

This Week's Citation Classic

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Weller T H. The cytomegaloviruses: ubiquitous agents with protean clinical manifestations. *N. Engl. J. Med.* 285:203-14; 267-74, 1971.
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This review provided a comprehensive and integrative summary of the expanding knowledge of the human cytomegalovirus (CMV) that had occurred in the 15-year period following their discovery.¹⁻⁴ Emphasizing the broad clinical implications of infection produced by CMV, the content was of interest to virologists and to clinicians from diverse subspecialties. [The *SCI*[®] indicates that these papers have been cited over 590 times in 396 publications since 1971.]

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"The paper falls in the category of *Citation Classics* that are review articles and thus contrasts with an earlier similarly cited paper⁵ on the cytomegaloviruses (CMV) that was experimental in scope. There are obvious reasons for the usefulness of the review. Appearing in a readily available publication, and emphasizing the great breadth of clinical manifestations induced by CMV, the review also attempted a synthesis of the natural history of CMV-host relationships.⁵ These concepts, based on fact and augmented with a degree of speculation, have stood the test of time and the summary figure in the paper has been reproduced extensively. We also attempted to assess the social significance of CMV, and indicated that in terms of personal tragedy and economic loss, the toll exacted by CMV far exceeded that produced by congenital rubella infections. The problem posed by the antigenic heterogeni-

ty of strains of human CMV, a concept then contentious, was emphasized. The review promoted relatively new concepts that are now generally accepted and in addition stimulated investigations by other workers. For example, it was suggested that CMV should be sought in the tears and feces of infected individuals; reports of isolations of virus from these materials appeared shortly thereafter.^{6,7}

"In all probability, the frequent citation of this review reflects another facet of current scientific writing that is to be deplored. Citation of a review ever more frequently supplants a reasoned, critical historical introduction. This tendency is enhanced by the increasing use of computerized literature searches with a limited time span. One can only speculate as to what proportion of the authors utilizing this review as a starting point are aware that the discovery of CMV stemmed from concurrent studies in St. Louis, Bethesda, and Boston? Probably few have read the original papers, although the review referenced a then current summary of the circumstances of the independent isolation of CMV by three groups of investigators.⁸

"Parenthetically, having been involved in the original isolation of varicella-zoster virus,⁹ of rubella virus,¹⁰ and of CMV,^{1,4} I am bemused by the fact that none of the papers describing these contributions, except the paper on rubella virus, have achieved the citation rate of a *Citation Classic*. However, it is a source of satisfaction that some ten years after its appearance, this review of CMV is still commonly cited as a basic reference. Whether this usage is a reflection of the content of the review, or a reflection of contemporary customs of preparation of a scientific paper, or a combination thereof, is not clear."

1. **Weller T H.** Problems revealed by the expanding use of tissue culture procedures in studies on infectious agents. *Amer. J. Trop. Med. Hyg.* 5:422-9, 1956.
2. **Smith M G.** Propagation in tissue cultures of cytopathogenic virus from human salivary gland (SGV) disease. *Proc. Soc. Exp. Biol. Med.* 92:424-30, 1956.
3. **Rowe W P, Hartley J W, Waterman S, Turner H C & Huebner R J.** Cytopathogenic agent resembling human salivary gland virus recovered from tissue cultures of human adenoids. *Proc. Soc. Exp. Biol. Med.* 92:418-24, 1956.
4. **Weller T H, Macaulay J C, Craig J M & Wirth P.** Isolation of intranuclear inclusion producing agents from infants with illnesses resembling cytomegalic inclusion disease. *Proc. Soc. Exp. Biol. Med.* 94:4-12, 1957.
[The *SCI* indicates that this paper has been cited in over 190 publications since 1961.]
5. **Weller T H & Hanshaw J B.** Virologic and clinical observations on cytomegalic inclusion disease. *N. Engl. J. Med.* 226:1233-44, 1962.
[*Citation Classic*, *Current Contents/Clinical Practice* 7(39):12, 24 September 1979.]
6. **Cox F & Hughes W T.** Fecal excretion of cytomegalovirus in disseminated cytomegalic inclusion disease. *J. Infect. Dis.* 129:732-6, 1974.
7. **Cox F, Meyer D & Hughes W T.** Cytomegalovirus in tears from patients with normal eyes and with acute cytomegalovirus retinitis. *Amer. J. Ophthalmol.* 80:817-24, 1975.
8. **Weller T H.** Cytomegaloviruses: the difficult years. *J. Infect. Dis.* 122:532-9, 1970.
9. -----, Serial propagation *in vitro* of agents producing inclusion bodies derived from varicella and herpes zoster. *Proc. Soc. Exp. Biol. Med.* 83:340-6, 1953.
[The *SCI* indicates that this paper has been cited in over 85 publications since 1961.]
10. **Weller T H & Neva F A.** Propagation in tissue culture of cytopathic agents from patients with rubella-like illness. *Proc. Soc. Exp. Biol. Med.* 111:215-25, 1962.
[The *SCI* indicates that this paper has been cited in over 315 publications since 1962.]