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SHORT COMMUNICATION

SCIENCE, MEDICINE AND SOCIETY: BIOMEDICAL ETHICS OF THE NEW MILLENNIUM

By

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Introduction

Each discovery of science and each invention of the mechanical arts are likely sooner or later to find its application in medicine (C.P. Emerson (1927) Bulletin of the Association of Medical Colleges, 2: 193-201). The future of medicine depends upon an enduring trust between the public and physicians who always pledged themselves to uphold the principles of beneficence, justice and respect for patients and to ensure the ethical conduct of research. Dramatic scientific advances in the new millennium are, however, likely to change the face of medicine and health care as we know it heralding not only new treatments but also new ways of diagnosing disease and tailoring of drugs to individuals with greater emphasis on disease prevention. Inevitably, these developments in medical science will present individuals, and society more generally, with a new set of ethical challenges and their ramifications in many areas of our lives are likely to be far-reaching.

For example, gene testing may become a routine part of healthcare in the future as part of a move towards preventive medicine, helping people to stay healthy. These developments might however lead to populations being classified according to their genetic constitution raising serious ethical questions about

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equality and discrimination. It is therefore important to ensure that the ethical consequences and implications of scientific advances in biomedicine are predicted and as far as possible managed so that their impact on society will be a positive one.

Biomedical ethics of the new millennium: Too often, biomedical ethical issues have in the past generated more sound than light and more dogma than wisdom that in the long term is in few people's interests. Ethical opinions about assisted reproductive technology and organ transplantation, for example, are still divided and rational ethical judgments remain uncertain.

The world's major research-funding agencies in this fast-moving area of biomedical science should become increasingly aware of their philanthropic responsibility and consider the ethical impact of future biomedical research. They should also be committed to a program of public engagement work seeking to discover public views about key ethical issues such as biological sample collection and run parallel projects of research into the social, ethical and public policy implications of advances in biomedicine. The two approaches complement each other since research can provide an additional way of capturing and illuminating people's different experiences and social values. The fundamental aim of these novel and related initiatives is to contribute to an evidence-base ethical framework in order to support well-informed and responsible public policy making.

In addition, the current biomedical research agenda should endeavour to support multidisciplinary approaches to bioethics that reflect the way contemporary ethical issues increasingly crosses traditional boundaries between disciplines. Developments in biomedical science are justifiably the territory of biomedical researchers, healthcare professionals, the legal profession, social scientists, moral philosophers and even theologians. Innovative programs should encourage these groups to interact, to bring their different expertise to bear on common problems and perhaps to learn a little more about each other's ways of thinking. Publication of interim research summaries of these collaborative activities also helps disseminate information to key audiences.

The target areas for bioethical research support in the new millennium, where there is likely to be a public policy demand for knowledge and expert opinion, are related to genetics particularly pharmacogenetics and human biological sample collections and neurosciences. Ethical questions in these two areas of genetics are closely linked since pharmacogenetic researchers are some of the biggest users of DNA collections. The sharing of genetic information is a recurring theme in terms of confidentiality and access by employers or others as well as information sharing within families. The purpose and practice of genetic counseling is also included. The field of mental health and neuroscience covers such topics as the legal implications of a better understanding of brain function particularly in terms of personal responsibility for one's actions and the difficulties associated with gaining informed consent from individuals with impaired or unusual mental function.

These emotionally charged arenas of contemporary medicine cover some of the most challenging conundrums facing society and make us question some of our deepest assumptions. At what point does behavior become "abnormal" and who has the right to say so? Is a genetic predisposition or neuroscientific explanation ever a mitigating factor for crime? Do we have any responsibility to share information with other family members who might be affected by our genetic inheritance?

There will seldom be easy answers to these and a host of other difficult questions. However, research funded through integrated biomedical ethics schemes can begin to generate a much-needed knowledge and evidence-base for the field and thus help to provide a function for logical discourse and decision-making by identifying some of the important ethical issues to be considered, gathering and analyzing information and studying the intricacies of human interaction. In fact, funding independent research into the social, ethical and public policy consequences of genetics and neuroscience will shed light on how medical advances will be delivered in the hospital or clinic. Moreover, much of the impact of new understanding and technologies will be felt outside the clinic, for example, in courtrooms and in people's homes. Biomedical ethics research may also usefully help to shape the direction of biomedical research by identifying how this affects the "real world".

In conclusion: from the human genome and gene patents to the "genetic underclass", the ethical, legal and social implications of biomedical science in the new millennium have rarely had a higher profile. The main objective of new models of biomedical ethics is to integrate research in these fields in order to contribute to the knowledge base, develop a better scientific understanding of the natural world and provide a clearer picture of the place of medicine in contemporary society. Research-funding bodies should begin to endorse a number of support activities to help develop networks of information flow and interdisciplinary work in ethical areas as well as pure scientific research. Researchers should concentrate on ethical issues that need tackling now or in the near future and are expected to integrate their efforts and indicate how their work could provide information useful to policy making. The most important topics are related to pharmacogenetics, biological sample collection and mental health.

Science is neither a philosophy nor a brief system. It is a combination of mental operations that has become increasingly the habit of educated peoples, a culture of illuminations hit upon by a fortunate turn of history that yielded the most effective way of learning about the real world conceived (E.O. Wilson (1998) The Unity of Knowledge).