BEFORE THE

INDEPENDENT CITIZENS' OVERSIGHT COMMITTEE
TO THE
CALIFORNIA INSTITUTE FOR REGENERATIVE MEDICINE
ORGANIZED PURSUANT TO THE
CALIFORNIA STEM CELL RESEARCH AND CURES ACT

REGULAR MEETING

LOCATION: SHERATON SAN DIEGO
1380 HARBOR ISLAND DRIVE
MARINA TOWER, HARBOR ISLAND I
SAN DIEGO, CALIFORNIA

DATE: WEDNESDAY, JUNE 23, 2010
9:30 A.M.

REPORTER: BETH C. DRAIN, CSR
CSR. NO. 7152

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I N D E X

SAN DIEGO, CALIFORNIA; WEDNESDAY, JUNE 23, 2010

09:50 A.M.

CHAIRMAN KLEIN: THANK YOU VERY MUCH. IT WAS A TREMENDOUS PRESENTATION ON ALS. THIS DISEASE TEAM HOLDS OUT GREAT CHALLENGES AND GREAT HOPES. WE WISH YOU THE VERY BEST.

I'D LIKE TO BEGIN THIS MORNING BY MELISSA KING LEADING US IN THE FLAG SALUTE FOLLOWED BY THE ROLL CALL, AND WE'RE GOING TO GO DIRECTLY INTO THE PRESIDENT'S REPORT. MELISSA KING.

(THE PLEDGE OF ALLEGIANCE.)

MS. KING: DONALD DAFOE FOR RICARDO AZZIZ.

DR. DAFOE: HERE.

MS. KING: ROBERT PRICE FOR ROBERT BIRGENEAU.

DR. PRICE: HERE.

MS. KING: FLOYD BLOOM. DAVID BRENNER.

DR. BRENNER: HERE.

MS. KING: WILLIAM BRODY. SUSAN BRYANT.

DR. BRYANT: HERE.

MS. KING: MARCY FEIT. MICHAEL FRIEDMAN.

DR. FRIEDMAN, I UNDERSTAND, WILL BE JOINING US BY PHONE THIS MORNING. I'LL COME BACK TO HIM.

LEEZA GIBBONS. MICHAEL GOLDBERG. SAM HAWGOOD.

DR. HAWGOOD: HERE.

MS. KING: BOB KLEIN.

CHAIRMAN KLEIN: HERE.

MS. KING: SHERRY LANSING. GERALD LEVEY. TED LOVE. ED PENHOET. PHIL PIZZO. CLAIRE POMEROY.

DR. POMEROY: HERE.

MS. KING: EXCELLENT. THANK YOU, DR. POMEROY, JOINING US BY PHONE.

FRANCISCO PRIETO.

DR. PRIETO: HERE.

MS. KING: CARMEN PULIAFITO. ROBERT QUINT.

DR. QUINT: PRESENT.

MS. KING: JOHN REED.

DR. REED: HERE.

MS. KING: DUANE ROTH.

MR. ROTH: HERE.

MS. KING: JOAN SAMUELSON. DAVID SERRANO-SEWELL. JEFF SHEEHY. JON SHESTACK. OSWALD STEWARD. AND ART TORRES.

MR. TORRES: HERE.

CHAIRMAN KLEIN: THANK YOU VERY MUCH. WE'RE GOING TO HEAR FROM DR. TROUNSON ON THE

PRESIDENT'S REPORT. WE WILL PROCEED WITH DR. OLSON WHO HAS A MEETING THAT SHE HAS SCHEDULED A PLANE TO CATCH ON CIRM BUSINESS, AND THEN WE ARE GOING TO GO TO THE BUDGET. BY THE TIME WE GET TO THE BUDGET, WE BELIEVE DR. FRIEDMAN WILL BE THERE FOR OUR QUORUM.

DR. FRIEDMAN: I'M ON NOW, BOB.

CHAIRMAN KLEIN: GOOD. GREAT. THEY'RE AHEAD OF SCHEDULE. DR. TROUNSON.

DR. TROUNSON: THANK YOU VERY MUCH, CHAIR. SO I WANTED TO -- MELISSA IS JUST GOING TO FIND ME A SLIDE, BUT WE'VE JUST BEEN THROUGH THE ISSCR MEETING LAST WEEK. AND THERE WERE A NUMBER OF PATIENT ADVOCATES AND OTHER MEMBERS OF THE BOARD THERE AS WELL AS ALL OF OUR SCIENTIFIC STAFF. IT WAS AN ABSOLUTELY FABULOUS MEETING. IT REALLY WAS SOMETHING VERY SPECIAL.

AND LET ME JUST GIVE YOU A LITTLE TINY BIT OF WHAT THIS BRILLIANT SCIENCE WAS. ONE OF THOSE TALKS WAS GIVEN BY RUSTY GAGE FROM THE SALK. AND HE KIND OF OPENED MY MIND AGAIN INCREDIBLY. HE'S JUST A FABULOUS SCIENTIST LEADING A WONDERFUL GROUP THERE.

BUT IN THE BRAIN, THE CENTRAL NERVOUS SYSTEM IS FULL OF NERVES, NEURONS AND NERVE CELLS WHICH ARE ALL DIFFERENT. AND HOW DO THEY BECOME

DIFFERENT? AT LEAST IN SOME RESPECTS HE'S ABLE TO SHOW THAT THESE SO-CALLED JUMPING GENES, THE TRANSPOSANS, BECOME VERY ACTIVE DURING EARLY DEVELOPMENT, VERY ACTIVE AND THEY END UP BEING VERY DIFFERENT IN EACH CELL. WHAT YOU DO END UP IS --

(PAUSE IN PROCEEDINGS.)

WHEN YOU JUMP INTO A TALK, YOU DON'T EXACTLY KNOW WHERE IT IS, BUT JUST LET ME FILL YOU IN ON THE JUMPING GENES. THAT IS PROBABLY ONE WAY BECAUSE THESE JUMPING GENES WILL ALL GO OUT IN DIFFERENT PLACES AS THEY MOVE AROUND IN THE GENOME, AND THEY WILL SILENCE GENES IN ALL DIFFERENT WAYS. THIS CAN BE INHERITABLE, OF COURSE. THESE TRANSPOSANS ARE ABLE TO MOVE AROUND, BUT THEY BECOME REASONABLY STABLE AFTER EARLY DEVELOPMENT. SO THEN YOU'VE SET UP A WHOLE CADRE OF DIFFERENT NEURONS.

ONE OF THE MOST INTERESTING THINGS THAT HE SAID, AND HE HADN'T REALLY SPOKEN ABOUT THIS BEFORE, JUST A SIGHT INTO WHAT MIGHT BE GOING ON IN AUTISM. USUALLY YOU HAVE THIS TREMENDOUS ACTIVITY OF THESE TRANSPOSANS. WHAT YOU SEE IN PATIENTS WHO HAVE HAD IPS CELLS MADE BACK INTO IPS CELLS FOR PATIENTS WITH AUTISM, THESE CELLS HAVE AN EXTRAORDINARILY HIGH ACTIVITY IN TRANSPOSANS, MUCH HIGHER THAN THE SO-CALLED WILD TYPE, THE PATIENTS WHO DON'T HAVE THE

DISEASE.

THIS IS THE VERY FIRST TIME I'D EVER HEARD OF THAT. IF THERE THIS IS ONE OF THE -- IT STRUCK ME AS SOMETHING THAT WE MIGHT BE ABLE TO GET A TOEHOLD ON FOR THAT TERRIBLE DISEASE, AND IT'S ONE OF THE DISEASES THAT WE'VE BEEN STRUGGLING WITH. WE HAD AN AUTISM WORKSHOP. WE FELT MAKING IPS CELLS WAS WORTHWHILE, BUT WE REALLY DIDN'T KNOW WHERE WE MIGHT FOCUS IT. I THINK SUDDENLY WE'VE GOT A FOCUS THERE THAT WE MIGHT BE ABLE TO EXPLORE IN THE BASIC SCIENCE SENSE WITH AUTISM.

SO HERE'S SOMETHING VERY SPECIAL THROUGH BASIC SCIENCE THAT YOU WOULDN'T HAVE EXPECTED, I DON'T THINK. I DON'T KNOW HOW IT ACTUALLY RELATES TO AUTISM, BUT IT PROBABLY CREATES SOME DEFECTIVE NEURONS OR GIVES YOU POPULATIONS OF NEURONS OVER AND ABOVE THOSE THAT YOU WANT. SO CERTAIN TRANSPOSAN ACTIVITY IS NEEDED FOR DEVELOPMENT AND HIGH ACTIVITY IS NOT.

THE OTHER -- I THINK THE OTHER CONCENTRATION OF PAPERS WERE IN THE AREA WHERE THEY'RE ABLE TO SHOW THAT IF YOU TAKE A SKIN CELL FROM A PATIENT, YOU CAN DIRECTLY CHANGE IT TO THE CELL THAT YOU WANT WITHOUT HAVING TO GO BACK THROUGH THE IPS. YOU DON'T HAVE TO MAKE THEM

PLURIPOTENTIAL. YOU CAN MAKE THEM DIRECTLY. SO, OF COURSE, DOUG MELTON'S EARLY WORK SHOWED THAT THIS WAS POSSIBLE, TO TAKE AN EXOCRINE CELL AND TURN IT INTO AN ENDOCRINE CELL WITH THREE TRANSCRIPTION FACTORS.

SO EVERYBODY IS USING NOW TRANSCRIPTION FACTORS TO SEE IF THEY CAN GET THE CELLS TO GO FROM THE FINAL CELL TO THE CELL THAT YOU'RE INTERESTED IN WITHOUT HAVING TO GO THROUGH THE PLURIPOTENTIAL CELL. SO THERE'S A WONDERFUL PAPER BY MARIUS WERNIG, AND I BROUGHT THAT TO YOUR ATTENTION EARLY THIS YEAR, SO I WON'T GO BACK THROUGH THAT, BUT THAT WAS ONE OF THE RATHER KEY PAPERS.

KEVIN EGGAN WAS LOOKING AT REPROGRAMMING MOUSE FIBROBLASTS TO MOTOR NEURONS. HE'S BEEN ABLE TO SHOW, AGAIN, WITH A SET OF TRANSCRIPTION FACTORS, HE CAN TAKE THEM TO MOTOR NEURONS. STILL LOOKING TO SEE WHETHER THEY'RE REALLY FUNCTIONAL, PROPERLY FUNCTIONAL CHARACTERIZED IN A PROPER WAY, AND LOOKING IN THE FEASIBILITY OF THE HUMAN.

MAGDALENE GURTEZ REPROGRAMMING ADULT MOUSE AND HUMAN ASTROCYTES TO NEURONS, SO DIRECTLY TAKING THE ASTROCYTES TO NEURONS. IT'S A VERY INTERESTING PATHWAY. MOST PEOPLE THOUGHT YOU COULDN'T DO THAT. AND THEN WONDERFUL WORK PUBLISHED BY DEEPAK

SRIVASTAVA AT THE GLADSTONE INSTITUTE WHERE HE'S REPROGRAMMING MOUSE CARDIAC FIBROBLASTS TO FUNCTIONAL CARDIOMYOCYTES WITH THREE FACTORS WITH A VERY HIGH EFFICIENCY OF 17 PERCENT.

SO THIS DIRECT PROGRAMMING IS LOOKING VERY, VERY INTERESTING. AND I THINK THAT'S THE HOT AREA AT THE MOMENT, IF YOU LIKE, THAT WE PICKED UP, THE SCIENCE GROUP PICKED UP FROM THAT MEETING. THIS IS GOING TO BE A FAST MOVING EDGE, AND IT'S ONE THAT WE NEED TO BE INTERESTED IN.

BUT I WANTED TO DRAW YOUR ATTENTION TO THE CIRM GRANTEE JOANNA WYSOCKA, WHO WON THE OUTSTANDING YOUNG INVESTIGATOR AWARD FOR THE WHOLE MEETING. THERE WAS OVER 1600 POSTERS AT THIS MEETING, WHICH WAS AN ENORMOUS NUMBER OF POSTERS, AND SHE WAS AWARDED THE TOP POSTER. SHE'S ONE OF OUR SEED NEW FACULTY AWARD GRANTEES, AND SHE IS LOOKING TO STUDY HOW CELLS DETERMINE THE EVENTUAL FATE IN THE EMBRYO, BUT SHE'S SPECIFICALLY LOOKING AT THE METHYL TRANSFERASE COMPLEX IN THE EPIGENETIC REGULATION OF DIFFERENTIATION. AND THOSE PARTS, AGAIN, ARE RESPONSIBLE FOR SILENCING GENES OF THE TRITHORAX AND POLYCOMB CLUSTERS. THESE ARE THE CLUSTERS THAT ARE REALLY IMPORTANT IN EARLY DIFFERENTIATION AND GOVERN MUCH OF THE GENE EXPRESSION SYSTEMS THERE.

SO SHE'S A WONDERFUL YOUNG RESEARCHER. AND I THINK WE SHOULD BE PROUD OF HER WINNING THAT. IT'S FANTASTIC. SO I WOULD SAY OVERALL THE PRESENTATIONS FROM CALIFORNIANS HAVE REALLY, REALLY INCREASED IN THEIR IMPACT AND THEIR OVERALL IMPORTANCE WORLDWIDE. AS I SAID, AT LEAST TWO OF THOSE MAJOR DIRECT PROGRAMMING STUDIES AND ALSO THE NEURAL WORK IS COMING OUT OF CALIFORNIA. SO THIS IS IMPORTANT TO RECOGNIZE THAT CALIFORNIANS ARE REALLY MOVING UP INTO THE FRONT LINE. AND I THINK THAT'S BASICALLY BECAUSE OF THE SUPPORT THAT THEY ARE RECEIVING THROUGH CIRM.

SO IF I CAN GO BACK TO THE FRONT, IF I MAY, BUT I THINK YOU SHOULD FEEL THAT THIS IS FANTASTIC AND THIS IS RECOGNITION OF ALL OUR IMPORT.

CHAIRMAN KLEIN: SO, PRESIDENT TROUNSON, PERHAPS WE CAN TRY AND GET SOME RECOGNITION FOR THIS YOUNG RESEARCHER WHO HAS RECEIVED INTERNATIONAL RECOGNITION MUCH LIKE THE EARLY TRAINING GRANT SCHOLAR AT UC SAN FRANCISCO WHERE THEY DID A SPECIAL PIECE ON THE INDIVIDUAL. THIS IS CREATING A GREAT MODEL FOR THE FUTURE FOR STUDENTS AND GRADUATE STUDENTS AND POST DOCS AND THEIR INTEREST IN THIS FIELD. IT WOULD BE GREAT TO SEE IF WE COULD FIND A FORM OF MEDIA THAT WOULD DO A HUMAN INTEREST STORY

BECAUSE IT'S A GREAT STORY HERE.

DR. TROUNSON: IT IS INDEED. AS YOU SAY, COMING FROM A SEED GRANT FROM OUT OF THE FIELD INTO THE FIELD, IT'S A SUCCESS STORY THAT'S WELL WORTH PUBLISHING. SO I'LL ASK DON GIBBONS TO LOOK INTO THAT. I KNOW HE AND HIS STAFF ARE INTERESTED IN DOING THAT. AND, OF COURSE, EVERYONE AT ISSCR WAS SO IN RAPTURES OVER THE WORK. IT WAS JUST FANTASTIC WORK.

SO I THINK THERE ARE A NUMBER OF PAPERS THAT I WANTED TO DRAW YOUR ATTENTION TO WHILE WE'RE WAITING FOR THAT TO HAPPEN. THERE'S ONE PAPER, THERE'S A LOT OF DISCUSSION ABOUT WHAT'S THE DIFFERENCE BETWEEN IPS CELLS AND EMBRYONIC STEM CELLS. WE HAD A VERY INTERESTING WORKSHOP JUST BEFORE THE ISSCR MEETING ON NUCLEAR TRANSFER, SCNT. WHEN THEY LOOKED IN THE MOUSE AND THEY WERE USING EXACTLY THE SAME CELLS, SO THEY TOOK EXACTLY THE SAME MICE AND THEY MADE EMBRYONIC STEM CELLS OUT OF THEM AND THEN THEY MADE IPS CELLS OUT OF THE SKIN CELLS. SO THESE HAVE GOT EXACTLY THE SAME GENOME COMPONENT.

WHAT WAS THE DIFFERENCE THERE? WELL, THE DIFFERENCE WAS REALLY ONLY IN ONE CLUSTER OF GENES, THE DLK-1/DIO3 GENE CLUSTER. IT'S ON CHROMOSOME 12.

EVERYTHING ELSE WAS THE SAME. THAT WAS THE ONLY DIFFERENCE. AND THESE IPS CELLS, WHEN YOU MAKE IPS CELLS, THEY'RE NOT VERY GOOD AT FORMING CHIMERIC MICE. THEY'RE MUCH MORE DIFFERENT THAN EMBRYONIC STEM CELLS, AND THEY'RE VERY DIFFICULT TO MAKE A WHOLE MOUSE OUT OF TETRAPLOID COMPLEMENTATION. IT'S REALLY DIFFICULT TO DO THAT WITH IPS CELLS.

WELL, IN IPS CELLS WHERE YOU'VE GOT A NORMAL EXPRESSION OF THIS CLUSTER, BECAUSE IT'S AN IMPRINTED CLUSTER, IT IS IMPRINTED IN ONE RESPECT BY THE MATERNAL AND ONE RESPECT BY THE PATERNAL, SO THERE'S DIFFERENCES IN THIS PARTICULAR CLUSTER. IF THEY WERE NORMAL, YOU GOT EXACTLY -- YOU RETURN THE CELLS TO EXACTLY THE SAME AS EMBRYONIC STEM CELLS. IF YOU CORRECTED THAT IMPRINTING DEFECT IN THAT ONE CLUSTER, THEY BECAME EXACTLY THE SAME AS EMBRYONIC STEM CELLS. AND SO IT'S THE EXPRESSION STATE IN THIS STUDY OF JUST THIS SINGLE IMPRINTED GENE CLUSTER THAT'S DIFFERENT BETWEEN IPS CELLS AND EMBRYONIC STEM CELLS, WHICH GIVES DIFFERENCE TO HOW WELL THEY WILL DIFFERENTIATE INTO DIFFERENT CELLS.

WE NEED TO FOLLOW THAT THROUGH WITH OTHER MOUSE MODELS, BUT THEN ALSO LOOK AT THE HUMAN. AND THE ONLY WAY YOU WOULD DO THAT WOULD BE MAKE IPS CELLS OUT OF HUMAN EMBRYONIC STEM CELLS BECAUSE YOU

CAN'T DO EXACTLY THE SAME EXPERIMENT AS YOU CAN IN THE MOUSE. SO I THINK THAT'S INTERESTING, THAT THERE ARE REALLY ONLY VERY SMALL DIFFERENCES BETWEEN THESE CELLS, AT LEAST IN THIS PARTICULAR STUDY. AND THAT WAS ONE PUBLISHED BY CONRAD HOCHEDLINGER'S LAB IN *NATURE*.

SO THIS NEXT STUDY IS ONE FROM TOM LANES'S LABORATORY PUBLISHED IN *PNAS*. AND HE WORKS ON MS, WHICH IS AN IMPORTANT DISEASE, AND IT'S NOT ONE WE'VE GOT A LOT OF TRACTION ON AT THE MOMENT. BUT MS IS A DEMYELINATING DISEASE WHERE THERE'S INFLAMMATION AND PROGRESSIVE LOSS OF MYELIN SHEATHS. SO YOU GET A LOSS OF MESSAGE TRANSMISSION DOWN THE AXONS, SO YOU CAN CREATE A PHENOTYPE BY INFECTING THE MICE WITH VIRUSES. AND THE CXC12 IS AN INFLAMMATORY CYTOKINE. AND YOU OFTEN GET AN INFLAMMATORY SITE WHERE YOU ARE LOSING YOUR MYELIN SHEATHS IN THE CENTRAL NERVOUS SYSTEM.

NOW, THIS INFLAMMATORY CYTOKINE IS RECRUITED BY CXCR5 RECEPTOR, WHICH IS A VERY IMPORTANT RECEPTOR IN THE INFLAMMATORY RESPONSE AREA. NOW, IF YOU SURGICALLY ENGRAFT NEURAL STEM CELLS AS SHOWN UP THERE IN GREEN, IF YOU CAN SEE THEM, AND THAT RESULTS IN MIGRATION AND PROLIFERATION AND DIFFERENTIATION TO THESE MYELIN

PRODUCING CELLS, THE OLIGODENDROCYTE PROGENITORS, WHICH REMYELINATE THE NEURONS.

AND WHAT'S HAPPENING THERE WITH THOSE GREEN CELLS, YOU SEE THAT THEY'RE CO-RELATED TO ANTI-CXCL12. SO THE EXPRESSION OF CXCL12 IS IN EXACTLY THE SAME SITE AS THOSE GREEN CELLS, SO WHEN THEY GO THERE, THEY'RE ENHANCED. THIS IS A WAY OF -- THIS MOLECULE IS ONE WHICH IS ENABLING THE TRAFFICKING OF THESE CELLS AND THE FUNCTIONING OF THESE CELLS. IF YOU BLOCK CXCR4, YOU GET KIND OF THE SAME RESPONSE.

