Embryonic Stem Cell Research
01/01/1990

First in an occasional series of pocket-sized issue papers from the American Society for Cell Biology, April 2001

Why is Stem Cell Research Important?
The discovery of stem cells was a major scientific breakthrough. The application of this discovery could lead to significant improvements in human health. Because of their potential to differentiate into many diffe rent cell types, stem cells may enable us someday to regenerate diseased or damaged tissue. Stem cells might replenish bone marrow for treating cancer and other hematopoietic diseases, pancreatic cells for alleviating diabetes, or neuronal cells for Parkinson's disease, Alzheimer's and other brain and spinal cord disorders. Human stem cells have been found in embryos and in certain adult tissues. Research on both embryonic stem cells (ES) and adult stem cells is progressing rapidly but basic questions remain unanswered and clinical therapies are still highly experimental. To close off research into either ES or adult stem cells at this early stage could be disastrous.

Why Should Federal Money Be Used?
Federal funds for human ES research will enable the nation's leading investigators, those supported by the National Institutes of Health and the National Science Foundation, to explore the enormous biomedical implications of stem cells. Barring federal funding would lock out our best and brightest researchers.
By funding this research itself rather than leaving funding to private organizations and individuals, the federal government retains the power to regulate stem cell use and standard practice. Peer-reviewed federal funding combined with public oversight is our best assurance of the highest quality research, performed with the greatest dignity and moral responsibility.

Why Aren't Adult Stem Cells Sufficient?
It is far too early to know if adult stem cells have the same potential as embryonic stem (ES) cells. So far, they appear to be very different. In additions, only small numbers of adult stem cells have been found in some tissues and it is not clear whether they can be grown to the numbers needed for treatments or that they are functionally interchangeable with ES cells. Research on mice suggests that ES cells can form any type of cell in the body. Thus ES cells have the potential to treat all kinds of diseases, whereas adult stem cells may be much more limited and may not have the needed flexibility.
Currently, we are in the midst of a flood of experimental reports involving stem cells but it will years to explore the differences between adult and ES stem cells. In the meantime, there are serious diseases that might be more readily treated with ES cells. An illustration of the dilemma comes from a June 2000 announcement by researchers at the University of Edmonton in Alberta of a breakthrough treatment for adults with the most severe form of Type I juvenile diabetes. The Edmonton researchers transplanted adult "islet" cells harvested from organ donors into the pancreas of a recipient whose pancreas was unable

to produce a natural supply of insulin. The Edmonton Protocol showed that islet transplantation is a viable treatment but it also showed the current limitations of adult stem cell therapy. To harvest enough islet cells, two organ donors were required for every recipient, a ratio and a cost that could not be sustained in ordinary treatment. Embryonic stem cell transplants are the next logical step in researching a cure for this disease, which is life threatening and debilitating. To abandon an approach with such real promise would be shortsighted and inhumane.

What about potential abuse?

The NIH has developed oversight guidelines to ensure that ES cell research is conducted in an ethical, legal and moral way. These guidelines completely separate those who conduct research from those who donate stem cells, preventing any conflict of interest. Most stem cell lines would be obtained from frozen embryos stored at in vitro fertilization (IVF) clinics that would otherwise be discarded, and with the informed consent of donors. There are currently some 100,000 frozen embryos at IVF clinics nationwide. Only a small fraction will ever be used.

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Visualizing Function Symposium Sampler Neurotransmitter Receptor
01/01/1990

Nerve cells are highly specialized for cell-to-cell communication. A number of small molecules called neurotransmitters act as the actual signals, released from one nerve cell only to dock on another cell. Docking molecules, or receptors, act as gates, triggered by the neurotransmitter. When a neurotransmitter molecule fits into a receptor, it typically opens the gate, allowing ions to travel through the cell's membrane. The ions, in turn, excite the cell. If the receiving cell is a nerve cell, this excitation can lead to release of its own neurotransmitters.

The image illustrates a part of a receptor molecule, the nicotinic acetylcholine receptor. The region colored blue is embedded in the cell membrane of the receiving cell. The ion-conducting pathway widens at this point to form a vestibule. Ions enter and leave this vestibule through narrow openings on the sides. The region colored green sticks out into the cytoplasm of the cell. (Nigel Unwin, unpublished results, obtained from helical crystals).

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Visualizing Function Symposium Sampler Yeast Ribosome
01/01/1990

Every cell must manufacture proteins, molecules that carry out all cellular functions. A complex organelle called the ribosome, conserved from bacteria to humans, performs this vital function. Each ribosome consists of two subunits. Some ribosomes attach to a system of membranes inside the cell called the endoplasmic reticulum.

A total of 13,000 projections yielded this computer reconstruction, showing a yeast ribosome. The small subunit is colored greenish yellow and the large subunit blue. Red indicates an attached protein called Sec61, which forms a channel through the membrane of the endoplasmic reticulum. A tunnel passes vertically (in this image) through the large subunit and aligns with a tunnel through Sec61, allowing the newly formed protein to pass across the membrane of the endoplasmic reticulum. (Reproduced from J. Frank, American Scientist 86 (1998) 428-439; courtesy of the author.)

###

Visualizing Function Symposium Sampler
01/01/1990

Escherichia coli Ribosome with Elongation Factor

Every cell must manufacture proteins, molecules that carry out all cellular functions. A complex organelle called the ribosome, conserved from bacteria to humans, performs this vital function. Small nucleic acids, called tRNAs, each carry one protein subunit, an amino acid, to the ribosome.

This reconstruction shows the ribosome of Escherichia coli bearing a molecule of elongation factor (red). This factor displaces one tRNA, making room for the next tRNA and its amino acid cargo. (from Agrawal et al., PNAS 95 (1998) 6134-6138; reproduced with permission by The National Academy of Sciences)

###

Regulation, Structure and Function of Cell Junctions
01/01/1990

Cells in multicellular organisms have evolved several mechanisms for linking to their neighbors. These so-called "cell junctions" consist of proteins that assemble into a variety of structures such as gap junctions, tight junctions, adherens junctions, desmosomes and hemidesmosomes, each with a different function. Such intercellular junctions do not simply hold cells together, they respond to environmental signals by breaking and reforming and take part in the propagation of signals that control cell growth and motility. These signals impact growth and development, and contribute to metastasis, the most devastating and life-threatening part of the cancer process. In Regulation, Structure and Function of Cell Junctions, investigators will touch on several steps in cancer progression.

Dr. David Bilder, of Harvard Medical School, will describe a newly discovered Drosophila gene that codes for a component of septate junctions. The gene, called scribble, is also a tumor suppressor, and mutations in such genes lead to uncontrolled cell growth and consequently, tumor formation.

Dr. Bruce Nicholson, of State University of New York, Buffalo, will explain how a cancer-causing oncogene can alter the communicating function of cellular channels called gap junctions. Drs. Keith Johnson, (University of Toledo) Al Reynolds (Vanderbilt University) and Claire Gaudry (Northwestern University, Chicago) will discuss how the different properties of molecules in adherens junctions and desmosomes might regulate junction integrity and determine, for example, whether a breast cancer cell will spread or not. (A related abstract linking cadherins to ovarian cancer will appear in the ASCB Press Book.)

Dr. Annette Gonzalez, of Northwestern University, Chicago, will report a new and surprising discovery about how a molecule that tethers cells to the extracellular matrix might have unexpected regulatory functions in controlling cell motility.

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Fetal Tissue Research
01/01/1990

Second in an occasional series of pocket-sized issue papers from the American Society for Cell Biology, April 2001

What is fetal tissue research?
A fetus is an implanted human embryo from eight weeks after conception until birth. Fetal tissue is derived from legal abortions and is used for scientific research into fundamental biological processes and human development. In addition, transplantation research uses fetal tissue to study potential treatment of life treating diseases.

Is fetal tissue research legal?
Fetal tissue research is legal in the United States. Scientists have used fetal tissue in research since the 1930s. Human fetal kidney cells were used to develop the polio vaccine that led to the 1954 Nobel Prize in Medicine. In 1975, federal law was clarified to say such research is permitted if "conducted only in accordance with any applicable state or laws regarding such activities (45 C.F.R. 46, Sec. 210)."

In 1993 Congress passed the National Institutes of Health Revitalization Act (Public Law 103-43), formalizing President Clinton's lifting of President Reagan's 1988 moratorium on federal funding for fetal tissue transplantation research The use of fetal tissue for other research purposes had not been affected by the 1988 ban The 1993 Revitalization Act amended the Public Health Service Act (42 U.S.C. 289 et seq.) as follows:

In General – The Secretary may conduct or support research on transplantation of human fetal tissue for therapeutic purposes.

Source of Tissue – Human fetal tissue may be used in research carried out under paragraph (1) regardless of whether the tissue is obtained pursuant to a spontaneous or induced abortion or pursuant to a stillbirth

Where do scientists get the tissue?
Scientists obtain fetal tissue for research purposes from a variety of sources including hospitals, nonprofit tissue banks (one of which is funded by the NIH), and, in some cases, abortion clinics.

Why is fetal tissue research important?
Fetal cells hold unique promise for biomedical research due to their ability to rapidly divide, grow, and adapt to new environments. This makes fetal tissue research relevant to a wide variety of diseases and medical conditions. Researchers use fetal tissue to explore normal fetal development, and to study its potential for transplantation into other humans as a way to prevent or treat disease and injury.

Fetal tissue research has already led to major advances in human health care. According to the Centers for Disease Control and Prevention, "some vaccines such as rubella and varicella [were] made from human cell-line cultures, and some of these cell lines originated from aborted fetal tissue, obtained from legal abortions in the 1960s. No new fetal tissue is needed to produce cell lines to make these vaccines, now or in the future." These vaccines have effectively eradicated a major source of child morbidity and mental retardation in the U.S.

New insights into birth defects and other developmental diseases have emerged from fetal tissue research. By comparing normal and abnormal development in fetal tissue, scientists will learn more about gene activation and other fundamental cell processes that may cause mental retardation, Down's Syndrome, SIDS, and defective eye development. By learning more about fetal development, doctors will gain new understanding of why some pregnancies are spontaneously aborted.

The genes responsible for some diseases that are not apparent until later in life, such as Alzheimer's, prostate cancer and Type II diabetes, may be activated during fetal development. More research in this area is needed to determine the possible link between fetal development and disease.

For clinical applications, fetal tissue transplantation is considered an approach with great potential for patients with illnesses such as Parkinson's, diabetes or heart disease.

Transplanted fetal cells elicit less of an immune response than do adult cells, lowering the risk of tissue rejection. In addition, early fetal cells are not as developed as adult cells and are more able to accommodate to the host. One area of research involves the comparison of fetal cell transplants versus adult cell transplants. For example, studies are underway to determine if transplanting fetal cardiac cells into patients with heart failure may prove a valuable treatment

What is going on in fetal tissue transplantation today?
The five year ban on federal funding undoubtedly slowed progress but in recent years, there have been significant advances. Cell transplantation is showing great promise as an effective therapy for some Parkinson's patients. Several Parkinson's patients (in the U.S. and abroad) are reported to be off medication and symptom-free as a result of these treatments. The transplantation of fetal cells into the brains of Parkinson's patients has allowed some patients to regain speech, speed of movement, and quality of life. Other areas have also shown promise.
Following evidence that the expression of a specific protein in the fetal thymus may be related to the development of Type I (juvenile) diabetes, fetal tissue transplantation is being evaluated as a possible treatment.

Fetal nerve tissue has been used in experimental treatments of spinal cord injury, holding promise of a possible repair for cord damage in certain types of paralysis.
In 1998, Dr. John Gerhart derived human pluripotent stem cells from fetal gonadal tissue destined to form germ cells. When grown in culture, these cells resemble other types of pluripotent stem cells in that they can develop into cells of other tissue types. This research represents a major breakthrough in stem cell research that may lead to treatments of a variety of devastating diseases. Yet fetal tissue transplantation is still not a proven technology. In 2001, a clinical trial to treat Parkinson's was halted after some patients developed severe neurological side effects. Scientific progress is not always a straight line. But without continuing this research, we will never gain the wider understanding of fetal cell processes that will lead to new clinical techniques.

What is the political situation surrounding fetal tissue research?
Since 1999, forces both inside and outside Congress opposed to any scientific use of fetal tissue have tried to make an issue of the supply of fetal tissue to researchers, denouncing those involved as engaged in "the sale of baby body parts." As a result, the House passed H. Res. 350, known as the Tancredo Amendment for its sponsor, Rep. Tom Tancredo (R-CO) in 1999. The Senate defeated a similar measure sponsored by Senator Bob Smith (R-NH) in same year. The Tancredo Amendment calls on the House of Representatives to conduct hearings to investigate the allegations of illegal trafficking of fetal tissue. During the 2000 campaign, candidate George W.

Bush declared himself opposed to any use of fetal tissue or embryonic stem cells for research. It is still unclear how the new Administration might try to enforce that position, especially as key Congressional leaders from both parties strongly support this research.

Is current enforcement adequate?

Under the current law, it is "unlawful for any person to knowingly acquire, receive, or otherwise transfer any human fetal tissue for valuable consideration if the transfer affects interstate commerce." The term "valuable consideration" is equivalent to "profit" but does not preclude reasonable charges for transportation, implantation, processing, preservation, quality control, or storage of human fetal tissue. This law applies equally to federally funded and non-federally funded scientists. Most researchers believe that widespread violations of the law are unlikely. In 1997 the General Accounting Office reported that all federally funded fetal tissue transplant projects were meeting established standards governing informed consent and fetal tissue acquisition. No complaints regarding fetal tissue research have been lodged with the NIH, the agency charged with the oversight. In 2000, the GAO reported that there was no incentive currently for commercial exploitation of fetal tissue supply.

