Which Protein Bands Are Significant?
Ross Miller¹ and Alina-Gabriela Sofronescu¹*¹

CASE DESCRIPTION
The serum protein electrophoresis pattern (SPEP)² for an 82-year-old female patient with known monoclonal gammapathy of undetermined significance demonstrated 2 aberrant protein bands, one in the α2-β1 interzone (Fig. 1A, fat arrow) and one in the β1-β2 interzone (Fig. 1A, thin arrow). The immunofixation electrophoresis (IFE) (Fig. 1B) revealed a large IgA κ paraprotein in the β1-β2 interzone (Fig. 1B, thin arrow) but only a very faint IgA heavy-chain paraprotein corresponding to the large α2-β1 interzone band (Fig. 1B, fat arrow).

QUESTIONS
1. Why would a dense band on SPEP and a corresponding faint band on IFE be a red flag for a discrepant result?
2. What are possible causes of additional α2-β1 interzone migrating protein bands?
3. What is the most likely type of laboratory error involved in this case: preanalytical, analytical, or postanalytical?

The answers are below.

ANSWERS
Paraproteins appear more defined with IFE than SPEP owing to the bound antisera and the removal of nonimmuno-

globulin proteins by washing. A reversal in the apparent size of the protein band (i.e., appearing larger on the SPEP) warrants further investigation. Causes for α2-β1 interzone bands include paraproteins, pre-β lipoprotein, haptoglobin–hemoglobin complexes, plasminogen, and fibronectin. In-

¹ University of Nebraska Medical Center, Omaha, NE.
* Address correspondence to this author at: 983135 University of Nebraska Medical Center, Omaha, NE 68198-5520. Fax 402-559-6018; e-mail alina.sofronescu@unmc.edu.
Received June 26, 2013; accepted August 16, 2013.
DOI: 10.1373/clinchem.2013.211888

² Nonstandard abbreviations: SPEP, serum protein electrophoresis pattern; IFE, immunofixation electrophoresis.
vestigation revealed a grossly hemolyzed sample, representing the most common type of preanalytical error. A nonhemolyzed sample for the same patient (Fig. 1C) correlated well with the initial IFE.

Author Contributions: All authors confirmed they have contributed to the intellectual content of this paper and have met the following 3 requirements: (a) significant contributions to the conception and design, acquisition of data, or analysis and interpretation of data; (b) drafting or revising the article for intellectual content; and (c) final approval of the published article.

Authors’ Disclosures or Potential Conflicts of Interest: No authors declared any potential conflicts of interest.

References

Where Has All the $\beta_1$-Transferrin Gone?
Yu Chen,$^{1,2,*}$ James Samsoondar,$^3$ and Liju Yang$^{4,5}$

CASE DESCRIPTION
A 50-year-old woman with advanced breast cancer underwent a lumbar spinal fusion to treat cord compression caused by metastases. There was a nonbloody, nonpurulent serous drainage from the incision. $\beta_2$-Transferrin was measured to rule out cerebrospinal fluid (CSF) leakage (Fig. 1).

Fig. 1. $\beta_2$-Transferrin testing of back drainage fluid and serum from the 50-year-old woman. Trf, transferrin.