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### Seminar Explores the Scientific and Ethical Concerns in Human Cloning

Washington, D.C. -- The concept of human cloning has moved from the realm of science fiction to debate concerning whether it should be done, said keynote speaker Rudolf Jaenisch at a AAAS seminar on 25 October. Jaenisch, a biology professor at the Massachusetts Institute of Technology, cautioned that technological and ethical questions must be answered before scientists proceed any further.

Jaenisch and respondent Ronald Cole-Turner, the H. Parker Sharp Professor of Theology and Ethics at Pittsburgh Theological Seminary, spoke at the latest seminar sponsored by the AAAS Dialogue on Science, Ethics, and Religion (DoSER), "Cloning of Mammals: What are the Implications for Human Cloning?" Jaenisch's research on cloned mice has led to important contributions, specifically in understanding how the genome from an adult cell is reprogrammed to create a new organism.

Jaenisch described how cloning works, possible applications of the research, and the distinction between reproductive and therapeutic cloning. In describing current reproductive cloning research on mammals, Jaenisch said 95-98% of clones are born with respiratory problems, irregular hearts, and severe overgrowth that prevents long term survival. He also said the vast majority of clones that survive suffer from serious abnormalities, making completely normal clones the exception. Jaenisch said reproductive cloning of humans would result in the same abnormalities posing an even greater problem than the method proposes to solve.

"If such research is conducted, what do you do with the abnormal cloned babies? You can't dispose of them like laboratory animals," he said.

Although he expressed that experiments in human reproductive cloning should be prevented, Jaenisch said human therapeutic cloning research should continue because it doesn't possess the risks associated with reproductive cloning and has great potential for medical benefits. He said much of the opposition to human therapeutic cloning occurs because the general public does not understand the differentiation between therapeutic cloning and reproductive cloning. Therapeutic cloning, already legal in Britain, does not produce a genetic replica of a person, as does reproductive cloning. Rather therapeutic cloning extracts an individual's cells, cloning those cells to create an embryo of identical genetic material, and then uses the embryo's stem cells to grow tissue a patient may require, such as skin, liver or brain tissue.

Cole-Turner said even if technological advances were to make reproductive and therapeutic cloning possible in the future, there would still be major ethical concerns regarding both. One of the primary concerns he cited was a blurring distinction between technology and humanity.

"The whole idea is symbolic of how technology will change our humanity," he said. "I think that if the technology does turn out to be safe in the future we need to pause and reflect upon the ramifications these advances would have."

The DoSER seminars, which are free and open to the public, are held in the AAAS auditorium located at 1200 New York Avenue, NW, Washington, DC. "Cosmology and Kabbalah," is scheduled for 29 November. For information requests on seminars or other DoSER programs please send an e-mail message to [doser-info@aaas.org](mailto:doser-info@aaas.org).

--Eric Grammer



Rudolf Jaenisch (left) and Ronald Cole-Turner (right) discuss concerns associated with human cloning.