

NCTF 9th On-line Session Transcript
Joined on March 25, 2008 at 9:00 PM

Moderator (bob): We'll have to start fresh with Dr. Melman. Hopefully you reviewed the transcript & know what he already answered.

Jonathan R GA: I wish I had more time to do personal research on the topics ... not just what you guys set out for us. Part of me feels like if i don't spend the extra time, that maybe we will miss something ...

Moderator (bob): Team 2 is NOW active. Ground rules slide is up as a reminder.

Teresita B CA to Patrick Hamlett, Tina Ndoh, bob: Jonathan, the articles on line are not that lengthy, the strategic plan is, but I agree that the on-line chats are great, but not full.

Frank C NH: Dr. Melman: In terms of regulation, does the U.S. ever forge alliances with other countries to control research, development and experimentation? And if so, have those agreements been successful?

Diana I GA: Dr. Melman---you indicated that the FDA may not be the best equipped to oversee nanotech.--who would you recommend be put in charge of oversight & regulations?

Dr. Melman to Patrick Hamlett, Tina Ndoh, bob: Frank: Not very often. There was an attempt to create an international compact prohibiting cloning research, but it didn't get through the UN. In 1975, there was a successful international moratorium of recombinant DNA research, however.

Moderator (Tina Ndoh): From Dr. Melman: Frank: Not very often. There was an attempt to create an international compact prohibiting cloning research, but it didn't get through the UN. In 1975, there was a successful international moratorium on recombinant DNA research, however.

Moderator (Tina Ndoh): Dr. Melman, you should be chat active now

Teri B CO: Dr. Melman--to what extent is research using lower economic individuals in foreign countries monitored?

Teresita B CA to Patrick Hamlett, Tina Ndoh, bob: Dr. Melman, please elaborate on "off label" of nanotech applications. Your ideas of ethical and social issues arising from these applications? Other comments /examples on the lack of ethical guidance on how to conduct enhancement experiments

Dr. Melman: Diana: As I said last Thursday, I am not an expert on nanotech. But that technology has multiple applications outside of potential medical/enhancement uses. Perhaps the National Academy of Sciences or a committee that it constructed.

Moderator (Tina Ndoh): From Teresita B: Dr. Mehlman, please elaborate on "off label" of nanotech applications. Your ideas of ethical and social issues arising from these applications? Other comments /examples on the lack of ethical guidance on how to conduct enhancement experiments

Moderator (Patrick Hamlett) to Teresita B CA: Teresita: Send your messages to "This Room" so everyone can see them

Frank C NH: Given the enormous cost of nano research, I'd think it might be a good idea to spread the risk, control and cost -- and results.

charles az to Patrick Hamlett, Tina Ndoh, bob: did we have a session on sunday?

Frank C NH: Scratch my last. Disqualified for not being in the form of a question.

Teresita B CA: Sorry, I just noticed I was sending to mods.

Moderator (bob) to charles az: No we were off Sunday.

Dr. Melman: Teri: This is a continuing source of controversy. The FDA for ma long time was reluctant to accept results from human experiments conducted abroad, but not because it was concerned about who was serving as subjects. There is a continuing controversy about AIDS research in Africa, centered mostly on the conduct of studies there that could not be conducted ethically here.

Nichole C CO to Patrick Hamlett, Tina Ndoh, bob: I am having issues with my connection. I am repeatedly being kicked off of the system.

Trisha B AZ: Dr. M..If a person finds out he has a disease that has no cure. how will that effect his managed health care?

An L CO: Am understanding a lot of concern if under represented groups are going to be allowed access. But also what might the risk of economically underprivileged and marginalized folks being unconcerned about as in it being consensual or done with full disclosures.

Frank C NH: Doctor, to what degree does the U.S. import technology from nations and does importing it speed the approval process?

Dr. Melman: Teresita: Under FDA law, there is no prohibition against using an approved drug, device, or biologic for an unapproved ("off-label") use, and plenty of sound reasons for doing so. But the technology in question will not be backed up by the same degree of experimental support as for the uses that the FDA actually approved. Moreover, there is sometimes a problem in getting health insurers to pay for unapproved uses.

Moderator (bob) to Trisha B AZ: Trisha. The question seems vague & not really on-point. Can you clarify?

Moderator (Tina Ndoh) to Nichole C CO: Nichole, just do the best you can, we were hoping that these problems would not persist, but keep trying, and if you can't stay on, review the transcripts.

Diana I GA: Thanks for your answer--since you have specialized in federal regulation of medical technology--I am curious as to how you think the FDA would best be convinced that this is not their area of expertise.

Nichole C CO to Patrick Hamlett, Tina Ndoh, bob: Thanks.

Dr. Melman: Trisha: It depends on who is paying for the managed care plan. People who get health benefits through large employers are protected in a variety of ways from facing problems if they get sick. But people who are self-insured, or insured by small employers, may lose their insurance, their jobs, or both, and there isn't usually much they can do about it.

Dr. Melman: An: I'm not clear what you are asking.

An L CO: Most people worry that only the wealthy will afford this technology. However, might it not be that experiments might be conducted on those less fortunate?

Dr. Melman: Frank: In terms of medical technology, the FDA is skeptical of the quality of scientific data from other countries, which is why there are many drugs and devices that are approved in foreign countries that take years before they are marketed here. Some people think this is a good thing: Let's let other nations take the risks with new technologies. A good example was thalidomide in the late 1950's and early 1960's.

Frank C NH: Thx.

Dr. Melman: Diana: Excellent point. Government agencies do not like to admit their deficiencies. It would be up to Congress to identify the need for greater expertise.

