

This Week's Citation Classic

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Abell L L, Levy B B, Brodie B B & Kendall F E. A simplified method for the estimation of total cholesterol in serum and demonstration of its specificity. *J. Biol. Chem.* **195**:357-66, 1952. [Columbia Research Service, Goldwater Memorial Hospital, Roosevelt (formerly Welfare) Island, NY]

This paper describes a simple, rapid, and specific colorimetric method for the determination of total cholesterol in serum. [The SC® indicates that this paper has been cited over 1,410 times since 1961.]

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"During the late forties our laboratory was deeply involved in research concerned with arteriosclerosis. When it became apparent that cholesterol was implicated in the etiology of this disease, much time was spent determining serum cholesterol levels in various groups. Existing methods were precise but laborious and time-consuming; therefore we decided to try and find a shorter procedure, which was just as accurate and specific. A starting point was provided by the method of W.M. Sperry and F.C. Brand,¹ and we proceeded to adapt this method to the needs of a laboratory where a very large number of samples had to be analyzed daily.

"By simplifying the extraction and saponification steps and by using a modified Liebermann-Burchard reagent we were able to eliminate several manipulations; this resulted in a considerable saving of time and omitted many sources of error.

"This new analytical procedure had to fulfill the following crucial conditions: (1) it must be specific, i.e., the product measured had to be proven to be cholesterol and nothing else; (2) it must be

reproducible; (3) the results must be validated by comparison with existing and established methods; and (4) it must be simple enough to be performed by a competent technician.

"We were very fortunate that Dr. Bernard B. Brodie was willing to cooperate. He and his group undertook the exacting task of providing the proof of specificity by countercurrent distribution. His laboratory was located some distance from ours, at the end of a long corridor, and many miles were covered carrying the little bottles containing the final extract to his laboratory, and innumerable separatory funnels migrated back and forth between our research divisions.

"The proof of reproducibility and the validation of the method were the most time-consuming parts of the work. This demanded infinite patience; it was a repetitive and exacting chore and involved coding the samples to exclude subjective judgment. My compulsive personality helped. Much of this work had to be done in the evenings because our only spectrophotometer was used for routine work during the day. Since my laboratory afforded a beautiful view of the lights of Manhattan across the East River, the monotony of the precise timing of the Liebermann-Burchard reaction was relieved when I discovered that I could time myself accurately by the change of appropriate traffic lights.

"As the procedure is simple and accurate it was chosen by the laboratories which participated in the first Cooperative Study of Lipoproteins and Atherosclerosis in 1951.² It is still used as a standard method in many laboratories around the world."

1. **Sperry W M & Brand F C.** The colorimetric determination of cholesterol. *J. Biol. Chem.* **150**:315-24, 1943.

2. **Gofman J F.** Evaluation of serum lipoprotein and cholesterol measurements as predictors of clinical complications of atherosclerosis. Report of a cooperative study of lipoproteins and atherosclerosis. *Circulation* **14**:691-742. 1956.