SO NOW WE KNOW ONE OF THE KEY MOLECULES THAT'S IN THAT AREA OF TRAFFICKING OF THESE CELLS TO THE SITES THAT THEY NEED TO GET TO. AND THAT'S A VERY IMPORTANT NEW OBSERVATION.

THERE'S ALSO, I DRAW YOUR ATTENTION TO THIS BECAUSE THERE'S A LOT PEOPLE WHO SAY YOU CAN FIND PLURIPOTENTIAL CELLS IN SKIN AND FAT AND SO FORTH. THERE IS A PAPER OUT OF THE KYOTO UNIVERSITY PUBLISHED IN *PNAS* IN MARCH WHERE THEY ARE ABLE TO ISOLATE SINGLE CELLS OUT OF SKIN. AND THEY DID IT REALLY BY DOING LONG-TERM TRYPSINIZATION OF THE TISSUE, WHICH IS A COMMON PROCEDURE. BUT LONG TERM MEANS YOU HAVE TO DO IT OVER AND OVER AND OVER AGAIN. AND THEY FOUND VERY RARE CELLS IN THAT SKIN

WHICH WERE ABLE TO FORM ECTODERM, ENDODERM, AND MESODERM, WHICH IS THE PRIMARY CHARACTERISTICS OF PLURIPOTENTIAL STEM CELLS. SO THEY'RE RARE CELLS THAT THEY FIND. THESE CELLS INTEGRATED INTO DAMAGED LIVER, SKIN, AND MUSCLE, BUT THEIR PROLIFERATION WAS NOT VERY HIGH, AND THEY DIDN'T FORM TERATOMAS.

I QUESTION WHETHER THESE ARE REALLY PLURIPOTENTIAL, BUT YOU DO FIND THEM THERE OCCASIONALLY. I THINK WE'RE GOING TO SEE SOME STRANGE OBSERVATIONS THAT MIGHT BE EXPLAINED BY THESE RARE CELLS IN SOME PLACES LIKE SKIN. AND PERHAPS THIS IS SOMETHING THAT WE OUGHT TO KEEP IN MIND IN TRYING TO INTERPRET SOME OTHER DATA THAT WILL BE COMING THROUGH, I THINK, IN THE NEXT FEW MONTHS ABOUT HOW CELLS THAT WERE MEANT TO BE MESENCHYMAL CELLS ACTUALLY GET TO FORM SKIN.

SO BIOLOGY IS NEVER ABSOLUTE. IT'S RELATIVE. AND I THINK WE ALL NEED TO KEEP IN MIND THAT THERE ARE SOME STRANGE THINGS THAT DO HAPPEN AT TIMES.

THERE'S SOME GREAT WORK THAT WAS PUBLISHED FROM THE WELLCOME TRUST SANGER INSTITUTE IN CAMBRIDGE ON *SCIENCEEXPRESS* BY LI, ET AL., WHICH SHOWS THAT YOU CAN CHANGE T-CELLS, WHICH ARE CRITICAL FOR ADAPTIVE IMMUNITY, INTO NK CELLS. SO

WHAT YOU DO THERE IS, AGAIN, IT'S SOME OF THIS WORK IS AGAIN ON THESE TRANSCRIPTION FACTORS, SO IMPORTANT THESE TRANSCRIPTION FACTORS IN TAKING ONE CELL TO ANOTHER. SO THIS IS ANOTHER DIRECT PROGRAMMING MOVE.

SO IF YOU DELETE THIS BC11B, WHICH IS EXPRESSED IN ALL T-CELLS, THEY ESSENTIALLY BECOME NK CELLS. AND SO THAT'S A PRETTY INTERESTING OBSERVATION, I THINK, AND ONE WHICH COULD BE UTILIZED IN PLACES THAT ARE INTERESTED IN THE IMMUNE RESPONSE, BUT IS ANOTHER EXAMPLE OF THIS DIRECT PROGRAMMING THAT I TOLD YOU ABOUT.

THERE'S A BEAUTIFUL STUDY PUBLISHED IN *NATURE* ON DISEASE IN A DISH ON THE LEOPARD SYNDROME. THIS IS AN AUTOSOMAL-DOMINANT GENETIC DISORDER WHERE YOU GET THE MAJOR PHENOTYPE IS HYPERTROPHIC CARDIOMYOPATHY, SO VERY LARGE HEART. AND THE IPS CELLS FROM THESE PATIENTS PRODUCE LARGER CARDIOMYOCYTES IN CULTURE WITH A HIGH DEGREE OF SARCOMERIC ORGANIZATION -- THEY'RE THE STRIPES THAT YOU SEE ON THE CARDIOMYOCYTES -- AND A PREFERENTIAL LOCALIZATION OF NFATC4 IN THE NUCLEUS COMPARED TO UNAFFECTED SIBLING CONTROLS.

SO THIS IS A NICE DEMONSTRATION OF DISEASE IN A DISH AGAIN. SO IT PROVIDES AN OPPORTUNITY TO

DETERMINE THE MOLECULAR AND SIGNALING PATHWAYS THAT CAUSE THE PHENOTYPE OF LEOPARD SYNDROME AND ALSO ENABLES THE DESIGN OF HIGH THROUGHPUT SCREENING FOR NEW DRUGS TO TREAT THE DISEASE.

QUICKLY, MY PRIORITIES HAVE BEEN ON THE VP R&D SEARCH. WE'RE HAVING DIFFICULTIES IN THAT AREA, DIFFICULTIES IN ATTRACTING SOMEONE BECAUSE OF THE HIGH SALARIES OF THESE VERY COMPETENT PEOPLE IN THE INDUSTRY TO JOIN US. SO WE'RE STILL IN RESEARCH MODE AT THE MOMENT, BUT I SHOULD LET YOU KNOW THAT ALAN LEWIS, WHO JUST STEPPED DOWN FROM THE JUNIOR DIABETES RESEARCH FOUNDATION, IS GOING TO JOIN US AS A CONSULTANT TO WORK TWO OR THREE DAYS TO HELP US WITH THE CLINICAL, PRECLINICAL PROGRAMS. HE'S A TERRIFIC GUY. I THINK MOST OF YOU WOULD KNOW HIM. AND HE'S AGREED TO BECOME A CONSULTANT FOR THE TIME BEING WHILE WE'RE STILL IN SEARCH MODE.

CHAIRMAN KLEIN: AND THAT'S TWO OR THREE DAYS A WEEK.

DR. TROUNSON: YES.

CHAIRMAN KLEIN: NOT TWO OR THREE DAYS.

DR. TROUNSON: TWO OR THREE DAYS A WEEK. SORRY, CHAIR. I'M TRYING TO BE QUICK, OBVIOUSLY A BIT TOO QUICK. BUT I THINK THE BOARD SHOULD FEEL THAT WE'RE DOING OUR BEST IN THIS RESPECT. WE'VE

HAD SOME DIFFICULTIES, BUT WE'RE STILL ON TRACK TO DO THAT. BUT WITHOUT HAVING SOMEONE LIKE TED LOVE ON BOARD, WE'RE REALLY STRUGGLING IN ORDER TO DO ALL THE THINGS THAT YOU REQUIRE OF US PROPERLY. SO HAVING ALAN PRESENT WILL CERTAINLY HELP GOING THROUGH THIS PARTICULAR SPACE.

WE'VE BEEN LOOKING AT CALIFORNIA STEM CELL LEADERSHIP, AND I THINK YOU WILL SEE SOME REALLY INTERESTING THINGS HAPPENING THERE. THESE ARE THE LEADERSHIP PROGRAM AWARDS COMING FORWARD AGAIN. WE HAVE A NEW ROUND THAT'S NEARBY TO US.

LOOKING AT FINANCIAL FORECASTING AND THE CIRM MISSION, I WANT YOU TO HEAR JOHN ROBSON'S PRESENTATION BECAUSE I THINK IT'S REALLY CRITICAL TO HAVE AN UNDERSTANDING OF WHAT WE'VE GOT AND HOW FAR WE CAN GO. ESSENTIALLY IF WE KEEP GOING AS WE ARE, WE MIGHT FINISH MAKING ANY NEW GRANTS IN 2014. NOW, THAT'S ONLY FOUR YEARS AWAY. SO I WANT YOU TO THINK ABOUT -- I'D LIKE YOU TO THINK ABOUT THOSE THINGS. AND I WANT JOHN TO BE ABLE TO PRESENT THAT TO YOU BECAUSE WE NEED -- IT'S FOR INFORMATION, AND IT NEEDS TO GET INTO THE THOUGHT FOR THE BOARD. AND IMPORTANTLY, OUR MISSION IS THE FOCUS OF WHAT I WAS HIRED TO DO, SO DELIVERING THAT MISSION IS VERY IMPORTANT TO ME AND TO ALL OF US IN THE MANAGEMENT

TEAM.

WE'VE HAD THE ISSCR AND THE CIRM REGULATORY WORKSHOP. IT WAS A GREAT WORKSHOP. THE OUTCOMES WILL BE DRAFTED UP, AND WE'LL PROVIDE YOU WITH INFORMATION ON THAT.

THOSE WHO ARE INTERESTED IN THE REGULATORY PATHWAYS WILL BE -- I THINK YOU WILL BE PLEASED TO HEAR THAT ALL OF THE REGULATORY BODIES WANT TO WORK IN A HARMONIZED WAY. AND SO IT'S A MATTER OF ENCOURAGING THE PATHWAY TO BE COMMON SO THAT AS WE WORK ACROSS INTERNATIONAL AND INTERSTATE BORDERS, THAT WE'VE GOT SOME COMMONALITY WITH RESPECT TO THE REGULATION AREAS.

WE HAD A WONDERFUL SCNT WORKSHOP. WE'LL GET YOU THE OUTCOMES OF THAT. I THINK WE MIGHT NEED A VERY SPECIALIZED RFA OR CALL ON THAT PARTICULAR AREA, BUT LET ME GET YOU THE WORKSHOP OUTCOMES. MY FEELING IS IN CONCERT WITH WHAT THE SCIENTISTS THINK. AND ALL THE SCIENTISTS WERE OF CONSENSUS VIEW THAT WE SHOULD DO THAT PERHAPS IN A MORE COMPLEMENTARY WAY WITH THE FEW PEOPLE IN OTHER COUNTRIES AND OTHER STATES WHO ARE DOING THAT WORK.

THERE'S A CIRM REVIEW COMING UP, AND WE'VE STARTED TO PROVIDE A PROGRAM FOR GETTING ORGANIZED FOR THAT REVIEW IN OCTOBER. THERE ARE

COMMUNICATIONS, COLLABORATIVE FUNDING AGREEMENTS, AND CONTRACTS THAT ARE KEEPING US BUSY TRYING TO MOVE FORWARD. MY INTEREST IN CREATING CIRM SCIENTIFIC CREATIVITY INTERNSHIPS FOR YOUNG SCIENTISTS, GET THEM INTO THIS SPACE EARLY, GET THEM ENCOURAGED, GET THEM INTERESTED BY WORKING IN SEVERAL LABS SO THAT THEY SEE A SPECTRUM WHICH WILL BRING NEW IDEAS FORWARD.

AND WE'VE BEEN BUSY WITH THE STANDARDS WORKING GROUP AS WELL LOOKING AT VARIOUS THINGS THERE.

SO THERE'S SOME NEW PERSONNEL ON BOARD. MANI VESSAL, PH.D., SCIENCE OFFICER WHO IS FROM STANFORD UNIVERSITY, ARIE ABO, AGAIN A PH.D. SCIENCE OFFICER FROM NUVELO, INC., JENNY LAM, A GRANTS MANAGEMENT SPECIALIST FROM THE KAISER RESEARCH FOUNDATION INSTITUTE. IT'S VERY PLEASING TO GET THESE NEW SCIENCE AND GRANTS MANAGEMENT SPECIALISTS INTO THE TEAM BECAUSE WE'RE HAVING A REALLY HARD TIME IN KEEPING UP. WE REALLY ARE. WE'RE UNDER A LOT OF PRESSURE, THE STAFF, AND I FEEL FOR THEM. AT THIS STAGE, THEY'RE REALLY HAVING A TOUGH TIME. BUT WITH THESE NEW PEOPLE COMING IN, THEY NEED TO BE INCORPORATED INTO THE TEAMS AND HELP US SORT OF GET BUSY WITH THEIR AREAS OF EXPERTISE.

UPCOMING RFA'S, JUST TO FILL YOU IN ON THAT. THE EARLY TRANSLATIONAL II, THE FULL GRANT APPLICATIONS ARE DUE BY THE END OF THIS MONTH, JUNE 30TH. THE REVIEW IS SET FOR SEPTEMBER, AND WE ARE EXPECTING TO BRING IT TO THE ICOC IN OCTOBER. SO THAT'S EARLY TRANSLATIONAL II.

THE TOOLS, TECHNOLOGY, AND BOTTLENECKS, WE'RE IN RECEIPT OF THE PREAPS ALREADY NOW. FULL GRANT APPLICATIONS IN AUGUST, THE 26TH, AND THE REVIEW IN NOVEMBER AND TO THE ICOC IN JANUARY. SO THESE ARE THE PROJECTS FOCUSED ON THOSE MORE APPLIED TECHNOLOGIES FOR ENABLING THE WHOLE RESEARCH PROGRAMS.

AND THE CLINICAL PROGRAM WHERE WE'RE LOOKING FOR ONE OR TWO CLINICAL PROJECTS TO SUPPORT WILL POST LATE IN JULY, REVIEW IN JANUARY, AND BE AT THE ICOC IN MARCH.

UPCOMING RESEARCH LEADERSHIP AWARDS, JUST TO REMIND YOU ABOUT THOSE, THERE'S A JUNE 17TH DEADLINE FOR GRANTS WORKING GROUP REVIEW IN JULY AND THE ICOC IN AUGUST. SO THAT WILL BE OUR SECOND ONE. SEPTEMBER THE 30TH WILL BE THE NEXT APPLICATION DEADLINE, GRANTS REVIEW IN NOVEMBER, ICOC IN DECEMBER. AND THERE'S ALSO A DEADLINE IN DECEMBER THE 2D WITH GRANTS REVIEW IN JANUARY AND TO THE ICOC

IN FEBRUARY. SO CONTINUING TO ROLL ON.

I'VE BEEN THROUGH THE ISSCR. I WANT TO -- I'M VERY KEEN TO PROMOTE AN ONLINE TRANSLATIONAL JOURNAL, WORK WITH ALL THE TRANSLATIONAL TEAMS IN CALIFORNIA. THERE'S A STRONG NEED FOR SOME EDUCATION AND SOME EXAMPLES OF REGULATORY ISSUES EITHER POSITIVE OR NEGATIVE GOING THROUGH THIS PIPELINE. FDA IS LOOKING FOR MORE REPORTS FROM INDUSTRY, INDUSTRY AND ACADEMIA, BUT PARTICULARLY INDUSTRY HAVE COME UP THAT PIPELINE. THEY'RE LOOKING FOR THOSE KINDS OF REPORTS. THEY WOULD LIKE TO SEE THEM PUBLISHED IN ONE SPACE WHERE WE CAN ALL GET AT THEM, AND WE CAN ALL EDUCATE EACH OTHER. WITHOUT THIS KIND OF EDUCATION, IT'S GOING TO BE A MUCH HARDER TRACK.

THE FEW TRANSLATIONAL PAPERS THAT HAVE BEEN PUBLISHED IN STEM CELLS ARE ALL OVER THE PLACE, NOT EASY TO FIND, AND TEND NOT TO ACCEPT NEGATIVE RESULTS. AND IN TRANSLATION, IT'S IMPORTANT TO KNOW THE NEGATIVE AS WELL AS THE POSITIVE. IT'S JUST AS INFORMATIVE. FDA WANT TO CONTRIBUTE TO THIS.

WHAT WE WOULD LIKE TO DO IS CREATE AN INTEREST IN ONE OF THE JOURNALS TO BRING OUT A TRANSLATIONAL JOURNAL WHICH WAS FOCUSED ON STEM CELL TRANSLATION AND FOR THEM TO DO ALL OF THE

INDEPENDENT EDITING AND ALL THE REVIEWING AND SO FORTH. WE WOULD ONLY BE HELPING TO INITIATE THIS BECAUSE ALL OF THE DISCUSSIONS WE'VE HAD WITH JOURNALS, AT THE PRESENT TIME, TRYING TO BRING OUT A NEW JOURNAL WHICH THERE'S QUITE A GAP BETWEEN THE COST OF AND THE ABILITY TO GET MONEY INTO THE JOURNAL, THERE'S A GAP THERE. AND UNLESS SOMEONE WILL STEP UP AND HELP IN THAT GAP, IT WON'T HAPPEN.

I THINK A YEAR'S DELAY IN THIS WOULD REALLY BADLY AFFECT THE AREA. AND I THINK THE ENTIRE ACADEMIC AND BIOTECHNOLOGY INDUSTRY'S REPRESENTATIVES, ALL OF THEM THAT I'VE TALKED TO, ARE VERY, VERY SUPPORTIVE OF THIS. ISSCR IS ALSO SUPPORTIVE. THEY WANT THEMSELVES TO HAVE A BIG JOURNAL THAT COVERS ABSOLUTELY EVERYTHING, AND I THINK THAT'S A VERY BIG TASK TO DO THAT. AND THAT'S A MILLION DOLLARS PLUS. SO THAT'S NOT OUR GAME. THAT'S UP TO THE SOCIETY, BUT THEY'RE VERY SUPPORTIVE OF US HELPING TO GET A TRANSLATION JOURNAL. THIS IS NOT VERY COMMON TO HAVE THOSE TYPE OF JOURNALS.

CHAIRMAN KLEIN: MY UNDERSTANDING ON THIS ITEM IS THAT YOU'RE GOING TO BRING THIS FORWARD AS A MATURED PROPOSAL TO THE FINANCE COMMITTEE, AND THEN WE'LL BRING THIS BACK TO THE AUGUST BOARD AND TRY

AND HAVE A FULL PACKAGE ON ADVANCING THIS IDEA. IS THAT WHERE WE'RE GOING?

DR. TROUNSON: I'M HAPPY TO DO THAT. WE PUT IT IN THE BUDGET BECAUSE OF NEXT YEAR, AND SO THAT ELEMENTALLY IS HOW IT TURNED UP IN THAT RESPECT.

CHAIRMAN KLEIN: I THINK IT'S IMPORTANT TO HAVE A FINANCIAL PROVISION SO THAT WE CAN DO IT. BUT AS I UNDERSTAND IT, IN THE FINANCE COMMITTEE WE OUTLINED A PATH THAT HOPEFULLY WILL BE SUCCESSFUL.

DR. TROUNSON: OKAY. I THINK IT'S VERY, VERY IMPORTANT TO DO THAT.

SO LET ME SKIP TO THE UPCOMING WORKSHOPS. WE'VE HAD THE MRC AND WE'VE HAD THE FIRST TWO OF THOSE. THERE'S A SCIENCE COLLABORATION WORKSHOP WITH THE NETHERLANDS. IT WAS INDICATED FOR THE 16TH. WE HAD THAT, BUT IT WAS A VERY BRIEF WORKSHOP. SO WE NEED TO GO ON AND DO A PROPER WORKSHOP THAT INCLUDES THE SCIENTISTS FROM BOTH THE NETHERLANDS AND CALIFORNIA.

THERE'S A NEW YORK-CIRM SCIENCE COLLABORATION PROGRAM THAT'S DUE FOR QUARTER THREE AND AN IPS CELL BANKING WHICH ARE QUARTER THREE OR QUARTER FOUR. IN THE CASE OF THE NEW YORK FOUNDATION, THEY'RE A LITTLE BIT DIFFERENT. SO WE

NEED TO ACTUALLY GET TOGETHER AND UNDERSTAND WHAT THEY DO AND WHETHER WE CAN BE COMPLEMENTARY REALLY. IT'S STILL NOT TOTALLY CLEAR TO ME THAT THAT IS THE CASE, BUT WE'RE GOING TO TRY AND WORK THAT THROUGH WITH THAT GROUP OF PEOPLE.

THE IPS BANKING IS VERY STRONGLY SUPPORTED BY ALL THE STEM CELL LEADERSHIP IN CALIFORNIA. SO WE NEED TO HAVE A WORKSHOP TO DISCUSS THAT IN A MORE OPEN WAY AND GET VARIOUS INPUTS INTO THAT, BUT IT SHOULD BE A VERY INTERESTING PROGRAM. I'M GOING FAIRLY QUICKLY TO GET THROUGH IT ON TIME.

THE BRIDGES PROGRAM IS GOING TO BE HELD JULY 8TH AND 9TH IN SAN FRANCISCO. IT'S THE ANNUAL MEETING FOR THE BRIDGES TRAINEES, PROGRAM DIRECTORS, AND MENTORS AND FEATURES POSTER PRESENTATIONS BY THE TRAINEES, GUEST SPEAKERS NETWORKING AND EDUCATIONAL SESSION. I THINK THOSE TRAINEES THAT DID GET TO THE ISSCR WERE A BIT OVERWHELMED, BUT I THINK THEY'LL FIND THEMSELVES VERY MUCH AMONGST THEIR PEERS IN THIS MEETING.

