FOLLOWED AS MUCH AS ANYTHING ELSE. THAT IS, OUR ABILITY TO MAKE CLEAR WHAT WE MEAN BY THESE TO FORM EFFECTIVE WORKING RELATIONSHIPS WITH THESE INSTITUTIONS AND TO BE ABLE TO ASSURE OURSELVES THAT MECHANISMS ARE IN PLACE AS WE GO ALONG THAT WILL BE EFFECTIVE.

BUT THE AMOUNT OF WORK ON MANY, MANY PEOPLE'S PARTS THAT WILL BE NECESSARY TO TURN THIS ENTIRE THING INTO OPERATION, THAT IS, TO GET IT ROLLING AT AN INSTITUTIONAL LEVEL, SHOULD NOT BE UNDERESTIMATED. AND I THINK EVEN SMALL MOVEMENTS BY THIS GROUP WILL HAVE VERY LARGE IMPLICATIONS FOR THOSE INSTITUTIONS. SO I THINK IT'S USEFUL TO BEAR THAT IN MIND, AND I SEE IT AS A WAY -- THAT IS, I SEE AS MUCH DAMAGE POTENTIALLY DONE NOT BY WILLFUL INTENT, BUT SIMPLY BY CONFUSION AND BY LACK OF CLARITY AND BY SORT OF GETTING ANYTHING LIKE THAT STARTED. SO IT'S A CHALLENGE WE WILL FACE AS BEST WE CAN.

CHAIRMAN LO: MY SENSE IS THAT WE'VE REACHED CLOSURE ON THIS ISSUE AND WE'LL CONTINUE TO ADDRESS IT. I'D LIKE TO MOVE ON TO A COUPLE OTHER ISSUES THAT ARE IMPORTANT THAT I'D LIKE TO ADDRESS. WE'RE GOING TO COME BACK TO THE ISSUE WE TALKED ABOUT BEFORE LUNCH WHEN SHERRY COMES BACK AFTER A CONFLICTING OBLIGATION. SHE'LL BE BACK AROUND THREE.

ONE TOPIC THAT WAS RAISED IN THE PUBLIC

COMMENTS THAT I THINK WE DO NEED TO ADDRESS IS THE QUESTION OF INHERITABLE GENETIC MODIFICATIONS. AGAIN, THE COMPOSITE OF COMMENTS THAT WE WERE UNABLE TO SUMMARIZE ON PAGE 3, AND THIS IS THE ONE THAT STARTS WITH THE COVER LETTER FROM GEOFF. PAGE 3, THESE ARE COMMENTS FROM THE PRO-CHOICE ALLIANCE FOR RESPONSIBLE RESEARCH AND THE CENTER FOR GENETICS AND SOCIETY. AT THE TOP OF PAGE 3, THEY MAKE TWO SUGGESTIONS.

ONE, THAT CIRM NOT FUND TWO DIFFERENT TYPES OF RESEARCH. F, TRANSFER OF A GENETICALLY MODIFIED NUCLEUS OR STEM CELL OR ARTIFICIAL CHROMOSOME INTO A HUMAN OOCYTE OR EMBRYO.

AND, G, THE GENETIC ALTERATION OF A HUMAN EMBRYO. THIS ADDRESSES THE POINT THAT WE DO NOT -- THERE'S BEEN CONCERNS ABOUT DOING GENETIC MANIPULATION OF WHAT WILL BECOME STEM CELLS AND PASSING ON A GENETIC MODIFICATION TO FUTURE GENERATIONS AND THE SUBSEQUENT RISKS THAT THAT MAY POSE.

ALTA CHARO VERY SAGELY POINTED OUT THAT WE ALREADY HAVE IN OUR PROPOSED REGULATIONS THAT THE ICOC APPROVED A PROHIBITION ON CIRM FUNDING OF TRANSFER OF A HUMAN STEM CELL INTO A HUMAN EMBRYO.

MS. CHARO: OF ANY STEM CELL.

CHAIRMAN LO: OF ANY STEM CELL, HUMAN OR ANIMAL, INTO A HUMAN EMBRYO. SO THAT TAKES CARE OF

PART OF F, BUT NOT ALL OF IT.

I GUESS THE ISSUE THAT IS BEING POSED TO US IS WHETHER ON THE SAME KIND OF ETHICAL FOUNDATION WE WANT TO EXTEND OR TO RESTRICT OR FORBID CIRM FUNDING FOR OTHER ACTIVITIES THAT WOULD BASICALLY DO GERM LINE GENETIC MANIPULATION.

DR. PETERS: COULD I JUST BE CLEAR ON WHAT YOU'RE CALLING THE ETHICAL FOUNDATION? IS IT THE SAME THING THAT LEADS US TO PROSCRIBE GERM LINE INTERVENTION, OR IS IT A DIFFERENT ISSUE?

CHAIRMAN LO: I THINK IT IS THAT SAME SET OF CONCERNS THAT GO TO GERM LINE MANIPULATION.

DR. PETERS: THANKS.

CHAIRMAN LO: THOUGHTS ON THAT ONE WAY OR THE OTHER?

DR. TAYLOR: IT'S KIND OF UNFORTUNATE THAT KEVIN IS NOT -- KEVIN, YOU OUT THERE?

DR. EGGAN: I'M HERE.

DR. TAYLOR: SO HERE'S THE QUESTION THAT MAYBE YOU AND ANN CAN HELP ME WITH. I'VE BEEN READING SOME OF THOSE JONATHAN TILLY PAPERS AND SOME OF THE DISCUSSION ABOUT THOSE AND SCRATCHING MY HEAD A LITTLE BIT. ARE WE GOING TO NEED TO POTENTIALLY WORRY ABOUT STEM CELL THERAPIES ENTERING THE GERM LINE EVEN WHEN WE'RE NOT EXPECTING IT? HIS DATA IN THAT MOUSE MODEL

SUGGESTED THAT A BONE MARROW TRANSPLANT, WHICH I BELIEVE HAS NEVER BEEN SEEN IN ANY HUMAN CONDITIONS, BUT THAT BONE MARROW TRANSPLANTS INTO MICE WITH THEIR OVARIES ABLATED EITHER GENETICALLY OR BY RADIATION COULD ACTUALLY REPOPULATE OOCYTES WITHIN THE OVARY.

SO I THINK WE ALWAYS THOUGHT THAT WAS GOING TO BE ESSENTIALLY IMPOSSIBLE TO ACHIEVE, EVEN THOSE OF US WHO WANTED TO TRY TO TREAT PREMATURE OVARIAN FAILURE, FOR EXAMPLE. I'M WONDERING NOW WHETHER NONTARGETED -- WHETHER STEM CELL THERAPIES MIGHT POTENTIALLY TARGET THE GERM LINE EVEN WHEN WE AREN'T INTENDING TO DO SO.

DR. EGGAN: I CAN SPEAK DIRECTLY TO THIS, ALTHOUGH IT'S DIFFICULT FOR ME TO DO SO FOR A NUMBER OF REASONS. BUT WHAT I WOULD SAY IS THAT I HAVE GOOD REASON TO BELIEVE THAT WE SHOULDN'T WORRY ABOUT THE DATA IN THOSE PAPERS. I WISH I COULD DO BETTER THAN THAT, BUT I CAN'T.

DR. TAYLOR: THAT'S PERFECT. THANK YOU.

DR. EGGAN: I WILL JUST SAY THAT I AM AWARE OF EXPERIMENTS WHICH SUGGESTED THE RESULTS IN THOSE EXPERIMENTS ARE NOT CORRECT, AND THAT THERE IS NO REASON TO BELIEVE THAT BONE MARROW PERIPHERAL BLOOD CELLS IN THE CIRCULATION CONTRIBUTE TO A PHYSIOLOGICALLY RELEVANT POOL OF OOCYTES IN ANIMALS.

DR. PRIETO: DO YOU THINK THAT THIS CONCEIVABLY COULD OCCUR IN THE FUTURE?

DR. EGGAN: NO.

CHAIRMAN LO: COULD I ALSO ASK KEVIN AND ANN AS WELL. IS THE KIND OF PROHIBITION ON CIRM FUNDING THAT'S BEING SUGGESTED IN F AND G, TOP OF THE PAGE, IS THAT LIKELY TO CLOSE OFF IMPORTANT RESEARCH THAT DOES NOT RAISE THE KINDS OF ETHICAL ISSUES THAT ONE THINKS ABOUT IN TERMS OF GERM LINE MANIPULATION?

DR. KIESSLING: CAN I ASK A SIDE QUESTION TO THAT? THE POINT OF G WOULD BE TO NOT GENETICALLY ALTER A HUMAN EMBRYO THAT YOU PLAN TO TRANSFER BACK INTO A UTERUS, RIGHT, BECAUSE HOPEFULLY WE'RE GOING TO GET BETTER AND BETTER AT DERIVING STEM CELLS FROM HUMAN EMBRYOS, AND GENETICALLY MODIFYING THEM MIGHT IMPROVE THAT. SO FOR A LABORATORY MANIPULATION, I DON'T SEE THAT G IS NECESSARY. IF THE GOAL IS TO NOT THEN TRANSFER IT BACK INTO A UTERUS, I DON'T HAVE ANY PROBLEMS WITH THAT. I DON'T KNOW ABOUT YOU, KEVIN, BUT I CAN'T IMAGINE THAT YOU'D WANT TO GENETICALLY ENGINEER SOMETHING AND THEN TRANSFER IT BACK INTO A UTERUS ANYWAY.

