

# Center for Ethics in Science and Technology

## ETHICS CENTER UPDATE

SPRING 2008

### Message from the Co-Directors

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Lawrence M. Hinman, Ph.D.  
University of San Diego  
hinman@sandiego.edu

Michael Kalichman, Ph.D.  
UC San Diego  
kalichman@ucsd.edu

Stuart Henry, Ph.D.  
San Diego State University  
stuart.henry@sdsu.edu

Kate Callen  
UC Office of the President

Administrative Contact:  
Diane Ballard  
UC San Diego  
(858) 822-2647  
ethicscenter@ucsd.edu

With this newsletter, we are reporting more good news for the Ethics Center. We are delighted to be able to say that Dr. Jeffrey Kirsch, Executive Director of the Reuben H. Fleet Science Center has agreed to join us in two roles. First, Jeff has joined our Leadership Council. The members of our Leadership Council are important to the Ethics Center because they lead groups and organizations that have particularly strong commitments to the goals and mission of the Center. This seemed like a perfect fit for us given that we have already convened three programs at the Fleet Science Center and because we have launched a new, regularly scheduled, series of events all to be held at the Fleet. In addition, Jeff



Jeffrey Kirsch

accepted our invitation to be a member of the Ethics Center Board of Advisors. The current Board was unanimous in their judgment that we will benefit greatly from Jeff's insight and wisdom. Please join us in welcoming Jeff to the Ethics Center Board of Advisors and Leadership Council.

We are also particularly excited to have added the talents of Kate Callen to our Ethics Center Executive Committee. Kate has worked in communications and outreach in a variety of settings including the Public Health Service, United Press International, and the University of San Diego. Most recently, Kate has worked at UC San Diego and at the UC Office of the President, where she currently serves as speechwriter. While Kate is continuing in that position, she will also be spending one day a week with us to help ensure that the Ethics Center is as successful as possible in carrying out its mission. We ask that you also join us in welcoming Kate to the Ethics Center.



Kate Callen

In recent months, it seems that the news stories about scientific breakthroughs are coming out almost daily. In some cases, it is the successes, for example, of highly sophisticated surveillance technology or coaxing embryonic stem cells to become cells of the heart or brain.

In other cases, it is the promise of new lines of research designed to regenerate lost fingers or limbs. These developments often sound more like science fiction than science fact. However, as exciting as they are, we face new ethical challenges often as difficult as the scientific challenges.

Facing these challenges not only as they arise, but before they become an impediment, is one of the primary purposes of the conversations convened by the Ethics Center. In this newsletter, we have summarized both some recent activities and our plans for new programs.

The Ethics in Science award competition for Science Fair recipients is now complete. We received 11 entries, which have now been reviewed. The finalists are announced in this newsletter. The Ethics at the Frontiers of Science course at the University of San Diego has just finished another successful series of presentations. Finally, and most importantly, we are well on our way to scheduling our new series of programs at the Fleet Science Center. We have now formally names this series: **Exploring Science: the science and ethics forum.** The first and second of these programs were held on May 7th, and June 4th. We hope to see you at our upcoming events.

Lawrence M Hinman and  
Michael Kalichman

The Ethics Center and its activities have enjoyed generous support from:

Legler Benbough Foundation ~ The Parker Foundation  
Donald C. and Elizabeth M. Dickinson Foundation  
Anita B. and Howard S. Richmond Foundation  
Burnham Institute for Medical Research  
Salk Institute for Biological Studies ~ The Scripps Research Institute,  
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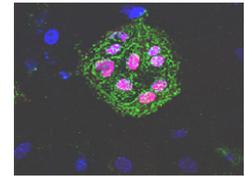
**EXPLORING ETHICS: *the science and ethics forum***

**Exploring Ethics** is an ongoing series of free, public events scheduled for the first Wednesday of each month, 5:30-7 pm, jointly sponsored by the Ethics Center and the Reuben H. Fleet Science Center