CHAIRMAN KLEIN: IN THAT REGARD, IT WAS A VERY REWARDING EXPERIENCE FOR MANY OF THEM. SCRIPPS HAS 12 POSTERS. SIX OF THE 12 POSTERS FROM SCRIPPS WERE BRIDGES STUDENTS, WHICH IS ENORMOUS ACCOMPLISHMENT FOR THOSE STUDENTS, A GATEWAY TO

OPPORTUNITY. ONE OF THEM IS A MASTER'S STUDENT THAT I HAPPENED TO SIT NEXT TO ON THE PLANE IS NOW DEDICATED TO GOING INTO A DOCTORAL PROGRAM, HAS A PRIOR DEGREE IN PHYSICS AND A PRIOR DEGREE IN BIOTECHNOLOGY, BUT NOW IS ON STEM CELL RESEARCH.

DR. TROUNSON: THEY'RE TERRIFIC. WHEN YOU MEET THESE YOUNG PEOPLE WHERE THEY'RE DOING WELL, THEY'RE SO KEEN TO BE INVOLVED AND SO DETERMINED TO DO WELL, IT'S INSPIRATIONAL. YOU'RE RIGHT.

SO IN MATTERS OF SIGNIFICANCE, I'VE ASKED PAT OLSON TO SPEAK TO YOU ABOUT THE KIND OF PROGRAMS OF DISEASE APPLICATIONS SO YOU HAVE IN YOUR MIND WHERE WE ARE WITH THAT. I THINK A REMINDER OF THAT WOULD BE HELPFUL FOR THE BOARD TO UNDERSTAND WHAT WE'VE GOT IN OUR PORTFOLIO AND WHERE WE'RE GOING.

AS I SAID, FORECASTING OF EXPENDITURES TO MATCH OUR MISSION IS SOMETHING THAT I'VE ASKED JOHN ROBSON TO WORK ON, AND I THINK IT'S VERY IMPORTANT FOR THE BOARD TO HAVE SOME IDEA OF THE EXPENDITURE AND WHAT WE NEED TO DO TO MEET THE MISSION. OTHERWISE WE WILL HAVE TO CHANGE THE MISSION IN ORDER TO BE ABLE TO DO IT. SO, AGAIN, I'VE TALKED TO THE SCIENTISTS, THE HEADS OF THE RESEARCH TEAMS IN CALIFORNIA, AND THERE'S A VERY STRONG CONSENSUS VIEW THAT WE NEED TO STICK WITH OUR MISSION. SO

FROM THEIR POINT OF VIEW, THEY'RE STRONGLY SUPPORTIVE OF US MAKING ADJUSTMENTS TO BE ABLE TO MEET THE MISSION AND DELIVER IT AS IT WAS SET OUT IN PROPOSITION 71.

SO, CHAIR, I THINK THAT'S ALL FROM ME. AND THEN THERE'S THE BUDGET ALLOCATION AND EXPENDITURE REPORT. UP UNTIL NOW, DO YOU WANT JOHN ROBSON TO SPEAK TO THAT?

CHAIRMAN KLEIN: I TALKED TO DR. ROBSON, AND I'D LIKE TO, GIVEN THE TIME CONSTRAINTS ON DR. OLSON, TO SEE IF I COULD HAVE DR. OLSON PRESENT, AND THEN DR. ROBSON IS GOING TO PRIORITIZE THE BUDGET IS MY UNDERSTANDING.

DR. ROBSON: MAKE THAT DECISION BASED ON THE QUORUM.

CHAIRMAN KLEIN: THAT'S RIGHT. AND THEN WE'RE GOING TO GO INTO A SECOND REPORT FROM DR. ROBSON. AT YOUR PLEASURE, DR. TROUNSON.

DR. TROUNSON: JUST ONE MINOR THING TO JOANNE WYSOCKA'S AWARD. SHE CITED CIRM AS BEING RESPONSIBLE FOR BRINGING HER INTO THE STEM CELL FIELD. SO THAT WAS -- I THINK IT WAS A NICE PUBLIC SUPPORT FOR WHAT WE'VE BEEN DOING, AND IT'S NICE TO RECEIVE THOSE RECOGNITION.

DR. OLSON: MR. CHAIRMAN, MEMBERS OF THE

BOARD, MEMBERS OF THE AUDIENCE, AND STAFF, WHAT I'D LIKE TO DO TODAY IS TALK TO YOU A LITTLE BIT ABOUT OUR DEVELOPMENT PORTFOLIO. AND THE REASON I WANT TO DO THIS IS I THINK IT'S IMPORTANT FOR YOU TO UNDERSTAND WHAT'S IN OUR CURRENT DEVELOPMENT PORTFOLIO. AND I THINK IT'S IMPORTANT FOR YOU TO BE AWARE OF WHAT'S IN OUR PORTFOLIO BECAUSE YOU AS MEMBERS OF THE BOARD AND THOSE OF YOU WHO ARE ALSO MEMBERS OF THE GRANTS WORKING GROUP ENGAGE IN PROGRAMMATIC DECISION-MAKING LOTS OF TIMES. SO I THINK IT'S REALLY IMPORTANT FOR YOU TO UNDERSTAND WHAT IT IS WE'RE WORKING WITH.

FIRST, I JUST WANT TO REMIND YOU WHAT I AM DEFINING AS OUR DEVELOPMENT PORTFOLIO. CIRM HAS FUNDED THE FIRST ROUND OF TWO REPEATING PROGRAMS THAT ARE PART OF OUR PIPELINE STRATEGY TO DEVELOP THERAPIES FOR PATIENT BENEFIT. AND AS EMBODIED IN TRYING TO MEET THAT MISSION, WE HAVE TWO STRATEGIC GOALS. ONE OF THEM THAT THIS BOARD APPROVED BACK WHEN THEY APPROVED THE STRATEGIC PLAN, AND ONE OF THEM IS TO HAVE PROOF OF CONCEPT FOR PLURIPOTENT-DERIVED CELL THERAPY, WHICH TYPICALLY MEANS A PHASE II RESPONSE, AND FOR HAVING SEVERAL STEM CELL-DERIVED THERAPIES IN PHASE I AND II.

SO THE TWO PROGRAMS THAT I'M TALKING ABOUT

ARE THE DEVELOPMENT CANDIDATE AWARDS THAT WERE ISSUED AS PART OF OUR FIRST EARLY TRANSLATIONAL AWARDS PROGRAM, AND THAT INCLUDES EIGHT AWARDS. AND YOU CAN SEE, THE GOAL OF THOSE PROGRAMS WAS ESSENTIALLY TO GET A CANDIDATE THAT WAS READY FOR WHAT I'LL CALL IND ENABLING PRECLINICAL DEVELOPMENT. AND THEN IT ALSO ENCOMPASSES THE 14 AWARDS THAT ARE PART OF OUR FIRST ROUND OF THE DISEASE TEAM PROGRAM. AND THE GOAL OF THAT ONE WAS TO ACTUALLY FILE AN IND THAT THEN, ONCE APPROVED TO GO FORWARD, COULD MOVE, ALLOW THERAPIES, CANDIDATES THERAPIES TO MOVE INTO PHASE I.

WHAT I'D LIKE TO DO IS TO BRIEFLY SUMMARIZE THE CHARACTERISTICS OF THIS PORTFOLIO AND THEN JUST ADDRESS SOME OF THE CONSIDERATIONS RELEVANT TO IT.

SO IF YOU LOOK AT THIS SLIDE, WHAT I'VE DONE HERE IS I'VE JUST PLACED THE CANDIDATES ON THIS PIPELINE. AND THE POINT I WANT TO MAKE FIRST IS THAT THE BOXES ARE THE EARLY TRANSLATIONAL PROJECTS, THE TRIANGLES ARE THE DISEASE TEAM PROJECTS, THE LARGE TRIANGLES ARE THOSE DISEASE TEAM PROJECTS THAT UTILIZE PLURIPOTENT STEM CELLS. AND AS YOU CAN SEE IN GENERAL, THE DISEASE TEAM, AS WOULD BE EXPECTED, IS SOMEWHAT MORE ADVANCED THAN THE EARLY

TRANSLATIONAL, SO THIS IS NOT SURPRISING.

I ALSO WANT TO BRING YOUR ATTENTION TO THE TIME COMPONENT. THIS IS, I THINK, PROBABLY REASONABLE. ESSENTIALLY THE PRECLINICAL RESEARCH, PRECLINICAL DEVELOPMENT PHASE IS ROUGHLY WE'RE ALLOWING FOUR YEARS, AND THAT PRETTY MUCH TIES IN WITH WHAT WE'VE PUT OUT FOR OUR DISEASE TEAM PROGRAM. WE'RE GIVING THOSE TEAMS FOUR YEARS TO TRY AND REACH THEIR GOAL OF AN IND FILING. THOSE THAT ARE EARLIER MIGHT BE EXPECTED TO TAKE LONGER. I WOULD ALSO POINT OUT THAT TO GET TO THE END OF A PHASE II PROGRAM, INCLUDING A PHASE I IS LIKELY TO BE, YOU KNOW, THREE TO SEVEN ADDITIONAL YEARS DEPENDING, AGAIN, ON THE THING. I'VE PUT UP A FIVE-YEAR JUST FOR -- BUT THE POINT IS IT TAKES TIME TO GET TO THE END OF PHASE II, AND THIS IS WHERE WE'RE STARTING FROM WITH THIS PARTICULAR PIPELINE.

I WOULD JUST REMIND YOU MONEY. AS YOU WELL KNOW, OUR DISEASE TEAM PROGRAM IS $225 MILLION. NOT ALL OF THOSE WILL SUCCEED. AND SO THE DOLLARS THAT IT WILL BE TAKING TO GET TO AN END OF PHASE II TO PUT THINGS INTO THE CLINIC WILL BE SUBSTANTIAL. AND I THINK YOU'VE ALL HEARD THE FIGURE 800 MILLION TO GET TO A PRODUCT. NOW, THAT'S A PRODUCT, NOT THAT. BY THE WAY, THAT NUMBER IS TOTALLY OUT OF

DATE. WE'VE HEARD ESTIMATES AS HIGH AS FOUR BILLION TO GET TO A PRODUCT, AND THAT INCLUDES ALL THE FAILURES IN RESEARCH AND EVERYTHING. THIS IS AN EXPENSIVE BUSINESS.

IF YOU CONSIDER THAT ONE OF OUR GOALS IS TO GET TO PROOF OF CONCEPT FOR A PLURIPOTENT DERIVED, I WOULD NOTE WE HAVE, WHAT, FOUR OR FIVE IN THIS CATEGORY. AND, YOU KNOW, THAT ACTUALLY WILL BE A VERY BIG DEAL. I SHOULD ALSO POINT OUT THAT, YOU KNOW, THE NUMBER OF PEOPLE INVOLVED IN THE PLURIPOTENT SPACE, IT'S A RELATIVELY YOUNG FIELD. WE NEED TO KEEP REMEMBERING THAT. AND SO OUR FUNDING IS HELPING TO MOVE MORE INTO IT, BUT NONETHELESS IT WILL TAKE TIME AND MONEY TO GET TO A SUCCESSFUL END GAME.

SO I JUST WANT TO OUTLINE SOME OF THE CHARACTERISTICS OF THIS PORTFOLIO. AND, AGAIN, THIS IS LOOKING AT BOTH OF THEM. WHAT ARE THE CELLS THAT ARE USED AS SOURCE FOR THE CANDIDATE THERAPEUTIC OR AS TARGETS? AND THE GREEN HERE, SO I HAVE THREE THAT ARE SHADED IN GREEN. WE HAVE EIGHT CANDIDATES, THE FIVE AND THE THREE, THAT ARE ESSENTIALLY PLURIPOTENT DERIVED, OR THE CANDIDATE THERAPEUTIC IS BASED ON A PLURIPOTENT SOURCE, EITHER HUMAN EMBRYONIC STEM CELL OR IPSC. THE THREE REFERS TO

WHERE THERE'S MULTIPLE; THAT IS, IT MAY INCLUDE AN ADULT STEM CELL, BUT IT ALSO INCLUDES A PLURIPOTENT STEM CELL. THESE ARE TEAMS THAT ARE COMPARING SEVERAL CELL TYPES AND ARE GOING TO MAKE A DECISION.

WE HAVE THREE PROGRAMS THAT ARE TARGETING CANCER STEM CELLS AND ONE PROGRAM THAT IS TARGETING ENDOGENOUS STEM CELLS. SO IN THAT CASE THEY'RE THE TARGETS AS OPPOSED TO THE ACTUAL THERAPEUTICS.

IF YOU ACTUALLY LOOK AT THE DISTRIBUTION BY THE TYPE, BY WHETHER IT'S THE DISEASE TEAM RFA OR THE EARLY TRANSLATIONAL, PERHAPS, NOT SURPRISINGLY, THE DISEASE TEAM DISTRIBUTION REPRESENTS, AND I USE THE TERM LOOSELY, MORE MATURE APPROACHES, BUT THAT'S WHERE YOU SEE MORE OF THE ADULT STEM CELL COMPONENTS. SO ADULT IS PRETTY MUCH EVERYTHING THAT'S NOT PLURIPOTENT AND NOT CSC. SO THAT'S WHERE THE BULK OF THOSE ARE.

WE HAVE MORE OF IPSC APPROACHES IN THE EARLY TRANSLATIONAL. AGAIN, YOU KNOW, OUR GRANTS REVIEW GROUP AND THE BOARD RECOGNIZED THE MATURITY OF THESE APPROACHES. WE HAVE TO KEEP REMEMBERING WE'RE WORKING AT THE CUTTING EDGE OF ESSENTIALLY SCIENCE AND OF PROPOSED THERAPEUTIC STRATEGIES.

I HIGHLIGHT HERE THE DISEASE DISTRIBUTION BOTH WITH THE NUMBER OF PROJECTS AND THE DOLLARS

THAT WE ARE INVESTING INTO THESE. THE DISEASE DISTRIBUTION, LET ME REMIND YOU, REPRESENTS THE SUM OF WHAT WAS PROPOSED BY THE INVESTIGATORS, WHAT WAS RECOMMENDED BY THE GRANTS REVIEW GROUP, AND WHAT WAS APPROVED BY THIS BOARD. AND, AGAIN, IT REFLECTS WHAT IS, IF YOU LIKE, MORE READY.

THINGS MAY INCLUDE A RANGE OF APPROACHES. SO IN THE NEURAL DEGENERATIVE DISEASE, THAT'S ACTUALLY FOUR DIFFERENT DISEASE TARGETS WITH DIFFERENT APPROACHES. IN THE EYE DISEASE, THAT'S ACTUALLY THE SAME DISEASE THAT'S BEING TARGETED IN ALL CASES. IT'S AGE RELATED MACULAR DEGENERATION. IT'S ACTUALLY THE SAME APPROACH AS WELL. IT IS A RETINAL PIGMENTED EPITHELIAL CELL THERAPY THAT'S BEING CONSIDERED, AND THEN THERE ARE SOME DIFFERENCES AS TO WHETHER THE SOURCE OF CELLS OR WHETHER IT'S A COMBINATION PRODUCT.

CANCER IS ACTUALLY LOOKING AT A COUPLE OF DIFFERENT DISEASES, EITHER THE BLOOD BORNE, THE HEMATOLOGIC MALIGNANCIES, OR THE SOLID TUMOR, AND IT'S ALSO ACTUALLY A VARIETY OF STRATEGIES. THERE'S SMALL MOLECULES TARGETING SURVIVAL AND SELF-RENEWAL PATHWAYS. THERE'S A MONOCLONAL ANTIBODY TARGETING A DON'T-EAT-ME ANTIGEN THAT'S BELIEVED TO BE OVEREXPRESSED ON CERTAIN CANCER CELLS. AND THEN

THERE'S A CELL TARGETING STRATEGY, AND THESE ARE TWO OF THEM. AND IT USES NEURAL STEM CELLS TO ACHIEVE A HIGH LOCAL CONCENTRATION OF A TUMOROCIDAL AGENT AT THE SITE OF THE TUMOR, AND WE HAVE TWO OF THOSE PROGRAMS.

FOR THE HIV DISEASE, WE HAVE -- IT'S THE SAME VALIDATED TARGET, SO IT'S CCR5, AND I DO NOT WANT TO -- WHEN I SAY VALIDATED IN THIS SENSE, I MEAN THE ULTIMATE VALIDATION, CLINICAL VALIDATION. THERE ARE ACTUALLY SMALL MOLECULE DRUGS OUT THERE TARGETING CCR5. IT IS A SIMILAR APPROACH, HSC GENETICALLY MODIFIED, BUT THERE ARE DEFINITELY DIFFERENCES IN THE TACTICS.

THE NEXT ONE IS BLOOD DISEASE. THAT'S ACTUALLY TWO DIFFERENT DISEASES. THAT'S THE SICKLE CELL AND THE FANCONI ANEMIA. AGAIN, THOSE ARE GENETICALLY MODIFIED HEMATOPOIETIC STEM CELLS, SO IT'S A SIMILAR APPROACH, DIFFERENT DISEASE.

SO I JUST WANTED TO GIVE YOU A SENSE OF THAT PORTFOLIO. I WOULD ALSO POINT OUT TO YOU THAT THE TOTAL INVESTMENT IN THIS DEVELOPMENT PORTFOLIO THAT THIS BOARD IS MAKING OR THAT WE ARE MAKING IS $264 MILLION. A BIOTECH COMPANY, A MIDSIZE BIOTECH COMPANY, WOULD BE THRILLED WITH THAT KIND OF R&D BUDGET. SO WE ARE INVESTING IN ESSENTIALLY CUTTING

EDGE THERAPIES HOPEFULLY THAT WILL BENEFIT PATIENTS.

THIS IS JUST THE SAME THING FOR THE DISEASE TEAM ONLY. I'LL LET YOU LOOK AT IT AT YOUR LEISURE.

THE OTHER POINT I WANT TO MAKE IS ABOUT ESSENTIALLY THE THERAPEUTIC APPROACH THAT IS REPRESENTED BY THIS PORTFOLIO. AND I'VE COLORED IN SHADES OF BLUE ALTHOUGH THIS ONE LOOKS A LITTLE BIT MORE GRAY TO ME. THOSE THAT ESSENTIALLY ARE CELL THERAPY BASED. WE HAVE SIX CELL THERAPY PRODUCTS. WE HAVE EIGHT THAT ARE GENETICALLY MODIFIED CELL THERAPY STRATEGIES, AND WE HAVE FOUR THAT I'LL CALL COMBINATION CELL THERAPY PRODUCTS.

AND WHEN I MEAN A COMBINATION PRODUCT, I MEAN -- SO, FOR EXAMPLE, VIACYTES (PHONETIC) PROPOSED PRODUCT WHERE WE HAVE HESC-DERIVED PANCREATIC PROGENITOR CELLS THAT ARE ENCAPSULATED IN A NONRETRIEVABLE DEVICE. THE DEVICE IS AN INTEGRAL PART OF THE PRODUCT AND, THEREFORE, YOU BRING IN TWO REGULATORY AGENCIES TO DEAL WITH IT. YOU HAVE TO DEAL WITH THE DEVICE COMPONENT AS WELL AS THE CELL THERAPY COMPONENT.

ANOTHER EXAMPLE OF THAT WOULD BE THE NEURAL STEM CELL TUMOR TARGETING THAT I MENTIONED IN THE CONTEXT OF TREATING NEURAL BLASTOMA. THAT'S

DESIGNED TO DELIVER A GENE THAT WOULD CONVERT A PRODRUG SMALL MOLECULE, AN APPROVED SMALL MOLECULE, TO A MORE ACTIVE DRUG AT THE SITE OF THE TUMOR. THAT IS ALSO A COMBINATION STRATEGY.

SO YOU CAN SEE THAT WE ARE HEAVILY INVESTED IN CELL THERAPEUTIC APPROACHES, NOT SURPRISING BECAUSE IF YOU LOOK AT THE MANDATE OF PROPOSITION 71, IT WAS, YOU KNOW, STEM CELL-DERIVED CELL THERAPIES FOR THE BENEFIT OF PATIENTS. SO I JUST WANT TO POINT THAT OUT.

WE ARE ALSO INVESTING IN WHAT I'LL CALL FOUR OF THE MORE WELL UNDERSTOOD FROM A REGULATORY STANDPOINT STRATEGIES. SO MONOCLONAL ANTIBODIES, SMALL MOLECULES, AND ACTUALLY A DELIVERY COMBINATION WITH A RECOMBINANT PROTEIN ARE STRATEGIES THAT ARE WELL UNDERSTOOD BY THE REGULATORY AGENCY.

I'D JUST LIKE TO DISCUSS WITH YOU OR FOR YOU TO THINK ABOUT A LITTLE BIT SEVERAL CONSIDERATIONS WITH RESPECT TO THIS PORTFOLIO. SO WHEN I TALK ABOUT THE STRATEGIC PORTFOLIO FOCUS, AGAIN, I THINK, AS I'VE ALREADY CITED AND AS YOU'VE SEEN, YOU HAVE AGREED WHEN WE LOOK AT -- WHEN WE DO CONCEPT PROPOSALS FOR THINGS, WE HAVE HAD A FOCUS ON PLURIPOTENT CELLS. YOU HAVE HEARD THAT ONE OF OUR PRIMARY STRATEGIC GOALS IS PROOF OF CONCEPT FOR A

PLURIPOTENT-DERIVED CELL THERAPY. AND AS I SAY, THIS IS A VERY IMPORTANT THING. NO ONE ELSE WILL INVEST IN THAT KIND OF STRATEGY AT THIS POINT. I THINK WE ALL KNOW THAT THE VENTURE COMMUNITY IS IN A RISK ADVERSE MODE, AND THIS IS NOT TYPICALLY THE PLACE THAT THEY WOULD GO.

