Synthesis of hemoglobin is under genetic control and the presence of abnormal hemoglobins is associated with functional, physical and morphological abnormalities of the red cells.

Hemoglobins are composed of polypeptide chains of globin and iron protoporphyrin heme groups.

Normal hemoglobins have similar structures with a molecular weight of about 67,000 daltons and consist of 2 pairs of globin chains each associated with one molecule of heme.

- Hemoglobin A: polypeptide chains 2 α and 2 β
- Hemoglobin A₂: polypeptide chains 2 α and 2 δ
- Hemoglobin F: polypeptide chains 2 α and 2 γ

Normal adult hemoglobins are HbA (98% of total hemoglobin) and small amounts of HbA₂ and HbF. Substitution of aminoacids in the polypeptide chains sequence leads to the formation of abnormal hemoglobin variants. At present over 600 structural hemoglobin variants are known: HbS, HbC, HbE, HbD, HbG, HbH, Hbl, Hb Lepore, etc.

Hemoglobinopathies are a group of diseases caused by the presence of abnormal hemoglobins.

About 60% of abnormal hemoglobins have a sufficiently altered charge distribution to be identified by electrophoresis. The variants most frequently observed are HbS and HbC.

Concomitant presence of HbA and another variant (HbS, HbC, HbE, etc.) is referred to as heterozygous hemoglobinopathy AS, AC and AE respectively. The presence of only one single type of hemoglobin variant is called homozygous hemoglobinopathy, like HbS or HbC.

These abnormal variants are genetically transmissible. Homozygous hemoglobinopathies may cause serious clinical effects. Acid hemoglobin electrophoresis on agarose allows confirmation of the presence of HbS or HbC already detected by Alkaline Hemoglobins electrophoresis.
**KIT CONTENT**

- Gel Plates: 10
- Blotting Paper: 10
- Buffered Sponges: 20
- Acid Blue Stain: 1
- Applicator Washing Sol.: 1
- Lysing Solution: 1
- Disposable Sample Plates: 10

**REAGENT PREPARATION**

Reagents are ready to use, only the Stain has to be reconstituted with 900 ml of distilled water. All may be stored at room temperature.

**SAMPLE PREPARATION**

After the red blood cells (RBC) are washed they are lysed as follows: 50 μl of packed washed RBC + 450 μl of lysing solution.

**SAMPLE STORAGE and STABILITY**

- Whole blood: 1 week at 2 to 8°C.
- Hemolysate: 12 hours at 2 to 8°C.

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**Position of hemoglobin bands on Acid Hemoglobin gel**

### Anode

- Normal HbA
- HbC
- HbS
- HbF

### Cathode

- Normal HbA
- HbF
- Normal HbC
- HbS
- HbA

Interpretation of results in the Acid Hemoglobin procedure is performed by visual inspection of the stained bands.

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**PERFORMANCE CHARACTERISTICS**

**Accuracy**

A total of 31 normal and abnormal specimens were tested with Interlab systems versus a commercial agarose system. The Interlab Acid Hemoglobin kits demonstrated equivalent band patterns with no false negative or false positive bands. This study yielded a 100% agreement with the reference method for the observed bands.

**Within Run Precision**

3 samples were run on 3 different gels. Each sample was run 13 times on the same gel. In each lane the bands were correctly identified.

**Between Run Precision**

4 samples were run on 10 different gels. In each lane the bands were correctly identified.