

Comment

No place like Ome

Gregory A Petsko

Address: Rosenstiel Basic Medical Sciences Research Center, Brandeis University, Waltham, MA 02454-9110, USA.
E-mail: petsko@brandeis.edu

Published: 26 June 2002

Genome Biology 2002, **3(7)**:comment1010.1–1010.2

The electronic version of this article is the complete one and can be found online at <http://genomebiology.com/2002/3/7/comment/1010>

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“The goal which all the Vedas declare, which all austerities aim at, and which men desire when they lead the life of continence, I will tell you briefly: it is OM. This syllable OM is indeed Brahman. This syllable is the Highest. Whosoever knows this syllable obtains all that he desires.”

— *Katha Upanishad I, ii, 15-16*

It was just sitting there on the table with the other free copies of miscellaneous journals, made available for attendees at the Miami *Nature Biotechnology* Winter Symposium. “OMICS,” its title shouted, in huge white letters, and underneath: “*A Journal of Integrative Biology.*” On the inside, on the contents page, in smaller print, it was revealed that this journal used to go by the name *Microbial and Comparative Genomics*. In an accompanying editorial (*Omics* 2002, **6**:1), the Editor-in-Chief explains that “this field is rapidly expanding and the science is growing well beyond genomics into other ‘OMICS-es [sic]’.” He goes on to state that the renamed journal “will span all the OMICS-es to date, including genomics (the quantitative study of genes, regulatory and non-coding sequences), transcriptomics (RNA and gene expression), proteomics (protein expression), and metabolomics (metabolites and metabolic networks).” As if this were not enough, he then adds: “Additionally it will cover all the future OMICS-es that will emerge in the era of post-genomic biology and medicine, including pharmacogenomics (the quantitative study on how genetics affects hosts’ responses to drugs), physiomics (physiological dynamics and functions of whole organisms), etc.”

Whew. I hope there’s plenty of room on the shelf of anyone who subscribes to this journal, because future issues are clearly going to be as thick as the London telephone directory. Of course, now that I think about it, there probably will be enough room on everybody’s shelves, because why would anyone need to subscribe to any other journal? We finally have a solution to the problem of journal proliferation: one journal that covers everything.

And yet, one can’t help thinking that all this is much less than it sounds. Leaving aside the creation of the new word OMICS, a word that I for one never wanted and, now that I’ve got it, want even less - and the even stranger-looking and less euphonious OMICS-es, which sounds like something Tolkien’s Gollum would say - the repositioning of this journal has the distinct air of bandwagon-hopping. Which begs the question: is this particular bandwagon worth hopping on?

As far as I can tell, the word ‘genomics’ was introduced 24 years ago by Victor McKusick and Frank Ruddle (who may, about now, be wishing they had never thought of it) for the new journal of that name they had just founded. The word ‘genome’ is an amalgam of the word ‘gene’ and the syllable ‘ome’. It was coined in 1920 by the botanist Hans Winkler. In their delightful essay, “‘Ome Sweet ‘Omics - A Genealogical Treasury of Words” (*The Scientist*, **15(7)**:8, 2 April 2001) Joshua Lederberg and Alexa T. McCray point out that, as a botanist, Winkler “must have been familiar with a host of -ome words like biome, rhizome, phyllome, thallome, tracheome - all of which predated 1920. They share in common the concept of -ome signifying the collectivity of the units in the stem. Thus rhizome is the entire root system, or modifications thereof. Any zoologist would have known coelome, or system of cavities. Hence, genome would be understood to be the collectivity - dare we say the genre - of the genes.”

Of the two components of the word genome, ‘ome’ is the more interesting. It subtly suggests the evocative ‘home’. Its sound is deep, resonant and powerful. It is a homonym for the great “Om!”, the sound by which, it is said, Brahman breathed the heavens and earth into existence - in the Hindu version of the Big Bang Theory. According to the Mandukya Upanishad, which deals with the understanding and symbolism of Om, the past, present and the future are all included in this one sound and all that exists beyond these three forms of time is also implied in it. So maybe that not only don’t we need any other journals now besides *OMICS*, we don’t need any back issues of other journals either.

But while it's easy to poke fun at attempts at being all-encompassing, and at the creation of words like metabolomics that cause one to nearly swallow one's tongue as one tries to say them, these are merely symptoms of the horse that is driving the bandwagon: the desire to cash in, literally and figuratively, on the buzz that genomics has produced in the scientific and lay communities. Attaching the '-omics' label to one's discipline increases visibility, opens avenues for new funding, and indicates a willingness to consider problems at the level of the whole cell, or whole organism. Apart from mangling the language a bit, you may ask, what's wrong with that?

Maybe nothing, but maybe something significant. Words have great power, and what one calls something can get confused with the true nature of that thing. Abraham Lincoln once asked a man how many legs a dog would have if you called its tail a leg. When the man replied five, Lincoln said, "No, calling a tail a leg doesn't make it a leg." Yet we often unconsciously accept the name of something as an accurate reflection of its essence. And when that happens, the consequences can be negative.

What, after all, is 'structural genomics' really? It is nothing but high-throughput structure determination. There is no insight claimed or realized at the level of the whole cell or organism. Determining the structures of all of the gene products in a cell doesn't automatically explain the workings of the cell. And if we give 'doing high-throughput structure determination' a name that makes it seem more glamorous than it is and possessed of a higher intellectual content than it has, don't we mislead students, funding agencies, the lay public, and maybe even ourselves? Or take metabolomics. Isn't that just a new-fangled word for a field that's been around for a couple of hundred years, namely physiology? Physiology became unfashionable sometime in the mid-to-late twentieth century, with the result that there are very few physiologists around to help us interpret genomic information in the context of the whole pathway, or the whole organelle, or the whole organism. It could be argued that inventing a new, glamorous term in place of the old name will attract new people to the field, but I think that misses the point. What they would be attracted to isn't the old field, it's something ill-defined. We don't need a new field here, we need the old one back, and calling physiology metabolomics will never lead to an increase in people who are trained the way we need them to be trained, in traditional physiology.

One could make similar arguments about proteomics - a field that mass spectroscopists have largely hijacked. The intellectual content of a list of expressed proteins is minimal. Useful, certainly, but minimal. What's needed, I would argue, are not proteomicists (and I wince just to write that word) but biochemists and enzymologists. Just about every one of the new '-omics' fields lacks the substance of the core disciplines. And if we create new fields willy-nilly, without

consideration for their substance and the effect they will have on how young scientists are trained, we run the risk of replacing solid science with fuzzy science.

Every time someone someone comes up with a new name for what's supposed to be a new field, we owe it to ourselves to ask if they aren't just calling a tail a leg - because calling a tail a leg doesn't make it a leg, and ultimately it's silly to pretend that it does. There should be nothing at all wrong with being called a name that describes what you really are.