SO WE ARE FULFILLING A VOID, BUT I THINK IT'S IMPORTANT FOR US ALL TO RECOGNIZE THAT WE ARE INVESTING IN VERY CUTTING EDGE APPROACHES AND STRATEGIES.

THE OTHER POINT I WANT TO MAKE ABOUT THAT THOUGH ACTUALLY IS THE FIELD, THE SCIENCE, IS MOVING EXTREMELY RAPIDLY IN THAT AREA. SO IPSC, FOR EXAMPLE, FIVE YEARS AGO, WELL, MAYBE '96 WAS THE FIRST PAPER, OKAY, MAYBE A LITTLE BIT BEFORE THAT, NO ONE HAD EVER HEARD OF IT. NOW PEOPLE ARE WORKING AT IT LIKE CRAZY. A LOT OF TALKS, DISEASE IN A DISH. SCNT PRACTICALLY DROPPED OFF THE SCIENTIFIC FIELD BECAUSE PEOPLE THOUGHT IPSC WAS EASIER. NOW YOU'VE HEARD ALAN MENTION THE BUZZ NOW IS DIRECTED TO DIFFERENTIATION. WELL, IF YOU'RE INTERESTED IN CERTAIN STRATEGIES, IF YOU'RE INTERESTED IN THE MECHANISM OF DISEASE, IF YOU CAN GO DIRECTLY TO A DISEASE MOTOR NEURON, YOU MAYBE AREN'T GOING TO WANT TO GO THROUGH AN IPSC INTERMEDIATE. SO I THINK YOU

HAVE TO THINK ABOUT WHAT'S GOING TO BE COMPETITIVE OVER THE LONGER TERM AND HOW FAST IS THE FIELD MOVING.

SO THAT'S JUST ONE THING BECAUSE WE'D LIKE TO ENSURE THAT THE PRODUCT CANDIDATES THAT WE FUND WILL BE THE ONES THAT WILL BE COMPETITIVE WHEN THEY GET TO PATIENTS. WE WANT TO MAKE SURE THAT THEY'RE DOING THE BEST THING.

FOR THE SECOND BULLET POINT, REGULATORY RISK, THIS IS HOW, ALL OTHER THINGS BEING EQUAL, A REGULATORY AGENCY LOOKS AT THE WORLD. SO, AGAIN, ALL OTHER THINGS BEING EQUAL. THE REGULATORS KNOW VERY WELL HOW TO DEAL WITH SMALL MOLECULES, MONOCLONAL ANTIBODIES, AND PROTEINS. ACTUALLY FOR ADULT STEM CELLS, AGAIN DEPENDING ON THE SOURCE, THEY'RE VERY COMFORTABLE WITH THINGS LIKE BONE MARROW CELLS. BONE MARROW TRANSPLANT HAS A HIGH SAFETY THING. HEMATOPOIETIC STEM CELLS, THEY'RE SOMEWHAT COMFORTABLE WITH THAT. AGAIN, BECAUSE THAT IS ESSENTIALLY -- IT'S A PROGENITOR FOR ALL THE IMMUNE CELLS AND ALL THE BLOOD CELLS IN YOUR BODY. SO I THINK YOU HAVE TO LOOK AT IT.

GENE-MODIFIED ADULT STEM CELLS, I WOULD JUST POINT OUT TO THIS AUDIENCE SOMETHING THAT I THINK THAT YOU ALL WELL KNOW. THERE ARE NO APPROVED

GENE THERAPEUTICS IN THIS COUNTRY YET. TWENTY YEARS AFTER, THERE'S STILL NO APPROVED GENE THERAPIES. THERE'S A LOT IN CLINICAL DEVELOPMENT. WE HAVE HOPES THAT SOME CAN BE APPROVED SOON. I BELIEVE ONE OR TWO IS APPROVED IN EUROPE, BUT THERE'RE NONE YET APPROVED IN THIS COUNTRY. AND, AGAIN, I THINK THAT DEPENDS ON WHAT IS THE STEM CELL YOU'RE TALKING ABOUT. THERE ARE DEGREES OF RISK WITHIN EACH OF THESE CATEGORIES.

PLURIPOTENT STEM CELL-DERIVED CELLS, AGAIN, THE FIELD IS YOUNG. WE KNOW OF, I THINK, TWO THAT HAVE SUBMITTED IND'S. ONE OF THEM HAS BEEN ON CLINICAL HOLD FOR, I THINK, SINCE MAY OF 2008. IT WAS OFF FOR A FEW MONTHS, BUT IT IS NOT EASY TO MOVE THINGS LIKE THIS FORWARD. THE REGULATORS ARE BASICALLY ERRING ON THE SIDE OF CAUTION. ANYTHING THAT WE CAN ENCOURAGE OUR TEAMS TO DO, ANYTHING THAT WE CAN DO TO HELP REDUCE RISK IS REALLY IMPORTANT.

ACTUALLY I WOULD JUST GIVE YOU AN EXAMPLE OF ONE OF OUR TEAMS. ACTUALLY, AGAIN, I'LL CITE THIS NEURAL STEM CELL USED FOR TARGETING. THE CELL LINE THERE IS A GENETICALLY MODIFIED NEURAL STEM CELL LINE. AND THIS PERSON IN ANOTHER -- THE PI ON THIS ONE IN ANOTHER CONTEXT WITH THE SAME CELL LINE, ALTHOUGH SOMEWHAT DIFFERENTLY GENETICALLY MODIFIED,

HAS ACTUALLY RECEIVED APPROVAL NOW TO INITIATE THE TRIAL. THAT IS A HUGE RISK REDUCTION FOR USE OF THAT CELL LINE IN OUR DISEASE TEAM PROGRAM. THERE'S ALREADY A DRUG MASTER FILE. THE FDA HAS ALREADY APPROVED IT. SO THAT'S JUST A MAJOR ELEMENT OF RISK REDUCTION IN THAT SENSE.

AND THEN FINALLY, I'D SAY GENE-MODIFIED PLURIPOTENT STEM CELL-DERIVED CELLS, AT THIS POINT, AND I'VE CLASSIFIED MOST IPSC IN THIS BECAUSE GENERALLY THEY'RE GENERATED BY RETROVIRAL TRANSDUCTION WITH FOUR GENES, ONE OF WHICH IS A KNOWN ONCOGENE, THE OTHERS OF WHICH HAVE ONCOGENIC PROPERTIES, BUT THE FIELD IS MOVING. PEOPLE ARE DEVELOPING EPISOMAL STRATEGIES FOR DELIVERY OF THESE FACTORS SO THAT THEY DON'T PERSIST. PEOPLE ARE DEVELOPING STRATEGIES TO USE RECOMBINANT PROTEINS OR TO USE SMALL MOLECULES TO SUBSTITUTE. BUT I'M JUST HIGHLIGHTING THAT IT IS IN GENERAL WITH THE PLURIPOTENT STEM CELL AND WITH THE OTHER, IT IS A FIELD IN TRANSITION.

THE BUSINESS MODEL TO BRING TO PATIENTS, I THINK WE WOULD ALL AGREE THAT ULTIMATELY WHAT WE WANT IS FOR THE THINGS THAT WE HAVE INVESTED IN TO BENEFIT PATIENTS. THAT'S REALLY THE END GOAL FOR US. AND I THINK YOU JUST HAVE TO CONSIDER DRUGS,

SMALL MOLECULES, THESE ARE ONE SIZE FITS ALL, THEY'RE OFF THE SHELF. ARGUABLY ALLOGENEIC CELL THERAPY FITS THAT CATEGORY. YOU HAVE THE RISK OF IMMUNOSUPPRESSION, AND SO THAT'S ONE THING, BUT IT'S AN OFF-THE-SHELF TYPE THING. AT THE OTHER EXTREME IS WHAT I'LL CALL THE BONE MARROW TRANSPLANT SITUATION. THIS IS ESSENTIALLY A HOSPITAL-BASED THING WHERE ESSENTIALLY THE BUSINESS COULD BE IN THE SERVICE PROVIDING, AND THEN THERE'S A HYBRID-TYPE THING.

ACTUALLY MANY OF YOU MAY KNOW THAT DENDREON'S PROVENGE WAS RECENTLY APPROVED IN APRIL OF THIS YEAR. PROVENGE IS ESSENTIALLY AN AUTOLOGOUS CELL-DERIVED THERAPY THAT'S GENETICALLY MODIFIED TO STIMULATE THOSE PARTICULAR CELLS. AND THAT HAS JUST BEEN RECENTLY INTRODUCED. SO ASKING THE TEAMS TO THINK ABOUT AND US TO THINK ABOUT HOW THESE WILL ULTIMATELY BENEFIT PATIENTS, I THINK, IS REALLY IMPORTANT.

IF YOU LOOK AT THE NEXT SLIDE, THIS IS JUST PUTTING ALL OF OUR PORTFOLIO, THE NEXT TWO SLIDES ACTUALLY PUT ALL OF OUR PORTFOLIO IN THE CATEGORY. IF YOU LOOK OVER WHERE I HAVE "OR" IS WHERE THE TEAMS ARE TESTING MULTIPLE DIFFERENT CELL TYPES, AND THEY WILL HAVE TO LOOK AT THESE TO GO

FORWARD. AND AS I'VE INDICATED, WE ARE WORKING AT THE CUTTING EDGE OF ESSENTIALLY THERAPY DEVELOPMENT, WHICH IS AN IMPORTANT PLACE TO BE BECAUSE WE'RE THE ONES WHO WILL HELP TO DRIVE THIS FORWARD.

SO, AGAIN, I PUT THINGS IN THE IPSC THAT WERE IPSC. UNLESS THEY SPECIFIED THEY WERE USING AN EPISOMAL STRATEGY, YOU CAN'T ASSUME THAT THEY AREN'T. SO THEY'RE IN THE GENE-THERAPY DERIVED.

SO FINALLY, I WOULD JUST LIKE TO SAY -- I'M SORRY. WHEN I SAY I'VE ALSO INDICATED WHETHER IT'S AN ALLOGENEIC OR AN AUTOLOGOUS STRATEGY, AND OTHER REFERS TO A SMALL MOLECULE, A MONOCLONAL ANTIBODY, OR A PROTEIN. IT'S JUST NOT A CELL THERAPY APPROACH.

SO IF YOU LOOK AT THIS, AND THIS IS BASICALLY THE RFA'S WE'RE TALKING ABOUT THAT, IN FACT, GET OUR DEVELOPMENT PIPELINE AND I THINK IS, YOU KNOW, WHAT I'D LIKE TO LEAVE THE BOARD WITH IS I'D JUST LIKE YOU TO THINK OVER TIME HOW ARE WE GOING TO MEET OUR MISSION? IT'S IMPORTANT TO MEET OUR MISSION AND TO MEET OUR GOALS. HOW CAN WE DO THIS? AND I WOULD JUST -- I THINK WE NEED TO CONTINUE TO INVEST IN A DIVERSE PORTFOLIO OF PROJECTS THAT REFLECT EXCELLENT SCIENCE OF SUFFICIENT MATURITY TO GET COMPETITIVE PRODUCT

CANDIDATES FOR ESSENTIALLY THE BENEFIT OF PATIENTS IN THE FUTURE. SO I'LL THANK YOU AND TAKE ANY QUESTIONS THAT YOU MAY HAVE.

CHAIRMAN KLEIN: ANY QUESTIONS FROM THE BOARD? I THINK THAT WAS AN OUTSTANDING REPORT. I WOULD ASK YOU -- DR. HAWGOOD, WHY DON'T YOU PROCEED FIRST.

DR. HAWGOOD: PAT, I THINK THAT WAS A WONDERFUL REVIEW OF WHERE WE STAND AND VERY THOUGHTFUL IN TERMS OF THINKING FORWARD. WHILE I'M INCREDIBLY EXCITED ABOUT THE MOVEMENT TO THE CLINIC, I'VE BEEN AN ADVOCATE TO MAKE SURE WE DON'T LEAVE BASIC SCIENCE BEHIND. I WAS JUST WONDERING DO WE HAVE ANY DATA IN A SENSE OF WHERE THE NIH IS PICKING UP THAT SLACK? I ASSUME --

DR. OLSON: SLACK IN WHAT, PLEASE?

DR. HAWGOOD: IN THE ENTIRE PORTFOLIO. IN OTHER WORDS, ARE WE IN A POSITION WHERE WE CAN ASSUME THAT THE NIH IS TAKING A BIGGER AND BIGGER ROLE IN THE LEFT-HAND SIDE OF YOUR PIPELINE?

DR. OLSON: WELL, WHAT I HAVEN'T PUT HERE AND WHAT I THINK IS IMPORTANT TO SAY IS I WAS FOCUSED ON THE DEVELOPMENT. I WANT TO REMIND, I DON'T THINK I NEED TO REMIND THIS AUDIENCE, AND I'LL GET TO YOUR QUESTION IN A MOMENT, BUT BASIC SCIENCE

REALLY IS THE UNDERPINNING OF ALL THIS. YOU HEARD THE PRESENTATION THIS MORNING. WITHOUT UNDERSTANDING ESSENTIALLY WHAT WE BELIEVE THE DISEASE MECHANISM IS IN ALS, WE WOULDN'T HAVE THIS STRATEGY TO GO FORWARD.

NOW, SPECIFICALLY TO YOUR QUESTION, WHAT IS NIH PICKING UP?

DR. HAWGOOD: I ASSUME THAT OUR INVESTIGATORS FILL OUT AN OTHER SUPPORT PAGE.

DR. OLSON: OF COURSE, THEY DO.

DR. HAWGOOD: SO THERE WOULD BE A WAY TO GET A WINDOW INTO WHAT ARE THEY SUBMITTING TO THE NIH.

DR. OLSON: ONE UNIQUE THING ABOUT WHAT WE FUND, AND I THINK MAYBE THIS IS, IS THAT, SAY, OUR FUNDING FOR SOMETHING LIKE DISEASE TEAMS, WE TEND TO COVER ALL THE ACTIVITIES NECESSARY TO GET TO A GOAL IN THE DEVELOPMENT SPACE; WHEREAS, I KNOW NIH HAS A PAC PROGRAM, WHICH WILL MAKE, THAT IF YOU ARE SUCCESSFUL IN APPLYING, YOU WILL GET YOUR CELLS MADE FOR YOU TO DO A TRIAL, BUT THAT DOESN'T FUND THE TRIAL. THAT FUNDS THE PRODUCTION OF THE CELLS.

SO OUR DISEASE TEAM MODEL IS UNIQUE IN THAT IT FUNDS THE ACTIVITIES IT TAKES TO GET THERE. NIH ACTUALLY HAS A HUGE INVESTMENT IN STEM CELL

RESEARCH AT THE BASIC LEVEL OR THINGS THEY CLASSIFY AS SUCH, BUT THEY INCLUDE IN THAT ZEBRA FISH, C. ELEGANS, EVERY SINGLE MODEL SYSTEM, SO IT'S DIFFICULT TO PARSE OUT. THEY INCLUDE IN THERE CLINICAL TRIALS FOR STEM CELLS. THEY INCLUDE ALL THE CORD BLOOD STUDIES. I ACTUALLY WENT ONLINE YESTERDAY, AND THERE ARE OVER 200 CORD BLOOD STUDIES THAT ARE ACTIVELY ENROLLING PATIENTS RIGHT NOW. SO THEY TEND TO FUND A CLINICAL TRIAL PERHAPS WITH SOME BEDSIDE-TO-BENCH-TYPE WORK.

I THINK ONE OF THE UNIQUE FEATURES OF OUR PROGRAM IS WE TEND TO FUND ALL THE ACTIVITIES IT TAKES TO DO IN A PARTICULAR STAGE OF RESEARCH. SO I CAN'T ANSWER EXACTLY, BUT THAT IS A DIFFERENCE.

DR. TROUNSON: SAM, WE COULD PROBABLY TRY AND GET SOME QUANTITATIVE DATA. IT'S PROBABLY A LITTLE BIT EARLY BECAUSE THERE WAS THE STIMULUS, BUT THEN IT SORT OF SLIPPED BACK, AS I UNDERSTAND, SO THAT THERE WASN'T A LOT OF MONEY REALLY FOR BASIC STEM CELL RESEARCH AFTER THE STIMULUS. BUT I THINK WE PROBABLY NEED A LITTLE MORE TIME, BUT I THINK YOUR POINT IS A GOOD ONE. CAN WE ANALYZE WHETHER WE'RE PICKING UP MORE THAN OR AS MUCH AS WE SHOULD BE GETTING GIVEN THAT WE'RE ACTUALLY STIMULATING OURSELVES THE BASIC SCIENCE. I THINK IT'S A VERY

IMPORTANT POINT.

AND THE OTHER IMPORTANT POINT IS THAT WHEN WE END, THERE WILL BE A TERRIBLE CLIFF IF WE DON'T ENCOURAGE THE RESEARCHERS TO ALSO SEEK OTHER FUNDING. THEY WILL FALL OFF AN ENORMOUS CLIFF, AND WE DON'T REALLY WANT THAT TO HAPPEN. I'M JUST ASSUMING IN THE WORST-CASE SCENARIO IF WE WEREN'T REFUNDED. IT'S UP TO US TO TRY AND MAKE SURE THAT WE ENCOURAGE THEM TO DO THAT.

DR. HAWGOOD: I THINK THAT WAS THE KIND OF POINT GIVEN THAT WE'VE GOT ROUGHLY 1 PERCENT THE NIH BUDGET, AND IT'S EXACTLY WHAT YOU WERE DRIVING AT. WHERE IS OUR NICHE? AND WHAT SHOULD WE BE ENCOURAGING TO HAND OFF SO THAT WHEN WE END, THERE'S NOT A BIG CLIFF?

CHAIRMAN KLEIN: SO, DR. OLSON, PERHAPS WE COULD CREATE A PROCESS FOR REALLY ANALYZING THROUGH THIRD-PARTY EXPERTS, MULTIPLE THIRD-PARTY EXPERTS WE MIGHT RETAIN, I DON'T WANT TO DESIGN THE PROCESS, JUST RAISE THE NEED FOR A PROCESS TO IDENTIFY WHAT THE COST WOULD BE, SHOULD BE, BEST CASE, WORST CASE FOR GOING THROUGH THE PHASE I AND PHASE II A AND II B CLINICAL TRIALS OF DIFFERENT TYPES BECAUSE AMD MAY BE A DIFFERENT COST THAN OTHER TYPES OF CLINICAL TRIALS. THE PHARMA MEMBERS I FIND DIFFICULT TO RELY

ON BECAUSE I BELIEVE THEY OVERSTATE IN SOME MAJOR WAY SOME OF THE COSTS WE MIGHT FACE.

THERE'S PUBLICATIONS THAT INDICATE A VERY HIGH PERCENTAGE, 40 TO 80 PERCENT, OF FAILED PHASE I'S ARE BASED UPON TOXICITY TRIALS THAT WERE NOT PREDICTIVE BECAUSE THEY WERE RELYING ON MOUSE TRIALS WITHOUT HUMAN CHIMERAS THAT WE CAN NOW PRODUCE POTENTIALLY. THERE'S A GREAT DEAL OF CONTRADICTORY INFORMATION. AND WHAT I'M SUGGESTING IS MAYBE IN A VERY FORMAL WAY WE COULD FIGURE OUT A PROCESS WHERE WE COULD REACH OUT TO A GROUP OF EXPERTS, HAVE THEM ANALYZE THE DIFFERENT AREAS OF TRIALS BECAUSE RIGHT NOW WE'RE DEALING WITH INFORMATION THAT IS BASED OFF OF DIFFERENT MODELS THAT MAY NOT BE COMPLETELY PREDICTIVE OF OUR COSTS.

DR. OLSON: BOB, THERE'S A LOT OF ACTUALLY INFORMATION OUT THERE ON THE COST OF DIFFERENT CLINICAL TRIALS. ACTUALLY WE HAD A DISCUSSION -- I MEAN I THINK CATRIONA JAMIESON EVEN MENTIONED YESTERDAY THAT SHE THOUGHT THAT SOME OF THE STEM CELL-BASED TRIALS, INSTEAD OF $20,000 A PATIENT, WOULD BE $60,000 A PATIENT BECAUSE OF THE MONITORING REQUIREMENTS. I THINK A LOT OF THE COST DIFFERENTIAL IS GOING TO BE IN AREAS THAT ARE PERHAPS NOT WELL UNDERSTOOD EXCEPT BECAUSE WE'RE

ESSENTIALLY PUSHING IT NOW, IT'S GOING TO BE THE PRODUCTION COST FOR THE CELLS. AND THEN, AS I SAY, DEPENDING ON THE TYPE OF TRIAL, THE INCREASED MONITORING COSTS. BUT THERE'S ACTUALLY A LOT OF INFORMATION OUT THERE ON THE COST OF HOW MUCH DOES IT COST TO RUN -- HOW MUCH DOES IT COST PER PATIENT IN A HEART DISEASE TRIAL, THAT KIND OF INFORMATION IS AVAILABLE.