DR. EGGAN: NO, I CAN'T THINK. I MEAN BASICALLY ALMOST EVERYTHING THAT WE'RE DOING IS PROHIBITING TRANSFERRING THEM INTO EMBRYOS AT ALL AND

BACK INTO THE UTERUS. I DON'T SEE THAT AS BEING AN ISSUE. I DO THINK WE HAVE TO BE CAREFUL TO QUALIFY THE LANGUAGE SUCH THAT WE DON'T, AS ANN POINTS OUT, INADVERTENTLY PROHIBIT THINGS THAT WE WOULDN'T WANT TO DO. FOR INSTANCE, I CAN SAY WITH SOME CERTAINTY THAT PEOPLE WILL WANT TO DO SOMATIC CELL NUCLEAR TRANSPLANTATION WITH TRANSGENIC HUMAN CELLS.

MS. CHARO: WITH WHAT?

DR. EGGAN: WITH TRANSGENIC HUMAN CELLS. SO, FOR INSTANCE, YOU COULD IMAGINE THAT SOMEONE WHO WANTS TO MAKE A PATIENT-SPECIFIC EMBRYONIC STEM CELL LINE FROM A PATIENT WITH DIABETES MIGHT OPT TO INTRODUCE SOME GENE INTO THAT SOMATIC CELL BEFORE THE NUCLEAR TRANSPLANTATION. SO YOU WOULD IN A SENSE MAKE IN THAT SITUATION A TRANSGENIC PREIMPLANTATION HUMAN EMBRYO. IT'S TRUE THAT THERE ARE CELLS WITHIN AN EMBRYO WHICH HAVE THE CAPACITY TO CONTRIBUTE TO THE GERM LINE, BUT, AGAIN, THE INTENTION IS NOT TO MAKE A PERSON WHICH CARRIES THAT GERM LINE MUTATION AND TO MAKE AN EMBRYONIC STEM CELL LINE WHICH HAS THAT GENETIC CHANGE.

SO WHATEVER LANGUAGE IS CRAFTED HAS TO TAKE THINGS LIKE THAT INTO CONSIDERATION.

CHAIRMAN LO: SO BASICALLY, KEVIN, YOU'RE POINTING THAT F AS WRITTEN WOULD PRECLUDE THAT LINE OF RESEARCH, WHICH SOUNDS LIKE WE WOULD NOT WANT TO

PRECLUDE IT AS LONG AS THE RESULTANT EXPERIMENT ISN'T USED FOR REPRODUCTIVE PURPOSES. I THINK WE PUT OUR FINGER ON THE ETHICAL CONCERNS REALLY HAVE TO DEAL WITH CREATING A HUMAN BEING WITH THAT GENETIC MODIFICATION IN THE NEXT GENERATION, BUT WE WOULD NOT WANT TO EXTEND THE PROHIBITION TO IN VITRO WORK THAT COULD ACTUALLY BE USEFUL FOR MECHANISMS LEADING TO POTENTIAL THERAPIES.

DR. KIESSLING: SO BOTH F AND G PROBLEM WILL BE PROBLEMATIC TO LIMIT THE KINDS OF STEM CELLS YOU CAN DERIVE FROM EGGS.

CHAIRMAN LO: SO WOULD YOU -- IF WE PUT IN A QUALIFIER, THAT NOT ELIGIBLE FOR FUNDING WOULD BE ONLY IF THE RESULTS WOULD BE USED FOR -- SOUNDS LIKE WE NEED TO HAVE -- IF WE WANT TO DO SOMETHING ALONG THE LINES OF F AND G, WE NEED TO PUT A QUALIFIER IN THAT IS ONLY WITH THE RESULT OF THE MANIPULATION.

DR. HALL: BERNIE, CAN YOU HELP US? WHERE IS F AND G?

CHAIRMAN LO: IT'S PAGE 3 OF GEOFF'S SUMMARY E-MAIL THAT'S -- IT'S FROM THE PRO-CHOICE ALLIANCE FOR RESPONSIBLE RESEARCH AND CENTER FOR GENETICS AND SOCIETY.

DR. HALL: OKAY.

CHAIRMAN LO: IT'S PAGE OF 3 OF THEIR NUMBERING.

DR. HALL: F AND G, GOT IT.

CHAIRMAN LO: OKAY. SO BASICALLY IT SOUNDS LIKE WE'RE SEEMING TO AGREE THAT IF THE RESULTING EMBRYO OR PRODUCT OF THAT SCNT WOULD BE USED FOR REPRODUCTIVE PURPOSES, THAT WE WOULD NOT WANT TO COUNTENANCE.

DR. PETERS: WE SAID FOR REPRODUCTIVE PURPOSES.

DR. EGGAN: I HAVE TO SAY THAT AS I READ THESE IN THIS CONTEXT AND THE WAY THAT THIS IS COUCHED, I DON'T THINK THAT EITHER OF THESE STATEMENTS ARE APPROPRIATE AND SHOULD BE SUPPORTED OR ENDORSED BY THIS COMMITTEE.

DR. KIESSLING: RIGHT. RIGHT. BUT DON'T WE HAVE THIS COVERED? I MEAN WE HAVE A LOT OF LANGUAGE THAT PROHIBITS CLONING FOR HUMAN REPRODUCTIVE PURPOSES.

CHAIRMAN LO: REPRODUCTIVE CLONING. SO THAT TAKES CARE OF THAT. WE ALSO HAVE LANGUAGE THAT PROHIBITS TRANSPLANTATION OF ANY STEM CELL INTO A HUMAN EMBRYO. SO THAT PRECLUDES THAT.

DR. KIESSLING: I THINK THESE TWO ARE BOTH COVERED.

CHAIRMAN LO: WHAT WE DON'T HAVE COVERED ARE THE GENETIC MANIPULATION --

MS. CHARO: I THINK ACTUALLY IT WAS KIND OF

SAID AROUND THE TABLE. AND, KEVIN, I'D BE VERY INTERESTED IN YOUR REACTION AS WELL AS ANN'S HERE. IS THERE ANY REASON NOT TO SAY EXPLICITLY THAT AMONG THE ACTIVITIES NOT ELIGIBLE FOR CIRM FUNDING IS THE TRANSFER INTO A UTERUS OF ANY HUMAN EMBRYO THAT HAS BEEN SUBJECT TO GENETIC OR STEM CELL MANIPULATION?

DR. KIESSLING: RIGHT. THAT'S FINE.

MS. CHARO: BECAUSE THEN WE CAN SIMPLY SAY CIRM FUNDING ISN'T AVAILABLE IF YOU'RE GOING TO TRANSFER A HUMAN EMBRYO THAT'S BEEN MANIPULATED INTO A UTERUS. I DIDN'T HEAR ANYBODY THINK THAT THAT SHOULD BE FUNDED, RIGHT?

DR. PRIETO: IT SEEMS TO ME WHEN I THINK ABOUT SOME OF THIS, THAT WE'VE STEPPED INTO STAR TREK HERE. BUT, YOU KNOW, I CAN CONCEIVE OF SITUATIONS IN THE DISTANT FUTURE OF PRENATAL DIAGNOSIS OF GENETIC DISEASES WHERE CURRENTLY THEY CAN BE DIAGNOSED AND THE ONLY SOLUTION, SO TO SPEAK, IS TO TERMINATE THE PREGNANCY. AND IN THE FUTURE GENETIC MANIPULATION, REPLACEMENT OF A DEFECTIVE GENE WITH A NORMAL GENE, WOULD INSTEAD ALLOW DEVELOPMENT OF A NORMAL EMBRYO.

MS. CHARO: FRANCISCO, THIS IS EXACTLY WHERE THE CONVERSATION ABOUT GERM LINE THERAPY HAS GONE IN THE LAST YEAR OR SO. YOU SEE ARTICLES BUBBLING UP NOW IN THE LITERATURE WHERE THERE'S BEEN A KIND OF BROADLY

HELD CONSENSUS THAT WE DIDN'T KNOW HOW TO EVALUATE THE RISKS WELL ENOUGH IS NOW BEGINNING TO YIELD LITERATURE SAYING ARE WE READY. BERNIE HAS SERVED FOR MANY YEARS ON THE NIH RECOMBINANT DNA ADVISORY COMMITTEE, WHICH WAS TASKED IN PART WITH ANTICIPATING EXACTLY THIS QUESTION.