Moderator (Patrick Hamlett) to Dr. Robert: Jason: Welcome aboard -- have you changed your screen yet? This is a private message just to you - - to send to the whole group, make sure you have "This Room" showing next to "Send"

An L CO: With my preference being giving people the ability to decline.

Dr. Robert to Patrick Hamlett, Tina Ndoh, bob: Hi Patrick - I have not changed my screen; I am sending this to moderators only, but will set it back to This Room

Frank C NH: To what degree do insurance companies influence FDA or other regulators? For instance, if an unborn child is determined to have a heart defect that can be repaired via nano manipulation in utero, would insurance companies be entitled to know that? And, consequently, be in a

position to demand the child be repaired in the womb - thereby saving the insurance company untold dollars in post-birth hospitalization and treatment?

Dr. Melman: An: There is an elaborate system of regulations governing human subjects research in the U.S., and one principle they embody is that the experimental subjects ought to be in a socio-economic class able to benefit from the results. But often this objective can be met simply by making sure that the actual subjects continue to have access to the technology, should it prove effective, while the other members of their class go without.

Moderator (Patrick Hamlett) to Dr. Robert: You should change from the default screen to wide screen. Go to the top left of your screen, click on "View," slide down to "Layouts" & select "Wide Layout"

An L CO: Thank you.

Dr. Robert to Patrick Hamlett, Tina Ndoh, bob: Just did - thanks.

Teri B CO: Is there stuff available in other countries right now that is not approved in the US related to "nano" types of enhancements?

Dr. Melman: Frank: The FDA by law is precluded from considering the cost or the cost-effectiveness of the technologies it reviews. For insurers, however, it's all about cost-effectiveness. So they operate completely independently.

Teresita B CA: Dr. M: you mention human subjects research, can the research require members of underrepresented groups be included, and where and how does that input get integrated?

Dr. Melman: Teri: As I said, I am not an expert on nanotech. However, my sense is that the technology is too new to be available other than on an experimental basis anywhere at the moment.

Diana I GA: Since Congress is bombarded by lobbyists isn't there a major concern that those who represent insurance companies, private technology developers, etc. will have an unfair advantage to influence our esteemed members of Congress and push for an govt. agency that is supportive of their interests? Guess I am worried about who is going to be really protecting the general public.

Dr. Melman: Teresita: Yes. For example, the FDA a few years ago began requiring drug and device manufacturers to conduct studies on children and women (2 underrepresented groups in terms of clinical studies).

Dr. Melman: Diana: I'm worried too.

Diana I GA: You made me smile!!!

Frank C NH: Is there a typical timetable for regs to be put into place? From time of research discovery to the time it goes on the market?

Moderator (bob): Any questions missed by Dr. Melman. Please resubmit if he skipped one you submitted.

Dr. Melman: Frank: No. The law requires a fairly elaborate process for making an administrative rule, including public notice and an opportunity for public comment. Based on the comments, the agency in question typically revises the proposed regulation and thus begins another round of notice-and-comment. Some regulations take years; some never make it through.

Dr. Melman: Moderators: Am I on for another half-hour later?

Frank C NH: So research may go forward with leaps and bounds before the regs catch up?

Teresita B CA: Dr M: your ideas of ethical and social issues arising from these applications, beyond social disruption? Your recommendations on ethical guidance?

Moderator (Patrick Hamlett): Dr. Melman: You're on for as long as your fingers hold up...but the bottom of the hour is what we planned.

Teri B CO: When or how does the FDA decide a product should or shouldn't be regulated? What is that process?

Dr. Melman: Frank: Yes indeed. And sometimes there never are any regulations. The entire assisted reproduction industry (in vitro fertilization, etc.) has been booming along for years with virtually no regulation.

Mary D CA to Patrick Hamlett, Tina Ndoh, bob: With Nanotechnology being a new frontier, what type of employment do you anticipate in this growing/developing field?

Moderator (Tina Ndoh) to Mary D CA: Mary, you will be chat active in the 2nd hour

James B AZ: Who, if anyone, watches over agencies like the FDA and EPA concerning regulations?

Dr. Melman: Teri: It's a combination of FDA and Congress. A good example is reproductive cloning. The FDA technically has jurisdiction over drugs, devices, and biologics, but cloning doesn't really involve any of those technologies. Nevertheless, the FDA has asserted regulatory authority over it. Sometimes Congress steps in, but recently Congress has been more inclined to limit rather than extend FDA authority (e.g., dietary supplements).

Dr. Melman: James: Congress. For years, the representatives most involved have been Waxman of California, Dingell of Michigan, Ted Kennedy, and Orin Hatch.

Moderator (bob): We are reaching the end of Dr. Melman's time & he is in the process of answering questions already submitted. So, please, no new questions.

Frank C NH: Thank you Dr. Melman

James B AZ: Thanks for the names.

Dr. Melman: You're most welcome.

Teri B CO: Thank you Dr. Melman!

Diana I GA: Thank you very much but now I am really worried!!!

Moderator (bob): We are in the process of switching to Team 3 as chat active. Hang on.

Teresita B CA: Thanks for your expertise!

Moderator (bob): Our new guest is Dr. Jason Scott Robert. His question & bio are on the whiteboard.

Dr. Melman to Patrick Hamlett, Tina Ndoh, bob: Moderators: Am I on again at 10p.m.?

Moderator (bob): Team 3 - You are up & running.

Angela C CA: Hi Dr. Scott. Thanks for being here.

Dr. Robert: Hi Angela - thanks for having me - "Scott" is my middle name

Angel D. NH: Then hello Dr. Robert.

Nichole C CO: I do not know if this has been addressed yet. Are manufacturers required to label products involving nanotechnology? So that the consumer is aware.

