

# Valuation Branding for Bioscience Research in the Twenty-First Century

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**B**iology is an old-fashioned label for a fundamental science. It remains in wide use for naming university departments but has become largely ineffective for identifying a functionally affiliated community of researchers. With the exponential growth of knowledge, it is now virtually impossible for a researcher to keep significantly informed, inspired, and interactive across the vast breadth of the subject matter represented by the latest discoveries in bioscience. It is time to rebrand ourselves. Just as early university departments of *natural history* and *natural philosophy* were at one time reorganized into more-specialized units with new names that represented the emerging core branches of science, the same exercise of reorganizing and renaming is now needed for *biology*. Some universities have responded to this in recent years, with the formation of specialized departments under new labels such as *molecular and cellular biology*, *integrative biology*, and *ecology and evolutionary biology*.

But do these labels represent the best scheme for a modern reclassification of our research domains? Like *biology*, these newer department labels still convey the same traditional “pure science” branding, implying a mission distinct from the practical concerns of humanity. These labels therefore continue the advocacy of a dichotomy for fundamental and applied research—rooted in old-school elitism—that is fast becoming artificial and out of fashion. An emerging vision for the progress of modern bioscience is based on a more efficient and more natural continuum, along which fundamental discoveries are informed and inspired by application objectives and vice versa (Nowotny et al. 2001, Cooke 2011). Successful grant applications for university bioscience research are now routinely defined, in

large measure, by their potential for generating not just new discoveries but discoveries whose probable impact can be clearly understood in terms of continuing research motivated by targeted or strategic objectives—with anticipated contributions in support of societal needs. Conspicuous prospects for these contributions are essential now more than ever for bolstering the public support of science. This is strongly reflected, for example, in the recent outreach campaigns on why research matters, initiated by the Ontario Council on University Research (<http://yourontarioresearch.ca/why-research-matters>), and is also evident in goals such as knowledge translation and thematic focus identified recently within strategic research plans at some universities, including my own ([www.queensu.ca/vpr/SRP/SRP-May2012Final.pdf](http://www.queensu.ca/vpr/SRP/SRP-May2012Final.pdf)). Governments have also responded by launching successful funding programs designed to build partnerships for innovation between academic researchers and industrial or commercial enterprises (e.g., [www.nsercpartnerships.ca](http://www.nsercpartnerships.ca) and the National Sciences and Engineering Research Council of Canada’s 2012 progress report: [www.nsercpartnerships.ca/\\_docs/SPI-Report\\_e.pdf](http://www.nsercpartnerships.ca/_docs/SPI-Report_e.pdf)).

The present age has been called the “Century of Biology,” not because we have recently acquired a heightened curiosity for biology but because the path of human civilization has imposed on our species a now-urgent need for innovative problem solving that bioscience research seems poised to provide (Kress and Barrett 2001). The old ivory tower tradition of purely curiosity-driven university research—with no particular societal benefit in mind—has largely run its course. The culture of bioscience research, in both theory and practice, is now transforming into a blend of

basic and applied research. Affirmation of this paradigm shift requires a new model for signifying the major domains of university research in bioscience, one based on valuation branding: missions for discovery defined by the generation of new knowledge that is contextualized and integrated with problem-solving relevance for human societies. On the basis of experience and interactions with university researchers over my own career, three distinct research valuation themes are evident in most biology departments: (1) *life health science*, foundational bioscience discoveries with contributions anticipated to support the promotion of human health and well-being; (2) *life products science*, foundational bioscience discoveries with contributions anticipated to support the identification, development, and availability of products derived from organisms or their activities for human consumption or use (e.g., those connected with commercially oriented disciplines such as agriculture, domestic animal science, fish farming, forestry products science, microbial products science, bioenergy science); and (3) *life conservation science*, foundational bioscience discoveries with contributions anticipated to support the conservation and management of wild species, their natural habitats, and the ecosystem services of which they are a part, and on which humanity depends.