###

Protein Turnover and Autophagy
01/01/1990

Proteins perform essentially all of the work that goes on within a cell. To properly coordinate cell processes, protein activity must be tightly controlled. Once a protein is made, it continues to function until it is degraded by specific enzymes. So specific protein degradation plays a large role in protein control. Much recent research has concentrated on this important method of control. Moreover, studies suggest that alterations in the cellular protein degradation machinery may contribute to a number of diseases, including human papilloma virus induced cervical cancer and AIDS. Certain protein-degrading enzymes must remain contained within membranes, separated from the general cell contents, called the cytoplasm. A process called sequestration moves proteins into a special protein-degrading zone called the lysosome or vacuole.

Cells degrade proteins using two major systems. In the first, proteins slated for degradation can be then moved into the lysosome/vacuole by several mechanisms. In the second system, proteins can be tagged with a small protein known as ubiquitin. Proteins marked with ubiquitin are recognized by a large protein-degrading structure known as the proteasome, which lies within the cytoplasm.

The minisymposium "Protein Turnover and Autophagy" will review recent research developments in the rapidly moving field of intracellular protein degradation. The first three talks will focus on the vacuolar/lysosomal degradation system, and the second three talks will focus on the ubiquitin degradation system. First half of the Symposium: Autophagy * Sarah Teter of the University of California, Davis will discuss recent advances in a process called macroautophagy, and the related biosynthetic process of cytoplasm-to-vacuole targeting. During macroautophagy, double-membrane vesicles called autophagosomes enclose small portions of the cytoplasm. The outer membrane of the autophagosome subsequently fuses with the vacuole/lysosome, releasing a single-membrane vesicle into the vacuole. The vacuole ultimately degrades this vesicle and its protein contents and recycles the components.

Dr. William Dunn, of the University of Florida, will discuss a degradation process called specific peroxisome degradation or pexophagy. Peroxisomes are small, enzyme-containing structures found in all cells with nuclei. Under certain conditions, two mechanisms specifically degrade peroxisomes and the proteins they contain. One is a process similar to macroautophagy. In the second mechanism, the vacuole engulfs peroxisomes in a process called microautophagy. Research into these mechanisms is starting to provide insights into the sequestration process. Dr. Hui-Ling Chiang, of the Penn State College of Medicine, will detail a different mechanism by which vacuoles degrade cytosolic proteins. In the case of one protein, a single-membrane vesicle first imports the protein. These vesicles then fuse with the vacuole, dumping their contents into the vacuole, where the proteins are degraded. The mechanism by which particular cytosolic proteins are specifically recognized and tagged for sequestration is not understood. Second half of the Symposium: Ubiquitin-dependent proteolysis * Yong Chi of the California Institute of Technology will talk about enzymes that attach ubiquitin to a protein that is destined to be degraded, specifically, SCF ubiquitin ligase and its role in targeting the transcription factor Gcn4 for degradation. Although the SCF ubiquitin ligases were first discovered to play a role in controlling cell division, it is now apparent that these enzymes participate in several processes within cells. Yong Chi's observation that Gcn4 is a target of SCF suggest that SCF plays an important role in determining what genes are expressed within a cell.

Dr. Peter Jackson, of Stanford University, will describe yet another unexpected role for the SCF ubiquitin ligases. Dr. Jackson's lab has found that SCF controls the duplication of the centrosome,

an important structure in cell division. The centrosome directs the formation of a set of fiber tracts within the middle of the cell known as the mitotic spindle. Duplicated chromosomes are segregated upon the mitotic spindle during cell division. Defects in the mitotic spindle can lead to errors in chromosome segregation, errors that may underlie many human cancers. Dr. Jackson's exciting findings suggest that SCF plays a key role in ensuring the fidelity of chromosome segregation.

Dr. Dan Finley, of Harvard Medical School, will focus on the architecture of the proteasome. The proteasome is a very complicated structure that resembles a pipe with a sophisticated valve assembly at each end. Proteins are degraded inside of the pipe, and the valves control how proteins gain access to the degradative chamber. This is a critical function, for if it were not for the valves, the proteasome would degrade any and all proteins with little discrimination. Dr. Finley will report on important advances that his lab has made in deciphering how the valves are assembled, and how they work.

###

Media Advisory - Stem Cell Briefing
01/01/1990

American Society for Cell Biology to Hold Audio News Conference on Release of NIH Stem Cell Guidelines

Who: Nobel Laureate Dr. Paul Berg of Stanford University;
Stem cell pioneer Dr. John Gearhart of Johns Hopkins University; and
Lyn Langbein of Olney, Maryland, mother of a five-year-old girl with juvenile diabetes.

What: Audio news conference (by telephone) for journalists to discuss new National Institutes of Health guidelines for federal research involving human pluripotent stem cells.

When: ASAP following release of guidelines

To Register for This Conference, Contact Nancy Bennett at the Telephone Number or E-Mail Address Above

Background: According to press reports, the National Institutes of Health will soon issue formal guidelines for the use of human pluripotent stem cells in medical research. Since they were first isolated less than two years ago, stem cells have shown the potential to dramatically change major aspects of medical research and therapies. But their use in federally funded research has been delayed during the public comment period that followed the issuance of draft guidelines in December 1999.

Potential applications of stem cell research include development of new drugs and treatments for a myriad of diseases, conditions and disabilities such as Parkinson's and Alzheimer's diseases, ALS (Lou Gehrig's Disease), cancer, spinal cord injury, stroke, burns, heart disease, diabetes, osteoarthritis and rheumatoid arthritis. Pluripotent stem cells, stimulated to develop into specialized cells, offer the possibility of a renewable source of tissue replacement. Almost every realm of medicine could be touched by this innovation.

(View the NIH primer on stem cells)

Contact: Kevin Wilson (301) 347-9300

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Biographies of Speakers
01/01/1990

Paul Berg, Ph.D.
Dr. Paul Berg is the Cahill Professor in Cancer Research in the Department of Biochemistry and Director of the Beckman Center for Molecular and Genetic Medicine at Stanford University School of Medicine. Dr. Berg serves as Chair of the American Society for Cell Biology (ASCB) Public Policy Committee. The ASCB has helped lead a coalition of scientific and patient advocacy groups who support federally funded stem cell research.

Berg received his undergraduate education at Pennsylvania State University, and earned his Ph.D. in biochemistry from Western Reserve University in 1952. He serves as Co-Chairman of the National Academy of Science Commission on Life Sciences and Director of the National Foundation for Biomedical Research.

His honors include the Eli Lilly Award in Biochemistry (1959), the California Scientist of the Year (1963), the Henry J. Kaiser Award for Excellence in Teaching (1969, 1972), and in 1980, he received the Gairdner Foundation Award, the Albert Lasker Medical Research Award and the Nobel Prize in Chemistry for his studies of the biochemistry of nucleic acids, particularly recombinant DNA.

Dr. Berg's research uses biochemical and molecular genetic approaches for the analysis of gene expression and recombination. He is here today on behalf of the American Society for Cell Biology to discuss the final NIH guidelines for federally funded scientists wishing to conduct research on human pluripotent stem cells.

John Gearhart, Ph.D.
Dr. John Gearhart is Professor of Gynecology and Obstetrics and of Physiology at the Johns Hopkins University School of Medicine. In November, 1998, along with Dr. James Thomson of the University of Wisconsin, Dr. Gearhart reported the isolation and culture of human pluripotent stem cells. He has also authored two perspectives on the use of the human embryonic stem cells in transplantation therapies.

Lyn Langbein
Lyn Langbein is the mother of a five-year-old daughter, Jamie, who has juvenile diabetes. Lyn left her position of ten years as an attorney with Health and Human Services in the Medicare area to be at home full-time to provide the best possible care for Jamie and her diabetes. Lyn and her husband Stuart are both volunteers for the Juvenile Diabetes Foundation International (JDF). Stuart is on the board of the JDF Capitol Chapter in Washington, DC and Lyn was a volunteer for the JDF Children's Congress. They live in Olney, Maryland with daughters, Jamie and two-year-old Jenna.

###

Talking Points for Members - Public Policy in Your Pocket
01/01/1990

The new ASCB "Talking Points" series "Public Policy in your Pocket" is designed to give members an instant public policy briefing on vital issues. Use "Talking Points" as a starting point for your Letters to the Editor, speeches to the Rotary Club, or for any forum where you want to make the scientific case quickly and concisely. Easily downloadable and printable as either a text or a PDF file, "Talking Points" are suitable for your pocket, purse, or PDA.

The first two "Talking Points" on "Embryonic Stem Cell Research" and "Fetal Tissue Research" are now available. They will be updated every few months to keep them reasonably current.

Issue 1- Embryonic Stem Cell Research
Issue 2- Fetal Tissue Research
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Fetal tissue research has already led to major advances in human health care. According to the Centers for Disease Control and Prevention, “some vaccines such as rubella and varicella [were] made from human cell-line cultures, and some of these cell lines originated from aborted fetal tissue, obtained from legal abortions in the 1960s. No new fetal tissue is needed to produce cell lines to make these vaccines, now or in the future.” These vaccines have effectively eradicated a major source of child morbidity and mental retardation in the U.S.

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For clinical applications, fetal tissue transplantation is considered an approach with great potential for patients with illnesses such as Parkinson’s, diabetes or heart disease. Transplanted fetal cells elicit less of an immune response than do adult cells, lowering the risk of tissue rejection. In addition, early fetal cells are not as developed as adult cells and are more able to accommodate to the host. One area of research involves the comparison of fetal cell transplants versus adult cell transplants. For example, studies are underway to determine if transplanting fetal cardiac cells into patients with heart failure may prove a valuable treatment

What is going on in fetal tissue transplantation today?
The five year ban on federal funding undoubtedly slowed progress but in recent years, there have been significant advances. Cell transplantation is showing great promise as an effective therapy for some Parkinson's patients. Several Parkinson's patients (in the U.S. and abroad) are reported to be off medication and symptom-free as a result of these treatments. The transplantation of fetal

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This "Talking Point" was prepared by the ASCB

Other "Talking Points" on public policy issues are in the works. Your comments, corrections, and suggestions are always welcome - send to John Fleischman.

###

Signaling and the Actin Cytoskeleton in Cell Motility and Adhesion
01/01/1990

For more than a century biologists have wondered how motile cells such a human white blood cells and amoebas respond to external signals by extending a pseudopod in the direction of movement. Such cellular movements are also essential for embryonic development, including the migrations of axons that wire together the billions of nerve cells in the brain. The assembly of filaments from the protein actin appears to drive the cell forward, but until recently, no one knew how filament assembly begins.

A recent convergence of cellular and biochemical experiments have provided a plausible answer to this question.

Drs. Thomas Pollard, of the Salk Institute of Biological Studies, and Gary Borisy, of the University of Wisconsin, will discuss the discovery and characterization of the missing link, a complex of proteins called Arp2/3 complex that initiate new actin filaments as branches on the sides of existing filaments. A family of proteins called WASp regulates Arp2/3 complex. Genetic defects in the DNA coding for WASp are responsible for a genetic disease of human white blood cells called Wiskott-Aldrich Syndrome.

Dr. Anne Ridley, of the Ludwig Institute for Cancer Research, will discuss a class of messenger molecules activated by binding a small molecule called GTP, a nucleotide. These GTP-binding proteins carry stimuli from cell surface receptors to WASp and other proteins inside the cell. These signals initiate and regulate actin filament assembly and organization.

The new work presented in the symposium explains the defects in Wiskott-Aldrich Syndrome and provides a molecular model for many types of cellular motility. Control of such cellular movements are important for stemming the spread of cancer cells and for limiting inflammation.

###

Signal Transduction Pathways from the Cell Surface to the Nucleus
01/01/1990

All cells must respond and adjust, if possible, to changes in their environment. Such changes in the external milieu could include rapid changes in temperature, in the availability of nutrients, or in exposure to radiation. In addition, during the formation, growth, and development of an embryo, cells must respond to external cues that inform and instruct the cells, so that each cell occupies its correct position spatially and temporally. Moreover, during normal metabolism in an adult organism, cells of one tissue "talk" to others by way of the release of extracellular molecules specialized to act as signals (including hormones, growth factors, pheromones, differentiation inducers, neurotransmitters, and the like).

In all of these circumstances, the cells must have mechanisms that allow them to decipher and decode these changes in their physical and chemical surroundings and thereby adjust their physiology, growth rate, shape, movement, and pattern of gene expression so that each cell deals appropriately with and survives under the new conditions. The biochemical mechanisms that the cell uses to respond to these extracellular changes are called, collectively, "signal transduction" pathways because the cell converts (transduces) the initial input (the signal, or primary stimulus) into a series of programmed responses.

When these kinds of signals go awry, a variety of human diseases can arise. For example, if signals that normally promote cell growth are overactive, a tumor can develop. Likewise, if a signal that normally prevents growth becomes inactivated, unchecked cell growth leads to a tumor. Many other human diseases, such as diabetes, hypertension, arthritis and other inflammatory ailments result from either overactive or underactive signal transduction pathways.

In the Minisymposium “Signal Transduction Pathways from the Cell Surface to the Nucleus,” six speakers will describe, using different experimental systems, recent progress and new insights about a variety of different signaling pathways.

Postdoctoral research fellow Dr. Nancy McNamara, from UCSF, will describe studies that have revealed an unexpected way in which mammalian epithelial cells recognize that they have been exposed to bacteria and how they use that mechanism to help mount a defense against the incipient infection.

Cochair Dr. Deborah Morrison, Laboratory Director at the National Cancer Institute, will discuss how a well-known signaling pathway is used in a novel way to promote the development of nerve cells in the brain.

Professor John Kyriakis, from Massachusetts General Hospital, will present his work on understanding how cells cope with the imposition of chronic stress.
Cochair Dr. Jeremy Thorner, from UC Berkeley, will describe how studies of fundamental signaling processes in an organism as simple as a unicellular microbe (yeast) can illuminate signal transduction mechanisms in more complex cell types. Graduate student Audrey Odom, from Duke University Medical Center, will present work that has elucidated, also in yeast cells, previously unknown routes by which products derived from the lipid molecules in cell membranes can serve as transducers of important regulatory signals. Professor Judith Venuti, from the College of Physicians and Surgeons of Columbia University, will discuss recent new insights about how certain cell fates are determined during the formation of an embryo.