Lynda Z: Dr. Robert, since nanotechnology is used by so many disciplines, could one entity even possibly regulate all nanotechnology uses? Wouldn't that be like saying in the past "FDA will regulate anything small enough that one must use a microscope to see?" Wouldn't each discipline have to work out its own ethics?

Dr. Robert: Hi Angel - thanks!

Moderator (Patrick Hamlett) to Dr. Melman: Max: You've completed your hour, so you're off the clock, officially. You can hang around to see what else the panelists bring up...Thanks for your help & your flexibility!

Angela C CA: Oops! Sorry Dr. Robert. You did not seem to address the privacy of genetic information in your response. Can you speak to the

possible use of this info by insurance companies or employers to discriminate against individuals?

Dr. Melman to Patrick Hamlett, Tina Ndoh, bob: Patrick: My Pleasure. Glad it worked so smoothly tonight.

Dr. Robert: Nichole - I don't think so. That might be something to think about for the future, but it might also be counter-productive. It really depends on how dangerous nanotechnologies turn out to be, I think.

Nichole C CO: Thanks.

emily m nh to Patrick Hamlett, Tina Ndoh, bob: Hi Dr. Robert, Why would it be counter-productive?

Dr. Robert: Hi Lynda - good question. The idea of "nanotechnology ethics" is a bit weird, for the reason you note. There are lots of different disciplines and fields using nanoscale science and engineering, and there are lots of different kinds of applications and products. So it makes a lot of sense to focus on specific applications or disciplines most of the time, even though there may be some issues (like toxicity of nanoparticles) that cut across all of these.

Moderator (Tina Ndoh): From Emily M: Hi Dr. Robert, Why would it be counter-productive?

Moderator (bob) to Emily H: Make sure you have "This Room" selected next to the send button.

Nichole C CO: Good Question.

Ariel T CO to Patrick Hamlett, Tina Ndoh, bob: Dr Robert - In your response you mentioned and I am paraphrasing that there must be some medium between giving up privacy all together and not giving up any at all...Who will define these boundaries?

Dr. Robert: Hi Angela - the privacy of genetic information is a really complicated topic. I'm glad you asked. Right now, it seems, the best advice is to be prepared for the worst when it comes to your genetic information. Insurance companies would *love* to have access to this info, and may use it against you (or, if you're lucky, in your favor) in decisions about coverage and premiums.

Moderator (Tina Ndoh): From Ariel T r Robert - In your response you mentioned and I am paraphrasing that there must be some medium between giving up privacy all together and not giving up any at all...Who will define these boundaries?

Moderator (bob) to Ariel T CO: Ariel - Make sure you select "This Room" next to the send button.

Ariel T CO: Sorry about that

Dr. Robert: Angela - you can find out about the status of a bill designed to protect genetic information here: <http://www.genome.gov/24519851>. Basically, the bill has been passed by the House of Representatives, but not yet voted on by the Senate.

Angela C CA: Thanks, Dr. Robert. Do you feel this bill does an adequate job covering the issue? Or do you have remaining concerns?

Lynda Z: To a certain extent, does the state of the art determine the practical ethics questions? If we try to answer all possibilities, we are sure to miss things; maybe the ethics have to evolve along with the science instead of trying to get too far ahead.

Dr. Robert: Hi Emily - you wanted me to clarify my comment about labeling being potentially counterproductive. Maybe that was the wrong term. What I meant was that if nanotechnologies turn out to be safe and effective, then the labeling of products might make people unnecessarily frightened. Or the labels might be misguided, if nanomanufacturing technologies were used but the product has no trace nanoparticles. Or the labeling process might be expensive, which could make nanotechnologies more rather than less expensive.

James B AZ: Dr. Robert, with enhancement technology seeming to aim at the "perfect being", shouldn't we at least consider the fact that perfection is impossible without imperfection? Like there cannot be good without bad right without wrong etc.

Angel D. NH: How can we totally prove that they will be safe and effective with tinkering on such a small level, what happens if something goes wrong 3 generations later?

emily m nh: thanks - it just made me think about the lack of labels with GMOs, which is kind of disturbing - to me at least

Dr. Robert: Hi Ariel - you will define these boundaries. Or your representatives will. Whenever governments or others violate privacy in unacceptable ways, they hear about it. And they should!

emily m nh: But can't corporations unduly influence our reps re. their access to our privacy through lobbying etc.?

Dr. Robert: Hi Angela - another good question. I feel pretty confident that this legislation is headed in the right direction. But it has taken a *long* time. Some of the first serious concerns about the privacy of genetic information and genetic discrimination were raised almost 15 years ago! In the meantime, it's probably better to be safe than sorry. Think hard about whether a genetic test is right for you. And buy insurance when you're healthy.

John B WI: I'm wondering whether it might be necessary to completely redefine privacy as it applies to medical records. The potential of medical electronic records cannot be attained with a mass of privacy regulations in the way. It is technically possible for a doctor on one side of the world to treat someone from the other side provided

the treating doctor has access to the medical records. The incredibly vast variation in formats makes effective sharing of records extremely improbable. The longer we continue to fashion these systems uniquely for each organization makes this a growing problem. As technology expands, the technical ability to deal with human enhancements/medical cures will advance much faster than current privacy concerns permit. Is there a solution to this dilemma?

James B AZ: We don't always know when our privacy has been violated.

Lynda Z: Maybe insurance company ethics are just as important as the ethics of scientists.

Dr. Robert: Hi Lynda - that's an interesting perspective. Most people are worried about the ethics being too far *behind* rather than too far ahead! I think we have to pay attention both to things that are happening now, and to things that might realistically happen in the future. Sometimes, it makes sense to pay attention even to things that may never happen at all, because we can learn things about our values and the kind of future we want to live in. I tend to worry that we wait until products are already available before thinking out their potential ethical and social implications. But maybe if we thought about these things early enough, we would be able to reduce the really worrisome implications, and make better products.