At universities today, each of these research themes is manifestly rooted in a seamless blend of application-relevant discovery with the generation of new knowledge, driven by curiosity and creativity, and each is (or should be) firmly grounded in Darwinian evolutionary theory, because a deep understanding of contemporary life systems, their present value, and predictions for their future potential and significance requires an

understanding of how they have come to be (Meagher 2007). These three domain descriptions could effectively distinguish the major research groups within a biology department, or they could provide a platform for expansion through a restructuring of a biology department into several organizational units, comprising new departments or families of departments. As new departmental branding labels, they could easily be born out of the biological sciences in the same way that several distinct departmental brands for engineering—each representing an integration of problem solving with deep curiosity—were at one time born out of the physical sciences.

These three labels could then effectively replace the relatively bland, amorphous label *biology* with a more information-rich classification of what we already do. They provide meaningful valuation branding for discoveries that we anticipate from university bioscience research. Both the research and the teaching activities of faculty members belonging to each of these units would be expected—in various combinations—to draw from and integrate across traditional scales of investigation, including cellular and molecular biology, genetics, physiology, behavior, ecology, and evolution. Accordingly, for the purpose of undergraduate teaching, the three units could be administered collectively within a *school of biosciences* (or a *school of life sciences*), in which the content of current biology (bioscience or life science) undergraduate programs could remain largely unchanged, with perhaps some new labels for streams of study to correspond with the new department labels and with teaching contributions from faculty members residing within all three of these proposed units. The traditional mission and goals of both undergraduate and graduate programs would also continue unchanged in espousing critical and creative thinking, independent learning, and inspiration drawn from raw curiosity—all with an eye toward practical relevance.

In adopting the above branching scheme for an existing biology department, the main research valuation of each

faculty member could be self-identified in terms of one of the three proposed units, with, in some cases, secondary interests possibly associated with another unit. Some researchers—those working at the cellular or molecular level, for example—may view their research as having equal potential for contributions in all three of the above domains, but in virtually all cases, they could probably define their primary interests and pitch in connection with one or two. The principal appointment for each faculty member could then be redefined accordingly in affiliation with one of these three units, with cross-appointments recognized where that would be appropriate. The proposed *life health science* unit, both in terms of research focus and undergraduate program, already exists at some universities—for example, in the Life Sciences Program at Queen's University, Canada, a family of three departments devoted to basic and applied biomedical sciences: Biomedical and Molecular Sciences, Community Health and Epidemiology, and Pathology and Molecular Medicine. In these cases, under the scheme proposed here, the new Departments of Life Products Science and Life Conservation Science could branch out of an existing biology department, thus presenting local opportunities for extending the breadth and depth of bioscience research and education.

All of the signs indicate that the mainstream of contributions from university bioscience research in the future will be driven by a dynamic synergy of deep curiosity, insightful creativity, and relevance informed by societal needs. Very few will be outcomes of esoteric curiosity voids, completely disconnected from the practical concerns of humanity. Importantly, the latter form of research would—and should—continue, nevertheless, to have a welcoming university home within the above scheme, although the vast majority of bioscience researchers already pitch their contributions in terms that reflect one or more of the above domain descriptions. For at least three reasons, therefore, the branding that we use to label our bioscience

research groups needs to be cogent and modern: (1) so that society can better appreciate what we do and why we do it, including parents seeing more clearly where their graduated daughters and sons might find careers; (2) so that we can organize ourselves into more operational research communities, in which members of each unit overlap significantly in terms of how they define infrastructural needs and how they identify the expertise and skills of departmental colleagues needed for building and maintaining effective local collaborations and centers of excellence; and (3) because the diversification of departmental labels on the basis of valuation branding would strengthen the identification of priorities for university administrations to invest in future growth and increased support for bioscience research and scholarship. All of these consequences would positively affect the progress of bioscience in the twenty-first century.

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