October 27, 2004

Senator John F. Kerry
John Kerry for President
901 15th Street NW
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Dear Senator Kerry,

Recently you have made the promotion of embryonic stem cell research, including the cloning of human embryos for research purposes, into a centerpiece of your campaign. You have said you will make such research a “top priority” for government, academia and medicine (Los Angeles Times, 10/17/04). You have even equated support for this research with respect for “science,” and said that science must be freed from “ideology” to produce miracle cures for numerous diseases.

As professionals trained in the life sciences we are alarmed at these statements.

First, your statements misrepresent science. In itself, science is not a policy or a political program. Science is a systematic method for developing and testing hypotheses about the physical world. It does not “promise” miracle cures based on scanty evidence. When scientists make such assertions, they are acting as individuals, out of their own personal faith and hopes, not as the voice of "science". If such scientists allow their individual faith in the future of embryonic stem cell research to be interpreted as a reliable prediction of the outcome of this research, they are acting irresponsibly.

Second, it is no mere “ideology” to be concerned about the possible misuse of humans in scientific research. Federal bioethics advisory groups, serving under both Democratic and Republican presidents, have affirmed that the human embryo is a developing form of human life that deserves respect. Indeed you have said that human life begins at conception, that fertilization produces a “human being.” To equate concern for these beings with mere “ideology” is to dismiss the entire history of efforts to protect human subjects from research abuse.

Third, the statements you have made regarding the purported medical applications of embryonic stem cells reach far beyond any credible evidence, ignoring the limited state of our knowledge about embryonic stem cells and the advances in other areas of research that may render use of these cells unnecessary for many applications. To make such exaggerated claims, at this stage of our knowledge, is not only scientifically irresponsible – it is deceptive and cruel to millions of patients and their families who hope desperately for cures and have come to rely on the scientific community for accurate information.

What does science tell us about embryonic stem cells? The facts can be summed up as follows:

• At present these cells can be obtained only by destroying live human embryos at the blastocyst (4-7 days old) stage. They proliferate rapidly and are extremely versatile, ultimately
capable (in an embryonic environment) of forming any kind of cell found in the developed human body. Yet there is scant scientific evidence that embryonic stem cells will form normal tissues in a culture dish, and the very versatility of these cells is now known to be a disadvantage as well – embryonic stem cells are difficult to develop into a stable cell line, spontaneously accumulate genetic abnormalities in culture, and are prone to uncontrollable growth and tumor formation when placed in animals.

• Almost 25 years of research using mouse embryonic stem cells have produced limited indications of clinical benefit in some animals, as well as indications of serious and potentially lethal side-effects. Based on this evidence, claims of a safe and reliable treatment for any disease in humans are premature at best.

• Embryonic stem cells obtained by destroying cloned human embryos pose an additional ethical issue – that of creating human lives solely to destroy them for research – and may pose added practical problems as well. The cloning process is now known to produce many problems of chaotic gene expression, and this may affect the usefulness and safety of these cells. Nor is it proven that cloning will prevent all rejection of embryonic stem cells, as even genetically matched stem cells from cloning are sometimes rejected by animal hosts. Some animal trials in research cloning have required placing cloned embryos in a womb and developing them to the fetal stage, then destroying them for their more developed tissues, to provide clinical benefit – surely an approach that poses horrific ethical issues if applied to humans.

• Non-embryonic stem cells have also received increasing scientific attention. Here the trajectory has been very different from that of embryonic stem cells: Instead of developing these cells and deducing that they may someday have a clinical use, researchers have discovered them producing undoubted clinical benefits and then sought to better understand how and why they work so they can be put to more uses. Bone marrow transplants were benefiting patients with various forms of cancer for many years before it was understood that the active ingredients in these transplants are stem cells. Non-embryonic stem cells have been discovered in many unexpected tissues – in blood, nerve, fat, skin, muscle, umbilical cord blood, placenta, even dental pulp – and dozens of studies indicate that they are far more versatile than once thought. Use of these cells poses no serious ethical problem, and may avoid all problems of tissue rejection if stem cells can be obtained from a patient for use in that same patient. Clinical use of non-embryonic stem cells has grown greatly in recent years. In contrast to embryonic stem cells, adult stem cells are in established or experimental use to treat human patients with several dozen conditions, according to the National Institutes of Health and the National Marrow Donor Program (Cong. Record, September 9, 2004, pages H6956-7). They have been or are being assessed in human trials for treatment of spinal cord injury, Parkinson’s disease, stroke, cardiac damage, multiple sclerosis, and so on. The results of these experimental trials will help us better assess the medical prospects for stem cell therapies.

• In the case of many conditions, advances are likely to come from sources other than any kind of stem cell. For example, there is a strong scientific consensus that complex diseases such as Alzheimer’s are unlikely to be treated by any stem cell therapy. When asked recently why so many people nonetheless believe that embryonic stem cells will provide a cure for Alzheimer’s disease, NIH stem cell expert Ron McKay commented that “people need a fairy tale” (Washington Post, June 10, 2004, page A3). Similarly, autoimmune diseases like juvenile
diabetes, lupus and MS are unlikely to benefit from simple addition of new cells unless the underlying problem – a faulty immune system that attacks the body’s own cells as though they were foreign invaders – is corrected.

In short, embryonic stem cells pose one especially controversial avenue toward understanding and (perhaps) someday treating various degenerative diseases. Based on the available evidence, no one can predict with certainty whether they will ever produce clinical benefits – much less whether they will produce benefits unobtainable by other, less ethically problematic means.

Therefore, to turn this one approach into a political campaign – even more, to declare that it will be a “top priority” or receive any particular amount of federal funding, regardless of future evidence or the usual scientific peer review process – is, in our view, irresponsible. It is, in fact, a subordination of science to ideology.

Because politicians, biotechnology interests and even some scientists have publicly exaggerated the “promise” of embryonic stem cells, public perceptions of this avenue have become skewed and unrealistic. Politicians may hope to benefit from these false hopes to win elections, knowing that the collision of these hopes with reality will come only after they win their races. The scientific and medical professions have no such luxury. When desperate patients discover that they have been subjected to a salesman's pitch rather than an objective and candid assessment of possibilities, we have reason to fear a public backlash against the credibility of our professions. We urge you not to exacerbate this problem now by repeating false promises that exploit patients’ hopes for political gain.

Signed,*

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