Angela C CA: Dr. Robert, could you foresee a time or situation when genetic testing becomes mandatory (i.e. required by an insurer or employer before enrollment or employment?)

Dr. Robert: Hi James - great comment/question. Some very clever people have started to ask this kind of question. There is a political philosopher at Harvard, Michael Sandel, who has written on this topic, including a really

Angel D. NH: Do you believe in the future there will be discrimination against people with certain unfavorable genetic traits for jobs/medical treatments?

Dr. Robert: accessible article - I'll find a link to it

emily m nh: I always felt that technology outpaced our ethical evolution - like the atomic bomb, etc.

Lynda Z: Dr. Robert. I agree completely. My point about the ethics not getting too far ahead is concern that we go down a certain ethical path and miss a path that science takes. Then we are behind the eight-ball.

Dr. Robert: James - the article is available here:
<http://www.theatlantic.com/doc/200404/sandel>. So, what would it mean to be perfect? Is "perfect" a relative term (defined in relation to imperfect) or is it possible to define "perfection" absolutely? I'd love to know what you all think about this.

Abbey J WI: I think you need "imperfection" to measure yourself against. What is the final outcome? Perfection versus perfection? That sounds like a recipe for a new World War to me...maybe?

Dr. Robert: Hi Angel - great question about assessing risk. We can never be totally sure that something is safe. The FDA requires LOTS of safety data for new drugs, and yet we often find out after the drug is approved and marketed that it really isn't so safe after all (e.g., Vioxx).

Nichole C CO: Perfect is definitely a relative term. We all have our own definitions of perfect.

John B WI: I have never seen an "absolute statement" that amounted to much. We might have to back to the geometric axioms.

Lynda Z: From a business standpoint, continual improvement implies that one never reaches perfection. Maybe that is also true biologically.

Dr. Robert: Hi Emily - I thought you might be thinking about labeling genetically modified organisms. It's a really complicated debate, and I'm not sure how I feel about it, whether with GMOs or nano.

Foster F GA to Patrick Hamlett, Tina Ndoh, bob: sorry got booted but I'm back

Angela C CA: Dr. Roberts, I completely agree with your concerns about the premature approval of drugs & the reactive nature of the FDA. What are your suggestions? More extensive clinical trials? Another oversight agency? Less industry influence in the testing? Other specific ideas? thanks!

Moderator (Tina Ndoh) to Foster F GA: welcome back

emily m nh: And it just seems like we have so many obvious basic social problems that it almost seems unethical to focus energies on achieving some narrow vision of perfection

Dr. Robert: Emily - yes, corporations with powerful lobbyists have a lot of authority in Washington. It's a little depressing sometimes. And I can understand why some people think that their vote just doesn't matter. But maybe it will be possible to make a difference, especially if we know what we care about and why, and make our views known loudly and clearly. (Maybe that's a little optimistic, though!)

emily m nh: yes, an aware and active public!

James B AZ: Well that's what we are here for.

Angela C CA: Emily-- bravo!

Moderator (bob): About four minutes until handoff to Team 4

Lynda Z: What one person desires as an improvement may be undesirable to someone else

Foster F GA to Patrick Hamlett, Tina Ndoh, bob: mods; will t4 and t5 have the same experts

Dr. Robert: Hi John - great comment/question about the privacy of electronic health records. I spend about half of my time at a medical school, where we have a strong emphasis on biomedical informatics (BMI). This includes things like electronic health records. Forget about privacy for a sec. You're absolutely right - organizations design or adapt systems to suit their needs, and there may be technological limits to how the data can be shared or integrated - lots of people worry about this because it makes it hard to use the information for clinical care or research purposes. Now, let's pretend that the technological problem is solved. Then we still have privacy issues to worry about. But... data can be de-identified (the data can be stripped of information that identifies particular patients) and made available for inspection. Finding good ways of de-identifying data - and then re-identifying it, if necessary - is something that a lot of BMI folks are working on right now. There's a lot more to say here!

Dr. Robert: James - absolutely true. In fact, I bet we hardly ever know when our privacy has been violated!

Moderator (bob): We are beginning the process of activating Team 4. Hang on.

Dr. Robert to Patrick Hamlett, Tina Ndoh, bob: ding genetic info

James B AZ to Patrick Hamlett, Tina Ndoh, bob: Thanks Dr.

Moderator (bob): Dr. Robert is still on board for Team 4.

Moderator (bob): Team 4 is now active. Submit your Questions.

Dr. Robert to Patrick Hamlett, Tina Ndoh, bob: Should I be responding to the last set of questions?

Moderator (Tina Ndoh): From Dr. Robert:: Angela - yes, I can foresee that time. We have already had some court cases, regarding individuals who are susceptible to chemicals in the workplace. If those individuals can be identified genetically, then they cannot be hired. Hmmm.

Tara V CO: Hi Dr. Robert. What do you believe is the (ideal) role of the researcher/scientist in ensuring the discoveries/breakthroughs they make are used in an ethical manner?

Moderator (bob) to Dr. Robert: You can answer the last set. I don't see any new ones yet.

Moderator (Tina Ndoh) to craig f CA: Hi Craig, did you get my message regarding the panelists' survey? You completed the survey multiple times; is the last entry the one that you would like to count?

Jennifer C. GA: How is this process to be administered and the individual protected? Does any type of protection really exist? Where is our privacy now? Have we not already been "invaded" under the guise of 'technology?'"

craig f CA to Patrick Hamlett, Tina Ndoh, bob: YAHA I GOT IT YOU CAN USE THE LAST ONE

Jennifer C. GA: Big Brother at his best, yes~

Moderator (Tina Ndoh) to craig f CA: ok, thanks

Jennifer C. GA: The issue of discrimination in so many areas is real, whether obvious or not.

