

The Ethics of Protocells—Moral and Social Implications of Creating Life in the Laboratory

Editors: Mark A. Bedau and Emily C. Parke
Contributors: Mark A. Bedau, Gaymon Bennett, Giovanni Boniolo, Carl Cranor, Bill Durodié, Mickey Gjerris, Brigitte Hantsche-Tangen, Christine Hauskeller, Andrew Hessel, Brian Johnson, George Khushf, Emily C. Parke, Alain Pottage, Paul Rabinow, Per Sandin, Joachim Schummer, Mark Triant, and Laurie Zoloth
The MIT Press (2009)
392 pp., \$28.00/£18.95 paperback

Someday—and some say it will be soon—we will all wake up to a headline that reads “New life created in the lab.” This new life will metabolize, reproduce, and evolve. It will be more than a recombinant modification of an existing cell. It may be a new life form created “from the bottom up,” from modular BioBrick components, or perhaps a modification of existing life that is so radically different—a wholly new embedded genome, with a minimalist but different metabolism—that its proponents will feel justified in calling it new. There will be questions about whether it really is “alive” and how it was created, and then there will be a stream of comments, negative and positive, ranging from the newly proven techniques’ potential for good to their extraordinary, if unknown, dangers, and some will ask whether scientists are wrong to be “playing God.” There will be calls for regulation, but by whom, with what tools, and to what end will be open for debate. Someone will mention a moratorium. Someone else will mention bioterrorism. To some, this will be dawn of a new era, in which the insights of genetics, combined with the practiced facility of engineering, have empowered geneticists to create profound new organismic applications for great good. They will have reachable applications in mind, for biofuels or tumor-targeting cells. Others will say that this is the day that we finally begin to achieve our doom, through acquiring a power so terribly beyond our wisdom to control that it will overtake us.

Some of these ideas are captured and addressed in “The Ethics of Protocells—The Moral and Social Implications of Creating Life in the Laboratory.” The aim of this upbeat edition is to prepare us for that day in a way that we have seldom been prepared for previous radically new scientific advances. The book contains several concise, nonhyped expositions of the scientific developments, with references that lead easily into web-based and other resources for understanding the surprisingly extensive ongoing scien-

tific work. There are anthropological and bioethical pieces of unusual focus, from grand masters of the profession, such as Laurie Zoloth, to relative newcomers, such as a disertant who spent thesis years mulling over reconciling contradictions in the so-called “precautionary rule.” Risk, fear, uncertainty, precaution, and how to address these issues ethically and publicly are the key themes. Additional themes include lessons from the old technologies and their use in understanding the new technologies, as well as predictable complications, such as intellectual property claims to life. A recurrent feature of the work, unheralded by the editors but nicely present, is, first, to address a subject directly and concretely (such as specific risks of protocells and risk-management approaches) and, second, to meta-question the underlying methods (e.g., “Why is a precautionary approach to risks of new science right or wrong? How do we assess risk generally, and are there ways to do it better?”).

This feature leads to an edition of unusual depth, with implications for science policy and bioethics. It also means that the progressiveness of the science is matched by recurrent willingness to query the typical norms of ethical and social connection. The reader will not find, in this edition, a principalist examination of protocell bioethics under classic or conventional frameworks. But the reader will find, for example, a challenge to bioethics itself, to move from “Mode 1,” specialty expertise, to “Mode 2,” engagement regarding how the public, scientists, and society should engage in creating process rules that will help science and other human values to flourish together. Similarly, one will find no articles mapping out exclusive patenting strategies to encourage venture capital support; but one will find two articles exploring the benefits of adapting open-source thinking. There is a zesty engagement with the future, in which the optimism of the scientists seems to have carried over into a progressive approach to the social and ethical problems, as well as a conviction that if these problems are frankly stated, they can be imaginatively resolved. It is as if by breathing new life into science, new forms of life appear for bioethics as well.

The editors rightly note that this book is the beginning of discussion, not the end of it. Volume 2—and one wants a Volume 2—would include some science- and technology-studies scholars, who could look at assumptions, policy development, and politics, as well as some legal and social engineers, such as those who have helped to develop self-regulatory guidelines and could frame alternative

*Correspondence: patrick.taylor@childrens.harvard.edu

DOI 10.1016/j.ajhg.2009.06.020. ©2009 by The American Society of Human Genetics. All rights reserved.

approaches with effective public engagement; and, for balance, some pessimists, who would challenge the optimists to continue to bring out their best work. It would also include some cross-talk among the different schools of protocell development, to clarify the extent to which their methodological debates have distinct social and ethical implications.

Both the book and the subject have multidisciplinary breadth. Thus, for any reader of a given background, an article or two will probably be uphill reading. Those who have pet theories, approaches, schools of thought, and factions may well find them absent from this book; if their measure of a book is whether they see their own views reflected, they are likely to be disappointed, because this book is neither an anthology nor a comprehensive treat-

ment in such a sense. It is a new book, with new ideas, and must be read on its own terms. Whether one is a geneticist wondering about new developments or a general reader interested in expanding horizons for ethics in science policy, there is much to learn from this engaging and prescient collection. It may not be until Volume 2, or even Volume 5, that we are all truly prepared for the day of the headline "New life created in the lab." But Volume 1 sets us well on our way and, most importantly, begins a thoughtful conversation of general importance that cannot have begun too soon.

Patrick L. Taylor^{1,*}

¹Children's Hospital Boston, Department of Pediatrics,
Harvard Medical School, Boston, MA 02115, USA