

# Fetal hemoglobin, HbF

see also Hemoglobin electrophoresis / Hemoglobin HPLC

General:

Fetal hemoglobin, (also hemoglobin F or HbF) is the main oxygen transport protein in the fetus during the last seven months of development. Functionally, fetal hemoglobin differs from adult hemoglobin by its ability to bind oxygen with higher affinity than the adult form, providing the developing fetus better access to oxygen from the mother's bloodstream.

In infants >3 months, fetal hemoglobin is nearly completely replaced by adult hemoglobin (HbA). Children with sickle-cell disease produce a defective form of hemoglobin called hemoglobin S. HbS forms filaments and can change the erythrocyte from round to sickle-shaped under certain conditions. These erythrocytes show an increased tendency to stack on top of one another and to block blood vessels. It can lead to painful vasoocclusive episodes, which are a hallmark of the disease.

In adults, fetal hemoglobin production can be reactivated pharmacologically, which is useful in the treatment of diseases such as sickle-cell disease.

The following tests are available:

- **Fetal hemoglobin**

Indication: Thalassemia syndromes ( $\alpha$ -,  $\beta$ -,  $\delta$ -thalassemia, HbH-disease), hereditary HbF-persistence (HPFH), hemoglobinopathy (HbS, Hb Lepore), anemia

Material: 3 ml EDTA blood

Stability: maximum 48 hours

TAT: 3 days, FML

Method: HPLC

Units: %

Ref.- range: see report

Comment: HbF increased: hereditary spherocytosis, AML, CML, myelophthistic anemia, untreated pernicious anemia;

- **Fetal hemoglobin (fetomaternal blood transfusion)**

**General:**

The quantification of fetal erythrocytes in the maternal blood is useful for the identification of a fetomaternal blood transfusion. Physiologically 0.1 - 0.2 ml of fetal blood pass from the fetus to the mother during delivery (in 30 - 50% of the cases). >0.1 ‰ fetal erythrocytes indicate a fetomaternal microtransfusion (0.5 – 15 ml fetal blood transfer), >3 ‰ fetal erythrocytes blood indicate a fetomaternal macrotransfusion (more than 15 ml fetal blood).

**Indication:** Suspicion of fetomaternal micro-/macrotransfusion, control of blood contamination in amniotic fluid after amniocentesis, vaginal bleeding during pregnancy, differentiation between maternal and fetal blood

**Material:** 1 ml EDTA blood, amniotic fluid, cord blood

**TAT:** 5 - 7 days\*

**Method:** %

**Units:** FCM

**Ref. Range:** <0.1 per mille

For complete list of laboratory test offered at Freiburg Medical Laboratory, please visit <http://www.fml-dubai.com/parameter-listings/>