###

Visualizing Function Symposium Sampler Escherichia coli Ribosome with tRNA
01/01/1990

Every cell must manufacture proteins, molecules that carry out all cellular functions. A complex organelle called the ribosome, conserved from bacteria to humans, performs this vital function. Small nucleic acids, called tRNAs, each carry one protein subunit, or amino acid, to the ribosome.

Reconstructed by computer from nearly 30,000 separate projections, this image shows the ribosome of Escherichia coli, a common bacterium of the human gut. In the center lies a tRNA molecule (green). The bottom end of the green tRNA points toward a narrow tunnel along which the chain of amino acids making up the new protein emerges from this molecular factory. (Malhotra et al., J. Mol. Biol. 280 (1998) 103-116, Design by Amy Heagle and Joachim Frank)

###

Visualizing Function Symposium Sampler
01/01/1990

Electron microscopy of biological macromolecules is emerging as a powerful new technique for understanding the structure of cellular components. Biological electron microscopy began as a qualitative method, primarily useful for looking at slices of cells.

It can, for example, illuminate the structure of proteins at the level of single atoms. Examples include the atomic structure of tubulin (lower middle, Eva Nogales), and the high-resolution structure of the nicotinic acetylcholine receptor (upper right, Nigel Unwin).

Click on an image to see a larger version and an explanation.

Researchers are developing new methods for protein crystallization that will rapidly increase the power of this technique. Studies of membrane proteins reconstituted into lipid bilayers, and of precious samples available in minute amounts should particularly benefit from these advances.

Cryo-electron microscopy can now be applied even to uncrystallized proteins and protein complexes. This "single-particle' methodology involves the use of thousands of direct images of well-preserved, hydrated proteins and complexes. Computer programs combine these individual views into three-dimensional reconstructions of, for example, viruses, molecules of the cytoskeleton, and complex molecular assemblies. Three-dimensional images of the ribosome in action (Joachim Frank) provide a spectacular example (see Frank's American Scientist article). A new method combines x-ray analysis with electron microscope reconstructions of whole protein complexes. It should prove invaluable in the study of the molecular mechanisms that provide the cell with all its essential functions.

Symposium will present examples of all these new microscopy developments and show how they have given us invaluable information on the structure and function of complex biological systems that are essential for the life of the cell.

###

ASCB Questions and Answers on Stem Cells
01/01/1990

What is a stem cell?
Stem cells have the ability to divide for an indefinite amount of time in culture and to give rise to specialized cells. They are best described in the context of normal human development. Human development begins when a sperm fertilizes an egg and creates a single cell that has the potential to form an entire organism. This fertilized egg is totipotent, meaning that its potential is total. In the first hours after fertilization, this cell divides into identical totipotent cells. Approximately four days after fertilization and after several cycles of cell division, these totipotent cells begin to specialize, forming a hollow sphere of cells, called a blastocyst. The blastocyst has an outer layer of cells and inside the hollow sphere there is a cluster of cells called the inner cell mass.

The outer layer of cells will go on to form the placenta and other supporting tissues needed for fetal development in the uterus. The inner cell mass cells will go on to form virtually all of the tissues of the human body. These inner cell mass cells are pluripotent-they can give rise to many types of cells but not all types of cells necessary for fetal development. Because their potential is not total, they are not totipotent and they are not embryos. In fact, if a cell from the inner cell mass were placed into a woman's uterus, it would not develop into a fetus.

The pluripotent stem cells undergo further specialization into cells that give rise to particular functions. Examples of this include blood stem cells that give rise to red blood cells, white blood cells and platelets; and skin stem cells that give rise to the various types of skin cells. These more specialized stem cells are called multipotent.

How are pluripotent stem cells derived?
At present, human pluripotent cell lines have been developed from two sources with methods previously developed in work with animal models.

(1) In the work done by Dr. James A. Thomson of the University of Wisconsin, pluripotent stem cells were isolated directly from the inner cell mass of human embryos at the blastocyst stage. Dr. Thomson received embryos from IVF (In Vitro Fertilization) clinics-these embryos were in excess of the clinical need for infertility treatment. The embryos were originally created for purposes of reproduction, not research. Informed consent was obtained from the donor couples. Dr. Thomson isolated the inner cell mass and cultured these cells producing a pluripotent stem cell line.

(2) In contrast, Dr. John Gearhart of Johns Hopkins University isolated pluripotent stem cells from fetal tissue obtained from terminated pregnancies. Informed consent was obtained from the donors after they had independently made the decision to terminate their pregnancy. Dr. Gearhart took cells from the region of the fetus that was destined to develop into the testes or the ovaries. Although the cells developed in Dr. Gearhart's lab and Dr. Thomson's lab were derived from different sources, they appear to be very similar.

What are the potential applications of pluripotent stem cells?
There are several reasons why the isolation of human pluripotent stem cells is important to science and to advances in health care. At the most fundamental level, pluripotent stem cells could help us to understand the complex events that occur during human development. A primary goal of this work would be the identification of the factors involved in the cellular decision-making process that results in cell specialization. We know that turning genes on and off is central to this process, but we do not know much about these "decision-making" genes or what

turns them on or off. Some of our most serious medical conditions, such as cancer and birth defects, are due to abnormal cell specialization and cell division. A better understanding of normal cell processes will allow us to further delineate the fundamental errors that cause these often deadly illnesses.

Human pluripotent stem cell research could also dramatically change the way we develop drugs and test them for safety. For example, new medications could be initially tested using human cell lines. Cell lines are currently used in this way (for example cancer cells). Pluripotent stem cells would allow testing in more cell types. This would not replace testing in whole animals and testing in human beings, but it would streamline the process of drug development. Only the drugs that are both safe and appear to have a beneficial effect in cell line testing would graduate to further testing in laboratory animals and human subjects.

Perhaps the most far-reaching potential application of human pluripotent stem cells is the generation of cells and tissue that could be used for so-called "cell therapies." Many diseases and disorders result from disruption of cellular function or destruction of tissues of the body. Today, donated organs and tissues are often used to replace ailing or destroyed tissue. Unfortunately, the number of people suffering from these disorders far exceeds the number of organs available for transplantation. Pluripotent stem cells, stimulated to develop into specialized cells, offer the possibility of a renewable source of replacement cells and tissue to treat a myriad of diseases, conditions, and disabilities including Parkinson's and Alzheimer's diseases, spinal cord injury, cancer, stroke, burns, heart disease, diabetes, osteoarthritis and rheumatoid arthritis. In fact, there is almost no realm of medicine that is not likely to be touched by this innovation.

Is stem cell research the same as cloning?
No. Stem cell research cannot be used to develop a human being. Embryonic stem cells derived from the inner cell mass of an early embryo cannot give rise to a placenta, even if the stem cells were implanted into a woman's uterus.

Will federal funding be used to procure stem cells?
No. Scientists cannot use federal funds to derive stem cells from embryos, although they may use federal funds to study stem cells once they have been isolated. Fetal tissue research is not subject to the government ban on isolating embryonic stem cells.

Why is federal funding for stem cell research important?
Federal funding will allow many more of the country's best scientists to conduct this critical research, and ensure public oversight and accountability among researchers receiving federal grants.

###

Stem Cell Research Polling Information
01/01/1990

Opinion Research Corporation International was commissioned by Patients' Coalition for Urgent Research (Patients' CURe) to conduct polling on the subject of stem cell research. Several questions were included in our CARAVAN® Survey, a weekly omnibus telephone survey.*

Between May 6-9, 1999 the survey of 1,005 adults was conducted. Chosen through a random-digit-sample, the adults included 503 men and 502 women 18 years of age or older, living in private households in the continental United States.

Prior to asking a question specifically addressing federal funding for stem cell research, a definition of the research was given. Following is the definition that was used:

As you may already know, a stem cell is the basic cell in the body from which all other cells arise. Medical researchers have been able to isolate stem cells from excess human embryos developed through in vitro fertilization and fetal tissue that has been donated to research. Medical researchers believe that human stem cells can be developed into replacement cells to cure diseases such as diabetes, Parkinson's, Alzheimer's, cancer, heart disease, arthritis, burns or spinal cord problems.

After hearing the definition, 74 percent of respondents said they favored the funding of stem cell research by the National institutes of Health.

Men are more likely than women to be in favor of the research funding (79% vs. 71%). Americans who have had at least some college education are more likely to favor the funding of research than those without any college education (78% vs. 71%).
* Janet Ulrich (800) 999-0213 phone (800) 759-5786 fax
Opinion Research Corporation International

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Crosstalk between Integrins and Other Receptors
01/01/1990

To effectively regulate their growth and differentiation, cells must coordinate information from at least two distinct "streams" of information. One complex stream begins with soluble hormones and other chemical factors interacting with protein receptors in the cell's external membrane. The other equally complex stream consists of positional information provided by appropriate cell-to-cell and cell-to-extracellular matrix interactions.

One group of cell-surface receptors, the integrins, plays a key role in cell-to-matrix adhesion, and is thus important in establishing tissue architecture and organization. However, recent research shows that integrins also participate in signal transduction events that influence decisions about cell growth, differentiation, or death. Integrins can directly generate signals themselves, but perhaps more importantly, they modulate signals generated by many other types of receptors.

The minisymposium "Crosstalk between Integrins and Other Receptors" will examine these interactions between integrins and other families of receptors.

- Dr. Joan Brugge will evaluate Vav, a key intracellular integrator of signals from several receptors.
- Dr. Steven Kaufman will discuss interactions between integrins and acetylcholine receptors during formation of junctions between nerves and the muscles they activate.
- Dr. William Frazier will illustrate how apoptosis in smooth muscle cells is regulated by the thrombospondin receptor (CD47) working with integrin a2b1.
- Dr. Alan Howe will describe how integrin-mediated cell adhesion regulates mitogenic signaling cascades.
- Dr. Sujata Persad will discuss ILK, a kinase that binds to integrins and that regulates cell cycle and apoptosis.
- Dr. Janne Balsamo will discuss crosstalk between integrins and cell adhesion molecules, cadherins, regulated by an intracellular tyrosine kinase.

This symposium should provide novel insights into interactions between cell adhesion receptors, including integrins and cadherins, and families of receptors that respond to soluble ligands.

###

Phil Stahl wins "Women In Cell Biology" Senior Award, Claire Walczak named WICB Junior Winner - 01/01/1990

Bethesda, MD. - Philip Stahl of Washington University School of Medicine in St. Louis has been named the winner of the ASCB's 2003 "Women In Cell Biology" Senior Career Recognition Award, the first time since its inception in 1986 that a man has been chosen for the WICB Senior award.

The 2003 WICB Junior Career Achievement Award goes to Claire Walczak of the Indiana University School of Medicine in Bloomington. Both WICB awards will be presented in San Francisco's Moscone Convention Center on Monday, December 15, during the ASCB's 43rd Annual Meeting.

As Head of the Department of Cell Biology and Physiology since 1984, Stahl has championed a wide range "women's" issues, including on-campus day care, hiring outside the "Old Boys" network, and gender pay equity. His department had a single female faculty member when Stahl arrived in St. Louis in 1971. Today women represent a quarter of the medical school faculty. Stahl has also pushed for greater minority representation on the faculty and in the student body by chairing special minority recruitment and outreach committees. Stahl was behind Washington University's widely-praised "Young Scientist Program," which brings "disadvantaged" high school students to campus for summer lab placements and special science seminars.

Walczak specializes in molecular motor molecules called kinesins that move along microtubule trackways inside the cell like tiny locomotives pulling trainloads of molecular cargo to their final destinations. She earned her BS in Chemistry from Rensselaer Polytechnic Institute in New York and a PhD in Biochemistry from the University of Wisconsin at Madison. As a postdoc at the University of California, San Francisco, she analyzed a kinesin subtype called KinI, and discovered that KinI was not a molecular motor at all but a destabilizing factor for microtubules. Instead of pulling cargo along the microtubule tracks, KinI seemed to trigger the catastrophic disassembly of the whole cytoskeleton. The disassembly and reassembly of microtubules is considered the key to understanding cell division or mitosis.

With over 10,000 members, the ASCB is the nation's leading voice for education and research in cell biology. Part of the ASCB mandate is to "promote and develop the careers of historically under-represented constituencies in biomedical research, including minorities and women." The Society's 43rd Meeting will run from December 13-17 at San Francisco's Moscone Convention Center.

For ASCB information, contact:
Kevin Wilson, Director of Public Policy, ASCB, (301) 347-9308
John Fleischman, Science Writer, ASCB, (513) 929-4635

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Harvard’s Kirschner Wins Cell Biologists’ Top Science Honor
01/01/1990

Bethesda, MD. - As a laboratory scientist at Princeton, UC San Francisco, and now Harvard, Marc Kirschner’s peers credit him with transforming at least three major fields in cell biology. For his contributions, Kirschner will be awarded the E.B. Wilson Medal, the ASCB's highest scientific honor for science, at the ASCB Annual Meeting on December 14 in San Francisco.

Kirschner has received Canada’s Gairdner Award (2002), Israel’s Shacknai Prize (2003) and the American Society for Biochemistry and Molecular Biology’s Rose Award (2001). He was elected to the U.S. National Academy of Sciences in 1989 and made a Foreign Member of the (U.K.) Royal Society in 1999.

Kirschner is the Carl Walter Professor and Founding Chair of the Department of Cell Biology at Harvard Medical School. A relentless advocate for experimental quantification, Kirschner and his longtime collaborator John Gerhart published their book on evolutionary theory in 1997, Cells, Embryos, and Evolution, that attempted to square the new molecular biology with the Darwinian model.