**RECENT EVENTS**

May 7, 2008 **Stem Cells: New Sources and New Questions**

For this inaugural event, we chose as our topic the recent and exciting developments in new technologies for deriving stem cells. We were privileged to have three people from the San Diego community who are each recognized as leaders in addressing the scientific and ethical implications of stem cell research: Dr. Larry Goldstein, a stem cell scientist, described some of the new technologies and how they compare with earlier methods for stem cell derivation; Dr. John Evans, a social scientist, provided some insight into how the general public does or may view these new approaches; and Dr. Mary Devereaux, a biomedical ethicist, helped us define and address the ethical challenges of different options for stem cell derivation.



HUES9 hESCs and mouse cells - Photo by Akiko Eguchi, UC San Diego hESC Core Facility

June 4, 2008 **Reading Minds and Detecting Lies**



Can a machine tell when a person is lying? What if it's wrong? And what should happen if it's right? These and other ramifications of state-of-the-art lie detection technology were debated at the June 4 "Exploring Ethics" forum co-sponsored by the Ethics Center and the Reuben H. Fleet Science Center. Three experts approached the issue from three starkly different viewpoints. Joel Huizenga, founder and CEO of San Diego-based "No Lie MRI," described how his company's use of functional magnetic resonance imaging (fMRI) to supplant polygraph tests has attracted global attention. Noted San Diego attorney Charles Sevilla cautioned that fMRI lie detection may face the same legal hurdles that have sidelined polygraph results in courtrooms. And UC San Diego neurophilosopher (and MacArthur

Fellow) Patricia Churchland was the self-proclaimed "village skeptic" who questioned whether any detection technology can deliver on promises of scientific accuracy.

**UPCOMING EVENTS**

Please join us for the upcoming **Exploring Ethics** programs at the Fleet Science Center. These programs are scheduled for the first Wednesday of the month from 5:30-7 pm and all are free and open to the public. To be sure that we will have space for you, please register in advance at <http://ethicscenter.net> and arrive by no later than 5:15 pm. Also, please note that 2008 program titles and schedules are subject to change depending on speaker availability and new developments in science and ethics.

- July 2 *Technology on the Border: If technology is the answer, what's the question?*
- August 6 *Surveillance and Sensors: Who's watching whom?*
- September 3 *Stronger, Higher, Faster: Do the wins justify the means?*
- October 1 *Politics in Science: Who decides what gets done and what it means?*
- November 5 *Post-Election Analysis: Topic to be announced*
- December 3 *Retrospective: Science and ethics news stories of 2008*

**ETHICS IN SCIENCE AWARD PROGRAM**

We are delighted to report that we have selected five finalists in the 2008 Ethics in Science Award Program. Although this is a new program, many of the entries demonstrated great insight and sensitivity in identifying the ethical dimensions of science. All entrants were senior division participants in the 2008 Greater San Diego Science and Engineering Fair. Over 30 of the science fair projects were selected by the Ethics Award Review Committee for invitations to submit an ethics project. Following review of the ethics papers based on published criteria, the five finalists, in alphabetical order, are: Christina Catabay (Bonita Vista High School), Gwendolyn Chang (Rancho Bernardo High School), Anna Kornfeld Simpson (Patrick Henry High School), Michael Vredenburg (Carlsbad High School), and Alicia Guerra (Bonita Vista High School). These students will be honored in an award ceremony at the beginning of the next Exploring Ethics event, scheduled for July 2, 2008 at the Fleet Science Center. We will be awarding three third place prizes of \$100 each, one second place prize of \$200, and one first place prize of \$500.

## ETHICS IN SAN DIEGO

**LUCY KILLEA, Ph.D. Senior Fellow, International Community Foundation**

Currently Dr. Killea serves as Senior Fellow with the International Community Foundation, where she provides strategic counsel and guidance to this California-based public foundation committed to philanthropy and grant making in Asia and the Americas. Dr. Killea's service to ICF comes after serving five years as the foundation's President & CEO (1996-2001).