Moderator (Tina Ndoh): From Dr. Robert: Hi Tara - great question! I think the worst thing a scientist can do is to pretend that this is someone else's job, that they are just discovering facts and what people do with those facts is of no concern to them. So one idea is for scientists to try to get along with ethicists (and for ethicists to try to get along with scientists) - at least well enough to think together about the discoveries and their potential applications, whether safeguards are possible, whether new regulations are required, and so on.

David C. AZ: is there any technology in the works in detecting "spy" nanotech? is the collection of new information from nanotech, because it is so small, virtually imperceptible?

Jennifer C. GA: If 'we' become a problem and/or issue, are we to expect to be eliminated? Terminated? To disappear?

Moderator (Patrick Hamlett) to Dr. Robert: Jason: Make sure you have "This Room" selected (next to "Send") so everyone can see your comments

Tara V CO: Interesting-Thank you.

Dr. Robert: Hi Jennifer - I share some of your concerns. There are some people who say we have no privacy whatsoever, and we fool ourselves into thinking we do. I'm not that extreme (and you probably aren't either). But new technologies almost always have these kinds of side effects. The question is: do we really value privacy? If so, how can we protect it, and balance protecting it against other things we value (such as security, and convenience, and so on)?

marc s nh: Hello Dr. Robert - I liked your idea of a "governance structure". Why can't we establish a 'prime directive' for research like "no military applications" or "no alterations to the human genome"? It seems it would avoid ethical problems by not letting them come up in the first place.

Dr. Robert to Patrick Hamlett, Tina Ndoh, bob: Right - it was reset when the new team came onboard. Now fixed.

Tara V CO: Is it the norm for scientists and ethicists to not get along...it seems as though you have managed to integrated the two fields

David C. AZ: because any advancement could potentially be seen as for military application or the human genome

Jennifer C. GA: But, might these things have become myths already and we have just not become willing to concede to same?

Dr. Robert: David - I have no idea. I can imagine that national security folks must be worried about this kind of surveillance, and maybe they are trying to develop counter-spyware nanotech. But I just don't know. Sorry.

Dr. Robert: Jennifer - you should write Hollywood scripts! (I mean that as a compliment!)

Jennifer C. GA: Thanks. I am often refered to as Det. Munch (Law and Order) as I see conspiracy in most things. I have little to no faith I guess.

les k wi: so what are your biggest concerns for our future as tech develops and what might we do? (wow broad question)

Nathan_C_WI: my question concerns nano-toxicity: before we worry about future developments, it seems we should know more about the toxicity of the nanoparticles being used in products available today. but how do we do that if, on the one hand, these particles are trade secret protected while at the same time it's argued these particles don't need new regulations since they are smaller versions of already regulated material? how or who will begin to address this loophole?

Jennifer C. GA: Do you possess one 'major' fear?

Jennifer C. GA: Who controls the script? Really?

Dr. Robert: Hi Marc - this idea of a 'prime directive' is an interesting one. There certainly have been attempts at this kind of thing. Many anti-cloning legislation has this kind of character, for instance. But a lot of people (scientists especially, but others, too) worry about (1) absolute prohibitions and (2) who makes them. Back in the 1970s, some scientists concerned about recombinant DNA technology initiated a moratorium (an absolute prohibition) for several years in order to make sure that the research was safe. (This happened at Asilomar, in CA.) Self-governance is something scientists like, along with temporary bans (as long as they come up with them).

Dr. Robert: Marc - re: the military - a lot of this technology is being developed specifically *for* military purposes.

les k wi: i read that there is an issue with hormones staying in our drinking water is it possible to clean out nano waste out of water? and do you know of any disposal processes for waste on a nano level at this point?

Dr. Robert: Tara - I *try* to integrate the two fields. I trained as a philosopher, but I now work in a biology department, specifically in order to try to make this work. It's really hard, though! And many ethicists don't like science (it's boring, they say) and many scientists don't like ethicists (they get in the way, they say). That is, as you point out, the norm.

Nichole C CO to Patrick Hamlett, Tina Ndoh, bob: Water filtered reverse osmosis

Dr. Robert: David - good point in response to Marc.

marc s nh: Can't we as a voting public, who fund this research with our tax dollars, make the call as to what research gets funded? Isn't this a democracy?

Dr. Robert: Jennifer - you mean the 'myth' of privacy?

Jennifer C. GA: Yes sir

les k wi: no kidding

Tara V CO: I would hardly call it a republic anymore

David C. AZ: dr. robert, question about the interesting title of your book. Is there currently research being made toward chimaeras?

Santiago M AZ: Dr. Robert, if we were to strive for genetic perfection and we were to have the genetic technology to do so. What would be the state of the individual, how would we specify individuality under a genetically perfect and consciously altered world?

marc s nh: NBIC research

David C. AZ: and are there any laws against chimaeras?

Dr. Robert: Les - VERY broad question! I worry a lot about the loss of public trust in science and scientists. Science is a very valuable activity. But we can't take it for granted. We have to work hard to maintain the trust of non-scientists in the work of scientists - and we have to do this by making scientists more trustworthy!

Jennifer C. GA: Does a "vote" really matter/count? Do not 'they' do what they want any way? I have no faith in that process. Better off just closing our eyes and wishing.

les k wi: the problem as i see it is that we have no choice right no (or very little) and people in power will do whatever they can to make a buck.

David C. AZ: that's a good point, has NBIC become a large enough industry that companies are collectively lobbying to open NBIC technologies to the market?

David C. AZ: or is it mostly just research right now?