Born in Chicago in 1945, Kirschner took his BA at Northwestern in 1966, started graduate work at Rockefeller University in New York but jumped to UC Berkeley for his thesis with Howard Schachman in 1971. After postdocs with Gerhart in Berkeley and John Gurdon in Oxford, Kirschner was hired by Princeton in 1972. In 1978, the Bay Area and UCSF’s emergence as research hot spot drew Kirschner back. Kirschner’s time at UCSF (1978-1993) is regarded as one of the pivotal periods in American science. In 1993, Kirschner was recruited to start a new Department of Cell Biology at Harvard Medical School.

Kirschner served as ASCB President in 1990-1991, establishing the Society as a national leader in science advocacy. He helped create the Joint Steering Committee, a broad coalition of scientific societies that educate Congress on the implications of the accelerating biomedical revolution and served as its first Chair. He was succeeded by legendary scientists Eric Lander and Harold Varmus. For his contributions to science advocacy, Kirschner received the ASCB’s Public Service Award in 1996.

The ASCB's E.B. Wilson Medal, named for an early 20th century pioneer of American biology who advocated the chromosomal theory of inheritance, is awarded by scientific peers to those who have made significant and far-reaching contributions to cell biology over the course of a career.

For ASCB information, contact:
Kevin Wilson, Director of Public Policy, ASCB, (301) 347-9308
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Evolution and God: Why Intelligent Design Theory Isn't Science
01/01/1990

Dear Ohio Resident of the ASCB
As most of us know by now, the forces of anti-evolution are afoot once again in Ohio. A group within the State Board of Education is trying to force an equal time provision into the state science curriculum giving the doctrine of so-called "intelligent design" a place in Ohio's already overcrowded and under-funded biology requirements. The scientific objections to this are legion but the practical ones are likely to carry the most weight in Columbus. The Public Information Committee of the ASCB is trying to prevent those who would demean the value of an Ohio science education, making it more difficult to attract scientists and scientific enterprises from other parts of the world.

We are circulating this notice of a special meeting to be held in Cleveland on March 2. We ask you, in turn, to circulate it to friends, colleagues, and students. We also ask you stay tuned for further word of how ASCB members in Ohio can help in this matter.

Comments, suggestions, and fresh information should go to:
John Fleischman
Science Writer
The American Society for Cell Biology
ASCB Midwest/Cincinnati
(513) 929-4635

For the Public Information Committee:

Thomas L. Egelhoff
Case Western Reserve University
Dept. of Physiology and Biophysics

Kathy L. Wilson (Chair ASCB-PIC)
Johns Hopkins University School of Medicine
Dept. of Cell Biology

Case Western Reserve University's Center for Policy Studies is pleased to announce a public presentation FREE and Open to the Public
EVOLUTION & GOD:
Why Intelligent Design Theory Isn't Science
March 2, 2002, 1:00 p.m.
Allen Theater, Playhouse Square, Cleveland, OH

Speakers:
Stephen Jay Gould
Kenneth Miller
Lawrence Krauss
Cynthia Beall

Stephen Jay Gould
Alexander Agassiz Professor of Zoology
Harvard University
Author of Wonderful Life, & Rocks of Ages

The Factuality of Evolution &The Non-Scientific Nature of Intelligent Design Theory"

Kenneth R. Miller
Professor of Biology
Brown University
Author of Finding Darwin's God
"Looking for God in All the Wrong Places: Do the Details of Life Reveal Design or Evolution?"

Lawrence Krauss
Professor and Chair of Physics
Case Western Reserve University
Author of The Physics of Star Trek
"The Nature of Science and the Current Situation in Ohio"

Cynthia Beall
Sarah Idell Pyle
Professor of Anthropology
Member of the National Academy of Sciences
Moderator

###

ASCB E.E. Just Lecturer Pioneer in Fighting Human Disease with Transgenic Cows
01/01/1990

Richard Goldsby of Amherst College, who pioneered the generation of bovine monoclonal antibodies and its potential application to human medicine, has been selected by the Minorities Affairs Committee of the American Society for Cell Biology to give the 10th Annual E.E. Just Lecture on Sunday, December 14 at the ASCB Annual Meeting in San Francisco. Named in honor of an early 20th century biologist, the E.E. Just Lecture recognizes outstanding achievement by a minority scientist.

Goldsby, who is African-American, is a founding partner of Hematech, a biotech company formed to break a major therapeutic bottleneck by using transgenic cattle to produce polyclonal human antibodies for clinical application. Currently, human donors are the only source of human polyclonal antibodies, a major limitation on their wider use to prevent and treat infectious diseases and immune deficiencies. Hematech is developing Goldsby's work on the bovine immune system to clone transgenic cattle that could crank out large quantities of human polyclonal antibodies.

Professor of Biology and the John Woodruff Simpson Lecturer at Amherst, Goldsby is currently on sabbatical in the Whitehead Institute/MIT laboratory of Robert Weinberg. Goldsby earned his BA in Chemistry at the University of Kansas in 1957 and his PhD in Chemistry at UC Berkeley in 1961, and taught at Yale and the University of Maryland-College Park before joining Amherst in 1982.

As part of the ASCB's mandate to "develop the careers of historically under-represented constituencies in biomedical research, including minorities and women," the Minorities Affairs Committee organizes a wide range of events including the E.E. Just Lecture at the Annual Meeting, to be held at San Francisco's Moscone Convention Center, December 13-17, 2003. With over 10,000 members, the ASCB is the nation's leading voice for education and research in cell biology.

For ASCB information, contact:
Kevin Wilson, Director of Public Policy, ASCB, (301) 347-9308
John Fleischman, Science Writer, ASCB, (513) 929-4635

###

American Society for Cell Biology Elects New Leadership
01/01/1995

The American Society for Cell Biology, representing 10,000 basic biology researchers across the country and throughout the world, has elected Gary Borisy, Ph.D. of Northwestern University President for 2002. Borisy is currently the Leslie B. Arey Professor in the Department of Cell and Molecular Biology at Northwestern University Medical School, and Feinberg Distinguished Investigator as well as Professor Emeritus in the Laboratory of Molecular Biology at the University of Wisconsin. His past ASCB work includes a term on ASCB Council and as Program Committee Chair for the 1995 Annual Meeting. Borisy is known for his insights into the mechanisms of cell division, molecular biology of the cytoskeleton, and the organization of the cytoplasm.

Four distinguished scientists, Kevin P. Campbell of the University of Iowa, Sandra L. Schmid of the Scripps Research Institute, W. Sue Shafer of the University of California, San Francisco, and Julie A. Theriot of Stanford University, were elected to ASCB Council on the slate with Borisy. Their three-year terms will begin in January 2001.

Kevin P. Campbell, Ph.D. is the Roy J. Carver Professor in the Departments of Physiology and Biophysics and Neurology at the University of Iowa College of Medicine and an Investigator of the Howard Hughes Medical Institute. Campbell's research concerns basement membrane receptors, calcium channels and the cell biology of Muscular Dystrophy. He was elected to the National Academy of Sciences in 2000, and has received honors from the German Muscular Dystrophy Association with the Duchenne-Erb-Preis Award in 1997, and the Emilio Trabucchi Foundation Medal in 1992.

Sandra L. Schmid, Ph.D. is currently Chair of the Department of Cell Biology at the Scripps Research Institute. Her work concerns the molecular mechanisms of endocytic clathrin coated vesicle formation, as well as the biochemistry and cellular function of the GTPase dynamin. She received the American Heart Established Investigator Award and is Scientific Advisor for the Molecular Biology Review Committee of the Human Frontier Science Program.

W. Sue Shafer, Ph.D. is Assistant Vice Chancellor for Research Administration at the University of California, San Francisco. She was Deputy Director of the National Institute of General Medical Sciences of the NIH from 1997-1999 and also served as Chair of the ASCB Women in Cell Biology Committee from 1994-1997. Shafer received the NIH Senior Executive Service Meritorious Executive Award in 1999 and the NIH Director's Award in 1986 and 1997. Her interest concerns the training and support of ethnic minorities in research and women's careers in science.

Julie A. Theriot, Ph.D. is Assistant Professor in the Department of Biochemistry and the Department of Microbiology and Immunology at the Stanford University Medical School. She serves on the ASCB Women in Cell Biology Committee. Dr. Theriot received the ASCB/WICB Junior Award in 1994 and the David and Lucile Packard Foundation Fellowship for Science and Engineering in 1998. Her current research is on actin-based motility and the cell biology of bacterial pathogenesis.

Contact: Kevin Wilson (301) 347-9300

###

ASCB Overview of Changes to NIH Stem Cell Guidelines
01/01/2000

The final NIH Guidelines for Research Using Human Pluripotent Stem Cells are very similar to the draft guidelines released on December 2, 1999. These will be effective on August 25, 2000. Most of the changes have to do with shifting the order of sections and clarifying statements. The preamble of the Guidelines addresses many of the issues raised in the 50,000 comments received by the NIH about the draft Guidelines. We have looked through the comments at the NIH and a great many of them are post card-type comments simply stating their objection to stem cell research and not addressing the details of the guidelines.

A summary of the major changes follows:

The word "early" in reference to human embryos has been deleted and the Scope of Guidelines section makes it clear that only embryos, which have not yet reached the stage at which the mesoderm is formed, can be used in federally-funded research.

The Scope of Guidelines section also clarifies that applications will be accepted from 1) current NIH awardees who want to use existing funds; 2) awardees requesting an administrative or competing supplement; and 3) applicants or intramural researchers submitting new research proposals.

In order to clarify that the Guidelines allow the use of human embryos from treatments that employ assisted reproductive technologies with fertile, as well as infertile individuals, the term "infertility" has been changed to "fertility".

Applications for research on embryonic stem cells must by accompanied by a signed assurance by the responsible institutional official that the stem cells were derived from human embryos in accordance with the Guidelines, as well as an abstract of the protocol used to derive the cells. The principal investigator must provide written consent to the disclosure of all materials submitted to carry out public review and other oversight procedures.

The Guidelines have been changed to make clear that the documentation of IRB approval regarding the derivation of cells from fetal tissue and human embryos are the same.
The Guidelines now require that the informed consent specify whether or not information that could identify the donor(s) will be retained.

The Guidelines were revised to remove the prohibition on potential donors receiving information on subsequent testing of donated tissue in the situation when physicians deem it to be in the donor's best interest.

The Guidelines now state that informed consent should include a statement that embryos or fetal tissue are donated without restriction or direction regarding the eventual recipient of the cell transplantation.

It is clarified that all new or competing continuation applications will be reviewed by the newly-created Human Pluripotent Stem Cell Review Group (HPSCRG) for compliance with the Guidelines and by a Scientific Review Group for scientific merit. In the case of intramural proposals or use of existing funds, HPSCRG will review the research before allowing it to proceed.

Since the Guidelines address proposals for the use, not the derivation of stem cells, applications from investigators planning to derive stem cells from fetal tissue no longer require review by HPSCRG.

###

Summary of NIH Guidelines for Research Using Human Pluripotent Stem Cells
08/23/2000

Preamble
Review of public comments submitted on the draft guidelines and explanation of changes made based on the comments.

I. Scope of Guidelines
Guidelines pertain to applications for federal funds for research utilizing stem cells from human embryos or human fetal tissue.

II. Guidelines for Research Using Human Pluripotent Stem Cells

1. Utilization of Human Pluripotent Stem Cells from Human Embryos
    a. NIH Submission Requirements for Intramural and Extramural Researchers
        i. Assurance signed by the responsible institutional official that the cells were derived in accordance with the guidelines
        ii. Sample informed consent document with patient identifier removed
        iii. Abstract of protocol used to derive cells from the embryo
        iv. IRB Approval
        v. Assurance that the cells were donated or that any payment made does not exceed reasonable costs of processing cells
        vi. Title of research proposal
        vii. Assurance that the proposed research is not ineligible for NIH funding
        viii. PI written consent that the materials submitted can be disclosed for purposes of review

    b. Conditions for Utilization of Human Pluripotent Stem Cells from Embryos
        i. Embryonic stem cells can only be studied if the embryos were created for the purpose of fertility treatment and are in excess of clinical need
        ii. No financial or other inducements should have been offered for donating embryos
        iii. Clear separation between the decision to create and embryo and the decision to donate an embryo for research
        iv. Cells should only have been derived from frozen embryos
        v. The embryo should have been donated without direction or restriction of the potential recipient of stem cells
        vi. Informed consent requirements need to include the following statements:
            1. That embryos will be used to derive pluripotent stem cells, may include transplantation research
            2. That the donation is made without restriction or direction as to the potential recipients of cells
            3. Whether or not identifiers will be removed prior to derivation of stem cells
            4. That cells/cell lines may be kept for many years
            5. That despite the possibility of commercial potential, there will be no financial reimbursement or other benefits to donors
            6. That research is not intended to provide direct medical benefit to donors
            7. That embryos will not be transferred to uterus, and will not survive derivation process

vii. IRB approval

2. Utilization of Human Pluripotent Stem Cells from Fetal Tissue
    a. Submission Requirements for Intramural and Extramural Researchers
        i. Assurance signed by the responsible institutional official that the fetal cells were derived in accordance with the guidelines.
        ii. Sample informed consent with patient identifier removed
        iii. Abstract of protocol used to derive cells from the fetal tissue
        iv. IRB Approval
        v. Assurance that the cells were donated or that any payment made does not exceed reasonable costs of processing cells
        vi. Title of research proposal
        vii. Assurance that proposed research is not ineligible for NIH funding
        viii. PI written consent that the materials submitted can be disclosed for purposes of review
    b. Conditions for Utilization of Human Pluripotent Stem Cells from Fetal Tissue
        i. Stem cells from fetal tissue may be derived as well as utilized using federal funds under federal statute 42 U.S.C. 289g-2(a) and federal regulation 45 CFR 46.210
        ii. Informed consent requirements need to include the following statements
            1. That fetal tissue will be used to derive pluripotent stem cells, and may include transplantation research
            2. That the donation is made without direction or restriction as to the potential recipients of cells
            3. Whether or not identifiers will be removed prior to derivation of stem cells
            4. That cells/cell lines may be kept for many years
            5. That despite possibility of commercial potential, there will be no financial reimbursement or other benefits to donors
            6. That the research is not intended to provide direct medical benefit to donors
        iii. IRB approval

3. Areas Not Eligible for Research Funding

    a. Derivation of stem cells from embryos
    b. Research in which stem cells are used to create human embryo
    c. Research using stem cells that were derived from human embryos created for research purposes, rather than fertility treatment
    d. Research where stem cells are derived using somatic cell nuclear transfer
    e. Research using stem cells that were derived by somatic cell nuclear transfer
    f. Research where stem cells combined with an animal embryo
    g. Research where stem cells are used in combination with somatic cell nuclear transfer for purposes of reproductive cloning of a human

4. Oversight by NIH

    a. The NIH Human Pluripotent Stem Cell Review Group (HPSCRG) will be established to review compliance with Guidelines, and to hold public meetings to review proposals for using newly derived line of stem cells or deriving new stem cell line from fetal tissue.

b. All new or competing continuation or competing supplement applications will be reviewed by HPSCRG and a Scientific Review Group. Requests for use of existing funds, administrative supplements or intramural proposals will also be reviewed by HPSCRG.
c. The NIH will compile a yearly report regarding all applications reviewed
d. HPSCRG will recommend to the NIH any revisions to the Guidelines and the need for any policy conferences.

