



THE PRESIDENT'S COMMISSION FOR THE STUDY OF BIOETHICAL ISSUES' REPORT ON THE ETHICS OF SYNTHETIC BIOLOGY AND EMERGING TECHNOLOGIES

The President's Commission for the Study of Bioethical Issues released the Executive Summary of its *Report on the Ethics of Synthetic Biology and Emerging Technologies*.

The Report suggests five ethical principles that should inform our ethical evaluation and oversight of emerging technologies, and then makes 18 recommendations for public policy around synthetic biology. While The Report specifies synthetic biology, it is clear that the recommendations could, and are meant to, apply to many other emerging biotechnologies as well.

The Report first rightly points out that, despite some of the media hype around the creation of an "artificial cell" by the Venter Institute last May, the cell did not "amount to creating life either as a scientific or a moral matter." The creation of a synthetic genome is a fine technological achievement, but it does not immediately require any change on our basic ethical oversight of biotechnology.

The five ethical principles articulated by The Report include (1) public beneficence, (2) responsible stewardship, (3) intellectual freedom and responsibility, (4) democratic deliberation, and (5) justice and fairness. These principles are used as categorical rubrics under which the 18 recommendations are described.

Overall, The Report does a fine job recommending the development of procedures, oversight mechanisms, general funding guidelines, and so on to assure the continued monitoring of synthetic biology as it develops. It encourages data sharing and dialogue among scientists and other stakeholders. It also emphasizes the need for both public and professional education. The public must be aware of the scope and activities of emerging technologies so it can participate in the dialogue around priorities and limits. Scientists must be

better educated in ethics and the social implications of science in order to self-regulate and to take responsibility for the scientific products they create.

If there is a place The Report seems to fall short is in specifying any of the potential ethical problems of synthetic biology. The only specific harm mentioned is the possibility of environmental release. The Report does emphasize the importance of ongoing risk assessment. Still, there were other concerns expressed by some of the scientists, scholars, and ethicists that should have been explicitly presented in the body of The Report. For example, significant testimony was received about the potential for physical harms as in pathogenic releases (the potential for a novel organism to cause disease), as well as social harms such as economic dislocations. There was concern expressed by religious spokesmen on the potential of the technology for oppressive use against others, and necessity of moral wisdom and the integrity of scientists in the process of creation. I expressed the worry to the Commission that the speed of biological transformation in synthetic biology precludes the self-correction and reflection that were inherent in slower means of biological change such as selective breeding, for example. It would have been fruitful had The Report given a fuller account of these and other concerns expressed.

Despite that lack, The Report is an excellent template for designing a comprehensive program for public policy around synthetic biology and other emerging technologies. The Executive Summary of the Report is available at www.ethics.emory.edu, or the bioethics.gov websites.