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Ethical challenges in tampering with the Holy Grail: Gene editing technologies

New biotechnologies are transforming human life, but are also raising profound bioethical questions. It is critical to assess these bioethical questions before adapting biotechnologies to clinical trials or to commercial applications. Gene editing is one example in which current and future potential medical and scientific benefits and risks of a technology may impact the way society should deal with inherent bioethical challenges. Some ethicists believe that geneticists using CRISPR (clustered regularly interspaced short palindromic repeats)/Cas in germline editing technologies are "playing God" and this may precipitate a backlash from nature that could be disastrous to the human race. There are other ethical questions associated with CRISPR. Will CRISPR lead us down a path to create designer babies? Is it morally legitimate to alter the genome of our children without their autonomous consents? How will eradicating a plant or animal species impact the overall bio-environment? This keynote will highlight critical bioethical issues that every scientist needs to consider when making decisions about translational biotechnologies. The potential benefits of CRISPR can be breathtaking. Currently CRISPR is being tested to reprogram, genetically, human T lymphocytes to kill lung cancer, to correct genetic mutations in patients with sickle cell anemia, and to instruct bacteria to self-destruct, thereby offering a new method to fight antibiotic resistant bacteria. CRISPR could be applied to non-therapeutic situations such as changing hair color, improving human intelligence or enhancing athletic capacity. CRISPR is not just a method to therapeutically edit the genomes of human embryonic cells; it is a powerful, efficient tool for editing genes in any organism. CRISPR can be used to eliminate pathogenic species such as Zika-carrying mosquitoes, to bring extinct animals back to life or modify, genetically, plants that are resistant to infection and drought. Without knowing all of the risk or benefits of CRISPR, a critical bioethical question emerges - how should we proceed in a new era of Promethean overreach to modify the germline in human beings, plants and animals? Balancing the use of new biotechnologies which can improve the quality of life with the introduction of bioethical challenges to the natural process of molecular genetics will be the focus of this critical keynote address.

Biography

John D Loike, PhD serves as Director for Special Programs for the Center for Bioethics and is the Co-Director for Graduate Studies in the Department of Physiology and Cellular Biophysics at Columbia University College of Physicians and Surgeons. He is also an Advisory Board Member of the Columbia University Center for the Study of Science and Religion, Creator and Faculty Editor of the Columbia University *Journal of Bioethics*, and Course Instructor for Crossroads in Bioethics, a course for undergraduates offered each spring at Columbia College. His areas of interest in bioethics include stem cells, cloning, neuroethics, bioterrorism, and the interface of science and religion. He has co-organized several national and international conferences on Genetics and Bioethics, and he is the Founding Co-director of BIOCEP (BIOethical Cross-cultural Education Program), a two-week intensive summer internship program designed to promote educational and cultural exchange in medical ethics (medical tourism, emerging infections, stem cell research, reproductive medicine, etc.) with students from Mahidol University in Bangkok, Thailand.

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