

This Week's Citation Classic

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Wetlaufer D B. Ultraviolet spectra of proteins and amino acids. *Advan. Prot. Chem.* 17:303-90, 1962.
[Dept. Biochemistry, Indiana Univ. Sch. Med., Indianapolis, IN]

Practical and interpretive aspects of protein absorption spectroscopy were reviewed, especially with a view to extracting protein structural information. [The SCI® indicates that this paper has been cited over 390 times since 1962.]

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"My first work in protein ultraviolet spectroscopy was at the Carlsberg Laboratory where I was a postdoctoral visitor with K. Linderstrøm-Lang. I applied the then rather new technique of difference spectroscopy in model compound studies to test Crammer and Neuberger's suggestion that some of ovalbumin's tyrosyl residues were H-bonded to carboxylate sidechains in the protein.¹ My results appeared to rule out all but very weak associations.

"When I moved on to work in John Edsall's laboratory at Harvard it was inevitable that, in addition to my primary work on myosin, I became involved in studies already under way on tyrosyl peptides. In the late 1950s most biochemical labs had only limited physical chemical instrumentation, most likely pH meters and spectrophotometers. The attraction of

using any plausible and available method to get protein fine-structure information struck several of a then young group of investigators at about the same time, and we were shortly in the middle of a minor publication explosion. Difference spectroscopy and refractive index perturbations became firmly rooted, and it was clear from synthetic polypeptide studies that the peptide absorption is dependent on conformation.

"I agreed to review the field, and started writing shortly after taking a new position in the mid-west. It was a very busy time, moving and settling a young family and equipping and staffing a new laboratory. Critical readings by Walter Gratzer and Edsall helped me smooth out a first draft, and by the time the review was actually published we were deep into a new vein of protein work.

"Protein spectroscopy matured with further studies, particularly in the peptide absorption region. These have been skillfully reviewed by Gratzer.²

"It's something of a surprise to learn that my review has continued to be useful. Perhaps the fact that it was pitched at an audience with limited physical chemical sophistication has contributed to its longevity. It also seems sensible that some familiarity with absorption spectroscopy, both theoretical and practical, is a useful preface to ORD, CD, and fluorescence studies."

1. **Crammer J L & Neuberger A.** The state of tyrosine in egg albumin and in insulin as determined by spectrophotometric titration. *Biochemical J.* 37:302-10, 1943.
2. **Gratzer W B.** Ultraviolet absorption spectra of polypeptides. (Fasman G D, ed.) *Poly- α -amino acids: protein models for conformational studies.* New York: Marcel Dekker. 1967. p. 177-238.