

Practical details...

BEFORE SENDING SAMPLES

Check gestational age conditions

- ≥ 8 weeks of gestation
(based on ultrasound report)
- ≥ 10 weeks of amenorrhea

Inform laboratory
prior to dispatch :

+33.1.34.40.20.80
smgenetique@lab-cerba.com

SAMPLING OF MATERNAL BLOOD

- Collect whole blood (3 x 7 ml) on a serum tube with separating gel

- Leave 30 minutes at room temperature until complete clotting then centrifuge for 10 min at around 4000 rpm.

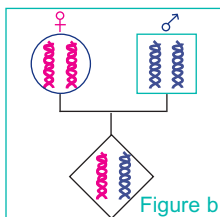
NEVER OPEN THE TUBES

The following documents **MUST BE** enclosed with all requests

- Ultrasound report (1st ultrasound dating: gestational age and number of foetuses)

- Test requisition form: "Fetal sex determination from maternal blood"

- Certificate of medical counseling and signed patient's informed consent.



Principle of ANALYSIS of CIRCULATING CELL-FREE FETAL DNA (figure a)

Since no fetal DNA is present in the cell nucleus, chromosomal analysis (fetal karyotyping) is impossible. Once in the maternal blood, fetal DNA is diluted in the much more copious and highly homologous DNA that constitutes circulating cell-free fetal DNA originating from the mother (in blue), although it cannot be isolated specifically. Thus, only alleles inherited from the father (in pink, figure b) constitute readily distinguishable specific fetal sequences in maternal blood.

This is a crucial point since only those fetal genetic sequences that either differ from (e.g. SRY) or are absent from the maternal genome can be sought and/or studied.

A RAPID, SIMPLE, EARLY et NON-INVASIVE TEST

This test is carried out using a single blood sample and thus presents no risk to the fetus. The test is also rapid since it simply requires extraction of nucleic acids from the maternal blood sample followed by PCR (result turnaround time: 1 day). In addition, it can be carried out from 10 WA, since circulating cell-free fetal DNA first appears in maternal blood from 5 WA although in very low concentrations. It disappears within a few hours of childbirth and does not persist in the mother's body. The test has the dual advantage of being both non-invasive and feasible in earlier stages of pregnancy.

This non-invasive prenatal diagnostic procedure has many uses, and it is currently offered by Cerba in two indications: determination of fetal sex and fetal RhD genotyping.

PRENATAL DIAGNOSIS

Invasive prenatal diagnostic procedures (amniocentesis, chorionic villus sampling or cordocentesis) are used solely for women with an identified high risk of giving birth to infants having genetic or chromosomal diseases, first, because these methods are only feasible from 11 weeks of amenorrhea (W.A.) at best, and second, because they are associated with a high risk of loss of the fetus (see table below). For this reason, much research until now has been devoted to non-invasive methods of prenatal diagnosis.

COMPARISON OF METHODS			
Sampling procedure	Choriocentesis	Amniocentesis	Cordocentesis
Sample type	Chorionic villosities	Amniotic fluid	Fetal blood
Sampling performed at:	11 W.A.	15 W.A.	18 W.A.
Analysis	Karyotyping	Fetal karyotyping (biochemistry)	Fetal karyotyping (bioch., hemato., immuno.)
Result turnaround	Direct: 1 d Culture: 10 d / 2 wks	Culture: 10 d / 3 wks	Culture: 3 d
Fetal risk	2 - 5 % (technique + spontaneous miscarriage)	0,5 - 1 %	2 %

From the report of the Society of Obstetricians and Gynecologists of Canada - November 2005

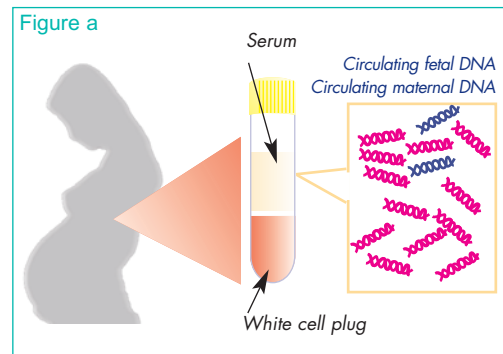
CIRCULATING FETAL DNA

Laboratoire Cerba has extended its human genetic diagnostic range to include an authentic alternative to these invasive procedures, namely analysis of circulating cell-free fetal DNA in maternal blood.

Besides fetal cells, use of which in prenatal diagnosis is restricted (due to difficulties of isolation), there is another source of fetal genetic material present in circulating maternal blood.

The presence of circulating cell-free fetal DNA was in fact demonstrated in 1997 and appears to be a physiological phenomenon associated with pregnancy.

In 2002, it was first used as a prenatal diagnostic tool. To date, more than 5000 tests have been performed by our team, a worldwide pioneer in this field.



Benachi A, Steffann J, Gautier E, Ernault P, Olivi M, Dumez Y, Costa JM. Fetal DNA in maternal serum: does it persist after pregnancy? Hum Genet 2003;113:76-79.

Lo YM, Corbetta N, Chamberlain PF, Rai V, Sargent IL, Redman CW, Wainscoat JS. Presence of fetal DNA in maternal plasma and serum. Lancet 1997;350:485-7

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Flori E, Doray B, Gautier E, Kohler M, Ernault P, Flori J, Costa JM. Circulating cell-free fetal DNA in maternal serum likely originates from cyto- and syncytiotrophoblastic cells. Hum Reprod 2004;19 :723-4.