SO I THINK YOU GET GOOD TEAMS, BUT I THINK THE POINT IS IT MAY BE DIFFICULT TO KNOW THE SPECIFICS, BUT I THINK YOU CAN SAY THAT -- AND WE DON'T KNOW THE KIND OF RATES. WE DON'T EXPECT UNFORTUNATELY ALL OF OUR DISEASE TEAMS TO MAKE IT THROUGH TO AN IND. IT WOULD BE GREAT IF THEY DID, BUT REALISTICALLY, AND IT'S THOSE THAT ARE SUCCESSFUL, THOSE THAT THE SCIENCE ENDS UP BEARING UP UNDER WHATEVER THEY DO THAT WE CAN MOVE FORWARD. AND THEN WE JUST SEE HOW THEY GO. I'M JUST SAYING THAT IT WILL -- YOU HAVE TO PLAN ON COSTING MONEY, AND YOU HAVE TO PLAN, AND THAT'S WHAT WE'VE ALWAYS INTENDED, AND YOU HAVE TO JUST PICK YOUR PROJECTS, PICK THEM WISELY, BE ABLE TO FUND THOSE THAT ARE SUCCESSFUL, AND MOVE FORWARD. I THINK THAT'S --

DR. TROUNSON: BOB, THERE'S ALSO EXPERIENCE THERE WITH THE ADULT STEM CELL WORK, AND

THERE'S PRETTY HIGH FAILURE RATE THERE AS WELL. YOU COULD ARGUE IF WE'RE MUCH BETTER AT KNOWING THE MECHANISM AND WE'VE GOT A BETTER CELL TYPE THAT WE MAY DO BETTER; BUT CURRENTLY IF YOU ANALYZE IT, THEY'RE STILL NOT DOING VERY WELL WITH ANY OF THOSE KIND OF CELL THERAPIES AT THE MOMENT. SO THERE'S A LOT OF QUESTIONS STILL OUT THERE. HOW LONG WILL THEY REQUIRE MONITORING OF THESE PATIENTS? THERE'S A LOT OF UNANSWERED QUESTIONS BECAUSE THERE ARE BASICALLY NO PLURIPOTENTIAL STEM CELLS AND FEW OF, SAY, THE NEURAL STEM CELL WORK WHERE THE CELL GOES IN AND REGENERATES AVAILABLE YET. BUT WE SHOULD TRY AND DO THAT, BUT IT'S A VERY UNIQUE SPACE THAT WE'RE GOING TO BE OCCUPYING.

CHAIRMAN KLEIN: I THINK WE'RE VERY FOCUSED THROUGH PHASE II A, II B, NOT THROUGH PHASE III, WHICH IS A HUGE DIFFERENCE.

JEFF SHEEHY, YOU HAD A QUESTION?

MR. SHEEHY: I JUST WONDER, AGAIN, THIS IS KIND OF TANGENTIAL TO DR. HAWGOOD'S QUESTION. THIS SPACE ON THE RIGHT SIDE REALLY IS NIH SPACE IN A LOT OF WAYS, THE PHASE I, PHASE II CLINICAL TRIAL. WHAT KIND OF DYNAMIC RELATIONSHIPS ARE WE CREATING WITH NIH? AND ALSO, THIS GOES TO SOMETHING DUANE ROTH HAS SPOKEN ABOUT WITH ADVOCACY GROUPS. WE'VE

ALREADY HAD CONVERSATIONS ABOUT THE HIV PROJECTS, PRESUMING THEY DO GET TO IND, WITH THE HEAD OF THE DIVISION OF AIDS. LARRY KRAMER HAS CALLED TONY FAUCI.

WE'VE BEEN TRYING TO START -- THERE'S A DUAL THING. ONE IS TO GET THE ADVOCACY GROUPS TALKING TO THE DIFFERENT INSTITUTES OF HEALTH THAT ARE FUNDING THE PARTICULAR PIECES OF SCIENCE. WE GIVE THEM SOMETHING WITH AN IND, THEN YOU'RE ALSO GOING TO NEED PATIENTS. YOU'RE ALSO GOING TO NEED, AS DUANE HAS SPOKEN ABOUT SO ELOQUENTLY, YOU'RE GOING TO NEED THE PATIENTS BOTH TO RELIEVE THE ANXIETY OF THE REGULATOR WHEN YOU ACTUALLY START TO PUT HUMAN BEINGS INTO THESE TRIALS AND ALSO TO BE THERE TO ALLEVIATE WHATEVER PUBLIC DISTRESS COMES WITH THE INEVITABLE FAILURES, WHICH ARE MORE LIKELY TO HAPPEN THAN NOT.

HOW CAN WE PLAY A ROLE OR ARE WE THINKING STRATEGICALLY ABOUT FACILITATING BECAUSE WE'RE A UNIQUE ENTITY IN THAT WE ACTUALLY HAVE THE ACADEMIC SIDE, THE BUSINESS SIDE, AND THE ADVOCACY SIDE ALL MERGED TOGETHER. HAVE WE THOUGHT ABOUT ENERGIZING THAT WITHIN THE CONTEXT OF OUR DISEASE TEAMS AS THEY START TO HIT IND BECAUSE I KNOW A LOT OF OTHER ADVOCACY GROUPS ARE FOLLOWING THESE PROJECTS AS

CLOSELY AS WE ARE IN THE HIV FIELD.

DR. TROUNSON: JEFF, I THINK THERE'S AN IMPORTANT, THERE'S A VERY IMPORTANT ROLE, AS YOU SAY. NIH AND FDA HAVE GOT TOGETHER, AND THEY ACTUALLY NOW HAVE A GROUP THAT'S FOCUSED ON THIS. AND THIS IS WHERE I THINK WE AND THE PATIENT ADVOCATES REALLY OUGHT TO BECOME INVOLVED. IT'S A LITTLE DIFFICULT TO WEIGH INTO THAT, BUT IT'S SOMETHING THAT I THINK IS REALLY RIGHT ACROSS THE TOP WHERE THEY'VE AGREED TO LOOK AT THESE AREAS AND TRY AND MAKE IT A BETTER SYSTEM.

I THINK INPUT OF THE PATIENT ADVOCATES UP AT THAT LEVEL AND OURSELVES IS REALLY IMPORTANT. WE'RE TRYING TO MAKE OUR WAY IN OURSELVES, AND I'M ENCOURAGING, REALLY WOULD LIKE TO ENCOURAGE PATIENT ADVOCATES TO JOIN THAT ALLIANCE AS WELL.

MR. SHEEHY: IS THERE SOME WAY TO OPERATIONALIZE THIS A LITTLE BIT? THE RESOURCES ARE REALLY EITHER HERE AT CIRM OR WITHIN THE ACADEMIC INSTITUTIONS. DEPENDING ON THE PARTICULAR ADVOCACY GROUP, THE LEVEL OF RESOURCES IS MUCH LOWER. AND SO THE COORDINATION, MAKING THESE KINDS OF RELATIONSHIPS OPERATIONAL SHOULD COME OR WOULD BE MORE EASILY FACILITATED BY THOSE WHO HAVE MUCH GREATER RESOURCES.

MR. ROTH: SO I HAVE BEEN WORKING ON A PUBLICATION ON THIS VERY ISSUE BASED ON MY EXPERIENCE HERE ON THIS BOARD TO SUGGEST A TOTALLY NEW APPROACH TO HOW WE EVALUATE RISK AND BENEFIT WITHIN THE CONFINES OF THE FOOD AND DRUG ADMINISTRATION. AND WHEN THAT GOES FORWARD, I THINK WE SHOULD -- IT'S REALLY BASED ON THIS EXPERIENCE. THIS IS THE PILOT THAT ENABLED MY THOUGHTS TO EVOLVE. YOU HEARD IT YESTERDAY FROM DR. LEVEY ABOUT HIS APPREHENSION ABOUT PATIENT ADVOCATES ON THE BOARD. I CAME WITH THE SAME BIAS. AND I HAVE DONE, EXACTLY AS HE SAID, 180 TO UNDERSTAND THAT THEY'RE PROBABLY THE ONLY GROUP THAT CAN REALLY EVALUATE RISK AND BENEFIT.

IF I'M A REGULATOR, MY GOODNESS, I SEE RISK, AND I WILL CONTINUE TO SEE RISK. I CANNOT CHANGE. IF I'M A SPONSOR, I JUST WANT TO MAKE PEOPLE WELL, AND I WANT TO MOVE FORWARD. BUT THERE WE SIT, AND WE WRITE RULES, WE WRITE REGULATIONS, AND IT DOES ABSOLUTELY NO GOOD. IT JUST MAKES IT LONGER AND MORE EXPENSIVE.

IF THE PATIENT, AND I CALL THEM MEDIATORS, WERE SITTING IN THE ROOM OFFICIALLY WITH A TEAM, STILL THE FDA'S FINAL CALL, THEY CAN SAY, "BOB, WE WANT TO GO FORWARD. WE UNDERSTAND THE RISK, AND WE

ARE GOING TO TELL EVERYBODY THAT TAKES THIS PRODUCT ABOUT THAT RISK, BUT LET'S NOT HOLD IT UP BECAUSE MAYBE WHAT IF IS THERE. AND IF IT DOESN'T WORK AND SOMETHING BAD HAPPENS, WE'VE GOT YOUR BACK. WE'RE GOING TO STAND UP AND SAY YOU TOLD US." AND TO THE COMPANY THEY SAY, "DON'T BE AFRAID TO TELL US EVERYTHING YOU KNOW BECAUSE WE KNOW THAT IF YOU TELL US TODAY, WE'RE PROBABLY GOING TO REACT TO IT." AS A REGULATOR, I WOULD. BUT IF YOU'RE TELLING ME YOU'LL BE REASONABLE ABOUT ME GIVING YOU A HEADS-UP, AND I KNOW SOMEBODY ELSE IS IN THE ROOM TO HELP GET US TOGETHER ON THIS, WHY WOULDN'T I DISCLOSE EVERYTHING RIGHT UP FRONT? IF WE CAN DO THIS, IT CHANGES EVERYTHING YOU JUST HEARD FROM PAT.

PAT, LIKE ALL OF US, WOULD DO EVERYTHING IN THE CONFINES OF THE REGULATOR. THAT'S HOW WE THINK. THAT'S WHAT WE'VE ACCEPTED. AND THAT'S HOW WE'RE GOING FORWARD. THIS PROCESS COULD DRAMATICALLY CHANGE THAT SO THAT WE'RE ALL TOGETHER DOING WHAT'S BEST AND RIGHT. AND THIS GROUP IS THE GROUP THAT REALLY SHOULD BE PURSUING THAT AND GETTING OTHER PEOPLE THEN TO JOIN IN.

AND I AM CONVINCED THAT IF WE CAN PUT THIS FORWARD, THAT WE CAN GET THIS LEGISLATED AS PART OF AN OFFICIAL PROCESS JUST ON INNOVATIVE PRODUCTS,

ONLY ON BRAND NEW, AND THERE'S A FULL-TIME, NOT ONE ADVOCATE, BUT A TEAM OF ADVOCATES WHO ARE PROFESSIONALS. THEY HAVE TO BE CERTIFIED IN SOME WAY TO SIT IN THAT ROOM, BUT THEY'RE THERE AS STATISTICIANS. PEOPLE SAY, WELL, SICK PEOPLE ARE LAWYERS, DOCTORS, STATISTICIANS, CLINICAL TRIAL EXPERTS. IT ISN'T UNIQUE TO PATIENT ADVOCATES NOT TO BE INVOLVED DIRECTLY IN THE PROCESS. ANYWAY, THAT'S WHERE WE STAND ON IT.

DR. OLSON: IT WOULD BE GREAT IF WE COULD GET THROUGH, BUT THAT'S A PARADIGM SHIFT.

MR. ROTH: WE NEED TO DO SOMETHING.

CHAIRMAN KLEIN: IN THIS SPECTRUM OF ASSETS, AS I TOLD DR. TROUNSON IN THE LAST COUPLE OF MONTHS, ONE OF THE LEADERSHIP INDIVIDUALS IN THE VETERANS ADMINISTRATION IN CHARGE OF THEIR RESEARCH HOSPITALS HAS SUGGESTED THEY'D LIKE TO COLLABORATE WITH US ON CLINICAL TRIALS. NOW, IT'S ONLY SO MANY THINGS WE CAN DO AT ONCE, AND WE NEEDED TO GET THROUGH ISSCR AND SOME OTHERS BEFORE THERE'S THE TIME TO FOLLOW ON THAT. BUT THEY POINTED OUT VERY CAREFULLY THAT THEY HAD TWO MAJOR RESEARCH HOSPITALS IN CALIFORNIA. THEY'D LIKE TO POSITION SOME STEM CELL RESEARCH ACTIVITIES IN THOSE HOSPITALS AND FOCUS POTENTIALLY ON THEIR FUNDING OF CLINICAL

TRIALS RELATED TO OUR WORK. IT'S ANOTHER ASSET TO BRING TO THE TABLE.

AND DR. GALLIN, WHO'S THE HEAD OF THE NIH CLINICAL TRIAL HOSPITAL ON THE NIH CAMPUS, I SPENT THREE OR FOUR HOURS WITH HIM LAST TIME I WAS IN WASHINGTON, D.C. HE'D LIKE TO HAVE A COLLABORATION WITH US IN WORKING ON OUR DEVELOPMENT PORTFOLIO AND WITH A GOAL TO BE PART OF A PHASE I TRIAL GROUP.

AGAIN, THESE ALL TAKE TIME. THEY TAKE STAFF. WE HAVE TO WORK AT IT INCREMENTALLY, BUT I THINK THAT THERE'S GOING TO BE SOME REAL VALUABLE COLLABORATIVE ASSETS OUT THERE WITH THEIR OWN FUNDS AND WITH PRESTIGIOUS LEADERSHIP POSITIONS THAT WILL ATTRACT SUPPORT FOR US AND HELP US. THE VETERANS ADMINISTRATION CAN BE A GREAT SUPPORT WITH THE FDA. I THINK WE HAVE A MISSION PORTFOLIO THAT IS EXTREMELY PROMISING, AND WE WILL ATTRACT RESOURCES AS WE GO FORWARD TO SUPPORT THIS MISSION.

DR. TROUNSON: I'D JUST SAY, BOB, THAT WE'VE STILL GOT TO GET THROUGH THE IND PROCESS EVEN THERE. SO COMPLETELY SUPPORT WHAT DUANE IS SAYING. AND ONE ELEMENT THAT WE NEED TO GET IN THEIR MINDS IS ONE OF THE RISKS IS NOT BEING ABLE TO TREAT OR CURE PATIENTS BY BEING DELAYED. THAT IS A RISK THAT NEEDS TO BE PUT INTO THE FORMULA.

AND MY READING, THEY DO SAY THERE ARE PATIENT ADVOCATES INVOLVED WITH THE FDA, BUT THEY'RE NOT LOOKING AT THIS AREA I CAN TELL YOU. SO VERY COMPLEX AND RISK ADVERSE AND MORE ADVERSE AS YOU GO UP THE TREE UNFORTUNATELY. SO MEMBERSHIP OF THE FDA IS VERY ENCOURAGING FOR US TO GET LINKED AND SO IS THE NIH, BUT THERE'S A BIT OF A RESISTANCE THERE. AND WE NEED TO SPEND TIME ON DOING IT, AND THAT'S WHAT I HOPE OUR NEW VP R&D WILL BE DOING.

CHAIRMAN KLEIN: I'M COMPLETELY SUPPORTIVE OF DUANE'S FOCUS AND THE FOCUS ON PATIENT ADVOCATES. AS YOU KNOW FROM A NUMBER OF DISCUSSIONS, BEING INVOLVED EARLY WITH A VERY BROADBASED COLLABORATIVE, AS DUANE DESCRIBES IT, VALIDATION AND SHIELD FOR THE FDA SO THEY FEEL THE FREEDOM TO MAKE THE DECISIONS THAT ABSOLUTELY HAVE RISK, BUT WITH INFORMED PATIENTS TO BE THERE IF SOMETHING GOES WRONG TO TELL THE PUBLIC THESE RISKS ARE ESSENTIAL AS THEY WERE IN HIV. THERE WILL BE TRAGEDIES ALONG THE WAY, BUT IT IS ESSENTIAL TO SAVE MILLIONS OF LIVES. I THINK IT'S A POWERFUL MESSAGE THAT'S CRITICAL.

SO WE ARE AT THE POINT OF THE BUDGET.

MR. TORRES: WE'RE FINALLY READY FOR POOR MR. ROBSON.

CHAIRMAN KLEIN: DR. ROBSON, YOU'RE

FOLLOWING SOME VERY EXCITING INFORMATION.

DR. ROBSON: I HOPE I GET TO THE OTHER PART TOO TODAY BECAUSE I THINK THAT WOULD HAVE FIT NICELY WITH THIS, BUT I UNDERSTAND THE PRACTICALITY.

CHAIRMAN KLEIN: WHILE THE LOGISTICS ARE BEING DEBATED, AGAIN, DR. OLSON, THANK YOU FOR THE WONDERFUL PRESENTATION.

DR. ROBSON: THANK YOU VERY MUCH. SO I'M HERE TO PRESENT THE PROPOSED BUDGET FOR FISCAL YEAR 2010-11 AND SEEKING YOUR APPROVAL OF THIS BUDGET.

NOW, BEFORE I GET INTO THE DETAILS OF THE BUDGET, BECAUSE IN A REVIEW LIKE THIS, IT'S APPROPRIATE TO LOOK AT THE DETAILS AND GET DOWN INTO THE WEEDS, AS THEY SAY, BUT I'D LIKE TO FIRST PUT OUR OPERATING BUDGET INTO A CONTEXT. SO I'VE GOT A SLIDE HERE WHICH HAS A LOT OF NUMBERS ON IT, AND IT SHOWS SOME OF OUR GROWTH AND INCREASE IN OUR RESPONSIBILITY SINCE OUR FIRST YEAR THAT WE DID SOME FUNDING IN 2005-6 UP THROUGH THIS CURRENT FISCAL YEAR.

I SHOW THIS FOR TWO REASONS. FIRST IS IF YOU LOOK AT THE FIRST TWO COLUMNS, ONE SHOWS GRANTS PAYMENTS. THIS IS HOW MUCH WE'VE ACTUALLY PAID OUT, AND THIS IS CUMULATIVE. SO IN 2005-6 WE PAID OUT A LITTLE OVER $12 MILLION. BY THIS POINT, BY THE END

OF JUNE THIS YEAR, WE WILL HAVE PAID OUT A TOTAL OF $521 MILLION.

NOW, THE REASON I WANT TO EMPHASIZE, I WANT TO DIFFERENTIATE BETWEEN EXPENDITURES AND COMMITMENTS. AND THE REASON I WANT TO DO THAT IS BECAUSE I OFTEN READ IN THE PRESS OR HEAR ON THE RADIO AND THE MEDIA THAT CIRM HAS NOW SPENT OVER A BILLION DOLLARS, AND WHAT PROGRAMS DOES IT HAVE, WHAT PROGRESS HAS IT MADE? THAT'S OFTEN AN INTRODUCTORY PHRASE, BUT THE FACT IS WE HAVE NOT SPENT A BILLION DOLLARS. WE'VE COMMITTED A BILLION. WE'VE ONLY SPENT ABOUT 520 MILLION. AND OF THAT KEEP IN MIND THAT ALMOST HALF WENT TO FACILITIES, AND THOSE FACILITIES ARE JUST NOW STARTING TO COME ONLINE.

SO WHEN WE REPORT THAT, FOR EXAMPLE, WE NOW HAVE 500 PAPERS PUBLISHED WITH CIRM SUPPORT, IT'S NOT BASED ON A BILLION DOLLARS. IT'S NOT BASED ON 500 MILLION. IT'S MORE LIKE $270 MILLION. THAT'S A LOT OF MONEY, BUT IT'S A LOT LESS THAN A BILLION. SO I'M GOING TO IN MY REPORTS ON OUR FINANCES REGULARLY JUST KIND OF KEEP YOU UP TO DATE ON OUR EXPENDITURES RELATIVE TO OUR COMMITMENTS BECAUSE I THINK IT'S IMPORTANT TO KEEP THAT STRAIGHT.

THE OTHER REASON I SHOW THIS SLIDE IS IF YOU LOOK AT THE COLUMNS TO THE RIGHT, THE ONE IN THE MIDDLE SAYS VALUE OF PROGRAMS UNDER MANAGEMENT. WHAT I MEAN BY THAT IS THAT'S ALL COMMITMENTS MINUS THOSE PROGRAMS THAT HAVE TERMINATED. SO OUR ACTUAL COMMITMENTS ARE AT ABOUT A BILLION 50 MILLION, BUT CURRENTLY WE ARE MANAGING PROGRAMS VALUED AT A LITTLE OVER A BILLION DOLLARS.

ACTIVE AWARDS HAVE GROWN. IN 2005-6 WE WERE MANAGING 16. WE NOW HAVE 303 ACTIVE AWARDS. STAFF HAS GONE FROM 22 TO 44, AND THE OPERATING BUDGET FROM 5.5 MILLION TO A LITTLE OVER 12 MILLION IN THIS PAST YEAR.

