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Ethical issues in cell and gene therapy using CRISPR/Cas9 system

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The CRISPR/Cas9 system has revived many safety issues regarding organisms and living systems such as environmental pollution, ecological calamity, risk assessment and genome editing in germline. The new concern is the simplicity, rapidity, accuracy and economics of CRISPR/Cas9 for cell and gene therapies, with the possibility of ethical issues. These issues may include balance of benefits and risks, compatibility of private interests and the public good, random manipulation of genes, and commercialization of human therapy. CRISPR/Cas9 has multiple advantageous applications, but hazards are unavoidable. A scientific evaluation system is needed to assure that benefits are greater than risks. There have been many disputes and frictions among companies over patenting CRISPR/Cas9 for human therapy because many commericial interests are involved. An agreement to regulate patent holders and licensees to consider the public goods is required. Altering a gene may produce new or undesired species, and lead to unknown or unpredictable diseases. The use of CRISPR/Cas9 in gene editing should be deliberately evaluated and strictly controlled, especially in human germline. CRISPR/Cas9 has been demonstrated, promising many disease treatments; however, cell and gene therapies usually require a long course of treatment and cost much. The therapy should be affordable for all patients. Ethics should never be a barrier to science, but allow it to develop in the long-term. It is necessary to have public opinion over the social, legal and ethical implications with the policy/regulatory needs of the system.

Biography

Yuan-Chuan Chen completed his PhD in Biochemistry at the University of California, Berkeley, USA in 2015 and Postdoctoral studies at the Taiwan Food and Drug Administration (TFDA) from 2015 to 2017. He has published 12 co-authored articles in peer-reviewed journals and three chapters in three reputed books, including the fields of basic science, biomedicine, and related policy/regulation. He is now an Assistant Researcher at the National Applied Research Laboratories (NARL), Taiwan. His research focuses on the perspectives and challenges of cell and gene therapy based on gene editing technologies such as the CRISPR/Cas9 system.

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