Cancer Research – The Dismal and Unscientific "One Cell Line" Approach

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Editor

What is happening today at the cellular level in cancer research is to look at these changes and find markers that indicate change and how this affects the functioning of the cell to drive unwarranted division. The other aspect is to target these quasi-specific changes or find drugs that can selectively kill tumour cells. Specificity of action is of prime importance. These are complex tasks because every cancer is unique yet we remain hell-bent of lumping a many together as we can to make management easier, despite knowing that no there is no panacea. Progress inevitably becomes piecemeal.

Markers are sought in cancer cells grown out in vitro, and treatments that might be effective using drugs and other agents are similarly tested, mostly for convenience. Culturing can be with cells that are gifted from other researchers, bought from suppliers, or grown from primary tissues. It is worth reminding ourselves that a considerable number of cell lines turn out to be the same type, due to contamination in sub-culturing. My first point is that only carefully authenticated lines should be used, but the majority of papers describe findings in a handful of well-established cell lines (HeLa, MCF7, etc.) that can be under suspicion. My second point is that, particular with regard to biomarkers, finding their overexpression in different cancers, finding just one is usually considered to be useful in future diagnosis of that cancer type. The same applies to drug development, testing a newly synthesised compound or an extract from a natural source (where the principal has not even been sought). An unacceptable and disturbing number of submissions dealing with these issues where one cell line has been used are increasingly coming across my desk these days as an editor of a cancer cell journal. The authors are immediately challenged at triage with the following questions:

(i) Have you explored other breast cancer cells (e.g. if only MCF7 cells were used)?
(ii) Have you looked at other types of tumour cell lines (e.g. prostate, lung, etc.)?
(iii) Have you looked at normal cells of similar origin?
(iv) In the case of drug testing, have you compared your findings with an established drug of known activity against tumour and normal cells?
(v) Have you explored your findings under other culture conditions?

All these comparisons help to establish whether a marker or a drug can be of any interest. Each issue raised above can be seen as adding a set of controls without which the one-cell line paper falters at submission. Whether the authors can improve their submission is another matter, but the basic problem here is that the approach adopted by so many researchers is scientifically unsound; the perpetrators need to go back their studies. It seems that most cancer researchers of this ilk have an agenda with two main items on it: (i) I can quickly contribute to the field of cancer research and show the value of my findings in diagnosis and/or treatment in the future. And (ii) if I get this paper published and then ring the changes, I can publish many more papers looking at different cell lines by the same procedure, perhaps later go for different markers or testing different drugs. This will help me secure grants and act positively regarding my career advancement.

One worrying aspect of all this is that these one cell line/one drug papers are appearing very frequently on line, often in journals where payment of a processing charge can help secure publication. Publishers are in business; their objective is to make money and this is one relatively easy way of doing it. Predatory journals seem to have no other objective; for them publishing poor unscientific papers, often "reviewed" by fake referees, is a cash cow that undermines the very basis of valid scientific communication. The task of separating the chaff from the grain for the scientific buff becomes ever more difficult. We are on a slippery slope, and something radical needs to be done. In cancer and other journals this issue has been addressed in many cases, but unfortunately not many researchers preparing papers do read the instruction to authors in which it explicitly states that this minimalist practice is not going to be tolerated. However, as the French say, we are probably "talking to the wind."

A typical message to authors:

Your submitted MS is a one-cell line study, which we can no longer accept in this form, especially where it deals with only one drug or one procedure under a single condition. Other similar cancer cells lines should be tested, and different types of cancer cell lines explored. And what about normal cells as controls? These need to be included. As it stands the paper is too preliminary until work suggested above is done.