NOW, IF YOU LOOK AT THE BOTTOM, I THINK THAT YOU CAN SEE THAT THERE HAS BEEN AN ENORMOUS GROWTH IN THE PROGRAMS, THE NUMBER OF GRANTS AND THE AMOUNT OF MONEY UNDER MANAGEMENT, FAR LESS GROWTH IN THE STAFF SIZE AND THE OPERATING BUDGET. ONE WAY TO LOOK AT IT IS IF YOU LOOK AT WHAT WAS THE OPERATING BUDGET RELATIVE TO THE PROGRAMS WE WERE MANAGING IN 2005-6, THE VALUE OF WHAT WE WERE MANAGING WAS ABOUT SEVEN TIMES THE OPERATING BUDGET. IT'S NOW ABOUT 90 TIMES THE OPERATING BUDGET.

I ACTUALLY GRAPHED THOSE LAST FOUR COLUMNS, THE INFORMATION HERE, SO THIS SHOWS

RELATIVE CHANGE SINCE 2005. THE GREEN LINE IS THE VALUE OF ALL THE PROGRAMS UNDER MANAGEMENT. SO THAT'S GONE UP 26 TIMES SINCE 2005. THE NUMBER OF AWARDS UNDER MANAGEMENT HAS GONE UP ABOUT 19 TIMES. THEN THOSE LINES AT THE BOTTOM SHOW THE OPERATING BUDGET, AND THE STAFF YOU CAN BARELY SEE BECAUSE THE RED LINE IS HIDING BEHIND THE YELLOW LINE. THOSE HAVE BASICALLY DOUBLED IN THAT PERIOD.

I THINK THIS IS AN INDICATION OF HOW THE PROGRAMS HAVE GROWN AND THE RESPONSIBILITIES HAVE GROWN, AND ALSO THE WORKLOAD ON THE STAFF HAS GROWN.

NOW, SORT OF IN THAT CONTEXT, LET'S LOOK AT THE BUDGET THAT WE'RE PROPOSING FOR THIS YEAR. I KNOW MANY OF YOU OFTEN LIKE TO KNOW HOW OUR NEW BUDGET COMPARES TO NOT WHAT OUR PREVIOUS BUDGET WAS, BUT TO WHAT OUR EXPENDITURES FOR THE PREVIOUS FISCAL YEAR WOULD BE. RIGHT NOW, SINCE WE HAVEN'T FINISHED THE FISCAL YEAR, BUT WE HAVE DONE A PRETTY THOROUGH ESTIMATE, MARGARET FERGUSON AND CHILA SILVA-MARTIN HAVE DONE THIS, AS TO WHERE WE WILL BE AS OF JUNE 30TH THIS YEAR. AND WE EXPECT TO BE ABOUT 5 PERCENT UNDER WHAT WAS APPROVED LAST YEAR. SO THAT'S THE CONTEXT FROM WHERE WE'RE STARTING.

NOW, YOU HAVE A LOT OF INFORMATION, A LOT OF TABLES IN YOUR BINDERS. I'M NOT GOING TO GO

THROUGH THESE IN DETAIL. I'M JUST GOING TO TRY TO HIT ON A COUPLE OF HIGHLIGHTS. THE OVERALL BUDGET THAT WE'RE PROPOSING IS ABOUT A 24-PERCENT INCREASE OVER WHAT WAS APPROVED LAST YEAR. IT'S 29 PERCENT ABOVE WHAT WE WILL HAVE EXPENDED AT THE END OF JUNE THIS YEAR.

AND THE INCREASE IS REALLY IN FOUR AREAS. THEY'RE SORT OF SUMMARIZED HERE. AND YOU HAVE SOME DETAILS ABOUT THIS, I THINK, IN YOUR BINDERS. SALARIES AND BENEFITS HAVE GONE UP ABOUT ALMOST 1.4 MILLION. NOW, THAT'S DUE IN LARGE PART TO THE FACT THAT WE'RE PROJECTING OUR STAFF SIZE WILL FINALLY REACH THAT UPPER LIMIT WE HAVE OF 50. SO WE WILL GO FROM OUR CURRENT LEVEL OF 44 TO 50. WE EXPECT TO BE THERE. AND THE OTHER THING THAT YOU NEED TO MAKE NOTE OF IS THERE'S ABOUT $400,000 OF THIS INCREASE IS DUE TO THE FACT THAT IN THE STATE OF CALIFORNIA SYSTEM, YOU HAVE TO WORK IN THE SYSTEM FOR TWO YEARS BEFORE YOU BECOME ELIGIBLE FOR STATE CONTRIBUTION TO YOUR RETIREMENT PLAN. WE HAVE 15 PEOPLE ON STAFF WHO WERE HIRED IN 2008-2009, AND THIS YEAR WILL BE THE FIRST YEAR IN WHICH THEY HAVE EITHER FULL RETIREMENT BENEFITS OR PARTIAL RETIREMENT BENEFITS. SO OF THAT ONE 1.4 MILLION, ABOUT 400,000 OF IT IS DUE TO THAT INCREASE IN RETIREMENT BENEFITS.

CHAIRMAN KLEIN: JOHN, I THINK IT WOULD BE APPROPRIATE TO POINT OUT THAT WHILE THERE WERE OTHER INDIVIDUALS ON PARTIAL YEAR SALARIES IN PRIOR YEARS, YOU'RE NOW PICKING UP THEIR FULL YEAR SALARIES.

DR. ROBSON: I THOUGHT I SAID THAT. I MEANT TO SAY THAT.

CHAIRMAN KLEIN: I JUST WANTED TO EMPHASIZE THAT IN ADDITION TO POSITIONS THAT YOU'RE ADDING, YOU'RE GAINING FULL YEAR SALARIES ON PRIOR PARTIAL YEAR SALARIES.

DR. ROBSON: THE SECOND ONE IS EXTERNAL CONTRACTS. AND, AGAIN, IN THAT WE HAVE A FEW AREAS WHICH ACCOUNT FOR MOST OF THAT $500,000 INCREASE. ONE IS WE'RE DOING A SALARY SURVEY. THIS IS SOMETHING THAT HAS BEEN DONE IN THE PAST. IT HASN'T BEEN DONE FOR SEVERAL YEARS, BUT WE DO THAT TO BENCHMARK OUR SALARY SCALES AGAINST COMPARABLE INSTITUTIONS IN THE STATE. WE HAVE -- THAT'S $80,000. THAT'S BASED ON WHAT IT COST US LAST TIME TO DO IT.

WE HAVE AN EXTERNAL SCIENTIFIC REVIEW. ALAN HAS MENTIONED THAT TO YOU SEVERAL TIMES. WE BUDGETED THAT AT ABOUT $180,000. THAT WILL TAKE PLACE IN THE FALL. AND THEN THE OTHER BIG ITEM THAT'S A NEW ITEM IS THE ONLINE JOURNAL THAT ALAN

DESCRIBED. AS YOU'VE HEARD, THERE'S GOING TO BE A PROCESS TO EVALUATE THAT, BUT THAT ACCOUNTS FOR ABOUT $200,000 OF THAT INCREASE.

THE THIRD AREA OF INCREASE IS IN THE GRANTS WORKING GROUP MEETINGS, AND THAT'S LARGELY BECAUSE WE'RE GOING TO HAVE A LOT MORE OF THOSE MEETINGS. AND ONE OTHER FACTOR, WHICH I'LL COME TO IN A MINUTE. WE HAD THREE FULL GRANT WORKING GROUP MEETINGS, ONE PREAPPLICATION REVIEW, AND ONE LEADERSHIP AWARD MEETING IN THIS CURRENT FISCAL YEAR. NEXT YEAR WE'RE TARGETING SIX FULL GRANT WORKING GROUP MEETINGS, SEVERAL PREAP MEETINGS, AND THEN FOUR FOR THE RESEARCH LEADERSHIP AWARDS. SO IT'S A REAL RAMP-UP IN THE NUMBER OF MEETINGS THAT WE'LL HAVE.

AND THEN THE OTHER FACTOR THAT ACCOUNTS FOR THIS DIFFERENCE, WHICH PROBABLY WE SHOULD NOT HAVE INCLUDED IN THIS CATEGORY, IS THAT WE WILL BE HAVING -- ASSEMBLING OVERSIGHT COMMITTEES FOR THE DISEASE TEAMS. AND WE HAVE BUDGETED FOR TWO MEETINGS OF THAT OVERSIGHT COMMITTEE DURING THIS FISCAL YEAR AT $125,000 EACH. SO THAT'S ANOTHER 250,000. THAT'S WHAT ACCOUNTS FOR THE INCREASE IN THIS CASE IN THIS CATEGORY.

AND THE FINAL ONE IS INFORMATION

TECHNOLOGY, AND THIS HAS BEEN A DIFFICULTY FOR US. WE'VE STRUGGLED WITH OUR I.T. ALL ALONG. WE ARE IN A POSITION NOW -- DURING THE PAST YEAR WE WENT THROUGH A VERY EXTENSIVE REVIEW OF OUR GRANTS MANAGEMENT SYSTEM. AS YOU KNOW, WE'VE BEEN TRYING TO DEVELOP AND IMPLEMENT AN AUTOMATED ELECTRONIC WEB-BASED GRANTS MANAGEMENT SYSTEM. WE'VE HAD SOME DIFFICULTY WITH THAT; BUT AFTER THIS REVIEW, THIS EXTENSIVE REVIEW WE DID OF COMMERCIAL PRODUCTS AND AN IN-HOUSE CUSTOM MADE PRODUCT, WE DETERMINED, AND WE HAD SEVERAL CONSULTANTS INVOLVED IN THIS WHO ALSO AGREED, THAT WE REALLY HAVE TO DO A CUSTOMIZED PRODUCT BECAUSE OF THE COMPLEXITY OF OUR PROGRAMS.

SO THAT PUTS US INTO THE DEVELOPMENT PHASE. WE HAVE A PRODUCT THAT'S NOW WORKING FOR LOOKING AT THE POSTAWARD REVIEW, KEEPING THAT INFORMATION IN LINE AND PROVIDING US ACCESS SO WE CAN VIEW ACROSS RFA'S, BUT WE STILL NEED TO BUILD PROGRAMS FOR THE APPLICATION, THE REVIEW MODULE, AND THE PROGRESS REPORTS. AND THAT'S NOW IN PROGRESS, BUT THAT PUTS US INTO A DEVELOPMENT PHASE. WE HAVE TO HIRE PROGRAMMERS TO DO THAT, AND WE HAVE ALSO CONTRACTED AN I.T. ADVISOR TO OVERSEE ALL OF OUR I.T. NEEDS FROM DESKTOP SUPPORT TO SERVER MAINTENANCE TO THE WEB SITE TO THIS GRANTS

MANAGEMENT SYSTEM.

SO THIS INCREASE IS REALLY BECAUSE WE'VE GONE INTO THIS AGGRESSIVE DEVELOPMENT PHASE, AND WE VIEW THIS AS REALLY A SPIKE IN OUR I.T. COST. AND WE ANTICIPATE THAT AS THE DIFFERENT COMPONENTS FOR THE GRANTS MANAGEMENT SYSTEM COME ONLINE, WE WILL BE ABLE TO REDUCE THE NUMBER OF CONTRACT PROGRAMMERS WE HAVE WORKING ON THIS, AND WE'LL BE ABLE TO SWITCH FROM MORE OF A DEVELOPMENT PHASE, WHICH IS MORE EXPENSIVE, AND MOVE TO A MAINTENANCE PHASE, WHICH WILL BE LESS EXPENSIVE. EVEN OUR I.T. ADVISOR, WE ANTICIPATE THAT IN ABOUT A YEAR THAT POSITION WILL MOVE FROM FULL TIME DOWN TO PART TIME.

SO THAT ACCOUNTS FOR THE INFORMATION TECHNOLOGY -- INCREASE IN INFORMATION TECHNOLOGY, BUT IT'S, WE THINK, GOING TO BE TEMPORARILY HIGH, BUT WILL BE REDUCED OVER TIME.

AND THE LAST THING I WANTED TO REPORT TO YOU ON, WHICH I'VE DONE IN THE PAST, IS WHERE WE STAND ON OUR 6-PERCENT ALLOCATION. AS YOU RECALL, WE ARE ALLOWED TO SPEND 6 PERCENT OF THAT $3 BILLION ON OUR OPERATIONS. NOW, AS WE'RE PROGRESSING TOWARDS RAISING THAT FULL 3 BILLION, THERE'S TWO WAYS WE CAN LOOK AT THIS THAT WE'VE DONE IN THE PAST. ONE IS BASE THE 6 PERCENT ON THE TOTAL BOND

SALES TO DATE. THE OTHER IS TO BENCHMARK IT AGAINST THE COMMITMENTS THAT HAVE BEEN MADE BY THE ICOC.

AT THE CURRENT TIME IT DOESN'T MAKE A BIG DIFFERENCE BECAUSE THOSE TWO NUMBERS ARE PRETTY CLOSE TO EACH OTHER. BUT IF YOU LOOK BASED ON BOND SALES, WE'VE SOLD A LITTLE OVER A BILLION, ALMOST $1.3 BILLION IN BONDS SO FAR. SIX PERCENT OF THAT IS 61 MILLION SEVEN. WE EXPECT TO BE OR WE WILL BE AT THE END OF JUNE, THIS MONTH WE WILL HAVE EXPENDED A TOTAL OF 36.8 MILLION ON OPERATIONS SINCE CIRM'S INCEPTION. WE EXPECT TO ADD ANOTHER 13.5 TO THAT THIS YEAR, WHICH WOULD BRING US TO 50.3, WHICH IS WELL UNDER THE 61.7, SO WE'LL STILL HAVE ROOM. IF YOU BASE IT ON TOTAL COMMITMENTS, OBVIOUSLY THOSE ARE A LITTLE HIGHER, SO WE'RE WELL UNDER THAT AS WELL.

CHAIRMAN KLEIN: AND, DR. ROBSON, THE ORIGINAL INTENT WAS, IN FACT, THAT BY SIZING IT ON COMMITMENTS, YOU HAVE A WORKING BUDGET THAT IS SCALED, AND THEN YOU RECONCILE IT BACK AGAINST BOND SALES BECAUSE WHEN YOU GO THROUGH THE BOND SALES, YOU CANNOT INCLUDE MORE THAN 6 PERCENT IN THE BOND SALES. SO IT'S A DOUBLE SYSTEM MEANT TO BE FORECASTING GOING FORWARD AND RECONCILING AS YOU ACTUALLY ISSUE THE BONDS.

DR. ROBSON: SO THAT WAS THE END OF MY PRESENTATION BECAUSE I THINK IT'S MORE APPROPRIATE TO OPEN THIS UP FOR QUESTIONS.

CHAIRMAN KLEIN: QUESTIONS?

DR. FRIEDMAN: MR. CHAIRMAN, IT'S MIKE FRIEDMAN. MAY I ASK A QUESTION?

CHAIRMAN KLEIN: ABSOLUTELY. YOU HAVE THE FLOOR.

DR. FRIEDMAN: I FEAR THAT I PROBABLY MISSED SOMETHING AND THAT THE INFORMATION TECHNOLOGY PLAN HAS PROBABLY BEEN REVIEWED AND APPROVED BY A WORKING GROUP OR SUBCOMMITTEE, BUT I AM VERY CONCERNED ABOUT THE IDEA OF CUSTOM DESIGNED SYSTEMS. AND NOTWITHSTANDING THE CONSULTANT'S PLEDGE THAT COSTS WILL GO DOWN AND THAT IT WILL BE TRANSITIONED, AND I'M CERTAINLY NOT DOUBTING THEIR SINCERITY, I JUST MY GUESS IS THAT EVERYBODY SITTING AROUND THIS TABLE HAS SEEN HORRIBLE EXAMPLES OF CUSTOM DESIGNED SYSTEMS GO BAD. AND FOR AN AGENCY LIKE OURSELVES THAT HAS A VERY MODEST AND VERY SLIM OPERATING BUDGET TO DO A GREAT MANY VERY COMPLICATED TASKS, I'M JUST VERY CONCERNED ABOUT THIS.

AND SO YOU CAN SET MY MIND AT EASE BY SAYING THAT THIS HAS BEEN REVIEWED AND MAYBE APPROVED AT A PREVIOUS MEETING, AND I'M JUST

FORGETTING IT, AND I APOLOGIZE FOR THAT. BUT I JUST WANT TO EXPRESS MY DEEP CONCERN OVER THIS. THANK YOU.

CHAIRMAN KLEIN: DR. ROBSON.

DR. ROBSON: WELL, WE HAVE BROUGHT THIS UP SEVERAL TIMES TO THE GOVERNANCE SUBCOMMITTEE. AND THE LAST MEETING IN WHICH WE DISCUSSED THIS WE EXPLAINED TO THEM THAT WE WERE GOING TO EVALUATE WHETHER OR NOT WE COULD DO AN OFF-THE-SHELF SYSTEM OR WOULD WE HAVE TO DO A CUSTOM SYSTEM. WE DID NOT GO BACK -- WE WERE NOT -- AS FAR AS I RECALL, THERE WAS NOT A REQUEST MADE FOR US TO COME BACK FOR APPROVAL ON THAT, SO WE DID NOT. THIS HAS BEEN AN INTERNAL DECISION THAT WE'VE MADE, BUT IT'S BEEN REALLY EXTENSIVELY DISCUSSED AND ANALYZED.

ONE OF THE REASONS THAT THE PRICE, AS I SAY, THE COST WILL BE HIGH THIS YEAR IS THAT WE'RE DOING TWO THINGS SIMULTANEOUSLY. WE'RE MAINTAINING THE CURRENT SYSTEM, AND WE NEED PROGRAMS TO DO THAT SO WE CAN KEEP OUR RFA'S MOVING ALONG, AND WE ARE BUILDING A NEW SYSTEM.

DR. FRIEDMAN: I DO UNDERSTAND THAT. AND, AGAIN, I MAY BE -- I WISH I COULD BE THERE TO SEE THE FACES OF MY COLLEAGUES BECAUSE THEY MIGHT THINK I'M JUST WASTING TIME, AND I APOLOGIZE FOR THAT.

BUT THE OUT-YEAR COST FOR THESE THINGS, YOU'RE GOING TO HAVE TO UPGRADE IT. AT SOME POINT YOU'RE GOING TO HAVE TO TRANSITION IT. MY OWN EXPERIENCE, AND A LOT OF I.T. PEOPLE THAT I'VE WORKED WITH AND TALKED WITH HAVE SAID THAT UNLESS YOU'RE PREPARED TO COMMIT AN ENORMOUS AMOUNT OF MONEY AND A HUGE AMOUNT OF EFFORT, YOU'RE REALLY -- YOU'RE STEPPING ONTO SOME VERY THIN ICE HERE.

AGAIN, I DON'T WANT TO SECOND-GUESS THE GOVERNANCE COMMITTEE. I RESPECT THEIR JUDGMENT ON THIS. I HAVE TO EXPRESS IN THE STRONGEST POSSIBLE TERMS MY DISCOMFORT WITH THINKING ABOUT A DESIGNED SYSTEM FOR SOMETHING THAT EVEN FOR COMPLICATED THINGS THAT WE DO, I'M SORRY. I WON'T REPEAT IT AGAIN. I JUST NEED TO EXPRESS MY CONCERN. THANKS.

CHAIRMAN KLEIN: JEFF SHEEHY.

MR. SHEEHY: WELL, JUST FOR THE RECORD FOR DR. FRIEDMAN, I'M ON THE GOVERNANCE COMMITTEE. I DON'T THINK WE'VE EVER LOOKED AT THIS THE WAY YOU HAVE.

MR. ROTH: ARE YOU SURE IT'S THE GOVERNANCE COMMITTEE THAT REVIEWED THIS? WASN'T IT THE FINANCE COMMITTEE? WHY WOULD GOVERNANCE?

DR. ROBSON: WHEN WE PRESENTED THE CONTRACTS.

CHAIRMAN KLEIN: FINANCE COMMITTEE.

MR. SHEEHY: I JUST DON'T THINK -- I THINK TO DR. FRIEDMAN'S POINT, AND THIS IS NOT WITHIN MY REALM OF EXPERTISE, THE KIND OF ANALYSIS THAT HE'S SUGGESTING I DON'T THINK HAS HAPPENED AT THE BOARD LEVEL IS ALL I WOULD -- MAYBE YOU HAVE A DIFFERENT VIEW ON THAT.

MR. ROTH: MY RECOLLECTION IS WE SPENT A GREAT DEAL OF TIME ON THIS LAST YEAR, AND WE HAD A LENGTHY DISCUSSION BECAUSE THAT'S WHEN WE DECIDED TO ABANDON THE FIRST OFF-THE-SHELF SYSTEM.

DR. ROBSON: IF YOU RECALL, WE DID HAVE AN OFF-THE-SHELF SYSTEM WHICH WAS CONSIDERED THE STATE-OF-THE-ART SYSTEM FOR US, AND WE COULD NOT ADAPT IT TO OUR NEEDS.

MR. ROTH: SO MY IMPRESSION IS THIS IS AN EVOLUTIONARY PROCESS, AND A DECISION WAS REACHED TO GO CUSTOM. AND THAT DECISION, AS JOHN JUST DESCRIBED, WAS BASICALLY AN INTERNAL DECISION. SO TO ANSWER THE QUESTION ACCURATELY, THERE WASN'T REALLY ANY COMMITTEE OF THE BOARD THAT LOOKED AT THIS. I DON'T THINK IT WAS BROUGHT FORWARD OR FELT TO BE NECESSARY.