For more information on the Guidelines and stem cells, see the NIH web site

###

Advocacy and Patient Groups Welcome New Stem Cell Research Guidelines
08/23/2000

Washington, D.C. - A coalition of more than 25 patient and health advocacy groups praised the release today of the National Institutes of Health Guidelines for Research Involving Human Pluripotent Stem Cells, hailing them as a major step toward finding the cure and treatment for many diseases. The Guidelines, which will enable federally-funded scientists to conduct research on human embryonic stem cell lines, were welcomed by such groups as the American Society for Cell Biology, the Juvenile Diabetes Foundation, the Michael J. Fox Foundation for Parkinson's Research, the Alliance for Aging Research, the National Health Council, the American Association for Cancer Research, and the Federation of American Societies of Experimental Biology. The entire list follows:

- Alliance for Aging Research
- The ALS Association
- American Association for Cancer Research
- American Medical Association
- American Pediatric Society
- American Society for Cell Biology
- American Society of Human Genetics
- Association of American Medical Colleges
- Association of Medical School Pediatric Department Chairs
- Canavan Research Fund
- Christopher Reeve Paralysis Foundation
- Coalition of Advocates for Research on the Eye (CARE)
- Colorectal Cancer Network
- The Endocrine Society
- Federation of American Societies for Experimental Biology
- International Myeloma Foundation
- Juvenile Diabetes Foundation International
- Lankenau Institute for Medical Research
- Memorial Sloan Kettering Cancer Center
- Michael J. Fox Foundation for Parkinson's Research
- National Health Council
- Patients'CURe
- Project A.L.S.
- PXE International, Inc.
- Research!America
- Society for Pediatric Research
- University of Minnesota

"The discovery of human pluripotent stem cells, the most basic building blocks of the human body, is a major scientific breakthrough, the full value of which cannot be overstated," said Nobel Laureate Paul Berg, Ph.D., on behalf of the American Society for Cell Biology. Stem cells have the capability to give rise to many different types of cells in the body such as muscle, nerve, heart and blood cells and can be potentially used to create new, healthy tissue to replace dead or damaged tissue. Research in this area could result in new treatments of and cures for many of humanity's most devastating illnesses, including Alzheimer's, ALS, heart disease, cancer and diabetes.

"Stem cell research offers one of the most promising avenues to finding a cure for my daughter and for all children with life-threatening diseases," said Lyn Langbein, mother of a five-year-old daughter, Jamie, with juvenile diabetes. "With a disease like diabetes, the greater the chances of developing devastating complications like blindness, kidney failure, amputations, heart attack and stroke. I want to find a cure before Jamie suffers from any of these and I'm very hopeful that stem cell research will be a significant part of that cure."

The NIH released its draft version of the guidelines for public comment last December. "We commend the NIH for the careful, thoughtful and deliberate way in which these guidelines were developed, and the opportunity for the public to comment and be heard in the process," said Paul Berg. "We believe that these guidelines will enable this critical research to advance while providing oversight and a high standard of accountability to this complex and ethically challenging area of science, both in the public and private sectors."

The federal government's role in funding and overseeing this type of research is considered highly important by a vast majority of the public. A May 1999 survey by the Opinion Research Corporation found that three out of four Americans support funding stem cell research through the NIH. The release of the NIH guidelines meets this mandate by expanding government involvement and public access to this groundbreaking research, and ensuring appropriate federal oversight and standards through a Human Pluripotent Stem Cell Review Group. The group will be charged with oversight of the guidelines and review of grant applications.

Despite general support of the guidelines, ASCB and other advocacy groups had urged modifications that did not emerge in the final document. Nonetheless, scientific and patient groups are enthusiastic about the release of the guidelines, which allow federally funded scientists to move forward with vitally needed research on embryonic stem cells.

The American Society for Cell Biology represents 10,000 basic biomedical researchers across the country and throughout the world and has been helping to lead the advocacy effort for federally funded stem cell research.

Contact: Kevin Wilson (301) 347-9300

Press Conference - Statement by Dr. Paul Berg Regarding the NIH Stem Cell Guidelines
08/23/2000

Good afternoon, I am Paul Berg of Stanford University. I am speaking today as the Chair of the American Society for Cell Biology Public Policy Committee.

Today, the National Institutes of Health have released the Guidelines for Research Involving Human Pluripotent Stem Cells (PSCs). Their release will enable federally funded scientists to conduct life-saving research using human PSC cell lines. We believe that this research can teach us how to treat disease and disability in wholly new ways. We may envision the creation of new, healthy tissue to replace damaged or dead tissue: for example, bone marrow for the treatment of cancer and other hematopoietic diseases such as sickle cell anemia and thalassemia; pancreatic cells for alleviating diabetes, and neuronal cells for treating Parkinson's disease, Alzheimer's and various forms of brain and spinal cord disorders. We believe that the NIH guidelines will enable this critical research to advance without violating the moral and ethical sensibilities of the American people.

In the 1970's, I and others fought then, as we do now, to put in place a system whereby research using this new technology would be reviewed to assure that it was conducted appropriately and safely. The forward thinking of the NIH then, with regard to Recombinant DNA technology, led to the explosive growth of molecular genetics we now refer to as the "Genetic Revolution." A most important consequence was the birth of modern biotechnology and the initiation of the Human Genome Project. The NIH's proposed review system for stem cell research will, we believe, lead to comparable breakthroughs.

Some have argued that this research is "immoral, illegal and unnecessary." I respectfully disagree on all counts.

First, I believe it would be immoral not to pursue PSC research, within the bounds of these guidelines, given that this research has the potential to save human lives. What greater morality exists than doing all we can to help those individuals whose lives are embattled by disease and disability?

Second, the charge that the NIH has acted illegally is unfounded. The Labor, Health & Human Services and Education Appropriation bills have restricted embryo research for the last several years. However, they are silent about the use of PSCs. PSCs are not embryos and by themselves can not develop into an embryo. The Guidelines prohibit the use of NIH funds to create embryos for experimental purposes and they set specific criteria governing the sources from which ES cells can be obtained.

Third, the argument that PSC research is unnecessary because stem cells derived from adult tissues would suffice is ill informed and certainly premature. We are all encouraged by the recent reports of the plasticity of certain types of adult stem cells but this line of

research is still in its infancy. For example, we know little about their availability, their differentiation potential or their ability for prolonged culture outside the body. While we strongly support continued research on adult stem cells, it is far too early to pursue that line at the expense of research with ES cells. We can ill afford the luxury of proceeding with these promising technologies in series. We owe it to those who are in need to explore all possible avenues that could lead to a cure.

Great Britain has already approved the use of PSCs and is considering what is not permitted by the NIH Guidelines, i.e., allowing researchers to create embryos for the purposes of establishing PSC lines. Are the English less moral or ethical than we? Are they less sensitive of the sanctity of life? I think not. They have chosen to use sources for stem cells that are sanctioned by law and medical practice in order to save lives and reduce suffering of the living.

Along with others in the scientific and patient advocacy community, we endorse the NIH stem cell guidelines and are ready to abide by them in order to move this research forward. A critical element of the proposal is that the federal government will oversee the production and uses of ES cells in federally-funded research and thereby circumvent exclusive access to this technology by private and commercial entities. This gives the government more effective control over standards for access to and use of stem cells and allows public debate and input into the appropriate uses of this important scientific opportunity."

I'll be happy to take questions after the others have given their statements.

For ASCB information, contact:
Kevin Wilson, Director of Public Policy, ASCB, (301) 347-9308.

Talking Points - Embryonic Stem Cell Research
04/01/2001

First in an occasional series of pocket-sized issue papers from the American Society for Cell Biology, April 2001.

Click the link below to download the PDF file.

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Talking Points - Fetal Tissue Research
04/01/2001

Second in an occasional series of pocket-sized briefing papers from the American Society For Cell Biology, April 2001.

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Careers and Rewards in Bio Sciences
04/01/2001

Careers and Rewards in Bio Sciences: the disconnect between scientific progress and career progression.

Supported by a Grant from the Alfred P. Sloan Foundation.

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Testimony on Stem Cell Research Before the Senate Committee on Health, Education, Labor and Pensions
09/05/2001

Presented by Douglas Melton, Ph.D.

Thomas Dudley Cabot Professor in the Natural Sciences at Harvard University
Investigator in the Howard Hughes Medical Institute
September 5, 2001

Good afternoon Chairman Kennedy, Senator Gregg and other distinguished members of the Committee. It is my pleasure to appear before you today to speak about human embryonic stem cells.

Mr. Chairman, before I begin my remarks on stem cells, I want to take this opportunity to thank you and the other members of this subcommittee for your leading role in supporting the NIH. I thank you on behalf of the nation's scientists who work to understand the basic principles of life and to cure human disease.

In the last three years, and increasingly so in the past few months, the potential of human embryonic stem cells has been widely debated in the public and rightly so. This subject forces us all to revisit the question of when life begins. We have to scrutinize the crossroads between scientific inquiry, our efforts to improve the human condition, and our moral and ethical responsibilities to preserve human dignity. Not surprisingly, a subject that combines the science of life's beginnings with politics and religion has captured the nation's attention. Indeed, this topic was recently the subject of President Bush's excellent speech on 9 August.

I am not here to testify on the moral, religious or political aspects of human embryonic stem cell research. I appear before you as a scientist and as the father of young boy with Type I or juvenile diabetes. I will furthermore not speak to you about the human burden of this disease, but simply say that I work on human embryonic stem cells with the aim of providing a cure for diabetes. My remarks today will be confined to the scientific potential of human embryonic stem cells and the implementation of the President's plan.

While I'm certain the committee is well aware of the potential uses for human embryonic stem cells, allow me to briefly put this research in context. In the last century, biologists showed that genes are the units of development and heredity, discovered that genes are made of DNA, and recently completed sequencing the DNA that comprises the human genome, that is, sequencing the DNA of all human genes. This monumental achievement will stand as one of the most important scientific triumphs from the last century. Knowing the sequence of DNA allows scientists to uncover the basis for development, heredity and disease and challenges us to understand how the code of life is read or interpreted. At the same time, this enduring achievement should not cause us to forget that the unit of life is not DNA nor the gene, but rather the unit of life is the cell. Cells are alive and reproduce and among cells, stem cells are unique. Embryonic stem cells are

special because they can reproduce to make more of themselves and they have the remarkable capacity to make any kind of cell in the body. One might think of them as the fire hydrant of all cells, having the capacity to renew or replenish lost cells and tissues. Understanding how these cells can duplicate themselves and how they specialize to make all types of cells will undoubtedly reveal important insights into human biology and disease.

The ability of stem cells to specialize or differentiate into any kind of cell is what holds their enormous therapeutic promise. Many of the diseases that currently plague our society are diseases of cellular deficiency, diseases in which one particular cell type is missing or defective. These diseases include Parkinson's, Alzheimer's, osteoporosis, some cancers and the one that has my full attention, juvenile diabetes. It has been estimated that as many as one hundred million Americans are affected by these diseases. Stem cells have the potential to replace the missing or deficient cells and it follows that the nation's scientists and those suffering from diseases are anxious to aggressively pursue this research. I should like to note that while embryonic stem cells have a much broader potential for growth and differentiation than do adult stem cells, research on both adult and embryonic stem cells is warranted; it's too early to know which type of stem cell will be most useful. Whereas the last century of biology can be said to have focused on the gene and the sequence of DNA, I believe this century will see biologists come to understand and harness the unit of life, the cell, specifically stem cells.

President Bush's plan for sixty embryonic cell lines

President Bush has made clear his commitment to support research on human embryonic stem cells, highlighting the importance of this research. The President's plan provides the opportunity to advance embryonic stem cell research in the US, at least for a few years, and as such his plan marks an important commitment. The Honorable Tommy Thompson has worked diligently for this research and his continued leadership will be critical in moving forward with the President's plan.

For this field the date of the President's speech, 9 August 2001, is important because only stem cell lines in existence at that time, estimated to be about sixty, are eligible for federal support. This date was not chosen for scientific reasons and its arbitrary selection will have an effect on the progress of research. For example, it will not be possible for federally funded researchers to explore new ways to derive human embryonic stem cells nor work with cells that have been isolated without possible contamination from mouse or other supporting cells. Nevertheless, it is now possible for the nation's researchers to initiate studies on how embryonic stem (ES) cells differentiate and we can begin to explore their therapeutic potential.

Looking ahead to how the plan will work, I turn to two issues: the quality of the sixty cell lines and their access or availability.

