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## Book Review

### Serum Protein Electrophoresis and Immunofixation Illustrated Interpretations

By: Didier Le Carrer

There are few electrophoresis texts available today. This book is designed to expand the reader's interpretive skills and to be used as a frequently called upon reference book to assist with difficult clinical cases. Included are discussions of the basics of zone electrophoresis, monoclonal components, protein diagnostic studies of multiple myeloma, Waldenström's macroglobulinemia, and other monoclonal components plus oligoclonal immune patterns. This illustrated guide includes many example gels with their corresponding densitometric tracings to sharpen readers' skills in identification of very diverse and challenging case studies.



Please circle number 105 on your reader response card for information about adding this text to your reference library.

## SEBIA AFTER DARK

By: Paul Delgado, Sebia National Service Manager

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If you need assistance call us at 800-835-6497. Your call will be answered by Sebia's automated answering system. Follow the instructions for after hours emergency support. Please leave your name, call-back phone number and brief description of the pending issue.

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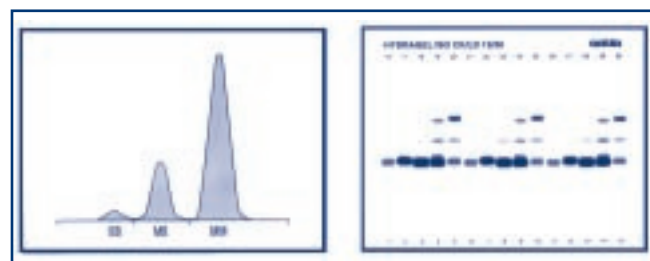
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## Colorimetric ISO-CK Assay Now Available!

By: Lydia Dodson-Lehrer, Director of Marketing

As part of Sebia's continuing product line and menu expansion, I am pleased to inform you that Sebia's creatine kinase isoenzyme (ISO-CK) assay is now available.



The ISO-CK assay is designed for the identification and quantification of the three creatine kinase isoenzymes found in human serum by electrophoresis on alkaline buffered agarose gels. Sebia's ISO-CK test is unique in that it is the only colorimetric CK assay available today. Colorimetric results can be evaluated both visually for pattern abnormalities and by scanning with a densitometer such as the HYRYS™ or a digital imaging device such as Sebia's new Phoresis™ scanner to obtain accurate relative quantification of individual isoenzymes. Additionally, since the assay is colorimetric, gels can be saved for future reference as a permanent record of testing.

The CK assay is available in 7, 15 or 30 sample gel formats to help optimize workflow and virtually eliminate waste. As with all Sebia assays, the new kits come complete with everything needed to run 70, 150 or 300 tests. Therefore, whatever your workload, simply mix and match the kits to address your laboratory requirements.

	Sebia Part Number	Samples per Gel	Tests per Kit
ISO-CK	4111	7	70
	4131	15	150
	4135	30	300

If you would like to receive more information on Sebia's new colorimetric CK assay or any other assay available from Sebia, simply circle number 107 on the reader response card

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# Separations

## Much Needed Guidelines Give Direction for Evaluation of Monoclonal Gammopathies

By: Lydia Dodson-Lehrer, Director of Marketing

In the February, 1999, issue of Arch Pathol Lab Med, Vol. 123 was published a document entitled "Guidelines for Clinical and Laboratory Evaluation of Patients With Monoclonal Gammopathies". It was authored by a prestigious group of medical doctors considered to be today's experts in the area of protein testing. This is a revolutionary document in that up until this time no consistent guidelines or recommendations had been published as to how to evaluate a patient suspected of having a clinical condition producing a monoclonal protein in serum or urine. It is so significant a publication that the College of American Pathologists distributed a copy with the results of the ELP-C proficiency survey.

Questions and observations have been raised regarding some of the guidelines by conscientious laboratorians. An interesting statement made in the Guidelines is "The M-protein should be followed using densitometric quantitation, unless a low-level M-Protein is obscured by other proteins. In such cases, quantitation of immunoglobulins by nephelometry may be more accurate." It is only through densitometric quantitation that the monoclonal protein can be reasonably isolated for more accurate quantitation.

One of the main questions seems to focus around the statement that a high resolution electrophoresis technique is recommended. In this instance, high resolution refers to a protein electrophoresis procedure that provides a greater resolution particularly of the beta fraction proteins.

Sebia offers customers a choice depending on the amount of resolution required in their protein separations. Sebia's Protein kit provides superior resolution and sensitivity for monoclonal band detection. With performance unparalleled by any other routine screening gel, samples are separated into the traditional five (5) fractions of albumin, alpha-1, alpha-2, beta and gamma and offers both serum and urine capabilities. This kit is currently available with

seven (7), fifteen (15), or thirty (30) samples per gel to optimize workflow, minimize waste, and to reduce laboratory costs.