I THINK, HOWEVER, BASED ON THE COMMENTS THAT DR. FRIEDMAN MADE, AND I KNOW A LOT OF PEOPLE

AROUND THE ROOM ARE NODDING THEIR HEADS, THE RECOMMENDATION FROM SOME OF US, INCLUDING DR. FRIEDMAN, WOULD BE TO LOOK VERY, VERY CAREFULLY BEFORE YOU DECIDE TO GO DOWN THE PATH OF CUSTOM SOFTWARE.

DR. ROBSON: WE SPENT A YEAR DOING JUST THAT.

CHAIRMAN KLEIN: I THINK IT WOULD BE PROBABLY VALUABLE TO SCHEDULE THIS FOR A REPORT SO WE CAN MONITOR THIS AS IT GOES FORWARD. WITH THE BEST EFFORTS OF STAFF, TOTAL DEDICATION, YOU CAN RUN INTO UNFORESEEN PROBLEMS IN THIS AREA. AS DR. FRIEDMAN SAYS, THEY ARE LEGEND. THE PROBLEM IS THAT THE SCIENTIFIC STAFF AND THE ADMINISTRATION HAVE PUT A HUGE AMOUNT OF TIME INTO TRYING TO FIGURE OUT WHAT STANDARD SYSTEM THEY COULD USE, AND THAT WAS NOT REALLY AVAILABLE. AND SO THEY DID MAKE THIS MODIFICATION, REPORTED IT TO THE FINANCE COMMITTEE, AND I THINK AT THIS POINT CLOSELY MONITORING IT, SEEING IF WE'RE MAKING GOOD PROGRESS, LOOKING AT THE MILESTONES IS PROBABLY WHERE WE'RE AT AT THE MOMENT.

SO I CAN TALK TO DR. TROUNSON, DR. ROBSON, AND WE CAN THINK OF A SCHEDULE FOR REGULAR MONITORING OF THIS ON PROGRESS AND MILESTONES SO WE CAN SEE HOW WE'RE GOING FORWARD. AND IN THAT

PROCESS, PERHAPS WE CAN GET AN INDEPENDENT ANALYSIS OF OUR ABILITY TO MAINTAIN THIS SYSTEM EFFECTIVELY AT A COST THAT IS REASONABLE.

DR. STEWARD: I WONDER IF THIS MIGHT BE A SITUATION WHERE A SUBCOMMITTEE OF THE BOARD COULD PLAY AN IMPORTANT ROLE. THERE ARE PEOPLE ON THIS BOARD, I'M NOT AMONGST THEM, WHO HAVE EXPERTISE IN THESE KINDS OF THINGS AND HAVE STRONG OPINIONS ABOUT IT. AND IT MIGHT BE SOMETHING THAT WOULD BE A USEFUL THING TO DO AT THIS POINT.

MR. ROTH: SO ONE -- JUST ONE COMMENT. I'M NOT SURE IT'S GOING TO AFFECT THE BUDGET EITHER WAY. SO THAT'S KIND OF AN INDEPENDENT DECISION. I DON'T WANT TO ARGUE THAT HERE BECAUSE IT'S GOING TO COST MONEY TO GO TO A NEW SYSTEM OFF THE SHELF OR CUSTOM. BUT I THINK THE RECOMMENDATION YOU'RE MAKING, OS, IS A GOOD ONE, NOT NECESSARILY THAT IT HAS TO BE THE BOARD, BUT THERE SHOULD BE SOME KICK THE TIRES ON THIS ONE MORE TIME AND GET SOME OTHER PEOPLE INVOLVED THAT DO UNDERSTAND AND MAKE SURE WE'RE ALL COMFORTABLE WITH THAT.

DR. ROBSON: PERHAPS AT ANOTHER MEETING, WE COULD PROBABLY DO IT IMPROMPTU THIS MEETING, BUT IF YOU'D LIKE AT ANOTHER MEETING, WE CAN GIVE YOU A REPORT ON WHAT WE ACTUALLY DID, THE PROCESS WE'VE

GONE THROUGH.

CHAIRMAN KLEIN: MY UNDERSTANDING IS THIS IS PARTIALLY OPERATIONAL TO DATE, AND THEY ARE GETTING GOOD DATA FROM IT. THEY HAVE SOME EXPERIENCE IN THIS DEVELOPMENT TEAM. BUT I'D SUGGEST, IN THE INTEREST OF TIME FOR THE BOARD, LET ME TALK WITH DR. TROUNSON, DR. ROBSON. WE'LL SEE IF THERE'S AN APPROPRIATE SUBCOMMITTEE, DR. STEWARD, AND SEE IF WE CAN EXPLORE A MONITORING AND MILESTONE DRIVEN PROGRAM ON THIS.

DR. TROUNSON: I THINK I'LL GET JOHN ROBSON TO GIVE A LITTLE BIT OF HISTORY IN A WRITTEN RESPECT FROM IT BECAUSE THERE HAVE BEEN A LOT OF CONSULTANTS INVOLVED IN THIS, ENORMOUS NUMBER. PART OF THE PROBLEM IS THAT WE KEEP CHANGING BECAUSE WE KEEP EVOLVING LOANS, ALL SORTS OF THINGS WHICH CAN'T BE ACCOMMODATED NORMALLY IN A FITTED SYSTEM, BUT WE'VE GOT TO BE ABLE TO ACCOMMODATE THEM SOMEHOW. SO ALL THE THINGS THAT WE CHANGE ALL THE TIME, WE NEED TO BE ABLE TO REFORMAT THE SYSTEM. WHEN IT'S NOT REFORMATTABLE, THEN WE RUN INTO PROBLEMS. SO IT'S A WORKING SYSTEM. THE SYSTEM IS WORKING, BUT WE WOULD LIKE TO BE ABLE TO INCORPORATE THE THINGS THAT WE MAKE CHANGES OF THAT COME DOWN FROM POLICY THAT ARE REALLY IMPORTANT TO GET IN AND NOT TRY TO

CARRY THEM ON THE SIDE WHEN THE SYSTEM CAN'T HAVE IT.

SO IF I GET JOHN TO PREPARE SOME OF THE HISTORY FOR IT JUST BECAUSE THERE'S BEEN A LOT OF TIME AND A LOT OF CONSULTANTS' TIME SPENT ON THIS, AND I THINK THEY'RE IN THE RIGHT SPACE. I'M NOT A REAL EXPERT IN THESE SYSTEMS EITHER, THAT'S FOR SURE. BUT I THINK IF YOU HAD THE FULL COMPLEMENT OF WHAT'S BEEN DONE IN THIS SPACE, PLUS AMY LEWIS WHO'S REALLY SHEPHERDED THIS SO HEAVILY THROUGH TIME, I THINK YOU WOULD GET A GOOD FEEL FOR THE PROGRAM.

AND I RECOGNIZE EVERYONE'S DISCOMFORT BECAUSE MY INITIAL RESPONSE TO ALL OF THIS WAS TOTAL DISCOMFORT. HERE WE GO AGAIN. BUT IF YOU HAVE A LOOK AT WHAT WE'VE GOT AND WHAT WE'VE GOT TO DO AND THE WAY WE'VE GOT TO CHANGE THINGS BECAUSE THINGS CHANGE ON US A LOT, I THINK YOU HAVE TO HAVE SOME DEGREE OF CUSTOMABILITY IN THE PRIMARY PROGRAM TO ENABLE IT TO WORK. CAN WE DO THAT? GET A HISTORY AND THEN WE BRING IT FORWARD FOR A GROUP OF INTERESTED PEOPLE.

CHAIRMAN KLEIN: ABSOLUTELY. AND JUST TO EMPHASIZE, THERE IS AN OPERATING SYSTEM AT THIS POINT THAT HAS BEEN MODIFIED AND IS PRODUCING A LOT MORE THAN DATA THAN WE COULD PREVIOUSLY ACCESS. SO

THERE IS CERTAINLY PROGRESS HERE. BUT, DR. FRIEDMAN, WE APPRECIATE YOUR SUGGESTION. WE'LL FOLLOW UP ON IT.

DR. ROBSON: JUST AS A FINAL COMMENT, THE PROGRESS REPORT COMPONENT IS REALLY IN ITS FINAL TESTING STAGES NOW. WE'RE JUST ABOUT READY TO ROLL THAT ONE, THE CUSTOM BUILT ONE WE HAVE.

AND THEN I WOULD ALSO REMIND YOU THAT THE COMMERCIAL PRODUCT THAT WE WERE WORKING WITH BEFORE, THE INITIAL CONTRACT WE HAD WAS FOR ABOUT HALF A MILLION DOLLARS, BUT IT HAD A LIMITED SCOPE OF WHAT IT WAS GOING TO PROVIDE. BY THE TIME -- TO INCORPORATE NEW PROCESSES THAT HAVE COME NOW SINCE THEN, WE WERE ESTIMATING THAT THAT PRODUCT WAS GOING TO COST US AT LEAST A MILLION DOLLARS, SO JUST TO KEEP THAT IN A CONTEXT.

CHAIRMAN KLEIN: LET ME BE CLEAR. MY UNDERSTANDING IS YOU MONITORED THAT VERY CAREFULLY AND CLOSELY AND CUT THAT OFF AT A VERY LOW COST; IS THAT CORRECT?

DR. ROBSON: ABOUT 250,000 WE PAID OUT IN DEVELOPMENT.

CHAIRMAN KLEIN: YOU CUT IT OFF AT ABOUT 50 PERCENT OF THE ORIGINAL CONTRACT LEVEL.

DR. ROBSON: YES.

CHAIRMAN KLEIN: SO IF WE CAN, ARE THERE OTHER QUESTIONS ON OTHER PORTIONS OF THE BUDGET?

MR. ROTH: I WOULD LIKE TO JUST MAKE ONE COMMENT, THAT I THINK IT'S CRITICAL THAT THE POSITIONS THAT ARE BUDGETED IN THIS BUDGET, WHICH WE WENT THROUGH PREVIOUSLY, THAT WE GET THOSE FILLED AS QUICKLY AS POSSIBLE. AND JUST I WAS ABLE TO HAVE A CONVERSATION TODAY BOTH WITH THE CHAIR AND THE PRESIDENT ABOUT GETTING THE BOND EXPERT POSITION FILLED, AND THERE'S AGREEMENT THAT WE SHOULD AGGRESSIVELY MOVE FORWARD ON THAT. SO I SUPPORT THAT.

I WOULD LIKE TO MAKE A MOTION THAT WE ACCEPT THE BUDGET AS PRESENTED.

DR. HAWGOOD: SECOND.

CHAIRMAN KLEIN: THERE'S A MOTION BY DUANE ROTH, SECOND DR. HAWGOOD. DISCUSSION? PUBLIC DISCUSSION?

DR. TROUNSON: THERE WAS JUST ONE CLARIFICATION. I'M BRINGING THAT UP BECAUSE IT WAS RAISED IN THE SUBCOMMITTEE BY DAVID SERRANO-SEWELL ABOUT TRAVELING EXPENSES IN THE PRESIDENT'S OFFICE. AND IF YOU NEED AN EXPLANATION OF THAT, IT'S PRIMARILY BECAUSE I'VE INCORPORATED THE GENERAL COUNSEL IN THAT PROGRAM. SO HER TRAVEL TO FDA, TO

NIH, AND TO WASHINGTON AND TO SOME OTHER PLACES HAS NOW BEEN INCORPORATED IN THAT BUDGET. BUT IF YOU NEED ANY MORE DETAILS OF THAT, WE'RE HAPPY TO SUPPLY IT. MINE ACTUALLY HASN'T GONE UP AT ALL.

CHAIRMAN KLEIN: I GOT THAT INFORMATION, REPORTED IT TO DAVID SERRANO-SEWELL. HE APPEARED TO BE FINE WITH THAT DATA.

PUBLIC COMMENT? COMMENT ONLINE? SO, MELISSA, WE DON'T HAVE TO HAVE A RECORD VOTE ON THIS. WE CAN DO A VOICE VOTE. SO CALL THE QUESTION. ALL IN FAVOR?

(CHORUS OF AYES.)

DR. FRIEDMAN: AYE.

CHAIRMAN KLEIN: OPPOSED?

(NO RESPONSE.)

MR. HARRISON: MR. CHAIR, WE HAVE A COUPLE OF MEMBERS ON THE TELEPHONE. WE HEARD DR. FRIEDMAN.

CHAIRMAN KLEIN: I'M GOING TO ASK MELISSA TO FOLLOW UP WITH DR. POMEROY AND DR. FRIEDMAN.

MS. KING: DR. FRIEDMAN.

DR. FRIEDMAN: AYE.

MS. KING: DR. POMEROY.

DR. POMEROY: YES.

MS. KING: DR. PULIAFITO.

DR. PULIAFITO: YES.

MS. KING: AND JOAN SAMUELSON.

MS. SAMUELSON: YES.

MR. HARRISON: MR. CHAIR, CAN I REQUEST THAT WE LEAVE THE ROLL OPEN ON THAT ITEM?

CHAIRMAN KLEIN: WE CAN. AND I'M GOING TO ASK THAT WE TAKE A FEW-MINUTE BREAK FOR THE BENEFIT OF THE REPORTER AND ALL OF US WHO HAVE BEEN HARD AT WORK AT THIS.

(A RECESS WAS TAKEN.)

CHAIRMAN KLEIN: WE'RE RECONVENING. DR. ROBSON, WOULD YOU LIKE TO BEGIN YOUR PRESENTATION.

DR. ROBSON: OKAY. THANK YOU, CHAIR. AND THIS PRESENTATION PROBABLY SHOULD HAVE FOLLOWED PAT OLSON'S BECAUSE IT'S A BIT OF A SEQUENCE, BUT HERS WAS RECENT ENOUGH THAT I'M SURE YOU CAN REMEMBER WHAT THE KINDS OF ISSUES SHE WAS COVERING. I WAS ASKED ABOUT --

CHAIRMAN KLEIN: DR. ROBSON, JUST A SECOND. DR. OLSON, I THINK THAT WE'RE FINE. WE KNOW YOU HAVE TO LEAVE FOR A PLANE, SO AT ANY TIME THAT YOU FEEL YOU NEED TO LEAVE.

DR. ROBSON.

DR. ROBSON: SO A FEW MONTHS AGO ALAN ASKED ME TO TRY TO DO SOME PROJECTIONS TO SEE HOW LONG OUR $3 BILLION WOULD LAST BASED ON THE CURRENT

RFA SCHEDULES THAT WERE BEING DEVELOPED AND HOW WE THOUGHT THINGS WERE GOING TO GO OVER THE NEXT FEW YEARS. THERE WERE A COUPLE OF REASONS TO DO THAT. ONE IS WE HAVE THAT EXTERNAL REVIEW COMING, SCIENTIFIC REVIEW COMING IN THE FALL, AND WE THOUGHT THIS KIND OF INFORMATION WOULD BE USEFUL FOR THAT PANEL TO HAVE. AND THE OTHER IS THAT WE FEEL THAT CIRM IS SORT OF AT A TRANSITION NOW. WE'RE KIND OF MOVING OUT OF THE START-UP PHASE INTO A MORE MATURE PHASE.

WE'VE FUNDED NOW PROGRAMS REALLY ALMOST ALL THE WAY ALONG THE PIPELINE THAT'S PART OF OUR MISSION. WE'VE GOT MANY OF OUR -- MOST OF OUR PROCESSES ARE IN PLACE AND HAVE BEEN TRIED OUT AT LEAST ONCE. AND SO WE SHOULD TAKE A LOOK AND SEE, TRY TO BENCHMARK THE TWO BILLION THAT WE HAVE LEFT AGAINST THE MISSION, AGAINST THE GOALS THAT WERE LAID OUT IN THE STRATEGIC PLAN IN 2006 AND JUST SEE HOW WE WERE DOING.

SO YOU HAVE A DOCUMENT THAT GOES THROUGH THIS IN YOUR BINDERS. I'M GOING TO PRESENT THE SAME MATERIAL. I'M GOING TO DO IT IN A BIT OF A DIFFERENT WAY, BUT IT'S ESSENTIALLY THE SAME ISSUES.

SO WHAT I'VE DONE IS OR WHAT WE DID IN THIS PROCESS WAS TAKE WHAT WE THOUGHT WAS THE MOST

DIFFICULT, MOST AMBITIOUS OF THE TEN-YEAR GOALS. I SHOULD JUST BACK UP A SECOND AND SAY IF WE DID AN ANALYSIS OF OUR FIVE-YEAR GOALS, WHICH IS ABOUT WHERE WE SHOULD BE NOW, WHERE WE SHOULD BE APPROACHING IN THE NEXT YEAR, WE'RE DOING VERY WELL. WE'RE REALLY ON TRACK TO ACCOMPLISH ALL OR MOST OF THEM WITHIN THE TIMEFRAME. SOME OF THEM WE'VE ALREADY ACCOMPLISHED.

SO THE FIVE-YEAR GOALS WE'RE DOING QUITE WELL. SO IT'S JUST THESE TEN-YEAR GOALS, AND I PICKED, LIKE I SAY, WHAT I THINK IS THE MOST AMBITIOUS, MOST DIFFICULT, AND THAT IS THE FIRST OF THE GOALS, WHICH SAYS THAT CIRM GRANTEES WILL HAVE CLINICAL PROOF OF PRINCIPAL THAT TRANSPLANTED CELLS DERIVED FROM PLURIPOTENT STEM CELLS CAN BE USED TO RESTORE FUNCTION IN AT LEAST ONE DISEASE. THAT MEANS WE WILL HAVE GOTTEN ONE OF OUR PROGRAMS THROUGH PHASE II CLINICAL TRIAL AND IT WILL SHOW SAFETY AND EFFICACY. SO CAN WE DO THAT.

LET'S LOOK TO SEE WHERE WE ARE NOW. THIS IS A SLIDE THAT'S VERY MUCH LIKE ONE THAT PAT SHOWED YOU EARLIER ONLY I'VE USED CIRCLES AND SQUARES INSTEAD OF TRIANGLES, BUT THE ONES TO FOCUS ON ARE THE PLURIPOTENT CELL PROJECTS THAT ARE IN THE DISEASE TEAMS. AND THOSE ARE THE ONES INDICATED BY

THE LARGE BLACK CIRCLES. SO WE'VE GOT FIVE PROJECTS THAT ARE HEADING TOWARDS THAT TARGET, THAT FIRST LONG-TERM GOAL. SO IS THIS ENOUGH?

WELL, IT MAY BE ENOUGH IF ONE OF THEM MAKES IT. BUT IF WE LOOK AT THE DRUG DEVELOPMENT HISTORY, THE WHOLE INDUSTRY, AND WE LOOK AT THE STATISTICS OF WHAT IT TAKES TO GET TO PHASE II OR TO GET A PRODUCT TO PATIENTS, WHAT YOU SEE IS THAT IF YOU GET, SAY, TEN INTO PRECLINICAL DEVELOPMENT, WHICH IS THE START OF OUR DISEASE TEAM I PROGRAM, ABOUT FIVE OF THOSE WILL GET TO AN IND. FOR EVERY FIVE THAT GET TO AN IND, ONLY ABOUT 20 PERCENT OR ONE WILL GET THROUGH PHASE II AND SHOW THAT IT'S SAFE AND EFFICACIOUS.

NOW, IT TURNS OUT THAT IF YOU WANT TO ACTUALLY GET TO MARKET -- NOW, THIS IS NOT PART OF OUR MISSION -- BUT IF YOU WANT TO GET A PRODUCT TO THE PATIENTS THROUGH PHASE III, ONLY ABOUT HALF OF THOSE THAT MAKE IT THROUGH PHASE II ACTUALLY MAKE IT TO PATIENTS AFTER PHASE III. SO IF YOU WANT TO THINK THAT IT WOULD BE NICE IF WE HAD SOME CONFIDENCE THAT WE GET COULD GET ONE THAT WAS ACTUALLY GOING TO MAKE IT INTO THE CLINIC, WE WOULD PROBABLY NEED 20 COMING INTO THE DEVELOPMENT PHASE AND TEN IND'S IN ORDER GET TWO THROUGH PHASE II. SO

THAT'S JUST A LITTLE BIT OF BACKGROUND. HOW MANY DO WE NEED? WE WOULD SAY, BASED ON THOSE STATISTICS, WE NEED TO GET FIVE TO AN IND. WE WOULD THINK OF THE CURRENT ONES WE HAVE, ABOUT TWO OF THOSE WILL MAKE IT. THAT'S OUR GUESS IN THE FOUR-YEAR PERIOD. THIS IS AN ESTIMATE.

CHAIRMAN KLEIN: DR. ROBSON, YOU'RE SPECIFICALLY ADDRESSING CELLULAR THERAPIES BECAUSE, OF COURSE --

DR. ROBSON: CELLULAR THERAPIES. THAT'S THE GOAL IS A CELLULAR THERAPY WITH PLURIPOTENT STEM CELL.

CHAIRMAN KLEIN: BECAUSE WE ALREADY HAVE A SMALL MOLECULE THERAPY FOR POLYCYTHEMIA VERA WHICH IS FINISHED THE PHASE I AND GOING INTO PHASE II.

DR. ROBSON: THAT ONE WOULD FIT INTO OUR SECOND TEN-YEAR GOAL.