SO I GUESS THE ISSUE HERE WOULD BE WHETHER IT MAKES SENSE TO PUT SOMETHING LIKE FUNDING RESTRICTIONS, NOT THAT PEOPLE CAN'T DO IT, IT'S THAT WE WON'T FUND IT HERE EXPLICITLY FOR THE SAKE OF COMFORT LEVELS, OR TO SIMPLY TRUST THE GRANTING GROUPS TO NOT DO THIS UNLESS AND UNTIL THERE IS A CONSENSUS IN THE FIELD THAT PEOPLE UNDERSTAND HOW TO EVALUATE THE PROPOSED RESEARCH.

DR. PRIETO: I SAY MY GUT FEELING IS WE'RE NOT READY.

CHAIRMAN LO: I THINK WE CAN PUT IN A QUALIFIER "AT THIS TIME."

DR. EGGAN: BERNIE, I'D ACTUALLY LIKE TO STRONGLY INTERJECT AT THIS MAKE AND MAKE THE FOLLOWING STATEMENT. AND THAT IS, SUPPOSE IT ENDS UP BEING QUITE DIFFICULT TO PRODUCE EMBRYONIC STEM CELL LINES BY NUCLEAR TRANSPLANTATION, BUT WE SUPPOSE THAT IF WE COULD OVEREXPRESS SOME GENE WHICH IS IMPORTANT FOR EMBRYONIC STEM CELLS INTO SOMATIC CELLS BEFORE WE DID NUCLEAR TRANSPLANTATION AND THAT WOULD MAKE THE

DERIVATION OF THOSE ES CELLS MORE EFFICIENT, WOULDN'T WE WANT TO DO THAT, AND WOULDN'T THAT BE CREATING A TRANSGENIC HUMAN EMBRYO?

MS. CHARO: YES. BUT, KEVIN, THE PROPOSAL HERE IS JUST TO NOT FUND ANYTHING THAT INVOLVES TRANSFERRING SUCH AN EMBRYO INTO A UTERUS.

DR. EGGAN: OKAY. GREAT. I'M SORRY. THAT WAS NOT CLEAR TO ME.

CHAIRMAN LO: THAT'S THE POINT THAT WE'RE TRYING TO CENTER ON. FOR RESEARCH WE'RE GOING TO ALLOW IT FOR RESEARCH PURPOSES, BUT NOT FOR REPRODUCTIVE PURPOSES. AND WE PUT THE QUALIFIER "AT THIS TIME" FOR THE REPRODUCTIVE PURPOSES TO LEAVE OPEN A POSSIBILITY FOR FUTURE GENETIC CORRECTION OF CONDITIONS DIAGNOSED THROUGH PGD.

DR. TAYLOR: I GUESS THAT WOULD BE THE POINT THAT I'D WANT TO EMPHASIZE. THERE ARE SORT OF THREE OUTCOMES. THERE'S REPRODUCTIVE REASONS, THERE'S RESEARCH REASONS, AND THERE'S ESSENTIALLY GENE THERAPY REASONS THAT COULD BE USED FOR THERAPEUTIC PURPOSES, AND WE CERTAINLY DON'T WANT TO LOSE THAT LATTER OPTION. RIGHT NOW AS WRITTEN, F WOULD COMPLETELY WIPE THAT OUT IF WE WERE TO ADOPT THAT LANGUAGE.

MS. CHARO: NOW, JUST BECAUSE ONCE WE MAKE ONE CHANGE, IT'S ALWAYS LIKE PULLING A THREAD ON THE

RUG. IT'S VERY DANGEROUS. SO IF WE TAKE A LOOK AT THE EXISTING REGS THAT WE NOW HAVE POSTED FOR COMMENT AND LOOK, FOR EXAMPLE, AT C AND D, WHICH SAID NO CIRM FUNDING IF YOU INTRODUCE BASICALLY HUMAN STEM CELLS INTO PRIMATE EMBRYOS OR ANY KIND OF STEM CELL INTO A HUMAN EMBRYO. WE DIDN'T TALK ABOUT MAKING THIS A FUNDING RESTRICTION WITH REGARD TO THEN TRANSPLANTING THOSE EMBRYOS INTO A UTERUS. IT WAS A BLANKET RESTRICTION, RIGHT.

IN OTHER WORDS, HERE WE'RE TALKING NOW ABOUT SOMETHING WITH REGARD TO GENETIC MANIPULATION OF EMBRYOS THAT IS LOOSER THAN THE VERY REGS THAT WE NOW HAVE, WHICH DO A BASIC PROHIBITION ON MANIPULATING THESE EMBRYOS AT ALL REGARDLESS OF WHETHER THEY WOULD ULTIMATELY BE INTRODUCED INTO A UTERUS.

SO WE ARE SETTING OURSELVES UP FOR SOME DEGREE OF INCONSISTENCY, AND I JUST WANTED TO NOTE IT IN CASE PEOPLE WANT TO DEAL WITH IT. IT'S ATTRACTED ATTENTION FROM PEOPLE WHO HAVE BEEN CRITIQUING THE NAS GUIDELINES. THERE ARE SCIENTISTS THAT HAVE ASKED WHAT THE PURPOSE IS OF, IN THE NAS GUIDELINES, A SUGGESTED PROHIBITION OR SELF-REGULATORY PROHIBITION ON SOMETHING THAT, ABSENT TRANSFER TO A UTERUS, COULD HAVE NO REPRODUCTIVE OUTCOME. SO THEY'VE BEEN ASKING WHY SO NARROW A SET OF RULES OUT OF THE NAS. AND SO WE'RE NOW

DISCUSSING EXACTLY THAT ISSUE THAT THEY HAVE BEEN DEBATING OUT THERE IN THE FIELD.

CHAIRMAN LO: ALTA, IS YOUR SUGGESTION THAT IF WE ADOPT OUR MODIFIED VERSIONS OF WHAT WE'VE PROPOSED INSTEAD OF F AND G, THAT WE THEN NEED TO GO BACK TO B AND C TO TALK ABOUT HAVING PROHIBITION ON CIRM FUNDING BE ONLY RESTRICTED TO TRANSFERRING TO UTERO AND TO ALLOW -- TO LEAVE OPEN THE POSSIBILITY OF CIRM FUNDING FOR IN VITRO RESEARCH?

MS. CHARO: RIGHT. IT'S ACTUALLY C AND D, NOT B AND C. YEAH. IT'S WORTH ASKING DO WE WANT THE THREE AREAS TO BE CONSISTENT WITH ONE ANOTHER. IF SO, WHAT ARE WE GOING TO PICK? THE PROHIBITION ON THE MANIPULATION OF THE EMBRYO PER SE OR THE PROHIBITION ON THE TRANSFER OF A MANIPULATED EMBRYO INTO A UTERUS? OR WE CAN LEAVE THEM INCONSISTENT. THAT'S ANOTHER CHOICE. I JUST WANT TO HIGHLIGHT IT.

CHAIRMAN LO: YOUR SUGGESTION?

MS. CHARO: MY SUGGESTION IS WE ASK KEVIN.

CHAIRMAN LO: KEVIN, ARE YOU STILL THERE?

DR. EGGAN: YES, I'M STILL HERE, BUT IT'S NOT CLEAR TO ME WHAT THE QUESTION FOR ME IS.

CHAIRMAN LO: OKAY. SO ALTA IS TALKING ABOUT IF WE GO TO 100300 IN WHAT WE NOW HAVE OUT FOR PUBLIC COMMENT, ACTIVITIES NOT ELIGIBLE FOR CIRM FUNDING, C

AND D TALK ABOUT THE INTRODUCTION OF STEM CELLS INTO NONHUMAN PRIMATE EMBRYOS AND THE INTRODUCTION OF ANY STEM CELLS INTO HUMAN EMBRYOS. WE DON'T ALLOW FUNDING EVEN IF THIS IS JUST BENCH RESEARCH AND THE EMBRYOS ARE NEVER USED FOR REPRODUCTIVE PURPOSES.

ALTA JUST POINTED OUT THERE'S AN INCONSISTENCY IN OUR APPROACH BETWEEN C AND D AND OUR REWORKED F/G. AND WE WANT TO MAKE THEM CONSISTENT OR WE THINK THERE'S A REASON FOR INCONSISTENCY.

WHEN I ASKED ALTA WHAT WE SHOULD WE DO, SHE SAID ASK KEVIN.

DR. EGGAN: THANKS, ALTA. I GUESS I'M TRYING TO FIND EXACTLY THAT LANGUAGE IN THE --

MS. CHARO: KEVIN, THE BOTTOM LINE IS THAT WE HAVE PROVISIONS THERE THAT TRACK THE NAS TO PROHIBIT CIRM FUNDING FOR THE MANIPULATION OF EITHER PRIMATE -- OF EITHER HUMAN OR NONHUMAN PRIMATE EMBRYOS, PERIOD. NO FUNDING, PERIOD, BY INTRODUCING STEM CELLS. AND --

DR. EGGAN: WAIT. WAIT. WAIT. WAIT. WAIT. OKAY. BY INTRODUCING STEM CELLS. I DON'T UNDERSTAND. I CAN'T FIND THE LANGUAGE RIGHT IN FRONT OF ME.

MS. CHARO: KEVIN, I'M GOING TO READ IT OUT LOUD TO YOU WORD FOR WORD AND SLOWLY.