Quality of the human embryonic stem cell lines

Scientists are, by their nature, inquisitive and skeptical and we hold dear the practice of publishing results following an independent review by qualified experts. Moreover, by

publishing results, scientists generally agree that the reagents reported, including cells, are available to be shared with the research community. In this way results can be independently verified and new directions and discoveries can be explored. In the present case, only a handful of the sixty+ embryonic cell lines have been published so it is not yet possible to evaluate or comment on the quality of cells. Nonetheless, legitimate scientific questions about the growth, differentiation potential, age, and purity of the lines must be considered. Decades of experience with mouse embryonic stem cells have shown that ES cells can lose their differentiation potential, become contaminated, accumulate mutations, and tend toward spontaneous or uncontrolled differentiation. The fact that mouse ES cells lose their full potential with increasing age or passage number is only one reason to believe that the sixty+ cell lines will not be sufficient for the years of research required to investigate therapies with these cells. Looking ahead to clinical applications, including transplantation and the problem of immunological rejection, there will certainly be a need for broader genetic diversity of cell lines. There may also be a need for cell lines that have been isolated without the use of mouse feeder layers.

I hasten to add that I am not criticizing the NIH nor the scientists who have reported the isolation of the sixty human embryonic stem cell lines. Indeed, the scientists have not published their work and they may well wish to further characterize the cells before doing so. It is therefore too early to tell how many of the sixty+ lines are truly useful embryonic stem cell lines. Preliminary indications from press reports do suggest that the final number will be significantly less than sixty. If the available lines have been grown extensively and have a high passage number that will further reduce their value.

Availability

A separate issue concerns whether the cell lines will be made available to federally funded researchers in a timely manner and without restrictions on their use for research. It is noteworthy that most of the entities that have isolated the sixty+ human embryonic stem cell lines are companies with proprietary and commercial interests. In addition, there are relevant patents on some of the cells that may further restrict their distribution and use. Experience shows that the negotiation of transfer from those who own a reagent to federally funded scientists can be slow, expensive, and sometimes accompanied by onerous restrictions on use. It is obvious that the legitimate interests of companies may not coincide with scientist's research plans or our nation's public health policy.

I believe this problem of access is likely to be quite serious. The NIH plan to create a registry of cells will leave it to individual investigators to negotiate for transfer of the cells. This places a heavy burden on researchers and one can anticipate, at a minimum, significant delays. In some cases the terms of the transfer may be too restrictive to allow scientists access to the material. Finally, I note that some of the potential suppliers have already indicated that they lack the resources and incentive to prepare their cells for distribution.

Create a federal repository for human stem cells

I would like to suggest a plan that addresses both of these issues. Specifically, I suggest that the NIH create a repository, not a registry, for the sixty+ embryonic cell lines. The

NIH could collect the cell lines, determine their quality, and certify them for distribution to qualified researchers. Equally important, this plan would have the NIH negotiate favorable terms with the suppliers, set out in a Material Transfer Agreement, so that scientists could use the cells for research purposes. The Federal government and the NIH are in an immeasurably stronger position than are individual investigators to obtain the human embryonic stem cell lines from suppliers, verify their quality, and arrange for their distribution.

Summary

In conclusion, Mr. Chairman, I think that President Bush and Secretary Thompson have proposed a plan that will allow federally supported scientists to begin to explore the potential of human embryonic stem cells and work towards a cure for numerous diseases. This is a very important step forward. If my remarks today seem cautious, the reason is the uncertainty about the quality, availability and longevity of the cells. Assuming that some of the sixty cell lines are made available, federally supported scientists can work to understand how these cells can be directed to differentiate. As the studies progress to the point where clinical applications can begin, I expect the plan will have to be revisited because the viability or utility of the sixty+ cell lines will have been exhausted.

In closing, I thank you and Committee once again for the privilege of speaking to you about this important area of biology.

###

A Better Anthrax Vaccine Ready for Human Testing
10/30/2001

Bethesda, MD. - A new, less-toxic and longer-lasting vaccine against anthrax is ready for clinical trials, say researchers from the Center for Biotechnology at Jawaharlal Nehru University in New Delhi, India. The team, led by Rakesh Bhatnagar, created harmless mutant forms of the three key proteins that together make anthrax fatal. The researchers bioengineered the anthrax proteins so that they could be expressed in safer hosts to produce immunogens for the new vaccine. In abstracts submitted for presentation to the Annual Meeting of the American Society for Cell Biology to take place in December, Bhatnagar reports scaling up the original experimental bioreactor to a near industrial-sized unit that can manufacture enough vaccine for upcoming human trials.

Anthrax toxin complex, which is responsible for the most dangerous effects of the disease, consists of three proteins: protective antigen, lethal factor and edema factor. Individually, the proteins are non-toxic. However, combining the protective antigen with lethal factor creates lethal toxin. Mixing protective antigen plus edema factor creates an edema toxin, which causes swelling and redness of the skin.

Protective antigen is the central component of anthrax toxin. This antigen binds to cell-surface receptors and mediates the entry of the other two components into the cell cytosol. It is also the main immunogen of the vaccine against anthrax. Including trace amounts of lethal factor and edema factor in the vaccine improves its efficacy.

Bhatnagar and his colleagues introduced mutations into all three proteins of the anthrax toxin complex, rendering them non-toxic. They then studied these mutated proteins intensively to understand how they act at the cellular level. They concluded that the mutant proteins were excellent candidates for an anthrax vaccine. The mutations made the proteins non-toxic but did not affect their distinctive molecular shapes, which are required to generate protective antibodies.

The anthrax vaccine currently used for immunization causes many side effects and requires booster doses, according to Bhatnagar. To create an improved vaccine, his lab introduced the genes for the mutated proteins into relatively safe host organisms. Expressed in quantity by their bioengineered hosts, the mutant proteins were then purified to homogeneity to ensure that reactivity and side effects of the vaccine were minimized.

Once they were confident that they could overexpress the protective antigens on a laboratory scale, Bhatnagar's team took the production to industrial scale with only a 5-liter capacity fermenter that can now produce approximately 5 grams of protective antigen per liter. One gram of this product can supply millions of vaccine shots. This antigen will soon undergo clinical trials, says Bhatnagar. Mass immunization with a safe and effective anthrax vaccine could thwart the attempts of terrorists to use anthrax as a biological warfare agent.

Dr. Bhatnagar will present three abstracts on his anthrax vaccine work at the Annual Meeting of the American Society for Cell Biology, on Tuesday, December 11 at the Washington Convention Center in Washington, D.C. He will also be available to the press at the ASCB's annual Press Conference, on Monday, December10 at 3:30 PM in the Convention Center.

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###

Discoverers of Ubiquitin System to Receive the ASCB's Top Scientific Medal
07/16/2002

Bethesda, MD. - It was named ubiquitin because the tiny protein is found in all organisms, even if its purpose was a mystery. It took the separate but complementary discoveries of researchers Avram Hershko and Alexander Varshavsky to reveal that this ubiquitous molecule is critical to nearly every significant activity in the cell. Ubiquitin is now the subject of one of the most important fields in medical research, as scientists strive to understand the role of ubiquitin in many human diseases, including cancer and neurodegenerative disorders.

For their discovery of the ubiquitin system and its crucial functions, the American Society for Cell Biology will present the E.B. Wilson Medal, the Society's highest scientific honor, to Varshavsky and Hershko, on December 15 in San Francisco, during the 42nd ASCB Annual Meeting.

Hershko, 64, is Distinguished Professor of Medicine at the Technion-Israel Institute of Technology, in Haifa, Israel. Varshavsky, 55, is the Smits Professor of Cell Biology at the California Institute of Technology, in Pasadena.

Tiny but powerful, ubiquitin keeps order in the cell by tagging unnecessary proteins for destruction. Hershko uncovered ubiquitin's role in protein degradation and delineated the ubiquitin conjugation pathway by which a healthy cell regulates the degradation of its proteins. In the meantime, while at MIT, Varshavsky studied ubiquitin conjugates in chromosomes. With Daniel Finley and Aaron Ciechanover, he was able to demonstrate that ubiquitin was essential for protein degradation in living cells essential for cell growth and division. Diseases as different as cancer and arthritis are, at least in part, defects in cell division.

Both medalists were refugees. Hershko was born in Hungary in 1937. His father was sent to one concentration camp, Avram and his mother to another. Amazingly, father, mother and son were reunited after the war. The family emigrated to Israel when Avram was 13. Hershko earned his medical degree at the Hebrew University-Hadassah Medical School and served as a doctor in the Israeli Defense Forces before returning to Hebrew University to earn his Ph.D. in 1969. He worked as a postdoctoral fellow with Gordon Tompkins at the University of California, San Francisco and returned to Israel to join the faculty of Technion in 1972.

Varshavsky was born in Moscow in 1946, earning his B.S. in Chemistry at Moscow University in 1970 and his Ph.D. in Biochemistry at Moscow's Institute of Molecular Biology in 1973. He managed to escape from the Soviet Union in 1977 by attending a scientific meeting in Finland, from which he made his way via Sweden to the American Consulate in Frankfurt. Having briefly met the American Nobel Laureate David Baltimore years before, Varshavsky was able to reach Baltimore, who helped Varshavsky procure a visa to the U.S. In America, Varshavsky became an assistant professor at MIT, rising to full professor by 1986. Varshavsky moved to Caltech in 1992.

For their basic research on ubiquitin, Varshavsky and Hershko have received many of the top international prizes in biology and medicine, including the Gairdner Award (1999), the General Motors Sloan Prize (2000), the Lasker Award (with Aaron Ciechanover in 2000), the Wolf Prize (2001), and the Horwitz Prize (2001).

The ASCB's E.B. Wilson Medal, named for an early 20th century pioneer of American biology who advocated the chromosomal theory of inheritance, is awarded by scientific peers to those who have made highly significant and far-reaching contributions to cell biology over the course of a career.

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Nobel Laureate Eric Wieschaus to Give Porter Lecture at Cell Biology Annual Meeting

07/16/2002

Bethesda, MD. - Nobel laureate and Princeton biologist Eric Wieschaus will give the Keith Porter Lecture at the 42nd Annual Meeting of the American Society for Cell Biology in San Francisco on December 17. The ASCB Annual Meeting is the largest and most influential gathering of biology researchers in the world.

Wieschaus, 55, won the 1995 Nobel Prize in Physiology with his collaborator, Christiane Nüsslein-Volhard of the Max Planck Institute in Tübingen, Germany, for their pioneering work on the genetic control of early embryonic development, and with Edward Lewis of Caltech for his earlier work on homeotic genes. At the European Molecular Biology Lab (EMBL) in Heidelberg, Germany in 1980, Wieschaus and Nüsslein-Volhard were the first to identify all the genes involved in a fundamental biological process. To find these genes in the fly drosophilia, they devised a "saturation mutagenesis screen," a process that first induced mutations in tens of thousands of fly embryos. Wieschaus and Nüsslein-Volhard developed an unprecedented technique to identify all the genes in early pattern formation. The subsequent discovery that the human embryo was controlled by the same genes brought Wieschaus and Nüsslein-Volhard's discovery into international prominence.

Born in South Bend, Indiana, Wieschaus grew up in Birmingham. He graduated magna cum laude from Notre Dame in 1969 and earned his doctorate at Yale in 1974. In 1975, Wieschaus began a post-doctoral fellowship at the University of Zurich before his appointment in 1978 to the new European Molecular Biology Lab in Heidelberg. There he teamed with Nüsslein-Volhard on the embryo development work that would lead to their Nobel Prize.

Wieschaus returned to the United States in 1981 to join the Molecular Biology department at Princeton and was made full professor in 1987. He lives in Princeton, New Jersey, with his wife, the German-born biologist and fellow Princeton professor Gertrud Schupbach. They have three daughters.

Wieschaus will deliver his Porter Lecture on Tuesday, December 17, at the Moscone Convention Center in San Francisco during the 42nd Annual Meeting of the ASCB.

For ASCB information, contact:
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###

MIT's Harvey Lodish Elected to the ASCB Presidency in 2004
07/16/2002

Bethesda, MD. - Harvey F. Lodish, 60, researcher at the Whitehead Institute and Professor of Biology at MIT, was elected President of the 10,000-member American Society for Cell Biology for the year 2004. He will succeed Suzanne Pfeffer of Stanford University as the ASCB's 43rd President.

Lodish became a member of the MIT faculty in 1968, a full Professor in 1976, and a founding member of the Whitehead Institute in 1982. He was a founder of the biotech company, Genzyme. From an initial interest in biosynthesis of plasma membrane glycoproteins, Lodish's research has expanded to include discoveries in fundamental cell processes such as the formation of hematopoietic stem cells and intracellular signal transduction by the erythropoietin, TGF-ß, and insulin receptors. He is exploring fatty acid transport proteins and a hormone secreted by fat cells that increases fatty acid and glucose metabolism in muscle.

Lodish finished his Ph.D. at Rockefeller University under Norman Zinder in 1966 and did a post-doctoral fellowship with Sydney Brenner and Francis Crick at the MRC Laboratory in Cambridge, England, before moving to Cambridge, Massachusetts, to join MIT. Lodish is a member of the National Academy of Sciences and a fellow of the American Academy of Arts and Sciences. He is the lead author of the widely-adopted textbook, Molecular Cell Biology, which he is updating for a fifth edition.

The ASCB membership also re-elected Lawrence Goldstein of the University of California at San Diego as Secretary and elected five members to the ASCB Council: Anthony Bretscher of Cornell University, F. Alan "Rick" Horwitz of the University of Virginia, Kathryn Howell of the University of Colorado Health Sciences Center, Jean Schwarzbauer of Princeton University, and Janet Shaw of the University of Utah.

Born in Cleveland in 1941, Lodish went to Kenyon College in Gambier, Ohio, on scholarship as did his younger brother, Leonard, now a professor at the University of Pennsylvania's Wharton School of Business. Harvey Lodish has been on the Kenyon Board of Trustees since 1985.