Dr. Robert: Nathan - this is a great question. The FDA thinks that nano requires no special new regulations. But the science seems to indicate otherwise: those nanoparticles really do have different properties than microparticles of the 'same' substance. There are a lot of scientists working on both sides of this issue, and I hope we'll see some progress. But it will definitely take time. And I don't know how much time we have.

Jennifer C. GA: Who would the kids pick on at school? There would be no one to tease? Isn't that part of the joy of childhood?

Santiago M AZ: teasing is part of the joy of childhood?

Jennifer C. GA: Perfection!?! What IS that?

Dr. Robert: Jennifer - at the end of the day, as I said in response to Les, I really do worry that scientists will have less credibility than they do right now, and this will make it hard to rely on science when we really need to.

David C. AZ: random

marc s nh: Our willingness to swallow what the establishment puts in our mouths is what got us into our current war. Our we really powerless in the funding arena and I don't consider forums or any public discussion groups a source of power. Can't we vote directly through Congress?

Ashley J GA: The lack of faith in science is scary

Dr. Robert: Les - I don't know the answer to your questions about nano waste. I do know that some scientists are working on using nanotechnology to help clean the water supply, but whether the cure is worse than the disease remains to be seen.

Abraham E CO to Patrick Hamlett, Tina Ndoh, bob: Someone asked the question about chimeras, I don't know if it qualifies as a "chimera" or not but here (<http://www.rense.com/general28/cows.htm>) is an article on cloned cows that were augmented with segments of human dna so that they produce human antibodies, if anyone is interested

Dr. Robert: Hi Marc - democratizing science is a really interesting idea to some people, and a really terrifying one to others. Certainly, evolutionary biologists don't want creationists deciding whether to fund evolutionary research! But HOW to democratize science, if we do think it is a good thing, is something that some of my colleagues here at ASU are

working on. Helping to engage non-scientists in discussions such as this is one way forward.

les k wi: how can we have faith in the fact that our voices will be heard when they haven't? What about the industrial revolution? It was catastrophic to many here as it is elsewhere now..

Moderator (Tina Ndoh): From Abraham E: Someone asked the question about chimeras, I don't know if it qualifies as a "chimera" or not but here (<http://www.rense.com/general28/cows.htm>) is an article on cloned cows that were augmented with segments of human dna so that they produce human antibodies, if anyone is interested

David C. AZ: wow

David C. AZ: ty

marc s nh: Can't scientists do their thing, but let the voting public decide if the research is put to public use?

les k wi: cool

pmingus co: whoa

Ashley J GA: thank you for sharing Tina

Dr. Robert: David - yes, there is a lot of research happening that involves making chimeras (or creatures with cells from distinct individuals). In order to solve the shortage of organs for transplant, for instance, some scientists are growing human livers in non-human animals (like sheep). And in order to find out whether human stem cells will behave when transplanted into a host, scientists do research with mice. And a lot of other things, too.

Santiago M AZ: Dr. Robert, personally, what do you believe is the best way to distribute new developing technologies that can have elevated prices that make access difficult but could potentially aid individuals in a multitude of ways?

Dr. Robert: Hi Santiago - wow - another really tough question! If we were all genetically identical with one another, then individuality would be an odd notion - we might be more like the Borg in Star Trek. If, though, we thought that there are lots of different kinds of genetic perfection (or degrees of perfection or some such), then I can imagine just as much individuality then as now - or a heck of a lot less. It's hard to predict.

Moderator (bob): About 4 minutes until handoff to Team 5. Please refrain from introducing new questions so Dr. Robert can catch up.

David C. AZ: awww, okay

Dr. Robert: David - there is an anti-cloning bill that has been proposed several times that would outlaw some kinds of chimeras in the

US. Such legislation exists in Canada, but only for a few kinds of entities. My main concern is to explore the *justifications* for this research, because I think the justifications are important in assessing the ethical permissibility of the research.

Dr. Robert: Jennifer - I can understand your frustration. But I really think that closing your eyes and wishing is less effective than other kinds of things. Maybe you have to vote with your wallet and not just at the ballot box. Or maybe protest. Or write letters to the editor.

Moderator (bob): We are starting switch to Team 5. Hang on.

Abraham E CO to Patrick Hamlett, Tina Ndoh, bob: Dr. Roberts, first of all I wanted to say I read "The Inevitability of Genetic Enhancement Technologies" that you had written in 2004 and found it very poignant but also very open-ended. Your point about the inevitability of human enhancement tech (and therefore the futility of attempts to ban) was well taken, but you also seemed to imply that any strong regulation efforts would be more or less futile as well because people will always creatively circumvent the regulation (you gave the example of Tour de France doping and also of complete human cloning attempts). Was that your intent or am I misreading you? Also, 4 years later and with many more advances in research in these fields, has your view on human enhancement tech changed any?

marc s nh to Patrick Hamlett, Tina Ndoh, bob: How about research dollars for cancer research instead of biological weapons

Abraham E CO to Patrick Hamlett, Tina Ndoh, bob: sorry

Abraham E CO: Dr. Roberts, first of all I wanted to say I read "The Inevitability of Genetic Enhancement Technologies" that you had written in 2004 and found it very poignant but also very open-ended. Your point about the inevitability of human enhancement tech (and therefore the futility of attempts to ban) was well taken, but you also seemed to imply that any strong regulation efforts would be more or less futile as well because people will always creatively circumvent the regulation (you gave the example of Tour de France doping and also of complete human cloning attempts). Was that your intent or am I misreading you? Also, 4 years later and with many more advances in research in these fields, has your view on human enhancement tech changed any?

Moderator (bob): Team 5 is up & there is already a question in.

