Completed	<ul> <li>Statistical analysis plan</li> <li>Results</li> </ul>
Last Edited 13/09/2017	<b>Condition category</b> Pregnancy and Childbirth	<ul><li>Individual participant data</li><li>Record updated in last year</li></ul>

## Plain English summary of protocol

Background and study aims:

Infants born to mothers with pregnancy diabetes have increased risk of type 2 diabetes later in life. The aim of this study is to examine the extent to which maternal metabolism and habits during pregnancy are related to modifications of genetic material from the fetus during pregnancy. Fetal gene information is collected from the woman's blood during pregnancy using standard blood collection.

Who can participate?:

Scandinavian women aged 25-35 years in early pregnancy. In total, 30 women will be recruited before pregnancy week 12+6. Of these participants, 50% will have a high risk of pregnancydiabetes while 50% are expected to have a normal pregnancy.

## What does the study involve?

This study involves three study visits during pregnancy (all including blood collection from the woman), passive bio-sample collection at delivery (e.g. from the placenta), and one study visit two months after delivery (blood collection from mother and infant). In addition to clinical visits, participating women are followed with continuous monitoring of blood-sugar and physical activity, and report their own weight.

What are the possible benefits and risks of participating?:

There are no direct medical benefits of participating in the study. However, the closer monitoring of blood-sugar in pregnancy could potentially lead to earlier detection of pregnancydiabetes. The main risk of participating should be potential skin-reactions from devices monitoring blood-sugar and physical activity. Standard blood collection through venipuncture is also associated with a small risk of infection.

Where is the study run from?: Skåne University Hospital in Lund/Malmö (Sweden)

When is study starting and how long is it expected to run for?: September 2017 to 2019 Who is the main contact?: Miss Angela Estampador angela.estampador@med.lu.se

# **Contact information**

# Type(s)

Public

**Contact name** Ms Angela Estampador

## Contact details

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# Type(s)

Scientific

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# Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers 1.0

# Study information

Scientific Title

The Diabetogenic Perturbations of the Fetal Methylome Project

**Acronym** DIAPRIME

#### Study objectives

We hypothesize that intrauterine exposure to maternal blood glucose during gestation will correlate with differences in patterns of fetal methylation; fetal methylation patterns will vary by timing and degree of intrauterine exposure to maternal glucose.

**Ethics approval required** Old ethics approval format

**Ethics approval(s)** Regional Ethical Review Board in Lund, Sweden, 01/09/2016, ref: 2016/489 with amendment 2016/1098

**Study design** Observational cohort study

**Primary study design** Observational

**Secondary study design** Cohort study

**Study setting(s)** Hospital

**Study type(s)** Other

**Participant information sheet** No participant information sheet available

# Health condition(s) or problem(s) studied

Maternal-fetal effects of metabolism in pregnancy

#### Interventions

Participants attend study visits at three time points in pregnancy (approximately at 12, 26, and 34 gestational weeks) during which maternal blood, questionnaire data on lifestyle, and anthropometry are collected.

Participants are also monitored between study visits with self-reported weight, continuous glucose monitoring and physical activity (wrist accelerometry) from recruitment in early pregnancy to delivery. At delivery, bio-sampling is performed (e.g. placental material and cord blood) and at approximately two months postpartum, additional maternal and infant data is collected, including blood sampling.

#### Intervention Type

Other

#### Primary outcome measure

Changes in fetal/placental DNA methylation at three time points in pregnancy are measured using cell-free fetal DNA isolated from maternal blood and next generation sequencing at approximately 12, 26, and 34 gestational weeks.

## Secondary outcome measures

1. Maternal physical activity as measured by wrist accelerometer from early pregnancy to delivery

2. Maternal blood-glucose as measured by a continuous glucose monitor and OGTT from early pregnancy to delivery

3. Maternal weight gain and body composition (daily weighing using a medical scale and/or clinically measured using the Styku 3D body scanning system) throughout pregnancy and postpartum

# Overall study start date

01/01/2016

## **Completion date**

15/09/2019

# Eligibility

## Key inclusion criteria

In total, we will recruit around 30 pregnant women: 1. Aged 25-35 before gestational week 12+6

Half of the recruited women (50%) will have a high risk of gestational diabetes mellitus:

- 1. Family history of diabetes
- 2. Prior pregnancy affected by diabetes
- 3. Current obesity

Half of the recruited women (50%) are expected to have a normal pregnancy not complicated by gestational diabetes mellitus (controls).

If a control woman develops gestational diabetes, she will be invited to continue to take part in the study and be monitored as per standard of care; we will then seek to recruit an additional woman to the control arm to ensure an adequate number of participants in the study.

**Participant type(s)** Mixed

**Age group** Adult

**Sex** Female

**Target number of participants** 30

#### Key exclusion criteria

- 1. Not of Scandinavian origin
- 2. Use of assisted reproductive technology
- 3. History of three or more first trimester miscarriages
- 4. Tobacco use (smoking/snus) in the previous three months
- 5. Diagnosed PCOS
- 6. History of gastric bypass surgery
- 7. Type 1 diabetes
- 8. Non-Swedish speaker
- 9. Planned termination of pregnancy or planning to give up infant for adoption

Date of first enrolment 20/09/2017

Date of final enrolment 15/09/2018

# Locations

**Countries of recruitment** Sweden

**Study participating centre Skåne University Hospital** Lund/Malmö Sweden 222 41

# Sponsor information

## Organisation

Lund University

## Sponsor details

Box 117 Lund Sweden 221 00

**Sponsor type** University/education

Website www.lu.se **Organisation** Skåne University Hospital

**Sponsor details** Getingevägen 4 Lund Sweden 222 41

**Sponsor type** Hospital/treatment centre

**Organisation** Lund University

Sponsor details

**Sponsor type** Not defined

Website http://www.lunduniversity.lu.se/

ROR https://ror.org/012a77v79

# Funder(s)

Funder type Charity

**Funder Name** The European Foundation for the Study of Diabetes

**Funder Name** The Swedish Heart-Lung Foundation

Funder Name Novo Nordisk Foundation

# **Results and Publications**

## Publication and dissemination plan

Planned publication in relevant peer-reviewed scientific journal.

## Intention to publish date

01/09/2020

## Individual participant data (IPD) sharing plan

The data sharing plans for the current study are unknown and will be made available at a later date.

#### IPD sharing plan summary

Data sharing statement to be made available at a later date