

The human genome: Cause to remember our humanity

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This article is based on the closing address given by Dr. Mitchell Spellman on behalf of Harvard Medical International at the third biennial Asan Medical Center-Harvard Medical International Symposium titled “Genetics and Proteomics: Impact on Medicine and Health” that took place at the Asan Medical Center in Seoul, Korea, July 3–4, 2001. Dr. Spellman’s remarks were addressed to a distinguished gathering that included President Changgi D. Hong and President Emeritus Pyung Chul Min of Asan Medical Center; President Emeritus Mun Ho Lee of Asan Medical Center, who is currently President, Korea Cancer Research Foundation; Secretary General Chul Lee of the Organizing Committee for the Symposium; Dr. Won Jong Kim, Dean of the University of Ulsan College of Medicine; Dr. Je Guen Chi, President of the Korean Academy of Medical Sciences; and the Faculty of the Symposium, together with colleagues, guests, and friends. First, Dr. Spellman reminds participants of the breadth of topics presented during the third biennial symposium. He then discourses on the inestimable worth of the sequencing of the human genome and how such knowledge provides us with the opportunity to consider the meaning and dimensions of humanity—biological, social, and ethical. **Genet Med 2002;4(6, Supplement):66S–67S.**

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My remarks signal the conclusion of an exercise in teaching and learning about transforming advances in the knowledge of human biology. Through a rich and eclectic mix of offerings, the symposium has provided (1) an explication of the science and methodologies of genome research, including functional genomics or proteomics; (2) a report of the study of the applications of gene transfer; (3) an assessment of the influence of genetics on medical education and practice; (4) elucidation of the ways that discoveries emerging from the sequencing of the human genome could diminish the burden of disease and disability; and (5) a commentary on the relevance of genomics to the human condition and to human values, together with an approach for weighing the consequential impact on society.

The challenges that lie ahead

A task for all of us is to consider the enormity of the promise derived from the sequencing of the human genome in the context of the global challenges and dilemmas posed by the rising cost of health care, the pressure of population growth, the lengthening of life span, the changing epidemiology of human disease, the explosion of informational technology, and the polarization of poverty and disparity. I believe we agree that the revelations of genomics have fueled expectations that genetics

will define human nature and that gene therapy will alter the natural history of disease. However, expectations and aspirations should be constrained by the reality that significant factors affecting medicine in the 21st century are, in large measure, social determinants of health that transcend national boundaries and jurisdictions.

Given the new paradigm, medical and health practitioners, geneticists, and others who would understand the meaning of “humanness” must incorporate an approach to learning and inquiry that includes, in addition to genetics and proteomics, the cognitive sciences, ethics and other social sciences, and the humanities.

In the title of a recent essay in *Science*, Alex Mauron, a molecular biologist and bioethicist at the University of Geneva Medical School, asked, provocatively, “Is the Genome the Secular Equivalent of the Soul?”¹ The author observed that the “plausibility of our genome as a definition of our humanness comes from the blending of ideas from nature, stability, immutability, and genes” and resulted in the proposition that “if a trait is in the genes, there is nothing that can be done about it.” However, Mauron discounted prospects that “behavioral genomics” could rationalize all human behavior as products of our genes, such as, for example, a gene for violence, a gene for depression, a gene for impulsiveness, a “Michael Jordan” gene for grace and the ability to soar and remain suspended aloft, a “bad hair day” gene, etc. Mauron concluded that human personhood is more than the human genome; it is the aggregate of determinants of the uniqueness of individuals, each of whom is endowed with historic identity, heritage, and cultural links to the human condition that are defined by time, place, and circumstance. To paraphrase the eloquence of Mauron, the task is

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to delineate ethical principles and values that are expressions of human intelligence and destiny while nurturing a tool as powerful as the human genome, with the aim of not only unlocking “the secrets of our genetic heritage,” but assigning our place “among other participants in the adventure of life.”

We are (almost) one people

It is sobering to recognize that the congruity and sameness of the human genome dispels any justification for a taxonomy or classification of humans based on race and ethnicity. Less than 3% of the differences in the human genome account for all the differences that distinguish us as individuals and peoples. It is humbling to know that the mouse genome is strikingly similar to ours and deflates the idea of human uniqueness. Indeed, the overall DNA sequence similarity between humans and chimpanzees is 99%. Svante Paabo speculates that when the chimpanzee genome becomes available, its gene content and organization will be very similar or identical with the human genome.² Thus, the eternal search for the essence of humanness and for markers of our common humanity must

encompass more than the study of genomics and the development of an “instructional manual” to depict how genes fulfill their functions.

This, then, is a “take-home message” from the third biennial symposium: Genomics will cause physicians and health professionals, performing as scientific healers or technologists, to subsume, more than our predecessors, the ennobling responsibilities to affirm our common humanity and assure for everyone equity of access to all that is available to advance health and prevent disease. In a world of perversity, the immutable markers of our humanness are our imperfections, but our singularity reposes in our capacities and abilities to solve complex problems, to build enduring institutions, and, above all, to love and make poetry of our lives.

References

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