If greater resolution is desired, Sebia offers two other protein electrophoresis assays in various kit sizes to address customer needs and workflow requirements. The  $\beta 1 - \beta 2$  assay has been optimized to separate proteins into six (6) fractions with a split beta zone.  $\beta 1$  corresponds to the transferrin fraction and  $\beta 2$  the complement fraction. Serum or urine can be tested with this kit and it is available currently with fifteen (15) or thirty (30) samples per gel. I am pleased to announce that a smaller seven (7) sample gel is scheduled for introduction soon.

High Resolution (HR) is the other type of protein assay available. This test is available with either seven (7) or fifteen (15) samples per gel. Qualitative or quantitative, this gel is unsurpassed in resolution and high sensitivity needed for the detection of very weak fractions and oligoclonal banding. The assay is intended for a multifractionation of proteins in serum, concentrated CSF or urine.

The following table summarizes the protein kits available from Sebia.

	Sebia Part Number	Samples per Gel per Kit	Tests
Protein	4100	7	70
	4120	15	150
	4140	30	300
$\beta 1 - \beta 2$	4121	15	150
	4141	30	300
HR	4102 - acid violet	7	70
	4105 - amido black	7	70
	4122 - acid violet	15	150
	4125 - amido black	15	150

Sebia is dedicated to providing customers with only the highest quality electrophoresis products. If you would like to receive more information on the assays discussed in this article please circle number 104 on your reader response card.

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Editor: Lydia Dodson-Lehrer, MBA, M.T. (ASCP)

## Ask Borek

By: Borek Janik, Ph.D.



Thanks to you all for communicating to me the questions you always had but had no chance to ask. I was surprised that your inquiries were solely about electrophoresis. This is very commendable as apparently clinical electrophoresis is what you live and breathe. If only Arne Tiselius knew how profoundly the techniques based on his invention will have influenced so many. Or perhaps, the magic of the past Holiday Season let you step into the New Year, new century and new millennium with all your other problems solved and therefore you are "sans question". Anyhow, test sensitivity seems to be a popular subject in your queries. So, rather than replying to each of you individually on this particular topic, I will combine your questions and treat them class action style.

### TEST SENSITIVITY (DETECTION LIMITS)

Your questions centered around electrophoretic detection limit (test sensitivity), how it is defined, expressed and determined.

Detection limit is important information that helps to decide which sample components can be detected at diagnostically significant levels, whether the sample may be run neat or should be concentrated, etc. The test sensitivity depends on a number of factors, such as quantity of the sample components that diffuse into the gel (this quantity depends primarily on the component concentrations and the sample application time), the detection reagent (choice of stain, immunofixation with plain or labeled antisera, etc.) and the development time.

In clinical electrophoresis, the test sensitivity (detection limit) can be most accurately expressed as the lowest surface concentration (amount/area unit) of a protein that can be detected upon visualization with a particular stain or by other means. Such expression of sensitivity however, is of little practical value since it cannot be readily related to the units in which protein concentration is commonly expressed in laboratories. Therefore, the sensitivity in the given system is generally defined in less scientific but more practical terms as "the lowest concentration of a protein in the applied sample that yields a visually detectable band upon electrophoresis and visualization".

TABLE I summarizes the detection limits, sample application times and the antiserum incubation times (predetermined and controlled by the migration programs) to illustrate the sources of sensitivity differences among the individual tests and migration programs. The detection limits shown in TABLE I were established either from serial dilutions of a sample containing a known concentration of a specific protein or by spiking a normal sample with a specific protein. The proteins used for the determination of detection limits are noted under "Comments" in the table. The reference to monoclonal proteins include IgG, IgA, and IgM with lambda or kappa light chains.

TABLE I. DETECTION LIMITS

HYDRASYS MIGRATION PROGRAM	APPLICATION TIME (minutes)	ANTISERUM INCUBATION TIME (minutes)	DETECTION LIMITS (mg/dL)	Comments
Protein $\beta$ 1- $\beta$ 2	1/2	N/A	10 - 40	Monoclonal Protein
HR1	1/2	N/A	10 - 40	Monoclonal Protein
HR2	2	N/A	1.5 - 2.0	Monoclonal Protein
HR3 7	1/2	N/A	15 - 50	Monoclonal Protein
IF PENTA	1/4	5	15 - 50	Monoclonal Protein
IF (amido black)	1	5	15 - 50	Monoclonal Protein
IF (acid violet)	1	5	15 - 25	Monoclonal Protein
Bence Jones	5	10	1 - 5	BJP 1.0 = Total 5.0 = Free $\kappa$ and Free $\lambda$ .
6 CSF	2	10	0.5 -1	
Proteinurie	10	N/A	1.5	Albumin or lysozyme per band

Next issue I will address another popular topic, cryoglobulin testing and sample treatment (and of course, it will be the right time to talk about spring activities).

