

LETTER TO THE EDITOR

To the Editor

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The mass spectrometry literature is replete with "catchy" acronyms and synonymous terms and phrases. Because this can be confusing at times to the mass spectrometry practitioner, it must be very difficult for scientists outside our discipline to decipher the mass spectrometry literature. This does a disservice to the scientific community in general, and to mass spectrometry in particular. One of the goals of a research article should be to present the results in as succinct and concise form as possible. As a step toward achieving that goal, we should minimize the use of acronyms and try to agree on single acronyms, terms, and phrases to describe each of the wide variety of experiments, procedures, etc. that are used in our discipline. The purpose of this letter is to focus on one small set of terms that has recently become controversial. These terms are *parent ion* and *daughter ion* used in mass spectrometry/mass spectrometry (tandem mass spectrometry, MS/MS, CAMS, MIKES, DADI).

These terms came into use in the early 1980's and I believe they were coined based on the analogy with the parent/daughter terminology used to describe nuclear disintegrations and other similar relationships in a number of scientific disciplines. This terminology is quite appropriate based on definitions in Webster's dictionary, achieves the goal of conveying the desired information in a succinct and concise manner, and the genealogy relationship should be easy for scientists (and nonscientists) outside the field to grasp. Until recently this appeared to be the consensus terminology. However, some members of the mass spectrometry community now find this terminology offensive and several other terms are appearing in the literature. While I personally do not think that *daughter ion* is sexist (i.e., it is not used in a degrading or a demeaning manner), it is obvious that continued use of this term will divide the mass spectrometry community in this area of nomenclature. Thus, to have uniformity of nomenclature in the literature, a new terminology needs to be agreed upon. I would like to suggest the terms *parent ion* and *product ion*. *Parent ion* serves the purpose of keeping the genealogical connection, as opposed to *precursor ion*. Because parent is not gender specific, I assume it should be offensive to few people and thus acceptable. While *product ion* may not be quite as concise and descriptive as *daughter ion*, it is the most reasonable alternative I have heard proposed. I feel quite strongly that *fragment ion*, or any derivative, should not be used. *Frag-*

ment ion is almost universally used for source generated ions in which there is no specific genealogical relationship, and thus it would serve us well to use it in that context and only that context. (As a related aside, I try to use and propose using the term *fragmentation* to describe events in which the genealogy is not specifically known, e.g., formation of ions in the ion source, and the term *dissociation* for cases in which it is known, e.g., MS/MS experiments.)

The biggest drawback of replacing *daughter* with *product* comes when describing experiments in which more than two stages of mass spectrometry are used, so-called MSⁿ experiments. A few years ago this would not have been a concern, but with the ever-increasing capabilities of ion trapping instruments we find that such experiments are rather routine in our laboratory now [1]. While the genealogy of granddaughter, great granddaughter, etc. is readily understood, grandproduct is nonsensical. The best alternative that I have heard or seen is *x generation product ion(s)* [2, 3], in which $x = n - 1$. Thus, for an MS³ experiment in which a parent ion is dissociated into product ions and then one of these product ions is selected and dissociated, the ions in the recorded spectrum would be second generation product ions of the initial (first generation) parent ion and product ions of the second generation parent ion. (Note that the second generation parent ion is also a first generation product ion.) This should suffice to describe the appropriate experiments to those familiar with the nomenclature, although it will take more thought to go through all the relationships, and it will be more confusing to the nonexpert.

There are strong, emotional feelings on both sides of the daughter/product issue. Hopefully we can at least limit the terminology to these two terms if a consensus cannot be reached, and disassociate parent ion from this issue.

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References

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