

Laurell C-B. Electroimmuno assay. *Scand. J. Clin. Lab. Invest.* 29(Supp.124):21-37. 1972.
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A technique for quantitative analysis of proteins is presented in detail. It is based on their electrophoretic migration from wells into an agarose gel containing the corresponding antibodies.¹ Rocket-like precipitates of antigen-antibody complexes are formed, and their heights depend on the amount of protein applied. Special emphasis is made on the interpretation of the varying morphology of the precipitates in different antigen-antibody systems. [The SCI[®] indicates that this paper has been cited in more than 1,900 publications.]

Fast, Specific, and Quantitative
Protein Analysis

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Plasma protein fractionation and analysis of individual proteins had been a main subject in our clinical laboratory to support clinical diagnosis and treatment. In 1971 I considered that we had collected sufficient experience with our new techniques and their clinical application to plasma protein analysis to present our experiences in a special issue. We believed that our approach was more constructive clinically than the predominant use of paper electrophoresis accompanied by scanning of the color distribution on the paper strips. Therefore, I invited my coworkers and clinical associates to participate in presenting a technical and clinical guide to clinical plasma protein analyses.

My colleagues showed limited enthusiasm but agreed to cooperate under restricted conditions of authorship. "Electrophoretic and electro-immunochemical analysis of proteins" appeared in 1972 as supplement 124, volume 29, of the *Scandinavian Journal of Clinical & Laboratory Investigation*. It was produced under the sponsorship of the Swedish Medical Research Council. The board of the journal (official organ for the association of Scandinavian clinical chemists) limited the edition to less than 1,000 copies besides those for the subscribers to the journal. The whole edition was gone within one or two months. This week's *Citation Classic* concerns one of the chapters: "Electroimmuno assay," which contains many examples and practical hints on the evaluation of the antigen-antibody precipitates formed during electrophoresis. More practical details and hints on the theory of antigen-antibody precipitations in an electric field were presented later.² However, most users still believe that the antigen-antibody precipitates formed during electrophoresis appear under the same optimal ratio as in radial double-immunodiffusion. This is a common mistake.

The "rocket" precipitation technique has now been superseded in large-scale, clinical, routine analysis by nephelometry and/or turbidimetry because of the advantages of automation in clinical laboratories. However, "rockets" are still more informative and better suited for chromatographic work since variations of antigenic determinants present themselves by alternations of the morphology of the immunoprecipitate. It ought to be a challenge to basic immunologic research to explain how, when, and why antigen-antibody precipitates are caught in the agarose gel network during electrophoresis. The suggestions in reference 2 do not contain a satisfactory answer.

1. Laurell C-B. Quantitative estimation of proteins by electrophoresis in agarose gel containing antibodies. *Anal. Biochem.* 15:45-52, 1966. (Cited 4,120 times.) [See also: Laurell C-B. *Citation Classic*. (Barrett J T, ed.) *Contemporary classics in the life sciences. Volume 1: cell biology*. Philadelphia: ISI Press, 1986. p. 112.]
2. Laurell C-B & McKay E J. Electroimmunoassay. *Meth. Enzymology* 73:339-69. 1981. (Cited 65 times.)