In the meantime, keep sending in those questions. You may use any civilized way for getting them to me. These include mailing them to Sebia at 190-6611 Bay Circle, Norcross, GA 30071, attn. "Ask Borek", faxing to 770-446-8511 attention "Ask Borek", or sending an e-mail at [bjanik@sebia-usa.com](mailto:bjanik@sebia-usa.com). Whichever method you choose, include your name, laboratory name and phone number should I have questions for you.

## Customer Focus

Cedars-Sinai Medical Center  
Los Angeles, California



When you're the largest non-profit hospital in the Western United States — and one of the most renowned medical centers in the world — you consistently attract a high volume of patients. Which leads to a consistently high volume of lab work.

So it's not surprising that Cedars-Sinai Medical Center in Los Angeles made the decision to automate one of its most labor-intensive lab processes. The century-old institution, famous for its celebrity clientele, selected the Sebia HYDRASYS® system for protein and immunofixation electrophoresis.

"These tests took up a lot of our technologists' time," explains Sharon E. Kelly, manager of Immunology and Cytometry, Hematology and ER/AC Labs. "We needed a solution that would semi-automate the process, yet still provide high quality gels and comparative values to our old system."

The HYDRASYS proved to be a winner for many reasons. For one, it eliminates some of the hands-on work required of manual tests. "With this system, PEPs and IFEs are faster, with a shorter incubation time — whereas with the manual system we had to personally wash the gel, then blot it and press it over and over again," says Delma Ines, a senior medical technologist at the lab.

**"With just a few touches on a keypad, technologists can now perform all phases of electrophoresis quickly — and almost effortlessly."**

—Sharon E. Kelly, M.A., M.T. (ASCP) S.I. Manager, Divisions of Immunology and Cytometry, Hematology and ER/AC Department of Pathology and Laboratory Medicine Cedars-Sinai Medical Center Los Angeles, California



With just a few touches on a keypad, Ines and her colleagues can now perform all phases of electrophoresis quickly — and almost effortlessly. The HYDRASYS, designed as a walkaway system, handles everything from sample application to migration to incubation to staining, destaining and drying.

"Another nice thing about the instrument is that we no longer have to make dilutions for PEP," adds Ines. "And, it allows us to pipette specimens and let them sit for eight hours if we want to run samples in batches."

While reduction of hands-on time was a major consideration in purchasing the HYDRASYS, the quality of the Sebia gels was also important to Kelly. "The protein gives us particularly good separation," she notes, "and the bands are very crisp and clear." Kelly also likes the fact that Sebia offers different-sized gels, giving her lab greater flexibility.

The HYDRASYS isn't the only Sebia system 'on staff' at Cedars-Sinai. The lab also employs the Sebia HYRYS™ Densitometer for results interpretation and analysis. The instrument features a series of windows-

based menus that allow technologists to perform overlapping functions — for example, scanning while printing previous scans, or reviewing curves while printing. This capability has shaved valuable minutes off of the process — which, over the course of hundreds of samples, can add up to a meaningful time savings.

"The HYRYS is very easy to use, and also very flexible," Ines says. "For example, you can rescan certain lanes on the fly as you're reviewing them. There's no need to type anything in."

Kelly adds, "The HYRYS produces very nice graphs, and it offers good functionality for data management." According to Kelly, the cost of implementing Sebia technology was not as high as one might expect. "We found that it really wasn't that much more expensive than our manual system — and it has allowed us to achieve greater efficiencies. It was definitely a smart move for us to go with Sebia."

### About Cedars Sinai Medical Center

Founded in 1902, Cedars-Sinai Medical Center has grown to become one of the world's most respected medical institutions. Staffed with more than 2,000 healthcare professionals, the 800-bed facility offers state of the art diagnostic and treatment technologies and services — among them the Sebia HYDRASYS and HYRYS electrophoresis systems.

In five consecutive surveys by an independent research firm, Los Angeles residents named Cedars-Sinai as having the best doctors, best nurses, best overall quality, most personalized care and most modern equipment. In keeping with its mission, Cedars-Sinai Health System continues to be a market leader in the delivery of affordable healthcare.

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Number of electrophoresis tests run per week

Protein\_\_\_\_\_

Immunofixations\_\_\_\_\_

Hemoglobin \_\_\_\_\_

Please include your name and address here.

check here if this is a new address

Comments:\_\_\_\_\_

**Thank You For Your Assistance**