DR. EGGAN: IS THIS 100300?

MS. CHARO: YES.

DR. EGGAN: IS NOT ELIGIBLE FOR CIRM FUNDING, AND THERE'S B, C, D, E.

MS. CHARO: YES, THAT'S IT.

CHAIRMAN LO: SO C AND D ARE WHAT ALTA IS POINTING OUT.

DR. EGGAN: SO B IS THE CULTURE IN VITRO OF ANY INTACT HUMAN EMBRYO OR ANY PRODUCT OF SCNT; C IS THE INTRODUCTION OF STEM CELLS FROM A COVERED STEM CELL LINE INTO A NONHUMAN PRIMATE EMBRYO; D IS INTRODUCTION OF ANY STEM CELLS, WHETHER HUMAN OR NONHUMAN, INTO HUMAN EMBRYOS. THOSE ARE ALL FINE. E IS BREEDING ANY ANIMAL INTO WHICH STEM CELLS FROM A COVERED STEM CELL LINE HAVE BEEN INTRODUCED.

MS. CHARO: OKAY. STOP THERE FOR A SECOND. SO WE'VE BEEN TALKING ABOUT A SUGGESTION FROM THE PUBLIC THAT WE EXPAND THE LIST OF THINGS WE WILL NOT FUND. WE WERE CIRCLING AROUND A CONSENSUS THAT MAYBE WE WOULDN'T FUND THEM, BUT ONLY UNDER CIRCUMSTANCES THAT INVOLVE TRANSFER TO A UTERUS BECAUSE THE EXTRAUTERINE WORK MIGHT BE VALUABLE AND POSES NO RISK OF REPRODUCTIVE OUTCOMES.

DR. EGGAN: YES.

MS. CHARO: SO THEN THE QUESTION IS IF YOU TAKE A CLOSER LOOK AT C AND D ON THAT LIST, WHICH ALSO ARE ABOUT EMBRYO MANIPULATIONS, SHOULD THOSE TWO BE

FUNDING RESTRICTIONS THAT ARE TIED TO NO TRANSFER TO A UTERUS WHERE THE EXTRAUTERINE MANIPULATIONS ARE FUNDABLE?

DR. EGGAN: NOW I UNDERSTAND.

MS. CHARO: OR SHOULD THIS REMAIN THE WAY IT IS? THERE'S A KIND OF PUBLIC RELATIONS COMPONENT IN THIS AS MUCH AS THERE IS AN ISSUE ABOUT ACTUAL PUBLIC HEALTH AND SAFETY RISK.

DR. KIESSLING: WE ACTUALLY DISCUSSED BEFORE WHETHER OR NOT THERE'S SOME VALUE IN PUTTING HUMAN EMBRYONIC STEM CELL LINES INTO A MONKEY BLASTOCYST AT LEAST FOR IN VITRO CULTURE.

DR. EGGAN: ANN IS RIGHT. WE WENT OVER THE GROUND BEFORE EARLIER, AND I THINK WE CAME UP WITH THIS IN THE END. AND I THINK LARGELY IT WAS DUE TO THESE PUBLIC RELATION CONCERNS MORE THAN ANYTHING ELSE BECAUSE I THINK THERE'S NO -- WHETHER OR NOT JUST THE ACT OF CREATING THESE THINGS IS SOMETHING THAT WE SHOULD OR SHOULDN'T DO, YOU KNOW, AS FAR AS THE ARGUMENT ABOUT -- WELL, I WOULD LEAVE IT AT THAT.

AGAIN, I THINK THAT ONE COULD EASILY SEE THE UTILITY OF CREATING THESE TRANSGENIC HUMAN EMBRYOS BY SOMATIC CELL NUCLEAR TRANSPLANTATION. IT STILL IS MORE DIFFICULT TO JUSTIFY THE UTILITY OF THESE OTHER THINGS, ALTHOUGH OTHERS MAY FIND WAYS TO DO IT. SO I CAN

CERTAINLY SEE EXPANDING C AND D TO SAY EXACTLY AS THESE PROPOSE F AND G TO BE ONLY PROHIBITED IN THE SITUATION WHERE THAT WOULD BE TRANSFERRED TO THE UTERUS. I THINK THAT'S POSSIBLE, BUT I CAN SEE IT BOTH WAYS. I FEEL STRONGLY ABOUT THE PROTECTING THE ABILITY TO MAKE THESE TRANSGENIC HUMAN EMBRYOS FOR IN VITRO USES, PARTICULARLY IN THE DERIVATION OF NEW STEM CELL LINES. I FEEL VERY STRONGLY ABOUT THAT.

CHAIRMAN LO: SO, IN SUMMARY, I THINK YOU'RE SAYING THERE IS A REASON FOR HAVING AN INCONSISTENCY TO ADDRESS ALTA'S QUESTION. WE HAVE A PUBLIC COMMENT THAT I WANT TO MAKE SURE WE GET.

MS. GREENFIELD: YEAH. AS A REPRESENTATIVE OF THE PRO-CHOICE AND ALSO, I KNOW, THE CENTER FOR GENETICS AND SOCIETY, I THINK THE ISSUE THAT MAYBE YOU'RE MISSING A LITTLE BIT IS NOT SO MUCH THAT WE THINK THAT CIRM-FUNDED RESEARCHERS WILL USE THESE THINGS FOR REPRODUCTIVE PURPOSES, BUT THE CONCERN THAT PERHAPS SOME WAY, SOMEHOW THEY WILL GET CIRCULATED OR END UP IN THE HANDS OF PEOPLE WHO MIGHT USE THEM FOR REPRODUCTIVE PURPOSES. THAT'S IN THE PREFACE TO THE STATED REASON.

DR. HALL: THAT'S NOW AGAINST PROPOSITION 71, WHICH IS STATE LAW. IS THAT CORRECT?

DR. EGGAN: IF SOMEONE DID WHAT YOU JUST

SAID, THEY WOULD BE PUNISHABLE BY LAW.

DR. HALL: WELL, IT'S --

MS. CHARO: THIS IS ALTA. THAT'S EXACTLY THE DEBATE THAT'S BEEN CIRCLING AROUND THE BROWNBACK BILL. WE SHOULD CRIMINALIZE ALL CLONING RESEARCH BECAUSE IT'S NOT ENOUGH TO JUST CRIMINALIZE MISAPPROPRIATION OF USE OF EMBRYOS MADE FROM CLONING.

DR. HALL: WHAT SHE JUST DESCRIBED, AS I UNDERSTAND IT, IS A FORM OF REPRODUCTIVE CLONING. IF WE MAKE THESE EMBRYOS FOR USE IN THERAPEUTIC CLONING, SHE'S WORRIED THAT SOMEHOW SOMEBODY WILL GET ONE. AND IT'S NOT QUITE SPECIFIED, BUT STILL THAT SOMEBODY MIGHT GET ONE AND USE IT FOR REPRODUCTIVE CLONING, AND THAT'S ILLEGAL IN CALIFORNIA. IS THAT NOT CORRECT?

CHAIRMAN LO: I'M GOING TO ASK THE SPEAKER TO RESPOND.

MS. GREENFIELD: I'M JUST TALKING ABOUT THE NAS GUIDELINES PROHIBITS THESE, AND WE WOULD -- IN OTHER WORDS, THERE'S A DISTINCTION THERE BETWEEN THINGS THAT IF YOU INCLUDE THE WORDS FOR REPRODUCTIVE PURPOSES AND THE INCONSISTENCIES, ONE OF THE REASONS WHY THAT MIGHT NOT BE GOOD ENOUGH IS FOR THE SAME REASON THE NAS DESCRIBED THOSE THREE PROHIBITIONS. DOES THAT MAKE ANY SENSE?

DR. HALL: I'M SORRY. I GUESS I WOULD HAVE

TO LOOK IT OVER. I'M NOT QUITE SURE NOW.

DR. EGGAN: IT WOULD BE HELPFUL IF YOU COULD RESTATE THAT IN A DIFFERENT WAY. WHAT YOU'RE SAYING IS THAT THIS WOULD CREATE AN INCONSISTENCY WITH THE NATIONAL ACADEMY OF SCIENCE GUIDELINES, AND YOU'RE CONCERNED ABOUT THAT?

MS. GREENFIELD: WELL, I'M SAYING THAT THE INCONSISTENCY REVEALS THE INTENT OF ADDING THOSE TWO, F AND G. I DON'T HAVE THE NUMBERS IN FRONT OF ME. IN OTHER WORDS, IF YOU SAY YOU CAN'T DO IT FOR REPRODUCTIVE PURPOSES AND YOU DO IT FOR THE THREE ABOVE, I THINK THAT YOU'RE THEN DIMINISHING SOMEWHAT WHAT THE NAS GUIDELINES HAS SUGGESTED SHOULD BE PROHIBITED.

DR. HALL: I'M NOT SURE THAT'S TRUE.

MS. GREENFIELD: WELL, I'M NOT SURE, BUT I DON'T THINK THE NAS STANDARDS SAY FOR REPRODUCTIVE PURPOSES.