Harvey Lodish married Pamela Chertow in 1963 and they have three grown children, Heidi, Martin, and Stephanie, plus four grandchildren. Lodish is an avid hiker who has "summited" on all 68 New England peaks over 4,000 feet.

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###

Letter to House Appropriations Committee Regarding NIH Funding
09/13/2002

The Honorable C.W. "Bill" Young
Chairman
House Appropriations Committee
H-218 Capitol
Washington, DC 20515

Dear Chairman Young:

The American Society for Cell Biology represents over 10,000 basic biomedical researchers across the United States and around the world. When the House Appropriations Committee begins to mark-up the fiscal year 2003 Labor, Health & Human Services and Education Appropriations bill, the ASCB urges that the Committee provide funding for the National Institutes of Health (NIH) consistent with the commitment made by Congress and supported by both President Clinton and President Bush to double the NIH budget in five years. Congress has been true to that commitment for the last four years and it is critical that it follow through on that promise in this fifth and final year.

As you know, the Fiscal Year 2002 budget for the NIH is $23.285 billion. While this was 14.7% more than the previous year, it was below the amount that was recommended to achieve a doubling of the budget in five years. In his budget request for Fiscal Year 2003, President Bush asked Congress to provide $27.3 billion for the NIH. This 16% increase, if approved by the House and Senate, would complete this goal.

Even before the terrorist attacks on the United States last fall, the work of the NIH was critical to the lives of people all over the world. Efforts by the NIH and NIH-funded researchers through the nation to unlock the mysteries of the human genome will provide medical science with the ability to understand and treat the cause of disease.

Now that biology has been turned against us as a weapon of war, the work of the NIH and NIH-funded scientists all over the United States is even more critical than ever. The development of improved methods of detection of anthrax and other deadly viruses advances in diagnostic methods and, ultimately, treatment methods are all part of the important work of the NIH. We are deeply indebted for the support of the House Appropriations Committee, and the full House of Representatives that has enabled great advances in biomedical science and respectfully urge the Committee to approve funding for the National Institutes of Health of $27.3 billion in Fiscal Year 2003 to complete the five-year doubling plan.

Sincerely,
Paul Berg, Chair
Public Policy Committee

###

Werb Elected ASCB President for 2005
11/01/2003

Bethesda, MD. - Members of the American Society for Cell Biology have elected Zena Werb of the University of California, San Francisco, President for 2005. Werb will serve as President-Elect next year, becoming the Society's 45th President on January 1, 2005. Werb will succeed Harvey Lodish of the Whitehead Institute and the Massachusetts Institute of Technology.

Also elected to three-year terms on the ASCB Council were Juan Bonifacino of the National Institute of Child Health and Human Development at NIH, Peter Devreotes of Johns Hopkins University, Linda Hicke of Northwestern University and Daphne Preuss of the University of Chicago.

44% of the Society's eligible voters participated in the election.

Long a champion for increased opportunities for women scientists, Werb will step down as head of the ASCB's Women in Cell Biology Committee to take up her new post. She has been an ASCB member since 1976 and active over the years in virtually every area of the Society's activities including publications, public policy and meeting programs.

Born in Europe in the chaotic closing days of WWII, Werb immigrated with her family to Canada in 1948. She earned her B.Sc. (Honours) in Biochemistry and Physiology from the University of Toronto in 1966 and her Ph.D. in Cell Biology from Rockefeller University in 1971. Werb joined the faculty at UCSF in 1976 and became a full Professor in the School of Medicine in 1983.

With over 10,000 members, the ASCB is the nation's leading voice for education and research in cell biology. Its Annual Meeting, which is widely considered to be the world's most influential annual conference in cell biology, will be held December 13-17, 2003 in San Francisco's Moscone Convention Center.

For ASCB information, contact:
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Cell Biologists Oppose United Nations Ban On Cloning Research
11/05/2003

Bethesda, MD. - The American Society for Cell Biology, consisting of 11,000 basic biomedical researchers in the United States and 45 other countries around the world, opposes the resolution before the United Nations' General Assembly that would lead to a world-wide ban on a valuable scientific and medical procedure called somatic cell nuclear transfer.

The ASCB does support a second resolution being considered that calls for a ban on reproductive cloning. Since 1997, the American Society for Cell Biology has strongly opposed the reproductive cloning of human beings. Despite politically motivated claims, current scie ntific research suggests that the technology now available will not enable the creation through cloning of a healthy human being or an embryo capable of being born as a healthy human.

There is, however, substantial scientific evidence indicating that somatic cell nuclear transfer, sometimes called therapeutic cloning, will play a significant role in the fight against some of the most debilitating illnesses known to humankind. New stem cell lines, produced by using the patient's own genetic material to generate patient-specific stem cells, may provide the potential for stem cell therapies for diseases including heart disease, cancer, diabetes, AIDS, spinal cord injury, and Parkinson's disease, and avoid the complication of rejection. "Stem cell research is an essential first step if we are ever to be able to achieve the promise of regenerative medicine, a wholly new approach for repairing cells and tissues in the treatment of currently intractable human diseases," said Dr. Larry Goldstein, Vice Chair of the American Society for Cell Biology Public Policy Committee.

In addition to the therapeutic promise, somatic cell nuclear transfer permits entirely new approaches to the study of how a single cell is transformed into the trillions of different cells and tissues with myriad fates and capabilities, and how these cells fail in disease. By generating embryonic stem cells with defined mutations , scientists gain a new approach to understanding how inherited predispositions lead to serious disease.

Current science also demonstrates that research on all types of stem cells is critical for rapid progress. Despite ill-informed oppos ition, there is no credible scientific basis for the claim that research on human adult stem cells can replace research on human embryonic stem cells, or vice versa. There is strong evidence that stem cells derived from human blastocysts (embryonic stem cells) have potential for treating and understanding many different diseases for which there is no solid evidence that adult stem cells can substitute. "In fact, adult stem cell researchers are among the strongest supporters for the need for embryonic stem cell research," said Goldstein.

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ASCB Education Committee Names Nancy Hutchison as Bruce Alberts Award Winner

12/01/2003

Bethesda, MD. - Nancy Hutchison, a Staff Scientist at the Fred Hutchinson Cancer Research Center in Seattle, Washington, has been named the 2003 winner of the Bruce Alberts Award for Excellence in Science Education by the American Society for Cell Biology.

Dr. Hutchison serves as director of the Science Education Partnership (SEP), a program she co-founded at the Fred Hutchinson Center in 1991. The SEP is a professional development program for secondary school science teachers throughout the state of Washington. In 1999, she helped to found HutchLab, a sister program to expose high school students to biomedical research at the Fred Hutchinson Cancer Research Center.

“Neither of these remarkable and effective partnerships would have been possible without Dr. Hutchison's pioneering vision and leadership,” says ASCB Education Committee Chair Kenneth Miller. “Dr. Hutchison's work with HutchLab and the SEP is a perfect example of the way in which basic science can strengthen science education. By linking the technical and human resources of one of the nation's great science centers to the continuing education of young people, Dr. Hutchison has set a powerful example of how scientists can encourage and nurture the next generation of researchers.”

Hutchison will receive the Alberts Award at the ASCB Annual Meeting to be held December 13-17, 2003 in San Francisco’s Moscone Convention Center. With 10,000 members, the ASCB is the nation’s leading voice for education and research in cell biology.

For ASCB information, contact:
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###

Cell Biologists Caution United Nations Against Compromising Important Biomedical Research

12/05/2003

Bethesda, MD. - The American Society for Cell Biology, consisting of 11,000 basic biomedical researchers in the United States and 45 other countries around the world, strongly opposes a United Nations resolution that would prohibit valuable stem cell research needed to understand and treat disease. The Society remains supportive of the resolution introduced in the U.N. earlier this year that would ban reproductive cloning but allow stem cell research to continue.

Since 1997, the American Society for Cell Biology has strongly opposed the reproductive cloning of human beings. Despite politically motivated claims, current scientific research suggests that the technology now available will not enable the creation through cloning of a healthy human being or an embryo capable of being born as a healthy human.

There is, however, substantial scientific evidence indicating that somatic cell nuclear transfer, sometimes called therapeutic cloning, will play a significant role in the fight against some of the most debilitating illnesses known to humankind. New stem cell lines, produced by using the patient's own genetic material to generate patient-specific stem cells, may provide the potential for stem cell therapies for diseases including heart disease, cancer, diabetes, AIDS, spinal cord injury, and Parkinson's disease, and avoid the complication of rejection.

"We condemn efforts to foreclose research efforts that could bring relief to millions of people throughout the world. Ethical concerns must be considered, but those considerations must also include the scientific community's imperative to explore every lead that could alleviate the suffering of the world's peoples," said Nobel Laureate Paul Berg, Chair of the ASCB Public Policy Committee.

"Stem cell research is an essential first step if we are ever to be able to achieve the promise of regenerative medicine, a wholly new approach for repairing cells and tissues in the treatment of currently intractable human diseases," said Dr. Larry Goldstein, Vice Chair of the American Society for Cell Biology Public Policy Committee.

In addition to the therapeutic promise, somatic cell nuclear transfer permits entirely new approaches to the study of how a single cell is transformed into the trillions of different cells and tissues with myriad fates and capabilities, and how these cells fail in disease. By generating embryonic stem cells with defined mutations, scientists gain a new approach to understanding how inherited predispositions lead to serious disease.

Current science also demonstrates that research on all types of stem cells is critical for rapid progress. There is no credible scientific basis for the claim that research on human adult stem cells can replace research on human embryonic stem cells, or vice versa. There is strong evidence that stem cells derived from human blastocysts (embryonic stem cells) have potential for treating and understanding many different diseases for which there is

no solid evidence that adult stem cells can substitute. “In fact, adult stem cell researchers are among the strongest supporters of embryonic stem cell research,” said Goldstein.

“As the United Nations reconsiders efforts to institute a world-wide ban on reproductive cloning, we urge that they carefully avoid precluding or compromising invaluable basic cell biology research with the potential to yield novel therapies and cures for a wide range of diseases,” said ASCB Public Policy Committee member Richard Hynes of MIT.

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Fluorescent Protein Pioneer to Give 2003 Porter Lecture at ASCB Annual Meeting
01/15/2004

Bethesda, MD. -The scientist who honed a glow-in-the-dark molecule derived from a jellyfish into one of biology's sharpest probes will give the Keith Porter Lecture at the 43rd Annual Meeting of the American Society for Cell Biology in San Francisco.

Roger Tsien, a Howard Hughes Investigator at the University of California, San Diego, refined the "green fluorescent protein" (GFP) from the Aequoarea victoria jellyfish into an ingenious scientific instrument. With additional yellow and blue "optical reporter molecules," Tsien's GFP tags are used today to unravel the inner dynamics of living cells in labs around the world, including his own in San Diego where he studies signal transduction in neurons. Tsien's glowing proteins also power "gene chips," the high-throughput screening devices for candidate drugs that are the workhorses of the pharmaceutical industry today. Tsien will give the Porter Lecture, "Breeding Molecules to Spy on Cells," on Tuesday, December 16, at the Moscone Convention Center.

Named for a pioneer of electron microscopy who was one of the founders of the ASCB, the Porter Lecture is a scientific highpoint in the Society's Annual Meeting, widely considered the largest and most influential gathering of biology researchers in the world.

Tsien began his distinguished career in science as a high school winner of the Westinghouse Science Talent Search in 1968. A native of New York City, Tsien, 51, took his undergraduate degree in 1972 from Harvard and his doctorate in 1977 from Cambridge University in England.

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Ohio Native, Science Leader Warns "Creationism" Could Damage State Economy
02/26/2004

Bethesda, MD. - Harvey Lodish, President of the American Society for Cell Biology and an Ohio native son has called on Ohio's governor and the state's Board of Education to reject the latest attempt by anti-evolution "Creationists" to undermine the integrity of Ohio science education. In letters to Governor Bob Taft and to all members of the Ohio State Board of Education, ASCB President Harvey Lodish, a native of Cleveland and a noted researcher at the Whitehead Institute and at MIT, today urged the state's educational leadership to reject an anti-evolution lesson plan proposed by advocates of "Creation Science" for use in Ohio's 10th grade biology classrooms.

"The inclusion of 'Creation Science' in lesson plans in the state of Ohio will damage the reputation and the economy of the state far beyond the classroom," Lodish wrote. "This action would compromise the credibility of public education in Ohio, making it extremely difficult for the state to recruit researchers and companies in modern biology and biotechnology."

This latest struggle over the teaching of evolution in Ohio science classrooms concerns a proposal before the Ohio Board of Education to approve a Creationist lesson plan called "Critical Analysis of Evolution" based on the concept of "Intelligent Design." Lodish described "ID" as the religious doctrine of "Creationism" sailing under another name. By any name, these doctrines are "not science," said Lodish. "The ideas that form the basis of these lesson plans have never been tested by any scientific peer-scrutiny or peer-review. They are religious doctrines. I respect and defend the right of any religious organization to teach these concepts to its followers, but they have no place in a lesson plan in any public school."

The ASCB which has 11,000 members internationally and roughly 300 in Ohio went on record in 2002 during an earlier attempt by Creationists to change Ohio's secondary school biology curriculum. A letter to Governor Taft and the state board by Nobel laureate and ASCB Public Policy Committee Chair Paul Berg of Stanford University and ASCB Public Information Committee member Tom Egelhoff of the Case-Western School of Medicine supported the Ohio board's eventual decision to strengthen biology curriculum guidelines including the teaching of Evolution as the fundamental basis of modern biology. "This latest lesson plan is a desperate end run by Creationists," says Egelhoff, "that threatens the future of Ohio's secondary students and Ohio's long tradition of scientific innovation."

