

Editorial

Cell Death and Disease: a new journal for a central area of pathophysiology

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If pathophysiology were a fan propeller, cell death would constitute the pivot. Indeed, most diseases are connected to deregulated cell death in some way. Excessive, unwarranted cell death accounts for pathological cell loss, be it slowly degenerative as in Alzheimer's disease or dramatically acute as in stroke and myocardial infarction. Infectious pathogens manipulate cell death pathways to induce or inhibit the death of host cells at will and to subvert the immune recognition of 'dangerous' cell death. Finally, cancer is inexorably linked to a partial suppression of cell death programs in tumor cells, although therapy aims to (re)activate such lethal programs. *Cell Death and Disease*, a new open-access, online journal aims to provide center stage to fundamental, disease-oriented and translational research in cell death.

By the end of the last millennium, cell death research had developed into a discipline of its own, with specific societies – the International Cell Death Society (www.celldeath-apoptosis.org) and the European Cell Death Organization (www.ecdo.eu). In 1994, *Cell Death and Differentiation* – the first journal to focus solely on cell death – was launched. Fifteen years on, it is still the best-reputed journal in the field, with an impact factor to match. We hope that *Cell Death and Disease*, a sister title to *Cell Death and Differentiation*, will support the developing interest in the field and below we will outline the reasons why.

(1) Now that the main pathways of cell death have been outlined – although not yet comprehensively – the attention of scientists is shifting towards its translational aspects. Research designed to disentangle the complex regulation and execution of distinct cell death pathways has led to the discovery that both lethal signaling and cell-death-associated catabolic reactions do not only intersect with many cell-death-unrelated processes, but also relate to multiple pathological conditions. Just as an example, many prominent oncogenes and tumor suppressor genes have a major and unsuspected impact on the regulation of cell death. Similarly, pathways that regulate processes apparently unrelated to cell death, such as autophagy, regulation of metabolism, or organismal aging, can have a profound influence on the propensity of cells to

undergo cell death. On the basis of these considerations, as well as on the ethical principle that science should – sooner or later – have a positive societal impact, we believe that it is important to attract researchers into an area in which the relationship between cell death and disease processes is actively investigated and in which new, biomedically useful insights can be gleaned from the realm of ignorance.

(2) Cell death is the ultimate (and irreversible) fate for cells that have been damaged, exposed to lethal signals, have failed to receive essential survival stimuli (such as nutrients, oxygen, essential growth factors, or trophic signals from neighboring cells), or have been intrinsically programmed for death (as a result, for instance, of telomere erosion or other mechanisms that 'count' the number of generations that a cell is allowed to reproduce). Thus, cell death can be preceded by a phase at which the cell is 'diseased', and the title of the new journal has been designed to attract scientists who study the behavior of deranged cells before they die. *Cell Death and Disease* will publish papers dealing with cell biology research applied to major human diseases, including (but not limited to) neurodegenerative diseases, myopathies, mitochondrialopathies, infectious diseases, cancer, and pathological aging.

(3) *Cell Death and Disease* will promote the implementation and utilization of systems biology (or integrated biology) by establishing a continuum between fundamental, translational, and clinical research. Systems biology approaches applied to human medicine are afflicted by the complexity of diseases, which are often heterogeneous entities that asynchronously manifest in a genetically variant population. In the absence of convenient model systems, pathology-oriented systems biology approaches are often limited to the collection of large data sets, without the possibility of performing multiple perturbations that are required to understand the dynamic properties of the system. To circumvent this problem, we propose that we should give priority to systems biology approaches that involve – at one or several levels – the exploration of cultured mammalian cells. Such culture systems are optimally suitable for the exploration of pathogenic events within a context of manageable complexity that

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can be subjected to multiple genetic, pharmacological, toxicological, or physical perturbations. Thus, the appropriate use of cell biology can yield invaluable information on disease processes, if the results are integrated with the exploration of suitable model organisms (that include yeast, nematodes, flies, mice, and other species) and extrapolated to and integrated with clinical datasets. This might lead to novel diagnostic, monitoring, and therapeutic approaches.

(4) The number, quality, and impact of cell death-related publications have steadily increased over the past two decades. Currently, over 21 000 publications, nearly 3% of the entire scientific literature, are related to cell death, but there is no dedicated journal that focuses on translational aspects. STM publishing is increasingly moving online in terms of how researchers search for and access the literature, and there is increasing support for online-only titles. This also enables societies and publishers to investigate launching journals in more niche areas, which might not be supported under a traditional business model. Finally, funding agencies are beginning to support open-access publishing in larger numbers, and researchers – especially those working in translational areas – want to increase access to the primary literature. All these factors have come together to support the launch of *Cell Death and Disease*: an online-only, open-access journal that operates under the author-pays business model.

(5) Given the explosion of scientific information, it is important to separate accurate information from inaccurate

background. However imperfect, one way of retrieving high-quality science is to consider its source, be it a well-reputed author, an institution, or a journal. *Cell Death and Disease* uses the long-standing experience and high reputation of its sister journal, *Cell Death and Differentiation*, and the dynamic technological platform of nature.com, with its record of top scientific publishing. In view of this consideration, we believe that it is essential to guarantee that papers published in *Cell Death and Disease* will live up to the highest scientific standards. For this reason, we have recruited the most competent scientists within their specialty to the Editorial Board of *Cell Death and Disease*. Their contribution to article triage and to the selection of expert reviewers will greatly contribute to the selection of the best articles and to their improvement during the revision process.

Based on the aforementioned considerations, we are proud to constitute the triumvirate of the founding *Editors-in-Chief* of *Cell Death and Disease*. We invite our colleagues to submit their finest research papers to this journal, which – we are confident – will become the primary source of disease-related cell research worldwide.



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