DR. HALL: REPRODUCTIVE PURPOSES, SO LET'S SAY WE MAKE A BLASTOCYST BY SCNT AND THAT INVOLVES A GENETIC MANIPULATION. AND WHAT WE'RE TALKING ABOUT, AS I UNDERSTAND IT, IS TO THEN TAKE THE INNER CELL MASS, MAKE STEM CELLS THAT CONTAIN THAT GENETIC MANIPULATION. THOSE CANNOT BE USED TO MAKE A HUMAN BEING, STEM CELLS CANNOT BE.

AS I UNDERSTAND, THEN THE CONCERN IS THAT SAME BLASTOCYST MIGHT BE THEN IMPLANTED IN THE UTERUS AND GIVE RISE TO A HUMAN BEING, A CHILD.

MS. GREENFIELD: I'M JUST POINTING OUT THE POSSIBLE INTENT OF DRAWING A LINE BETWEEN DOING IT AT ALL AND DOING IT, BUT NOT DOING IT FOR REPRODUCTIVE PURPOSES. I'M JUST DRAWING -- I'M JUST SAYING THAT THAT'S POTENTIALLY THE SAME INTENT FOR THE THINGS WE SUGGEST.

DR. HALL: ARE YOU CONCERNED THAT IF ONE MAKES THOSE, IF PERMITTED TO MAKE THOSE EMBRYOS USED TO MAKE STEM CELL LINES WILL INCREASE THE PROBABILITY THAT THEY EMBRYOS WILL BE USED ILLEGALLY FOR REPRODUCTIVE PURPOSES? IS THAT FAIR OR IS THAT NOT WHAT YOU'RE SAYING? I'M TRYING TO UNDERSTAND.

MS. CHARO: ZACH, IF I MIGHT, I'M NOT SURE THAT THE DEBATE THAT IS SHAPING UP ON THIS IN THIS DIALOGUE IS THE ONE THAT IS ACTUALLY ON POINT FOR THE TEXT THAT WE'RE DISCUSSING HERE. IT'S RELATED, BUT I'M NOT SURE IT'S EXACTLY ON POINT. THE NATIONAL ACADEMY'S GUIDELINES, WHICH WERE THE STARTING POINT FOR THIS COMMITTEE'S WORK, DO STATE WITHOUT ANY RESERVATIONS THAT ONE OUGHT NOT PLACE A HUMAN EMBRYONIC STEM CELL INTO A PRIMATE EMBRYO, AND THAT ONE AUGHT NOT PLACE ANY KIND OF STEM CELL INTO A HUMAN EMBRYO. AND IT DOESN'T

SAY DON'T DO IT WHEN YOU THINK YOU MIGHT USE THE EMBRYO FOR REPRODUCTION, DON'T DO IT WHEN YOU'RE GOING TO TRANSFER INTO A UTERUS. IT JUST SAYS DON'T DO IT.

IN A SENSE WHAT I WAS ASKING HERE WAS WHETHER OR NOT WE WANTED TO THINK THAT THROUGH AFRESH ABOUT WHETHER OR NOT SUCH A PROHIBITION SHOULD APPLY ONLY WHERE THE RESULTING PRIMATE EMBRYO OR HUMAN EMBRYO, NOW BEEN MANIPULATED, WAS GOING TO BE PLACED INTO A UTERUS. THE REASON I WAS ASKING THAT QUESTION IS THAT WE WERE LOOKING AT THE NO TRANSFER INTO A UTERUS DEMARCATION LINE AS A VALUABLE ONE IN ADDRESSING OTHER FORMS OF GENETIC MANIPULATION OTHER THAN A STEM CELL TRANSPLANT INTO AN EMBRYO.

NOW, AT THE TIME THE NAS GUIDELINES WERE WRITTEN, THE SAME DEBATE TOOK PLACE, AND ONE OF THE RESPONSES AT THE TIME WAS, WELL, THERE'S NO SCIENTIFIC NEED THAT CAN BE IDENTIFIED FOR DOING RESEARCH THAT INVOLVES TAKING A HUMAN EMBRYONIC STEM CELL AND PUTTING IT INTO A PRIMATE EMBRYO. THERE'S NO SCIENTIFIC NEED WE CAN IDENTIFY FOR PUTTING ANY EMBRYONIC STEM CELLS INTO HUMAN EMBRYOS. SO LET'S JUST WRITE SOMETHING THAT'S REALLY CLEAR.

AND WHAT WE HEARD JUST A MOMENT AGO, I THINK, IS THAT THAT IS STILL THE CASE, THAT THERE'S NO SCIENTIFIC NEED TO DO SUCH PREIMPLANTATION RESEARCH,

BUT IN THE CASE OF OTHER KINDS OF GENETIC MANIPULATIONS, LIKE THE ONES THAT KEVIN WAS TALKING ABOUT, THERE IS SUCH A NEED, WHICH MEANS WE ABSOLUTELY HAVE TO FOCUS ON WHETHER OR NOT WE WANT TO NOT FUND THAT RESEARCH OR FUND IT WITH A CONDITION THAT YOU CAN'T TRANSFER TO A UTERUS AND LEAVE SOME DEGREE OF CONSISTENCY BETWEEN THE PROVISIONS WHICH WILL ALWAYS BE REVISITABLE IN THE FUTURE. RIGHT. WE COULD MAKE THEM ALL CONSISTENT. WE COULD TIE EVERYTHING TO DON'T TRANSFER INTO A UTERUS, AND THE REAL DOWNSIDE WOULD BE MORE PUBLIC RELATIONS THAN ANYTHING ELSE.

I THINK THE DIALOGUE BEGAN WITH THE ASSERTION THAT IF THINGS ARE DONE IN THE LABORATORY, IT INCREASES THE RISK OF MISAPPROPRIATION AND MISUSE THAT WILL LEAD TO ACTIONS THAT VIOLATE THE EXISTING STATE LAW. AND THE ANSWER, YEAH, THAT'S A RISK YOU RUN WITH EVERYTHING, BUT YOU CAN'T OUTLAW THE WORLD BECAUSE SOMEBODY IS GOING TO BREAK THE LAW. WE HAVE, AS YOU POINTED OUT, STATE LAW THAT CRIMINALIZES THE VERY ACTIONS THAT PEOPLE ARE SAYING THEY FEAR. SO IT'S REALLY MORE STYLISTIC CHOICE AND POLITICAL CHOICE BEFORE US.

DR. PETERS: ALTA, I THINK YOU'RE KEEPING US RIGHT ON THE POINT AND YOU ARE DOING IT VERY WELL. I WAS ACTUALLY UNHAPPY WITH THE NAS GUIDELINES WHEN IT

FIRST CAME OUT ON THIS POINT. I EVEN SAID SO A COUPLE OF TIMES. AND THESE POTENTIAL, ALTHOUGH NOT MAYBE ACTUAL, BUT POTENTIAL RESTRICTIONS ON SCIENTIFIC RESEARCH WITH REGARD TO EMBRYOS THAT WILL NOT BE IMPLANTED SEEM TO BE UNNECESSARY. AND I DON'T REALLY KNOW WHAT ETHICAL FOUNDATION THERE WOULD BE FOR THOSE PROSCRIPTIONS OTHER THAN PUBLIC RELATIONS.

SO I THINK, IF I HEARD YOU CORRECTLY, A POLICY ON WHAT ARE THE THINGS FOR REPRODUCTION THAT WE WILL NOT FUND, WE'LL PUT THESE THINGS IN THAT CATEGORY, BUT THAT DOESN'T MEAN THAT IN VITRO THESE KINDS OF EXPERIMENTS COULDN'T GO AHEAD SHOULD THE RESEARCHER DEEM THEM APPROPRIATE.

CHAIRMAN LO: I'M TRYING TO SORT OUT WHAT --

DR. HALL: BERNIE, I'M SORRY. WE'RE GONG TO HAVE TO SIGN OFF HERE. BOTH KEVIN AND I ARE DUE AT ANOTHER MEETING SOME WAY FROM HERE IN ABOUT 15 MINUTES. IF THERE'S ANY LAST WORD OR HELP, WE'LL BE HAPPY TO DO IT.

CHAIRMAN LO: NO. WE'RE NOT QUITE THAT CLOSE YET. THANKS. WE MAY NEED TO COME BACK TO THIS.

DR. HALL: GOOD LUCK AND THANKS FOR A GOOD MEETING.

CHAIRMAN LO: THANKS VERY MUCH FOR JOINING US. LET'S GO BACK. WE HAD A PROPOSAL FROM THE PUBLIC

TO ADD TO THE LIST OF THINGS THAT WERE NOT ELIGIBLE FOR FUNDING. THESE INVOLVE SOME SORT OF GENETIC MANIPULATION. WE THOUGHT ABOUT THAT, AND KEVIN RAISED SOME POSSIBILITIES OF RESEARCH THAT MIGHT BE SCIENTIFICALLY USEFUL IF IT WERE DONE IN VITRO AND WANTED TO PRESERVE THE ABILITY FOR CIRM TO FUND THAT KIND OF RESEARCH WHICH IS DIFFERENT THAN WHAT'S IN C AND D. SO HE'S PARTICULARLY TALKING ABOUT GENETICALLY MANIPULATING A NUCLEUS WHICH WOULD BE INTRODUCED INTO AN OOCYTE USING SCNT TO FORM A STEM CELL LINE. AND NONE OF THAT COULD BE USED, OF COURSE, FOR REPRODUCTION UNDER BOTH OUR REGULATIONS AND PROPOSITION 71 AND EXISTING CALIFORNIA LAW.

