

## Serendipitous detection of rare hemoglobin variants

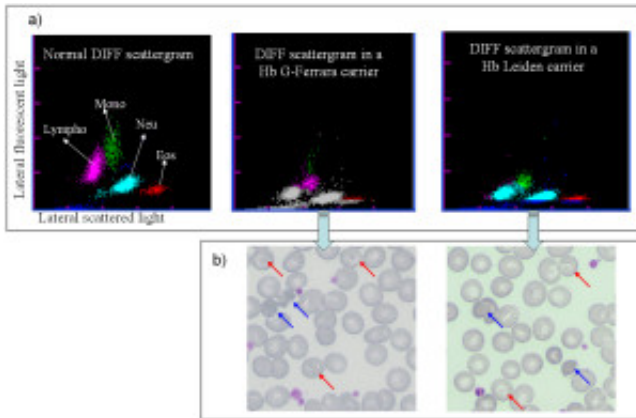


Fig. 1: a) XE-2100 scattergram. b) Blood smear stained with May-Grunwald Giemsa showing irregular contracted RBC (blue arrows) and target RBC (red arrows)

The centralization of laboratory activities optimizes the resources and improves the expertise of the staff that can observe with a higher probability rare and exceptional cases. In the recent months, the Area Vasta Romagna's laboratory, which provides a diagnostic service for a population of over a million inhabitants in North Italy, detected an unusual instrumental alarm in two routine blood counts. Further investigation demonstrated the presence of two Hemoglobin (Hb) variants characterized as Hb Leiden and Hb G-Ferrara.

These two hemoglobins variants do not allow the XE2100 Hematology Analyzer to provide differential leukocyte counts as it reduces the fluorescence signal (Fig. 1a). In both cases irregularly contracted red blood cells (RBCs) and target RBCs (Fig. 1b) were present. The two Hb variants, with 4.28 minutes and 3.23 minutes of elution time (Fig. 2),

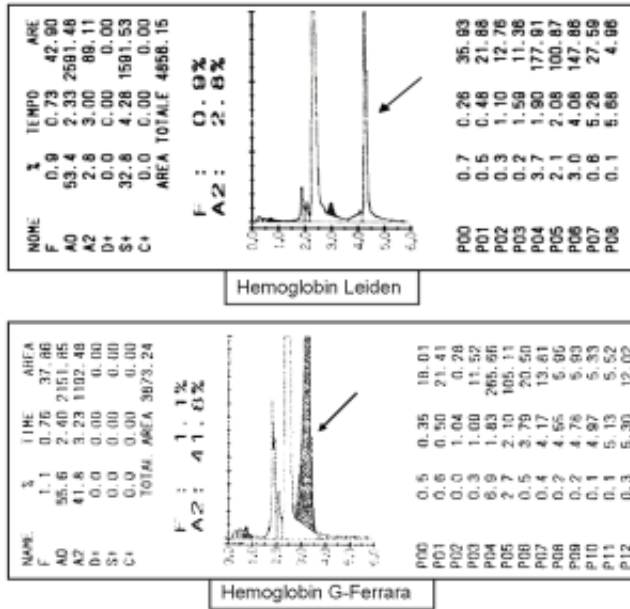


Fig. 2: HPLC report showing hemoglobin variants (black arrows)

were typed as Hb Leiden and Hb G-Ferrara respectively. Heterozygotes for these Hb variants are asymptomatic but heterozygosity for Beta thalassemia or other Hb variants could induce clinical complications. Therefore, it is clinically useful to identify carriers of these variants in specific clinical setting. The mechanism of interference by these Hb variants with the DIFF channel of XE-2100 is not clear but, since the reagents used in this instrument lyse the red blood cells, permeabilize the white blood cells and mark with fluorescence the nucleic acid content of leukocytes, these hemoglobins could reduce leukocyte membrane permeabilization or prevent the binding of fluorescent marker to nucleic acids. These findings suggest that the need to search for hemoglobinopathies all the cases with a similar DIFF interference when using Sysmex analyzers.

## Publications

[Serendipitous detection of Hemoglobin G-Ferrara variant with Sysmex DIFF channel.](#)

Rosetti M, Poletti G, Ivaldi G, Rondoni M, Baldrati L, Dorizzi RM  
*Clin Biochem.* 2015 Sep 21

[A rare case of Hemoglobin Leiden interfering with the DIFF channel of Sysmex XE-2100.](#)

Rosetti M, Poletti G, Sensi A, Ravani A, Rondoni M, Baldrati L, Dorizzi RM  
*Scand J Clin Lab Invest.* 2015 Sep