Dr. Robert: Abraham - thanks for the thoughtful question. I was really trying to argue that bans are probably not the answer, but regulations are important.

Abraham E CO: ok, follow up question, would you mind if I posted the link to that pdf for the group to read?

charles az: alright everyone

Dr. Robert: Abraham - go right ahead.

Don S WI: Dr. Robert - as a philosopher, what is your opinion on the ethics or fairness of theoretical enhancements like brain implants for improved memory or communications that could give someone significant performance advantages over non-enhanced people?

Catherine J NH: Dr. Robert, hello. I'm quite concerned about the (mis) use of animals in research, especially primates. What ethical guidelines, if any, are being used by scientists in experimentation on animals?

Foster F GA: Dr Robert; given your involvement on " international committees" what do you see as the MAJOR difference between US and other countries with respect to regulation, etc.

Abraham E CO: thank you, I really think that it does a great job framing the issue without pushing any one viewpoint:
http://bioethics.medicine.dal.ca/PubsBaylis/Bioethics_1.pdf

Rose M CO: Dr. Robert, Is nano and nuclear converging? Besides other military application, In the case of a war, Could the brain chip in humans be a means of storage to protect knowledge that might be otherwise lost if it were stored in one place? Would the information in the brain chips of survivors be enough to re start civilization?

charles az: i got a serious question got the doctor

charles az: is this the last type of technology that is being invented?

Dr. Robert: Don - I worry about the fairness of enhancement technologies, and about the creation (or exacerbation) of divides between the haves and the have-nots. I can see the value in the attempt at enhancements of various sorts (and I am a total moron without my trusty Blackberry), and I can see the usefulness of them, but the growing divide, in this country and internationally, is worrisome

Dr. Robert: Hi Catherine - animal research is pretty heavily regulated, but even so, lots of people have concerns about the misuse of animals. These include concerns about abuse (which everyone thinks is a problem, even animal researchers) and about approved uses that are morally troubling - like brain-machine interfaces tested in monkeys. The Animal Welfare Act governs a lot of biomedical research - see <http://www.nal.usda.gov/awic/legislat/usdaleg1.htm>

Foster F GA: Dr. Robert: ? Scientist vs ethicist; how do we bridge the gap. A critical issue don't you think

Catherine J NH: Thank you, Dr. Robert. I was thinking I was alone in my concern.

Richard S GA: I definitely agree with the doc when he said earlier that REGULATION is better than BANING. IF we banned anything in this country that would only make it "more valuable" to some people and causes

places like underground or backroom enchantment spots where you could go and get procedures done.....

Dr. Robert: Hi Foster - great question. I am most familiar with Canada and the UK, both of which are more heavily involved in regulating science and technology than the US. One area for comparison is reproductive technology - in vitro fertilization, for instance. This is almost entirely unregulated in the US, but subject to review and licensing requirements elsewhere. Some people think that the requirements are too strict. Many people think just the opposite - it's 'window dressing'; the regulators rubber stamp whatever docs and scientists want. I think the truth is somewhere in between.

emily m nh to Patrick Hamlett, Tina Ndoh, bob: Please fwd to Catherine J NH- a great resource on animals in science is Physician's Committee for responsible Medicine

craig f CA: MY MAIN CONCERN IS THE MILITARY USING THESE TECHNOLOGIES TO SPY ON US CITIZENS

charles az: so by your knowledge nano technology is not the last type of technology that has to do with human enhancement

Abraham E CO: they can already tap our phones whenever they want, how much more spying do they need?

Catherine J NH: Bravo, Abraham!

Virginia P WI: We keep using the term "they"....who are "they"?

Andrea C WI: They are working on implanting technology into real bugs that can fly right into your room -- literally a fly on the wall watching you...

Dr. Robert: Hi Rose - those are very interesting questions! I know that some people are very interested in the idea of 'uploading' one's consciousness to computers. Maybe that, if successful, would work to 'restart the civilization' after a war?

Moderator (Tina Ndoh) to emily m nh: Emily, can you send this as a private message to Catherine?

Andrea C WI: I'm guilty for using "they" also, Virginia.

Dr. Robert: Charles - do you mean that it would be the last type of technology because it would destroy the world? Or something else?

Abraham E CO: Dr. Roberts, we've spent the whole evening talking about what technologies we need to be wary of, but are there any human enhancement technologies that you are aware of that you are looking forward to, even excited for?

Foster F GA: ok thanks; if the UK and Canada have more regs on in vitro than the US does that say something?

Tamera R. Az.: What do you mean by uploading one's consciousness to computers?

Dr. Robert: Foster - an absolutely critical issue. I said something about this before, in response to a couple of questions from the other teams. Hopefully, those comments will be helpful.

charles az to Patrick Hamlett, Tina Ndoh, bob: in 2012 the government are going to implant chips to keep track of everyone no matter

charles az to Patrick Hamlett, Tina Ndoh, bob: where you go in the world

Dr. Robert: Hi Craig - the US military? Or enemies?

Richard S GA: ...DR: I am not sure if anyone has asked this already OR if I may have missed a question such as this --- but ETHICALLY SPEAKING - how do you feel about the science of creating life - like cyborgs and clones? Morally speaking - could we do anything we want with "THOSE" people because essentially they have been "created" or maybe even seen as "purchased property"? Could a clone marry? Find religion? Be free? -- Just my thoughts.....

Foster F GA: thanks, just saw your comments and agree it is a MAJOR issue

Dr. Robert: Charles - I have no reason to think that nano will be the last technology that could potentially be used for enhancement purposes. It is just one in a long line of such technologies - but a potentially important one.

Rose M CO: Dr. Robert, thank you and another question, besides caged drugs, do you see the prison population as likely test subjects for other testing ? Will they have the option not to participate?