SO IT SEEMS LIKE RIGHT NOW THERE'S NO NEED TO SAY WE'RE NOT GOING TO FUND IT BECAUSE IT'S ILLEGAL. WE'RE NOT GOING TO FUND IT.

THERE ARE OTHER THINGS THAT WERE SUGGESTED IN F AND G BY THE COMMENTERS, THAT WE ALSO NOT FUND, AND I GUESS THE QUESTION IS DO WE WANT TO INCLUDE THAT AS NOT FUNDABLE OR NOT. AND IT HAS NOW BROUGHT UP THE QUESTION OF, WELL, YOU SEEM TO BE SAYING AROUND THE ISSUE THAT IT'S NOT THE ACTION ITSELF, BUT IT'S USE OF THE PRODUCTS OF THAT RESEARCH FOR REPRODUCTIVE PURPOSES THAT WAS OBJECTIONABLE, AND THEN SHE POINTED OUT IS INCONSISTENT WITH WHAT WE HAD IN C AND D.

SOUNDS LIKE I THINK WE NEED TO SEPARATE OUT WHAT WE WANT TO DO WITH C AND D AND WHAT WE WANT TO DO, IF AT ALL, TO INSERT A NEW F/G. THE WAY I READ IT, WE DON'T NEED TO SAY ANYTHING ABOUT A MANIPULATION OF A NUCLEUS THAT WILL BE INTRODUCED INTO A HUMAN OOCYTE BECAUSE THE REPRODUCTIVE USES ARE BANNED, AND WE VERY DEFINITELY, AS KEVIN ARGUED, WANT TO ALLOW THAT FOR RESEARCH, AND ACTUALLY A HIGH PRIORITY FOR CIRM FUNDING.

AND IT SEEMS TO ME ALSO THAT ARTIFICIAL CHROMOSOME, I'M NOT SURE WHAT THAT MEANS, BUT YOU COULD, FOR INSTANCE, IMAGINE SOMEONE WANTING, AGAIN FOR RESEARCH PURPOSES, TO CREATE A STEM CELL LINE THAT MIGHT BE USED FOR THERAPY, NOT FOR REPRODUCTIVE PURPOSES, INTRODUCING A GENE, NOT A WHOLE CHROMOSOME, BUT A GENE INTO A HUMAN -- A MANIPULATED GENE TO A HUMAN OOCYTE.

I GUESS I'M WONDERING OUT OF THE SUGGESTED F AND G WHAT IS IT THAT WE WANT TO ADD TO OUR LIST OF NOT ELIGIBLE FOR CIRM FUNDING IF IT'S USED FOR REPRODUCTIVE PURPOSES OR, AS WAS FURTHER SUGGESTED, WHETHER OR NOT IT'S USED FOR REPRODUCTIVE PURPOSES, WE WANT TO NOT FUND IT BECAUSE IT MAY BE MISUSED FOR REPRODUCTIVE PURPOSES BY SOMEBODY ELSE.

I DON'T KNOW IF THAT'S A FAIR STATEMENT. I'M

NOT SURE WHAT WE'RE LEFT WITH IN TERMS OF THINGS WE WOULD DEFINITELY NOT WANT TO FUND UNDER CIRM THAT INVOLVES SOME SORT OF GENETIC MANIPULATION, WHICH IS TO ME DIFFERENT THAN INTRODUCING STEM CELLS INTO EMBRYOS.

DR. TAYLOR: BERNIE, I HATE TO MAKE IT MORE COMPLICATED, BUT I GUESS IF YOU ARE GOING TO FOLLOW THAT LINE OF THINKING, AND BASED ON WHAT KEVIN MENTIONED ACTUALLY IN SORT OF SIGNING OFF, I COULD IMAGINE POTENTIALLY THAT THERE COULD BE ADVANTAGES OF INTRODUCING STEM CELLS INTO A HUMAN BLASTOCYST IN VITRO IN TERMS OF DIFFERENTIATING OR POTENTIALLY MANIPULATING THAT STEM CELL AGAIN WITH NO INTENT TO TRANSFER THAT EVER BACK INTO A UTERUS OR TO USE THAT AS A MECHANISM TO CONDITION THE CELL POTENTIALLY IN SOME WAY TO MAYBE DIFFERENTIATE ALONG A PATHWAY THAT MIGHT BE THERAPEUTICALLY BENEFICIAL.

SO THERE'S ETHICAL AND, I SUSPECT, IF THESE GUIDELINES CAME FROM THE NAS WITH CONCERN THAT ANY KIND OF MANIPULATION OF A LIVING HUMAN EMBRYO WAS POTENTIALLY CROSSING THE LINE, THAT LINE IS STARTING TO FADE FOR ME A LITTLE BIT. I DON'T REALLY QUITE SEE HOW, IF WE ARE CONSIDERING APPROVING SOME GENETIC MANIPULATION OF AN EMBRYO IN VITRO FOR THERAPEUTIC PURPOSES, THAT ONE WOULD NECESSARILY PRECLUDE THE INTRODUCTION OF A STEM CELL INTO A HUMAN EMBRYO FOR THE

SAME KINDS OF PURPOSES.

MR. TOCHER: IF I COULD JUST REVIEW THE DEFINITION FROM PROP 71, HUMAN REPRODUCTIVE CLONING. I'M NOT SURE HOW IT MAY AFFECT THINGS, BUT AT LEAST THE WAY IT DEFINES, WHICH IS THE SUBJECT OF CONSTITUTIONAL PROHIBITION ON THE INSTITUTE FROM FUNDING, THE CONSTITUTION SAYS, "NO FUNDS AUTHORIZED OR MADE AVAILABLE TO THE INSTITUTE SHALL BE USED FOR RESEARCH INVOLVING HUMAN REPRODUCTIVE CLONING." SO THE DEFINITION OF HUMAN REPRODUCTIVE CLONING MEANS THE PRACTICE OF CREATING OR ATTEMPTING TO CREATE A HUMAN BEING BY TRANSFERRING THE NUCLEUS FROM A HUMAN CELL INTO AN EGG CELL FROM WHICH THE NUCLEUS HAS BEEN REMOVED FOR THE PURPOSE OF IMPLANTING A RESULTING PRODUCT IN THE UTERUS TO INITIATE A PREGNANCY.

IT SEEMS AS THOUGH SOME OF THE DISCUSSION ABOUT SOME OF THESE PROVISIONS IS GOING BEYOND THAT, AT LEAST FROM THE MINIMAL SCIENCE THAT I CAN UNDERSTAND. SO I JUST WANTED TO KEEP UP THERE WHAT THE PROHIBITION IN THE ACT IS.

MS. CHARO: I APPRECIATE THAT, SCOTT. OBVIOUSLY YOU APPRECIATE THAT WHAT YOU'RE TALKING ABOUT NOW IS LOOKING AT PARALLELS BECAUSE IT'S NOT ON POINT FOR THIS. I THINK ROB HAS PUT HIS FINGER ON IT, WHICH IS THAT AS A MATTER OF LOGIC, IF THE EMBRYO IS NOT TO

BE CONSIDERED THE KIND OF ENTITY THAT CAN BE HARMED BY BEING DESTROYED, WHICH IS WHAT IS ROUTINELY GOING TO BE DONE FOR SURPLUS EMBRYOS THAT ARE USED TO GENERATE STEM CELL LINES, THEN IT MAKES LITTLE SENSE TO CONSIDER IT TO BE HARMED BY BEING MANIPULATED BEFORE IT IS DESTROYED. AND UNDER THAT THEORY, COLD AND CALLOUS AS IT SOUNDS, RIGHT, IT WOULD SEEM LOGICALLY THAT ONE COULD MANIPULATE IN ANY FASHION AND THAT THE ONLY REAL CONCERN IS THAT YOU MAKE SURE THAT IN THE END THAT EMBRYO IS NOT TRANSFERRED TO A UTERUS, WHETHER IT IS THE RESULT OF CLONING OR SOME OTHER MANIPULATION BECAUSE YOUR REAL CONCERN IS IN A NEWBORN CHILD DOWN THE ROAD NINE MONTHS LATER WHO COULD SUFFER HARM.

DR. TAYLOR: IN LESS THAN 12 DAYS.

MS. CHARO: AND WE'VE GOT ANOTHER PROVISION HERE THAT ABSOLUTELY SAYS WE CAN'T CULTURE BEYOND 12 DAYS. SO WE KNOW THAT WE'RE TALKING ABOUT A 12-DAY WINDOW FOR THE MANIPULATIONS.