During her tenure at ICF, Dr. Killea expanded ICF's grant making in Latin America, especially along Mexico's



Northern Border with the United States, and spearheaded the foundation's philanthropic initiatives in China.

Dr. Killea earned a Ph. D. in Latin American History from the University of California San Diego; M.A. from the University of San Diego; B.A. from the Incarnate Word College, San Antonio, Texas. A 36-year resident of California, she also lived ten years in Mexico and traveled extensively in Latin America, Europe and the Asia Pacific region. She speaks Spanish fluently.

**Interview*****What is your role on the Ethics Center Advisory Board?***

As a non-scientist, I was excited to be invited to join the Advisory Board in 2004. I view my role as a representative of those in our society who are interested in the influence of scientific research on vital public policy issues, and possibly on them personally. These are in effect my "constituents." In my time as an elected official, I learned to hear and respond to the various voices seeking more information and understanding of critical developments. Now it is about critical scientific developments that I hope to be responsive through the Ethics Center.

***How is the Ethics Center meeting your concern for better public understanding of the impact of scientific research on public policy?***

The Ethics Center is responding in a number of ways. First, to me most vital, is an emphasis on students and young people. Much of current scientific research may become effective only in a remote future, but the youth of today need knowledge and appreciation of how scientific developments will affect them for most of their lives. The Ethics Center is helping to make this possible by events specifically for high school students such as two held at the Fleet Science Center on the topic of MySpace and other social networking sites. Secondly, the Center is able to attract top quality scientists and ethicists of national and international stature as speakers and panel participants. Finally, the Center makes good use of the connections and resources of the Leadership Council, including three universities, two law schools, three research institutes and the Fleet Science Center.

***What have you personally gained from your participation on the Ethics Center?***

My attendance at most of the Center's public events has raised significantly my level of understanding and appreciation of the current and future impact of scientific discoveries on our society and on us as individuals. Now and then, I enjoy surprising my friends by demonstrating my increased knowledge and encouraging them to participate.

***What are the future plans of the Ethics Center that you view as meeting your concerns?***

I am particularly excited about plans for further student and school outreach. One excellent example is the new "Ethics in Science Awards," which will provide students with the opportunity to use their projects in the Greater San Diego Science and Engineering Fair as a springboard for addressing some of the ethical challenges of new areas of science and technology.

## IN THE NEWS: ETHICS AND SCIENCE\*

***Brain Scanners Can See Your Decisions Before You Make Them***

From: Brandon Keim, *Wired Science*, April 13<sup>th</sup>, 2008

**Summary:** A recent study published in *Nature Neuroscience* (Soon et al., 2008) describes the use of brain scanners to predict an individual's decision several seconds **before the individual is aware of making such decision**. The study consisted of a "freely paced motor-decision task" while the subject's brain activity was monitored with functional magnetic resonance imaging (fMRI). Participants were asked to focus on a screen displaying a succession of letters. When instructed to do so, the subjects were to immediately press one of two buttons, using either their left or right index finger. The authors found that up to ten seconds prior to the button choice, brain activity had changed in an area of the brain that is linked to "high-level planning". This was then followed by a shift in brain activity to the region associated with "sensory integration". In combination, these changes in neural patterns continually predicted which button the subject would press. Thus, the choice of which button to push was encoded in brain activity several seconds before the person was aware of his/her decision. Researchers suggest that this delay demonstrates the "operation of a network of high-level control areas", which start to prepare an impending decision before it enters consciousness.

**Ethical Challenges:** The meaning of these findings will have to await further studies and analysis, but the implication is counter-intuitive. If it's possible for our brain to have made a decision before we are aware of making that decision, then we have to either think differently about the meaning of "free will" or face the possibility that our brain is in a sense the home of at least two individuals (the one making the decision and the one becoming aware of the decision). Is our ability to consciously and freely decide between two options merely an illusion? If our decisions and resulting actions are "initiated by unconscious mental processes" preceding our awareness, then is the notion of personal responsibility fundamentally flawed? Though the study design was artificial, the findings cause us to question the meaning of autonomous decisions.