Will caged drugs be used at borders to prevent illegal crossing?

Are there military applications of caged drugs being considered at this time?

Catherine J NH: Would a clone be soul-less??

Dr. Robert: Virginia - excellent point! I try not to be careless about "we" and "they", and I apologize if I have added to the confusion.

Foster F GA: I'm a scientist by training. Change (with stips) is good. it's what brings about improvements. BUT all sci's should have an awareness of environment, society, repercussions, obligations, etc.

Moderator (bob): Team 5 - We are going to be ending this segment at 10 til the top of the hour because we have a couple of announcements. Dr. Robert is trying to answer all your questions, but is behind, so please, no new questions.

Virginia P WI: I really wish we would either agree on who "we"/"they" are, or be more specific!

Andrea C WI: I can't imagine that a (human) clone would be treated any differently than any other human created by in vitro or other lab techniques.

Dr. Robert: Abraham - great question! I think it will be hard to distinguish enhancement technologies from other kinds of technologies. I mean, many technologies can be used for enhancement purposes (for better or worse) but also for other purposes (curing disease, enabling people with paraplegia to use technologies, and so on). So at the end of the day, I think it's most important to think about the *uses* of technologies, and not the technologies themselves. What excites me, though? Faster internet access, especially from mobile devices. Casts that work with the body as it heals - rigid at first, then gradually weaker as the ankle strengthens, but maybe retaining the capacity to get more rigid again (especially if this capacity can be triggered by, say, rolling the ankle!). Other things, too.

Tamera R. Az.: "they" are the government or the small group of people in charge of controlling (at least attempting to on some level) the vast majority of people

Abraham E CO: Dr. Roberts, before we get cut off; You had raised the question on what we thought on the pursuit on perfection, my opinion is that no one ever tells stories about reasonable situations going off without a hitch, imperfection is where life happens. More importantly: when can we expect to be able to pick up your book at the local bookstore?

Catherine J NH: Perhaps optimum health is perfection.

Dr. Robert: Foster - yes, it says something about the political systems and cultures that differ between the countries. It also says that women and couples in the US may be less protected than Canadians or Brits. But it also says that scientists and doctors here have fewer headaches!

Dr. Robert: Tamera - I know that 'uploading' is a weird notion, and I don't really understand the technology that they have in mind. But check this out:

Alex R CO: to Patrick Hamlett, Tina Ndoh, bob: hi

Dr. Robert: Uploading:
<http://www.transhumanism.org/resources/faq.html>

Moderator (bob): We should all say a thnaks & give a round of applause to Dr. Melman & Dr. Robert.

Charles P CA: Thank you, Doctors. Good night.

Jonathan R GA to Patrick Hamlett, Tina Ndoh, bob: thanks

Nathan_C_WI to Patrick Hamlett, Tina Ndoh, bob: tx

Abraham E CO: Thanks for your time Dr. Robert, very edifying

Teresita B CA to Patrick Hamlett, Tina Ndoh, bob: Great expertise tonight!

Foster F GA: thanks thanks

Catherine J NH: Many thanks.

Moderator (Tina Ndoh): Please note the new slide, there are several announcements

Tamera R. Az.: Thank you Dr. Robert you have given us a lot of valuable information!

Moderator (bob): Note the new slide. NO SESSION THURSDAY- Use the time to get ready for the final weekend.

Dr. Robert: Abraham - early next year, I hope.

alan h CA:: this was awesome

Moderator (bob): Any questions about the final session?

Abraham E CO: right on, I'll keep my eyes peeled

les k wi: so we don't have a session on Thursday?

Dana A WI: Thanks for facilitating a very interesting conversation

les k wi: or we do

Ashley J GA: Thank you all for this opportunity it has been very informative!

Jonathan R GA: Will the transcripts and stuff on the website be available?

John E WI to Patrick Hamlett, Tina Ndoh, bob: emily m nh: regarding your riddle from earlier... are you an egg?

Frank C NH: Thanks for the moderating.

alan h CA:: none here..Looking forward to final f2f

Santiago M AZ: thank you all

john k nh: Findings and recommendations, or just recommendations?

Darlene J AZ: thanks

Ricky L. Co: Thanks A lot!

Moderator (bob): Many thanks to you all for participating!

Dr. Robert: Thanks, everyone.

John E WI to Patrick Hamlett, Tina Ndoh, bob: Thank you! very enlightening!

les k wi: thank you

Teresita B CA: After this weekend, there will be a series of events on nanotechnology via venues across the country, a public awareness effort. Our job will be challenging!

James B AZ: This has been illuminating

Foster F GA: thanks to everyone for their comments. This has been VERY interesting

Marissa S WI: Thank you Bob, Tina, and Patrick for all your work.

Angela C CA: Experts, thank you so much for your time. I realize it must be crazy addressing all our questions at once!!

Terry R AZ: terry R Az Dr Robert, great marathon

alan h CA:: yes you guys were outstanding

Teresita B CA: Kudos to the mods!

Moderator (Tina Ndoh): you're welcome

magda v wi: It's been "Elluminating"

Allison A Ga: wow ... i have really learn a lot thanks to all

Tim H GA: I want to thank the Moderators, the experts and participants

kokila r GA: Thanks for a very enlightening session

Alex R CO: thanks to all!

Tamera R. Az.: Thanks to everyone. I have learned a lot!

Moderator (bob) to john k nh: Your local team leadership will clarify those formal issues.

James B AZ: Thanks to all and to all a goodnight

Virginia P WI: the week-end should be interesting and challenging!

Jonathan R GA: Thanks Dr. Roberts and Dr. Melman and Dr. Hamlett,
Tina, and Bob.

Catherine J NH: Ciao, now. Thank you, all.