AS A MATTER OF KIND OF POLITICAL REALITY, IF THERE'S NO SCIENTIFIC NEED TO DO SUCH MANIPULATIONS, AND IF THERE IS THE SENSE THAT THE MANIPULATIONS WOULD GENERATE CONCERN AND OPPOSITION AND MISUNDERSTANDING, ONE MIGHT SAY WE WILL NOT FUND -- WE WILL WRITE GUIDELINES THAT CLARIFY THAT WE'RE NOT FUNDING THIS BECAUSE, IN FACT, SCIENTIFICALLY WE HAVE NO NEED OR

INTENT TO FUND IT. THE ONLY REASON I'M STUMBLING HERE IS THE POLITICAL ISSUE, I THINK, IS CLEAR, BUT REGULATIONS HAVE A LIFE THAT SEEMS TO GO ON AND ON AND ON EVEN AFTER THE FACTS HAVE CHANGED. SO I'M CONCERNED WITH THE ISSUE OF HOW ONE WOULD CHANGE THE REGULATIONS IF THE EQUATION ALTERED AND WE DISCOVERED THAT THERE REALLY WAS SOME DRIVING NEED TO DO WORK.

DR. PETERS: ALTA, I THINK, AGAIN, YOU FORMULATE THE ISSUE VERY CLEARLY AND CONSCIENTIOUSLY WRESTLED IT, BUT I'M SO PERSUADED BY THE LOGIC OF YOUR FIRST ARGUMENT, THAT I REALLY DON'T THINK WE NEED TO CAPITULATE TO WHAT WE FEAR MIGHT BE THE PUBLIC REACTION WITH REGARD TO THE SECOND COMPROMISE BECAUSE I MEAN AT BEST IT IS VAGUE. WE CERTAINLY HAVE A VERY CONSERVATIVE WINDOW, THE 12-DAY WINDOW, WITHIN WHICH WE CAN WORK ON THE EMBRYO BEFORE ITS DESTRUCTION.

SO THEN TO -- LET ME JUST KIND OF DRAW OUT THE IMPLICATIONS OF THE SECOND OF YOUR TWO ALTERNATIVES. WE WOULD CONSTRICT, LIMIT THE SCOPE OF SCIENTIFIC RESEARCH ON THE BASIS OF A PERCEIVED SPECULATIVE NEGATIVE PUBLIC REACTION. AND I'M JUST SAYING I DON'T FIND THAT SUFFICIENT REASON FOR PUTTING THAT INTO A REGULATION, AS YOU SUGGESTED MIGHT LAST TEN YEARS OR SOMETHING.

MS. CHARO: JUST A FRIENDLY CLARIFICATION.

WE'RE NOT TALKING ABOUT PROHIBITING ANYTHING. WE'RE TALKING ABOUT WHAT WE WOULD CHOOSE OR NOT CHOOSE TO FUND AS A DISCRETIONARY MATTER, WHICH IS A SLIGHTLY DIFFERENT KIND OF ANALYSIS, RIGHT.

DR. PETERS: YES, IT IS. BUT STILL, ALTA, I'D LIKE TO HAVE YOU SPEAK TO MY ARGUMENT ABOUT THE INTERNAL LOGIC OF MAKING THIS KIND OF A DECISION, THAT WE'RE NOT GOING TO FUND A CERTAIN AREA OF SCIENCE WHICH ON RELATED ISSUES WE THINK IS LEGITIMATE, AND IN THIS CASE WE'RE NOT GOING TO FUND IT BECAUSE OF SOME SORT OF VAGUE PERCEPTION ABOUT A NEGATIVE PUBLIC REACTION. I JUST WONDER IF THAT'S SUFFICIENT GROUNDS. WHAT IF -- I DON'T WANT TO PUSH IT THIS FAR, BUT WHAT IF IT WERE SORT OF A PRECEDENT THAT WE WOULDN'T FUND CERTAIN AREAS OF SCIENCE JUST IN GENERAL BECAUSE WE'RE CONCERNED ABOUT THE POLITICAL IMPORT WHEN YOU SORT OF MADE OTHER DECISIONS THAT WOULD PERMIT THIS KIND OF OR ENCOURAGE THIS KIND OF RESEARCH ON A DIFFERENT BASIS.

SO IT'S A CONSISTENCY ARGUMENT. IN OTHER WORDS, WHY ARE YOU NOT PERSUADED TOTALLY AND COMPLETELY BY THE LOGIC OF THE FIRST SIDE OF THE HORN OF THE DILEMMA THAT YOU PUT US ON?

MS. CHARO: BECAUSE I ACTUALLY BELIEVE THAT IN CASES OF DISCRETIONARY DECISIONS ABOUT FUNDING, THE VIEWS OF THE PUBLIC HAVE SOME LEGITIMATE WEIGHT IN THE

DISCUSSION. AND THAT IF YOU HAVE PEOPLE WHO ARE DEEPLY PERTURBED BY SOMETHING, AND YOU HAVE NO OFFSETTING NEED TO DO IT, THAT MAY BE AN ARGUMENT FOR WHY YOU WOULD CHOOSE NOT TO FUND IT, AND YOU WILL CONTINUE TO MAINTAIN THAT CHOICE UNLESS AND UNTIL THE DAY COMES THAT THERE IS A SUFFICIENT NEED FOR IT THAT YOU NOW HAVE TO REVISIT THE PUBLIC DISQUIET VERSUS THE POTENTIAL BENEFITS TO INDIVIDUALS NOW AND IN THE FUTURE AND THE BALANCE OF INTERESTS MIGHT CHANGE.

I GUESS IT'S BECAUSE I TAKE THE PUBLIC CONCERN SERIOUSLY AS AN ELEMENT OF THE ETHICAL ANALYSIS IN AND OF ITSELF AND NOT JUST THE CONCERN ABOUT THE STATUS OF THE EMBRYO.

DR. PETERS: COULD I ASK ABOUT THE -- DO YOU HAVE SUFFICIENT CLARITY THAT THIS IS NOT A NEED THAT OUR SCIENTISTS HAVE? WE'VE GOT SOME SCIENTISTS IN THE ROOM. I MEAN IF THERE IS ABSOLUTELY NO NEED, THEN IT PROBABLY DOESN'T MAKE ANY DIFFERENCE, BUT IT JUST SEEMS TO ME THAT TO CLOSE THE DOOR IN ADVANCE, OF COURSE, YOU SAY WE COULD REOPEN IT, BUT I GUESS I'M NOT THAT CONVINCED THAT THERE COULDN'T BE A REASONABLE NEED FOR THE SCIENTISTS IN THE FUTURE TO DO THAT.

CHAIRMAN LO: TED, LET ME JUST SAY THIS WAS VERY EXTENSIVELY DISCUSSED BY ALL THE INSTITUTIONS WHO HAVE APPLIED FOR FUNDING UNDER THE TRAINING GRANTS, ALL

THE UC CAMPUSES, SCRIPPS, BURNHAM, STANFORD, USC. AND A LOT OF THE PEOPLE WERE SCIENTISTS, AND NONE OF THEM RAISED AN OBJECTION TO C AND D TO SAY THIS IS NOT ALLOWING US TO DO IMPORTANT RESEARCH THAT WE'RE READY TO DO AT THIS TIME. I GUESS I WOULD --

DR. PETERS: THANKS. THAT'S QUITE RELEVANT.

CHAIRMAN LO: AGAIN, I THINK YOU'RE RIGHT, THAT YOU DON'T WANT TO SORT OF BALANCE SPECULATIVE HARMS VERSUS KNOWN SCIENTIFIC BENEFITS. BUT AT THIS POINT THE SCIENTIFIC WARRANT FOR DOING C AND D IS ALSO SPECULATIVE. I THINK WE'D BE, AGAIN, TO USE SHERRY'S LANGUAGE FROM THIS MORNING, MORE CONSERVATIVE TO SAY WHEN THE TIME COMES WHEN SCIENTISTS SAY WE'RE NOW STARTING TO THINK ABOUT EXPERIMENTS THAT DON'T FIT UNDER C AND D, BUT WOULD BE REALLY USEFUL, THEN THAT'S THE TIME TO REVISIT. OTHERWISE TO SORT OF GO BACK ON WHAT WE HAVE PREVIOUSLY SAID WITHOUT A COMPELLING ARGUMENT AT THIS TIME, IT'S NOT SOMETHING WE NEED TO DO RIGHT NOW AND WE CAN WAIT TILL IT COMES UP.

DR. KIESSLING: HOW DOES THAT RELATE TO F AND G?

MS. CHARO: F AND G NOW WE HAVE ACTUAL SCIENTIFIC NEED TO DO IT.

CHAIRMAN LO: I THINK WE WANT TO SAY F AND G -- MY SENSE IS, I DON'T KNOW HOW TO WORD THIS, BUT F

AND G WE WOULD LIKE TO BE ABLE TO FUND SCIENTIFIC NONREPRODUCTIVE PURPOSES, BUT IT'S NOW ALREADY FORBIDDEN AND SOME OF THIS ALREADY IS WITHIN PROP 71. WE DON'T WANT THESE KINDS OF TECHNIQUES USED FOR REPRODUCTION BY CIRM-FUNDED RESEARCHERS.

