To the editor:

Cationic peptides from leukocytes might kill bacteria by activating their autolytic enzymes causing bacteriolysis: why are publications proposing this concept never acknowledged?

A large series of publications1-9 has proposed that cationic peptides from leukocytes kill bacteria primarily by causing a depolarization of their membranes leading to enhanced permeability. One group of cationic peptides from human neutrophils was even coined bactericidal/permeability-increasing proteins.2 Surprisingly, however, none of a large series of other publications that had proposed a concept that cationic agents from neutrophils might be bactericidal also by virtue of their capacity to activate the bacterial autolytic wall enzymes (muramidases), leading to bacteriolysis and cell death,10-22 has ever been cited in any of the publications by the leading authors in this field of research.1,9

For the information of your readers, there exist a series of 16 publications since 1974 entitled “Effect of leukocyte hydrolases on bacteria” and several additional publications on the same subject under different titles, many of them published in journals covered by Medline; the references contain a selected list of these.10-22,24 These had proposed that many of the highly cationic agents either present in plasma or generated by activated phagocytes (eg, lysozymes, PLA2, elastase, cathepsin G, myeloperoxidase, bactericidal/permeability-increasing proteins, defensins, etc) might kill bacteria not simply by acting on the membranes to cause depolarization and enhanced permeability1-7 but also by an indirect mechanism. This involves a deregulation, by the cationic agents, of the anionic and amphiphilic regulators of the autolytic wall enzymes (muramidases) (lipoteichoic acid in Gram-positives and Forssman antigens in Gram-negatives) resulting in hydrolysis of the peptidoglycan, in bacteriolysis, and in cell death. It is of great clinical importance that the bacteriolysis-inducing activity of cationic agents mimics that of beta-lactam antibiotics.26 Furthermore, the observations that a variety of highly negatively charged, sulfated anionic agents can act as potent inhibitors of the cationic agent– and beta-lactam–induced bacteriolysis1,12,14,16,17,27-30 further stress the importance of the autolytic systems in bacterial killing. This phenomenon might also be of great clinical significance especially in selecting measures to control postinfectious sequelae that undoubtedly are triggered by the release of bacterial components, especially following bacteriolysis.

Regrettably, attempts to bring these issues to the awareness of the leading investigators in the field of cationic proteins1-9 and of clinicians involved is the clinical aspects of sepsis control have not been successful.

If the concept that cationic agents might be bactericidal also because of their bacteriolysis-inducing properties is reasonable and scientifically sound, it is expected that publications describing this phenomenon should be cited by authors studying the bactericidal effects of cationic agents. If on the other hand one deems that this concept is for some reason erroneous, nonsensical, and scientifically unacceptable, such publications should definitely be cited but properly discussed, challenged, and even also ridiculed. But it is totally unacceptable and unreasonable that such publications be simply ignored!

Unfortunately, the avoidance of relevant citations and the disregard for concepts that might perhaps not “fit” current dogma and beliefs have reached epidemic levels. This is how pioneering publications proposing “novel approaches and ideas” to explain additional mechanisms of microbial killing might be lost forever. More importantly, these concepts will probably never reach the attention of clinicians interested in the pathogenesis of inflammation, infection, postinfectious sequelae, and the mechanisms of host defense.79-31

But what is even more disturbing, concerning, and unacceptable is that the expert referees selected by the editorial boards of journals and who should have been knowledgeable of the relevant literature failed to alert the authors to the existence of key publications on bacteriolysis so relevant to the subject of the papers and of the reviews they had been assigned to judge.

Am I wrong to assume that the task of a journal’s editorial board is to ensure that all viewpoints and ideas, both “conventional” and nonconventional, be equally represented? Excuses either that limitations to the number of references permissible were the reason for not citing basic and pioneering publications or that the authors had been “instructed” to discuss only a narrow field of research and to disregard others fields with direct relevance are unacceptable.

A failure to give credit to relevant papers is also unacademic, self-defeating, unethical, and therefore unacceptable by all standards. Furthermore, are papers older than 15 years, or so, already passé and, therefore, unworthy of being acknowledged?

Isaac Ginsburg
Department of Oral Biology
Hebrew University
Jerusalem, Israel

References
modification of the bactericidal and bacteriolytic reactions by cationic and anionic macromolecular substances and by anti-inflammatory agents.


31. Ginburg I. The Biochemical basis of bacteriolysis and its role in the pathophysiology of inflammation and post-infectious sequelae. APMIS. In press.
Cationic peptides from leukocytes might kill bacteria by activating their autolytic enzymes causing bacteriolysis: why are publications proposing this concept never acknowledged?

Isaac Ginsburg