



## Commentary

## The “Distinguished” Physician-Scientist: Is a single bibliometric index sufficient for distinction?

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In the old times, a distinguished scientist, especially in the fields of medicine and biology, was the one who described a new nosological entity, discovered the cause of a disease or groups of diseases, devised a new diagnostic method or found medicines and vaccines that treated or prevented common diseases that cause death or handicap. The names of these distinguished physician-scientists are known and, hence, mentioning them is superfluous. Consistency, continuity, and a progressively increasing depth in the understanding of the study subject were the characteristics of renowned biomedical scientists who left behind their stigma in the international bibliography and made a difference in the lives of people.

In the last decades, however, there has been a new mechanistic way, in some Institutions, to evaluate the level of scientific accomplishments of a physician or scientist in order to appoint her or him as a faculty member of a school or to promote an individual onto the next academic rank, solely on the basis of her or his Hirsch (h) index without analyzing in depth the originality of her or his contributions. More arbitrarily, however, some scientific societies, or even the lay press, call an academic physician/scientist distinguished, when her or his *h* index is above 100.

What does an *h* index of 100 or more connote? It actually means that 100 publications of the person under evaluation have been acknowledged by at least 100 other scientists [1]. Of course, this high *h*-index and even higher can be achieved by biomedical researchers who study consistently and in-depth the pathogenetic mechanisms of a group of diseases, or have evaluated the role of physiologic circuit in disease development or have discovered important targets, inhibition of which can ameliorate disease manifestations and arrest tissue injury due to the disease process. The *h* index alone, however, does not capture the originality of a scientist's contributions, may reflect a small portion of her or his work, does not indicate whether she or he is the first or last author of the cited work, and may not value how the rest of her or his individual contributions are appreciated by the scientific community [2]. More analysis is needed for that.

Let us see how a physician-scientist can possess an *h*-index = 100 or even > 100 without having the originality expected for somebody of

true distinction. This factor can be obtained by participation of the physician-scientist in scientific committees of various institutions, such as medical societies, public or private organizations, and so on that develop – on the basis of the original contributions of other scientists – diagnostic or therapeutic guidelines for one or more diseases. Such guidelines are published in the scientific literature, and are cited and used widely. Thus, the *h*-index of such a participant, who just enlisted in such committees developing guidelines keeps growing. Can such a contribution be considered original? Yet, this is a common practice through which physician-scientists may obtain an *h*-index of 100 or higher with very little or no original work.

Another example of a physician-scientist with a high *h*-index but without necessarily original contributions, is when one participates in scientific committees of the pharmaceutical industry, which design clinical protocols studying the safety and effectiveness of new diagnostic or therapeutic substances. The results of such clinical studies are usually published in a scientific journal. Subsequently, when a scientist publishes an article in which she or he refers to the new drug, he or she cites the names of the participants of such committees. Of note, these committees and publications are frequently funded by the pharmaceutical industry. Can such contributions by physician/scientists be considered original or even innovative?

Finally, the *h*-index of a physician-scientist can increase simply because he or she, by being a director of a clinical department or laboratory, requires to have her or his name included in the publications of other scientists, who happen to work under them. Frequently, such individuals do not even know what the findings and their significance are, sometimes even the title of the study evades them. Again, the *h*-index increases and the individual “scientist” shines bibliometrically.

Thus, there is another side to the coin of bibliometrics. Scientists with significant research discoveries in the pathogenesis of diseases or establishing novel diagnostic and therapeutic targets may not reach an *h*-index of 100. Unfortunately, they are not considered distinguished scientists, yet they are respected and honored by their peers for their original contributions.

In an attempt to objectively evaluate scientists, scientific

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publications and Academic institutions, several bibliometric indices have been employed, such as the citation index, impact factor and the H, M, G and R indices or factors [3–6]. These are now routinely used as objective evidence to make major hiring, promotion and funding decisions. However, the value and limitations of these indices and their evidentiary appraisal have been compared to that of evidence-based Medicine, useful as guides, but only suggestive and mutable. Their uncritical use and the pressures exerted through them on institutions and individual scientists may have untoward effects in the entire scientific edifice.

Not everything that shines is gold. Just looking at numbers is not sufficient to declare the substantive contribution of a scientist to world science. Numbers, such as the h-index, are indicative but not decisive. They are like the Aristotelian view of the law. Suggestive but not absolute, modified by the virtue of *phronesis* or practical wisdom. Only

true, in depth analysis of the scientific contribution of a physician-scientist will make her or him distinguished.

## References

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