

# This week's Citation Classic

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**Jacobs W P.** The role of auxin in differentiation of xylem around a wound. *Amer. J. Bot.* **39**:301-9, 1952. [Department of Biology, Princeton University, Princeton, NJ]

**By applying quantitative techniques to a problem of developmental anatomy, it was shown that the plant hormone auxin (previously known as a growth hormone) was the limiting factor for the differentiation of xylem cells. [The SCI® indicates that this paper has been cited over 130 times since 1961.]**

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"I would guess that the paper has been cited often because it used physiological (i.e., larger) sample sizes and statistical analysis of data in the field of developmental anatomy (where such an approach was not usual at that time), and because it presented convincing evidence that the well-known 'growth hormone' auxin was also the limiting factor for the regeneration of xylem cells. Before this work was published, most American developmental plant anatomists were not, apparently, trained to think physiologically and most plant physiologists were not, apparently, trained well as anatomists. Ralph Wetmore at Harvard University had the perspicacity to see that botanists trained in both anatomy and physiology would have a special edge in attacking some problems, and I was lucky enough to benefit from his insight and training.

"The research was started while I was a junior fellow in the Harvard

Society of Fellows and was finished when I was an assistant professor at Princeton University. When the paper was submitted to the *American journal of Botany*, I found to my wry amusement that I was whipsawed by the two reviewers: the anatomist described me as 'one of those physiologists who thinks auxin does everything,' while the physiologist scorned me as one of those *anatomists* who always does something else! Despite that parochialism, one of the reviewers gave me a valuable tip: he wrote that although the paper was acceptable as submitted, he was sure I could make it better by doing more work on it and that I should so improve it for the sake of my own standards. The reworked and amplified paper is the one that was published. That was my first inkling of the idea that the minimal standards of a field might be less high than one should aim for, and I have been grateful ever since to that anonymous reviewer.

"The paper was awarded an A. Cressy Morrison Prize in 1951 by the New York Academy of Sciences.

"In the intervening years, various people in this lab have investigated in a similar way the role of various plant hormones in controlling the differentiation of various cells. Quite a few of the citations, therefore, are apt to be from here.<sup>1-2</sup> Others are from some of the many researchers who have all together demonstrated how widespread the role of auxin is in controlling the differentiation of xylem cells—our initial paper being on only one species. I have written a recent review currently in press with Springer-Verlag."<sup>3</sup>

1. **Thompson N P & Jacobs W P.** Polarity of IAA effect on sieve-tube and xylem regeneration in *Coleus* and tomato stems. *Plant Physiol.* **41**:673-82, 1966.
2. **Jacobs W P.** Regeneration and differentiation of sieve tube elements. *Int. Rev. Cytol.* **28**:239-73, 1970.
3. .... Function of hormones at tissue level of organization. (Scott T K, ed.) *Encyclopedia of plant physiology—new series*. Heidelberg: Springer-Verlag. Vol. 10. In press, 1981.