Speaking on behalf of the national ASCB, President Lodish told the Ohio Board of Education, "I urge you to keep religion and science separate and reject the inclusion of these unsound and anti-scientific plans in the education of Ohio students." Lodish was born in Cleveland, attended Cleveland Heights public schools and graduated from Kenyon College in Gambier, Ohio, before pursuing graduate studies at Rockefeller University. Lodish has been on the biology faculty of MIT since 1968 and was a founding member of the Whitehead Institute in 1982. He became president of the ASCB

in January. Lodish maintains ties to his native state as a Member and former Chair of the Advisory Board of the Lerner Research Institute of the Cleveland Clinic and as a Member of the Kenyon College Board of Trustees.

The complete text of ASCB President Harvey Lodish's letter to Governor Taft can be found online.

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Cell Biologists Oppose Removal of Top Scientist
03/02/2004

Bethesda, MD. - The American Society for Cell Biology, a nonprofit organization representing over 11,000 basic biomedical researchers in the United States and 45 other countries, objects to the decision by President Bush to remove world-renowned biologist Elizabeth Blackburn from his Presidential Bioethics Council.

Distinguished cell biologist Elizabeth Blackburn of the University of California, San Francisco, who served as ASCB President in 1998, is one of two members of the President's Council on Bioethics who were terminated from service on the Council with a late Friday afternoon call from the White House. The other member, William May, also supports research.

"In his 2001 speech announcing the creation of the Council, President Bush said the Council would include strong representation from leading scientists. This action significantly undermines the ability of Councilors base its considerations on the foundation of sound science. Even before Dr. Blackburn's dismissal, scientists were heavily outnumbered by nonscientists with strong anti-research ideological views. Now it will be even more unlikely than before that the Council will be able to make informed ethical decisions," said ASCB President Harvey Lodish.

Blackburn had been outspoken in her insistence that the Council consider the moral cost of forgoing potentially lifesaving research, and was frequently at odds with the Council Chairman, Leon Kass, over how the science on this should be presented.

Blackburn said that, "it was only with the initial strong, personal assurances of the Council Chairman, and of the President of the United States himself, that I was persuaded that the voice of science would be heard and integrated into the statements of the Council. I continue to feel that bioethical issues are important to every biologist and worthy of debate."

Blackburn says it is, "I am greatly concerned that reports of the Council failed to rise to the standards of scientifically defensible and intellectually balanced documents, despite the dedicated attempts of myself and others on the Council to make them so."

She adds that she is, "heartened only by the fact that some members of the Council have maintained open minds during our many hours of deliberation. Although these members may not have always agreed with the scientist-members, they were willing to distinguish between science and religion, and to recognize when facts and motivations were being misconstrued in order to substantiate a predetermined point of view."

The timing of the dismissals has become standard operating procedure for this Administration, which regularly takes controversial action on Friday afternoons, when it is most likely to fall into a weekend news void.

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Lindquist, Näthke Win ASCB Women In Cell Biology Career Awards
06/28/2004

Bethesda, MD. - Two scientists whose research discoveries shifted the ground rules in their respective fields were named winners of the 2004 "Women In Cell Biology Senior and Junior Career Awards" by the American Society for Cell Biology. Susan Lindquist of the Whitehead Institute in Cambridge, Massachusetts, will receive the 2004 WICB Senior Career Recognition Award and Inke Näthke of the University of Dundee, Scotland, will receive the WICB Junior Career Achievement Award at the Society's 44th Annual Meeting on December 6, in Washington, DC.

Lindquist, who became the Director of the Whitehead Institute in 2001 after 23 years on the faculty at the University of Chicago, is known internationally as a pioneer in protein conformation, particularly of abnormally folded proteins called prions that are increasingly linked to neurodegenerative diseases such as Alzheimer's, Parkinson's and Creutzfeldt-Jakob. According to Rockefeller University cell biologist Elaine Fuchs, "Susan Lindquist's focus on protein folding mechanisms has led to paradigm-shifting discoveries in stress tolerance, gene regulation, evolution, and human protein folding disease."

The Senior WICB Career award is given each year to "a woman or a man whose outstanding scientific achievements are coupled with a long-standing record of support for women in science." According to Fuchs, Lindquist is not only an exceptional scientist but as Director of the Whitehead holds a pivotal leadership position in international science. Says Fuchs, "Susan Lindquist stands virtually alone at this high level of responsibility among American women scientists."

Inke Näthke's career got off to a controversial start with her original hypothesis linking mutations in a protein called APC (adenomatous polyposis coli), which are found in 85 percent of all cases of human colorectal cancer, with an unsuspected defect in cell motility. "It was brave and original research to discover new functions for this protein, especially when a strong consensus had emerged of its role as a regulator of catenins (proteins that control growth factor production)," says Sir David Lane, Näthke's colleague at the University of Dundee. "Dr. Näthke has established beyond doubt that the protein has other key roles in the control of mitosis and genetic stability. Moreover, she has enthusiastically pursued the medical implications of her work in treating colorectal cancer."

A native of Germany, Näthke began medical studies at the University of Hamburg but finished her undergraduate work in biochemistry at San Jose State University. She did her PhD at the University of California, San Francisco, and post-doctoral fellowships at Stanford University and Harvard Medical School. With over 11,000 members, the ASCB is the nation's leading voice for research and education in cell biology. The WICB Career awards help fulfill the Society's mandate to "promote and develop the careers of historically under-represented constituencies in biomedical research, including minorities and women." The Society's Annual Meeting, which is widely considered to be the

world's most influential annual conference in cell biology, will run from December 4-8, 2004 in the Washington, DC Convention Center.

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Top ASCB Scientific Medal to Yale's Tom Pollard Who Discovered How Cells Move
08/09/2004

Bethesda, MD. - In the dance of life, there can be no wallflowers. The scientist whose research group discovered the long-sought mechanism by which eukaryotic cells step out is the 2004 winner of the E.B. Wilson Medal, the highest scientific honor of the American Society for Cell Biology.

Thomas D. Pollard, 62, of Yale University, will receive the Wilson Medal at the ASCB's 44th Annual Meeting in Washington, DC, on Sunday, December 5, for the pioneering studies of his laboratory on cellular motility including the discovery of the Arp2/3 complex. This protein complex controls the extension of actin filaments at the cell margin, allowing cells to crawl into new positions and to reshape themselves. The discovery of this fundamental system has immense implications in human health from fetal development to cancer biology.

Before joining Yale University in 2001, where he is now Chair of the Department of Molecular, Cellular and Developmental Biology, Pollard was President of the Salk Institute for Biological Studies in La Jolla, California. From 1977 to 1996, Pollard was Professor and Director of the Department of Cell Biology and Anatomy at the Johns Hopkins School of Medicine in Baltimore. A native of Pasadena and a 1964 graduate of Pomona College, Pollard earned his MD at Harvard Medical School in 1968.

Seen under the microscope, it has been obvious for 200 years that cells creep along by first extending a "process" or a pseudopod into new territory. Yet at the start of Pollard's career, cell biologists knew nothing about the molecular basis of this activity, which involves the assembly, extension and disassembly of the process. He began to investigate the mechanism as a medical student in the HMS laboratory of Sus Ito. Pollard's presentation of his work on actin filaments in motile cellular extracts at the 1969 ASCB Annual Meeting was the only paper on the subject. Thirty-five years later, actin filaments and cellular motility are among the hottest topics in research biology. Cellular motility, for example, makes it possible to wire up the million miles of connections between the nerve cells in the human brain. It's also behind the ability of our white blood cells to track down and ingest invading bacteria.

After a clinical internship at Massachusetts General Hospital, Pollard took a research position at the National Institutes of Health with Edward Korn. Using Acanthamoeba as a model system, they discovered the first "unconventional myosin", the first motor protein that differed substantially from muscle myosins. That fostered a large field of research on the family of myosin motors.

Pollard's laboratory discovered some of the key proteins in the actin motility system in Acanthamoeba, including capping protein and Arp2/3 complex. Discovery of homologous proteins in other organisms established their importance and relevance to human biology and medicine. Pollard's laboratory has specialized in working out the biophysical mechanisms of actin-based motility including high-resolution protein

structures and the rates of key reactions. His laboratory now focuses on cytokinesis, the mechanism that pinches cells in two at the end of cell division. The work on actin and cytokinesis is throwing light on a variety of conditions from birth defects to tumor metastasis.

Pollard has been married to Patricia Snowden Pollard, an educational and community service activist, since 1964. Their children, Katherine and Daniel, are both mathematicians building careers in computational biology. Pollard served as president of the ASCB (1987-88) and of the Biophysical Society (1992-93). He is a member of National Academy of Science, Institute of Medicine and the American Academy of Arts & Sciences.

ASCB's E.B. Wilson Medal, named for an early 20th century American pioneer in biology who advocated the chromosomal theory of inheritance, is awarded by scientific peers to those who have made significant and far-reaching contributions to cell biology over the course of a career.

For further ASCB information, contact John Fleischman, (513) 929-4635. At Yale, contact Janet Emanuel at (203) 432-2157.

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Cell Biologists Caution United Nations Against Compromising Research
10/20/2004

Bethesda, MD. - The American Society for Cell Biology, with membership of 11,000 basic biomedical researchers in the United States and 50 countries around the world, opposes any action by the United Nations that would prohibit valuable stem cell research with the potential to understand and treat disease. The Society remains supportive of the resolution introduced in the U.N. in 2003 that would ban reproductive cloning but allow stem cell research to continue.

Since 1997, the American Society for Cell Biology has opposed human reproductive cloning. Despite sometimes politically motivated claims, current peer-reviewed scientific research suggests that technology now available cannot result in the creation through cloning of an embryo capable of being born as a healthy human.

"As the United Nations once again considers efforts to institute a world-wide ban on reproductive cloning, we urge that it carefully avoid precluding or compromising invaluable basic cell biology research with the potential to yield novel therapies and cures for a wide range of diseases," said Dr. Larry Goldstein, Chair of the ASCB Public Policy Committee.

There is substantial scientific evidence that somatic cell nuclear transfer, sometimes called therapeutic cloning, could play a significant role in the fight against some of the most debilitating illnesses known to humankind. Stem cell lines, produced by using the patient's own genetic material to generate patient-specific stem cells, may offer the potential for therapies for diseases including diabetes, AIDS, cancer, heart disease, spinal cord injury, and Parkinson's disease, while avoiding the complication of rejection

"Somatic cell nuclear transfer would also allow entirely new approaches to the study of how a single cell is transformed into trillions of different cells and tissues and how these cells fail in disease. By generating embryonic stem cells with defined mutations, scientists would be able to gain a new approach to understanding how inherited predispositions lead to serious disease," Goldstein said.

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Cell Biologists Praise Frist Stem Cell Decision
07/29/2005

Dr. Larry Goldstein, Chair of the Public Policy Committee for the American Society for Cell Biology, praised the decision by Senator Bill Frist (R-TN) to support embryonic stem cell legislation currently pending before the Senate.

"I commend Senator Frist for his decision to join a growing majority in the Senate in support of an expansion of the current federal embryonic stem cell policy," Goldstein said. “Embryonic stem cells hold great promise in the fight against human disease." Goldstein continued. “This promise will be best realized through responsible, ethical research funded by the National Institutes of Health."

In May 2005, the House of Representatives passed H.R.810, The Stem Cell Research Enhancement Act of 2005, by a vote of 238–194. The bill now waits for action by the Senate. "Members of the Senate respect Senator Frist for his views on medicine and look to him for advice,” said Dr. Goldstein. “I am sure his support of this legislation will have a major impact on their support for H.R.810."

"The ASCB looks forward to working with him to secure passage of this bill this fall," said Goldstein.

The American Society for Cell Biology is a nonprofit organization representing over 11,000 basic biomedical researchers in the United States and over 50 other countries.

For further information, contact Kevin Wilson, ASCB Director of Public Policy, at (301) 347-9300 or John Fleischman, ASCB Science Writer, at (513) 929-4635.

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Goldberg Named Director of Cell Biology Society
10/11/2005

Bethesda, MD. – The American Society for Cell Biology (ASCB) has named Joan R. Goldberg as its next Executive Director. Goldberg currently serves as Executive Director of the American Society for Bone and Mineral Research (ASBMR), a post she has held since 1998.

In announcing her appointment, ASCB President Zena Werb, Ph.D. said, ""We are delighted to have recruited Joan to lead the ASCB in this next era. Her effective engagement in issues important to ASCB members, including public policy and scientific publishing, will serve the ASCB well."

During Goldberg's tenure at ASBMR, membership increased 15 percent, while its revenue more than doubled. She also oversaw a series of successful meetings co-sponsored with the NIH and the self-publication of ASBMR's journal and primer on metabolic bone diseases. "I am excited about joining the ASCB and eager to work with ASCB's impassioned leadership, staff, membership and others to promote ASCB's continued success in policy, publications, meetings, membership outreach, and more, " said Goldberg.

She succeeds Elizabeth Marincola, who served as ASCB Executive Director for 14 years and resigned earlier this year to be President of Science Service.

The ASCB is a professional society representing over 11,000 basic biomedical researchers in the United States and 50 other countries.

For further ASCB information, contact Kevin Wilson at (301) 347-9300.

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Cell Biologists Applaud Intelligent Design Ruling
12/21/2005

Bethesda, MD. - "Yesterday was a great day for science education," said Zena Werb, President of The American Society for Cell Biology, in reaction to the ruling by U.S. District John Jones in Kitzmiller et al v. Dover Area School District. Judge Jones ruled that teaching "intelligent design" would violate the Constitutional separation of church and state.

“The ruling by Judge Jones preserves the notion that science classrooms are solely for the teaching of science,” continued Werb. “When students open a science textbook, they need to know that the lessons they learn are based on evidence and not on simple belief. At the same time, science teachers need to feel confidant that the ideas that form the basis of their lesson plans have been tested by scientific peer-scrutiny and peer-review.”

The American Society for Cell Biology is a nonprofit organization representing nearly 12,000 basic biomedical researchers in the United States and 50 other nations. The ASCB supports the advancement of knowledge through scientific research, meetings, publications and other education programs.

For further ASCB information, contact Kevin Wilson at (301) 347-9300.

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