***DNA Tests Offer Deeper Examination of Accused***

From: Rick Weiss, *Washington Post*, April 20<sup>th</sup>, 2008

**Summary:** Recently, courtrooms have begun to introduce "second generation" DNA tests. Unlike the simple DNA fingerprint tests of the past, these new tests provide an alternative and much more complex analysis of genes. "Second generation" DNA tests strive to reveal information about the psychological and physiological traits of a suspect. Depending on the nature of the case, the DNA tests might be used by the courts to make various predictions. For example, how long is an individual likely to live or what is the likelihood that a convicted felon would commit a crime again if released from prison? In one case, a chemical manufacturing company being sued for faulty products convinced the courts to allow DNA tests on the alleged victims to determine whether illness was caused by an individual's genes rather than the company's product. Another controversial use of such tests is the use of DNA analysis to determine whether an individual is a "born criminal" or whether a person's action was due to his or her genes. This premise challenges our current understanding of "criminal responsibility." Scientists make it clear that genes are not wholly responsible for a human's mental health or behavior. For this reason, they question the emphasis placed on these "second generation" DNA tests. As of now, most of these tests are in the research stage and are inadmissible in a court of law.

**Ethical Challenges:** What would the proposed use of "second generation" DNA tests look like? Would everyone accused of a crime have their DNA scrutinized or would this be on a case-by-case basis? Would a DNA test be tantamount to requiring an individual to testify against himself or herself? Since the tests almost certainly will not be perfect indicators, how much weight will we give to a test that, for example, indicates only a genetic "predisposition" for violence? In sentencing someone convicted of a crime, will judges and the courts use genetic information to predict the risk of crimes that have not yet been committed?

***Heart Pump Creates Life-Death Ethical Dilemmas***

From: Rob Stein, *Washington Post*, April 24<sup>th</sup>, 2008

**Summary:** With an aging population suffering from heart failure, new medical technologies are being introduced to prolong lives. One such technology, called Left Ventricular Assist Devices (LVADs), is used as a "partial artificial heart". LVADs operate by first being implanted next to an individual's heart and then attached to the aorta and a main pumping chamber. Though originally created for the purposes of keeping a patient alive before a donated organ was made available, the medical field is now using LVADs as "destination therapy". Today, patients are able to live for years on these devices alone. LVADs are no longer considered just an intermediary solution before an organ transplant is performed. In fact, over 60 medical centers across the United States perform this operation and it is estimated that around 1,000 LVAD implants occur annually. Unlike a traditional heart transplant surgery, LVADs are widely available to patients in need and Medicare has committed to covering the cost, estimated around \$200,000. Doctors and patients alike understand that LVADs have the ability to improve quality of life,

**Ethical Challenges:** Life support technologies, like LVADs, force us to consider how much individual autonomy we should allow in decisions about life and death? Though rare, patients implanted with LVADs have the ability to decide when to turn their device "off" and thus end their own lives in a matter of hours. When, if ever, does a patient have the right to cease medical intervention if they are experiencing such a severely diminished quality of life that the person no longer wishes to live? How can medical professionals respect an individual's freely made decision, while maintaining their commitment to save lives? If the individual has determined that he/she has "had enough", is that tantamount to "actively killing"? Or should it be considered succumbing to the "underlying disease"?

\*Torrey Velasquez, UC San Diego Research Ethics Program intern and UCLA graduate, identified these stories, summarized the science, and suggested some ethical questions.

**ABOUT THE ETHICS CENTER**

The Center for Ethics in Science & Technology is an independent center that has a close working relationship with UC San Diego, the University of San Diego, and San Diego State University.

Contact: [ethicscenter@ucsd.edu](mailto:ethicscenter@ucsd.edu), <http://ethicscenter.net>, (858) 822-2647