THE OTHER QUESTION RAISED BY THE PUBLIC WAS WHAT ABOUT THE TECHNOLOGY BEING USED BY SOMEONE WHO'S NOT A CIRM-FUNDED RESEARCHER SINCE YOU'RE MAKING THIS INFORMATION WIDELY AVAILABLE ABOUT HOW TO DO IT. I GUESS THAT'S A SEPARATE ISSUE. AT LEAST ON THE CIRM FUNDING, DO WE WANT TO -- RIGHT NOW WE DON'T SAY ANYTHING ABOUT THIS GENETIC MANIPULATION INVOLVING AN EMBRYO. SO KEVIN'S PROJECT COULD GET FUNDED. NO ONE COULD DO IT UNDER CIRM FUNDING FOR REPRODUCTIVE PURPOSES, BUT F AND G ACTUALLY PROPOSE TO BAN OTHER TYPES OF GENETIC MANIPULATION. AND I THINK THE SENSE OF OUR COMMITTEE WAS THESE TYPES OF GENETIC MANIPULATION WOULD ONLY BAN, IF AT ALL, IF IT WAS USED FOR REPRODUCTIVE PURPOSES. I GUESS I'M NOT HEARING A CLEAR MESSAGE FROM THE COMMITTEE THAT WE WANT TO BAN IT AT ALL AT THIS POINT, WHICH IS WHAT OUR CURRENT REGULATIONS DON'T ADDRESS.

MS. CHARO: I THOUGHT I HEARD THAT WE WERE GOING TO BAN THE TRANSFER TO A UTERUS OR THE GENETICALLY MODIFIED HUMAN EMBRYO.

CHAIRMAN LO: SO THAT STRIKES ME AS WHEN YOU TAKE F AND G AND SORT OF TAKE OUT WHAT'S ALREADY BANNED BECAUSE REPRODUCTIVE CLONING IS BANNED, WHAT'S LEFT IS THE RESEARCH THAT TAKES AN EMBRYO AND GENETICALLY ALTERS IT AND THEN PUTS IN... AND TO SAY THAT WE'RE NOT GOING TO FUND THAT FOR SURE, BUT LEAVE WE'RE OPEN TO FUNDING IF IT'S JUST FOR RESEARCH LAB PURPOSES ONLY.

MR. LOMAX: SO THIS WOULD ENCAPSULATE THE SPIRIT OF, HOPEFULLY, BOTH F AND G, AND THE STATEMENT WOULD READ, "TRANSFER TO A UTERUS OF A HUMAN EMBRYO THAT HAS BEEN GENETICALLY MODIFIED."

CHAIRMAN LO: SO WE COULD USE CIRM FUNDING. SO THAT'S AN EXTRA PROHIBITION ON CERTAIN TYPES OF RESEARCH.

MR. TOCHER: GEOFF, CAN YOU DO THAT ONE MORE TIME?

MR. LOMAX: TRANSFER TO A UTERUS OF A HUMAN -- LET ME START OVER AGAIN. LET ME JUST READ THIS ONCE MORE.

TRANSFER TO THE UTERUS OF A HUMAN EMBRYO --

MS. CHARO: NO. TRANSFER TO A UTERUS OF A HUMAN EMBRYO THAT HAS BEEN GENETICALLY MODIFIED.

CHAIRMAN LO: SO YOU DON'T WANT TO TRANSFER A HUMAN EMBRYO THAT HAS BEEN GENETICALLY MODIFIED. YOU CAN'T PUT THAT IN A UTERUS.

MS. CHARO: ACTUALLY WE CAN SIMPLIFY IT AND JUST SAY TRANSFER TO A UTERUS OF A GENETICALLY MODIFIED HUMAN EMBRYO. HOW ABOUT THAT? THAT MAKE IT EASIER TO UNDERSTAND?

CHAIRMAN LO: PUBLIC COMMENT PARTICULARLY FROM THE PEOPLE WHO MADE THE ORIGINAL SUGGESTION?

DR. KIESSLING: JUST FOR THE RECORD, I CAN'T FIND ANY EVIDENCE FOR G IN THE NATIONAL ACADEMY GUIDELINES. MAYBE SOMEBODY WHO'S MORE FAMILIAR WITH THOSE GUIDELINES. I DON'T SEE ANYTHING IN THE NATIONAL ACADEMY GUIDELINES ABOUT GENETIC ALTERATION OF A HUMAN EMBRYO.

MS. CHARO: G WAS NOT FROM THE GUIDELINES. G WAS FROM THE PUBLIC COMMENTERS.

DR. KIESSLING: RIGHT, BUT I THOUGHT THE PUBLIC COMMENT TOLD THEM -- THAT IT WAS BASED ON, THAT IT WOULD MAKE IT MORE CONSISTENT WITH THE NAS GUIDELINES.

MS. CHARO: NO. NO. THAT DIALOGUE HAD TO DO WITH WHETHER WE MODIFY THE EXISTING C AND D KIND OF GLOBAL PROHIBITIONS ON STEM CELL INTRODUCTION INTO EMBRYOS TO APPLY ONLY WHERE IT'S TRANSFERRED TO A UTERUS AND WHERE THE NAS GUIDELINES MADE NO SUCH CONSTRAINT ON THE PROHIBITION. AT LEAST THAT'S HOW I UNDERSTOOD THE CONVERSATION.

CHAIRMAN LO: ALL RIGHT. ANY FURTHER DISCUSSION OF THIS PROPOSED ADDITION TO OUR REGULATIONS? INVITING MEMBERS OF THE PUBLIC.

DR. PETERS: LET ME JUST BE CLEAR ON WHAT WE'RE VOTING ON. WE ARE GOING TO ADD THIS PARTICULAR PROVISION, AND WE'RE NOT GOING TO CHANGE THE EXISTING WORDING; IS THAT CORRECT?

CHAIRMAN LO: OF C AND D. GEOFF, ONE MORE TIME.

MR. LOMAX: TRANSFER TO A UTERUS OF GENETICALLY MODIFIED HUMAN EMBRYO.

CHAIRMAN LO: THIS FITS UNDER THE FOLLOWING ACTIVITIES ARE NOT ELIGIBLE FOR CIRM FUNDING, AND WE ADD IN UNDER HERE --

MS. LANSING: SAY THAT SENTENCE AGAIN.

MR. LOMAX: TRANSFER TO A UTERUS OF GENETICALLY MODIFIED HUMAN EMBRYO.

CHAIRMAN LO: SO WE'RE ALLOWING IT FOR RESEARCH PURPOSES IN THE LAB, BUT YOU CAN'T --

MS. LANSING: WE'RE MAKING IT STRICTER.

CHAIRMAN LO: WE'RE ADDING THAT TO ADDRESS THE CONCERNS ABOUT TRANSMITTING GENETIC MODIFICATIONS TO THE NEXT GENERATION. SOMEONE WANTS TO MOVE THAT WE ADOPT --

DR. PETERS: SO MOVED.

MS. CHARO: SECOND.

CHAIRMAN LO: AGAIN, LAST CALL FOR DISCUSSION. OKAY. ALL THOSE IN FAVOR. AND AGAIN, NOW IT'S JUST A SENSE OF THE COMMITTEE BECAUSE I HAVE NOBODY ON THE TELEPHONE AS FAR AS I KNOW. ALL THOSE IN FAVOR. ANY OPPOSED? ANY ABSTENTION? IF SOMEONE COULD JUST RECORD THE NUMBER OF PEOPLE HERE.

MR. TOCHER: EIGHT.

CHAIRMAN LO: NOW I WOULD LIKE TO RETURN, HAVING HAD A FULL LUNCH AND ADEQUATE TIME TO DIGEST, I'D LIKE TO RETURN TO WHAT WE WERE TALKING ABOUT BEFORE OUR LUNCH BREAK. WE HAVE FOUR KIND OF POSSIBILITIES HERE FOR RESOLVING THE ISSUES WE TALKED ABOUT THIS MORNING, AND THEY'RE LISTED IN DECREASING RESTRICTIVENESS.

SO THE FIRST ONE WHICH I WANTED TO AT LEAST HAVE US CONSIDER IS FOR CIRM-FUNDED RESEARCH INTENDED TO DERIVE COVERED STEM CELL LINES INVOLVING THE DONATION OF UMBILICAL CORD, CORD BLOOD, OR THE PLACENTA FOR PURPOSES OTHER THAN AUTOLOGOUS DONATION. THE CHANGE IS WHO DO YOU GET CONSENT FROM? ONE VERSION IS CONSENT SHALL BE OBTAINED FROM EACH LEGAL PARENT, GUARDIAN, AND IDENTIFIED GENETIC PARENT.

ACTUALLY, GEOFF, WHAT I MEANT TO SAY, EACH OF THE PARENT OR GUARDIAN AND FROM BOTH GENETIC PARENTS