MS. SAMUELSON: IS THERE ANY CELLULAR THERAPY THAT IS ON COURSE LIKE THAT ANYWHERE IN THE WORLD?

DR. ROBSON: WELL, THERE ARE SOME THAT HAVE RECEIVED -- BEEN THROUGH THE IND APPROVAL. THE ONE THAT'S THE BEST KNOWN ONE, I THINK THERE ARE TWO NOW AND ONE IS ON HOLD, CLINICAL HOLD, THAT'S PLURIPOTENT STEM CELL.

CHAIRMAN KLEIN: I THINK DR. OLSON'S COMMENT IS THAT THERE ARE ALREADY CELLULAR THERAPIES OUTSIDE OF PLURIPOTENT.

DR. ROBSON: BUT I'M FOCUSING RIGHT NOW ON PLURIPOTENT STEM CELL THERAPIES.

SO HOW LONG WILL IT TAKE? WELL, PAT OLSON TALKED ABOUT THIS EARLIER. OUR ESTIMATE IS IT'S GOING TO TAKE THROUGH THAT PRECLINICAL RESEARCH AND DEVELOPMENT PHASE TO AN IND ABOUT FOUR YEARS. AND FROM THERE TO PHASE II, THE HISTORY IN THE INDUSTRY IS THAT THAT WOULD TAKE US ABOUT FIVE YEARS. IT'S A LITTLE HARD TO PREDICT FOR US BECAUSE THIS STEM CELL THERAPY, THE REGULATORY TRACK IS SO NEW, WE DON'T REALLY KNOW WHAT'S GOING TO BE REQUIRED. AND SHE TALKED ABOUT THAT AT SOME LENGTH. I WON'T GO INTO THAT AGAIN.

AND THEN FINALLY, HOW EXPENSIVE IT WILL BE. BASED ON OUR ESTIMATES SO FAR AND THE PROGRAMS THAT WE'VE BEEN PUTTING TOGETHER, WE THINK THAT THIS PRECLINICAL PART UP TO THE IND WILL TAKE ABOUT $20 MILLION. AND THAT TO GET THROUGH PHASE II WILL BE ABOUT ANOTHER $25 MILLION. MAY COST MORE THAN 25 MILLION, BUT WE'RE SORT OF ENVISIONING THAT AS OUR CONTRIBUTION IN ORDER TO PUSH THESE PROJECTS THROUGH TO PHASE II. ADDITIONAL FUNDS WOULD HAVE TO COME

THROUGH MATCHING PARTNERS OR SOMETHING.

SO LET'S JUST THEN LOOK AT THE PROGRAMS WE HAVE COMING DOWN THE LINE AND SEE ARE WE GOING TO GET THERE AND DO WE HAVE THE FUNDS? HOW MANY OF THESE PROGRAMS DO WE NEED TO PUSH FORWARD? SO THE TOP LINE SHOWED, THIS IS NOW SHOWN AGAINST A CALENDAR, SO THE DISEASE TEAM I PROJECT, WE HAVE FIVE, AS INDICATED ON THE LEFT, PLURIPOTENT STEM CELL THERAPY PROJECTS IN THE WORKS. IF TWO OF THOSE MAKE IT TO AN IND IN ABOUT FOUR YEARS, AN ADDITIONAL FIVE YEARS, IT WOULD TAKE TILL ABOUT 2020 FOR THOSE TO BE THROUGH PHASE II.

WE'RE PLANNING A CLINICAL DEVELOPMENT PROGRAM IN THE NEXT YEAR, AND THAT COULD FUND UP TO TWO PROJECTS THAT ALREADY HAVE AN IND. THAT REQUIREMENT OF THAT PROGRAM WOULD BE THAT THEY HAVE AN IND AT THE TIME THE FUNDING STARTS. SO THAT ONE COULD MAKE IT BY, IF IT STARTS IN 2011, COULD MAKE IT BY 2016 BASED ON THE STATISTICS AND PROBABILITIES AND OUR EXPECTATIONS. AND SO IN ORDER TO GET FIVE OR TEN PROGRAMS THROUGH AN IND, WE'RE GOING TO NEED ADDITIONAL CANDIDATES COMING FROM DISEASE TEAMS II OR DISEASE TEAMS III PROGRAMS WHICH WOULD BE IN 2011 AND/OR 2012. AND THOSE PROGRAMS WOULD THEN, AS YOU CAN SEE, EXTEND OUT ADDITIONAL YEARS BEFORE THEY

WOULD BE THROUGH PHASE II.

SO THE QUESTION IS ARE THE PROGRAMS THAT WE'RE DESIGNING NOW, WILL THEY ENABLE US TO DO THIS. SO, AS YOU KNOW, THE SCIENCE OFFICE HAS BEEN WORKING TOWARD BUILDING A REGULAR REPEATING CORE GROUP OF RFA'S THAT COVER THE FULL SPECTRUM OF THE TRACK -- THE PIPELINE THAT IS THE CIRM MISSION. THAT INCLUDES BASIC BIOLOGY, EARLY TRANSLATION, AND DISEASE TEAMS SO FAR.

AND THOSE, AS YOU CAN SEE ON THIS RFA SCHEDULE, REPEAT EVERY 12 MONTHS. SO THIS SCHEDULE THAT I'M SHOWING YOU INCLUDES REGULARLY REPEATING RFA'S, THOSE THREE CORE ONES, BUT WE ALSO KNOW THAT THINGS COME UP EVERY YEAR THAT WE WANT TO FUND, THAT YOU WANT TO FUND, PROGRAMS THAT NEED TO BE PUSHED FORWARD OR THINGS THAT HAPPEN IN THE SCIENTIFIC FIELD THAT REQUIRE THAT WE RESPOND TO THOSE. SO WE'VE ALSO INCLUDED IN HERE A TO-BE-DETERMINED OR VARIABLE RFA THAT WOULD REPEAT EVERY YEAR AT ABOUT $30 MILLION.

AND THEN AT THE BOTTOM I SHOW ONE-TIME PROGRAMS THAT HAVE EITHER BEEN ALREADY THROUGH CONCEPT APPROVAL FROM YOU, TOOLS AND TECHNOLOGY AND CLINICAL DEVELOPMENT, AN IPS CELL BANKING RFA THAT WE'VE BEEN DISCUSSING INTERNALLY, AND THEN ALSO

TRAINING AND BRIDGES WHICH WE ANTICIPATE THAT WILL REPEAT BECAUSE THEY'VE BEEN VERY HIGHLY SUCCESSFUL PROGRAMS.

SO IF WE TAKE THAT PLAN AND WE PROJECT FORWARD, WHAT DO WE SEE THEN? WELL, WHAT WE WILL SEE, AS IS INDICATED AT THE BOTTOM, IS THAT THE FINAL RFA THAT WOULD GO OUT WOULD BE DISEASE TEAMS V, AND ICOC DECISION ON THAT WOULD BE MADE IN AUGUST OF 2014 BASED ON THIS SCHEDULE. SO IF WE LOOK AT THIS CHART, WHICH IS LIKE WHAT I'VE BEEN SHOWING YOU FOR FINANCES, ALTHOUGH THIS IS NOW LOOKING AT THE FULL $3 BILLION, SO IN THIS CASE EACH COLUMN IS A FISCAL YEAR. THE RED SHOWS THE AMOUNT WE'RE SPENDING ON GRANTS, THE BLUE IS OPERATIONS, AND THE YELLOW IS OTHER EXPENDITURES. A LOT OF THAT HAS TO DO WITH BOND FUNDS, AND THE FIRST COLUMN ON THE LEFT IS ACTUAL EXPENDITURES. THAT'S WHAT WE'VE SPENT SO FAR UP UNTIL THROUGH DECEMBER OF LAST YEAR. AND THEN THE OTHER NUMBERS ARE PROJECTED.

SO THAT WOULD INDICATE, THEN, THAT OUR FINAL RFA WOULD GO OUT IN 2014 OR 15. IT'S BEEN TAKING ABOUT UP TO SIX MONTHS FOR THE DISEASE TEAM PROGRAMS TO ACTUALLY GET THROUGH THE PREFUNDING APPLICATION REVIEW PROCESS. SO IF YOU APPROVE IT IN AUGUST, THOSE PROJECTS WOULD START LATE IN THE YEAR

OR EARLY IN THE FOLLOWING YEAR.

AND THEN IF THEY WERE FOUR-YEAR PROGRAMS, THEN OUR MONEY WOULD BE FULLY EXPENDED BY FISCAL YEAR -- ACTUALLY JUST IN 2019, EARLY IN THAT FISCAL YEAR 2018-19. SO THAT'S WITH THE CURRENT PROGRAM.

SO IF I TAKE THAT INFORMATION AND PLOT IT ON THIS TIME SCALE THAT I SHOWED YOU EARLIER, IT'S INDICATED BY THE RED LINE IS WHEN THAT LAST RFA WOULD BE ISSUED AND DECISION WOULD BE MADE BY THE ICOC. SO AS YOU CAN SEE ON THE TIMELINE, THAT WOULD MEAN THAT FOR DISEASE TEAM I PROJECTS, IF SOME OF THOSE GET THROUGH AN IND, THERE WOULDN'T BE ANY MONEY LEFT. OUR MONEY WOULD HAVE ALREADY BEEN COMMITTED BY THE TIME THEY GET THROUGH THE IND. WE WOULDN'T BE ABLE TO SUPPORT ANY CLINICAL TRIAL WORK FOR THAT PROJECT. OF THESE FOUR THAT ARE SHOWN, THE ONLY ONE THAT WE WOULD BE ABLE TO PROVIDE FINANCIAL SUPPORT FOR WOULD BE THIS CLINICAL DEVELOPMENT ONE, THE SECOND ONE IN THAT ROW THERE.

IF, HOWEVER, WE DEVELOPED AN RFA PROGRAM THAT SHIFTED THE FINAL FUNDING OUT TO WHERE THAT DASHED LINE IS, OUT TO 2017, THEN WE WOULD HAVE ENOUGH MONEY TO PICK UP -- WE WOULD BE ABLE TO PICK UP DISEASE TEAM I PROJECTS THAT MADE IT THROUGH THE IND APPROVAL, DISEASE TEAMS II, AND DISEASE TEAM III

PROJECTS IN ADDITION TO THAT CLINICAL DEVELOPMENT ONE.

SO HOW DO WE DO THAT? HOW CAN WE PUSH THE LINE OUT? SO I'M JUST PRESENTING THIS. THIS IS JUST AN EXAMPLE. THIS IS FOR YOUR -- JUST TO HELP YOU MAKE YOUR DECISIONS IN THE FUTURE AND HOPEFULLY TO INITIATE SOME DISCUSSIONS, SOME STRATEGIC DISCUSSION.

SO WHAT I'VE DONE IS TAKEN THE SAME RFA SCHEDULE THAT I SHOWED YOU BEFORE. I'VE ADDED SOME WHAT WE CALL CLINICAL TRIALS FOLLOW-ON. THESE WOULD BE RFA'S THAT WERE DESIGNED TO PICK UP THOSE DISEASE TEAM PROJECTS THAT GOT TO THE IND PHASE, TO PICK THEM UP AND CARRY THEM THROUGH TO PHASE II. THOSE ARE INDICATED BY THE GREEN LINE. SO THOSE WOULD BE NEW EXPENDITURES.

AND THEN IN ORDER TO ALLOW FOR NEW EXPENDITURES, WE HAD TO REDUCE SOME EXPENDITURES. THE BIG ONE THAT IS REDUCED HERE IS DISEASE TEAMS. WE'VE BEEN BUDGETING THAT AT 230 MILLION BASED ON WHAT YOU DID LAST YEAR IN THE PREVIOUS EXAMPLE THAT I SHOWED YOU. IN THIS EXAMPLE I'VE LEFT IT AT 200 MILLION FOR THE NEXT ROUND SO WE COULD KIND OF GET ANOTHER BOLUS OF PROJECTS GOING. AFTER THAT, IT WOULD BE REDUCED TO $120 MILLION PER ROUND, BUT

THERE WOULD BE AN ADDITIONAL ROUND. SO THERE WOULD BE SIX ROUNDS OF DISEASE TEAMS UNDER THIS MODEL INSTEAD OF FIVE.

AND THEN WE WOULD REDUCE THE EARLY TRANSLATION A LITTLE BIT AND BASIC BIOLOGY A LITTLE BIT, ABOUT $5 MILLION FOR BASIC BIOLOGY, AND I THINK IT WAS 15 MILLION FOR THE EARLY TRANSLATION TO ALLOW IT -- TO GAIN THOSE EXTRA DOLLARS THAT WE WOULD NEED FOR THOSE CLINICAL TRIALS.

NOW, IF WE DID THAT, IF WE ADOPTED A SCHEME LIKE THIS, A PLAN, AN RFA PLAN, THE LAST RFA THAT WOULD GO OUT WOULD BE THAT CLINICAL TRIAL III. AUGUST OF 2017 WOULD BE WHEN YOU WOULD MAKE A DECISION ABOUT THAT. AND IF THAT WAS A FIVE-YEAR PROGRAM, IT WOULD TERMINATE IN 2022, AND WE WOULD HAVE A SCALE-DOWN OF OUR MONEY THAT LOOKS LIKE THIS. SO THE $3 BILLION IS SHOWN IN THE GREEN, UPPER LEFT IT WOULD DROP DOWN TO ZERO IN FISCAL YEAR 2022 AND 2023.

SO THAT'S THE PROGRAM THAT WE HAVE OUTLINED HERE. IT'S AN ALTERNATIVE TO THE PATH WE'RE CURRENTLY HEADING ON. OBVIOUSLY THIS IS NOT AN ACTION ITEM. THIS IS -- AGAIN, THIS IS TO HELP YOU MAKE DECISIONS IN THE FUTURE AND HOPEFULLY TO INITIATE SOME DISCUSSION.

I SHOULD MENTION THAT I'VE ONLY TALKED ABOUT ONE OF THOSE STRATEGIC GOALS, AND THERE ARE TEN OF THEM FOR THE TEN-YEAR GOALS THAT ARE IN THE STRATEGIC PLAN. THE SECOND ONE IS ONE BOB ALLUDED TO A MINUTE AGO, WHICH JUST SAYS CIRM GRANTEES WILL HAVE THERAPIES BASED ON STEM CELL RESEARCH IN PHASE I OR PHASE II CLINICAL TRIALS FOR TWO TO FOUR ADDITIONAL DISEASES. WE THINK THAT SHOULD BE PRETTY EASY FOR US TO DO. IT'S A FAIRLY BROAD CATEGORIZATION. IT INCLUDES ALL KINDS OF RESEARCH, SMALL MOLECULES, AS LONG AS IT INVOLVES STEM CELLS IN THE RESEARCH PROGRAM. IT COULD, HOWEVER, PRODUCE -- THERE COULD BE A LARGE NUMBER OF THESE THAT WOULD COME TO US FOR CLINICAL TRIAL SUPPORT.

NOW, THAT'S A DECISION THAT'S GOING TO HAVE TO BE MADE. DO YOU WANT TO BE ABLE TO SUPPORT THOSE WITH $25 MILLION JUST LIKE WE TALKED ABOUT SUPPORTING THE PLURIPOTENT STEM CELL PROGRAMS? SO IF THERE'S JUST A COUPLE OF THEM THAT YOU WANT TO SUPPORT, THAT'S PROBABLY NOT TOO DIFFICULT TO PULL OUT OF THAT PLAN, PULL THE MONEY OF THAT. IF YOU WANT TO DO 10 OR 20 OF THEM, THAT COULD GET TO BE A LOT OF MONEY.

THE OTHER SEVEN, THERE ARE EIGHT THAT ARE IN THERE, MANY OF THOSE WILL RELY, AND I HAVE TO

EMPHASIZE THIS BECAUSE PAT AND I REALLY HAVE BEEN TALKING ABOUT GETTING THINGS TO THE CLINIC, THOSE OTHER EIGHT RELY VERY HEAVILY ON BASIC RESEARCH. SO WE FEEL THAT IT'S ESSENTIAL THAT WE KEEP PUSHING THE BASIC RESEARCH, FUNDING THE BASIC RESEARCH, AND KEEP THOSE FINDINGS COMING FORWARD.

SO I THINK THAT I WILL STOP THERE AND BE HAPPY TO FIELD ANY QUESTIONS.

CHAIRMAN KLEIN: SO A FUNDAMENTAL QUESTION, DR. ROBSON, IS WHY IS IT THAT YOU DON'T HAVE A SCENARIO THAT ASSUMES ANY MATCHING FUNDS? IF WE LOOK AT OUR DISEASE TEAM APPROVALS TO DATE, I THINK THERE'S A VALIDATION EFFECT OF OUR APPROVAL PER SE. AND WE CAN SEE PFIZER IS PARTICIPATING IN THE JOINT VENTURE ON ADVANCED MACULAR DEGENERATION.

DR. ROBSON: OUR ASSUMPTION IS THAT THE MATCHING FUNDS WOULD COME IN DURING THE CLINICAL TRIAL PHASE AND THAT THE 25 MILLION WOULD PROBABLY BE WHAT WOULD BE REQUIRED OF US. THAT'S THE ASSUMPTION WE'VE MADE.

CHAIRMAN KLEIN: RIGHT. SO --

DR. ROBSON: MATCHING FUNDS WOULD COME FROM OTHER SOURCES.

CHAIRMAN KLEIN: I THINK WE CAN SEE SOME EVIDENCE THAT THERE ARE SOME FUNDS AVAILABLE FROM

OTHER SOURCES THAT MIGHT REDUCE OUR CONTRIBUTION ON AN AVERAGE BASIS BELOW 25, ALTHOUGH CERTAINLY 25 MIGHT BE NECESSARY IN OTHER CASES. I THINK, DUANE, YOU HAVE A QUESTION. DR. PRIETO.

DR. PRIETO: I JUST WONDER IF YOU'VE PROJECTED HOW PROCEEDS FROM OUR CIRM LOAN PROGRAM WOULD AFFECT THESE ASSUMPTIONS.

DR. ROBSON: THE LOAN PROGRAM -- WELL, THE LOAN PROGRAM COULD COME INTO PLAY HERE WITH THIS SORT OF SPREAD-OUT PLAN. BUT FOR THE CURRENT PLAN, WHAT I CALLED CURRENT PLAN BASED ON THE FIRST ASSUMPTION, THE LOAN PROGRAM WON'T BE OF MUCH BENEFIT BECAUSE THE FIRST -- WE ONLY HAVE ONE LOAN OUT. THAT LOAN IS NOT DUE TO BE REPAID FOR TEN YEARS. SO WE WILL BE OUT OF MONEY AND WE WOULD BE CLOSED DOWN ACTUALLY BY THEN UNLESS WE GOT NEW MONEY FROM ELSEWHERE.

ONE THING I DIDN'T MENTION THAT I PROBABLY SHOULD HAVE IS THAT WE MAY GET SOME MONEY BACK FROM SOME OF THESE PROGRAMS. SOME OF THESE PROGRAMS MAY NOT MEET MILESTONES. THAT'S VERY HARD FOR US TO ESTIMATE HOW MUCH THAT MIGHT BE. CERTAINLY ALL OF THE DISEASE TEAM, ALL THE MILESTONE-BASED PROGRAMS ARE GOING TO GET AT LEAST ONE YEAR OF FUNDING BECAUSE THEY HAVE TO GET OUT THERE AND SEE IF THEY

CAN MAKE THE FIRST MILESTONE. WE DON'T REALLY KNOW HOW MUCH WILL COME BACK.

SO WE DID MAKE -- WE MADE SORT OF A NAPKIN ESTIMATE. LET'S SAY THAT EVERYTHING WE PUT OUT FROM THIS POINT FORWARD, $2 BILLION OR ABOUT 1.9 BILLION, IF 10 PERCENT OF THAT COMES BACK, WE WOULD HAVE ANOTHER $190 MILLION. SO THAT WOULD BE ENOUGH PERHAPS TO FUND SOME OF THOSE CANDIDATES IN THAT SECOND GOAL, SOME OF THESE OTHER STEM CELL PROGRAMS THROUGH CLINICAL TRIALS, OR IT COULD INCREASE THE SIZE OF A FUTURE DISEASE TEAM PROGRAM OR SOMETHING, BUT IT'S VERY HARD FOR US TO ESTIMATE. WE ACTUALLY BUDGET BASED ON THE ASSUMPTION THAT THESE PROGRAMS ARE GOING TO SUCCEED.

DR. HAWGOOD: JOHN, I THINK THIS IS A GREAT SCAFFOLD TO HELP US THINK STRATEGICALLY IN TERMS OF THE FLOWS. MY QUESTION IS KIND OF A TECHNICAL ONE AROUND THE LANGUAGE IN THE PROPOSITION AND OUR ABILITY TO SPREAD IT BEYOND THE TEN-YEAR WINDOW, PARTICULARLY IF WE'RE NOT DEALING WITH LOAN MONEY OR MATCH MONEY, BUT DEALING WITH THE ACTUAL STATE BOND MONEY.

DR. ROBSON: THE PROPOSITION, THE BILL THAT -- THE AMENDMENT CREATED CIRM. THERE'S NO END DATE FOR CIRM IN THE CONSTITUTION. WHAT THERE ARE

LIMITS ON IS HOW MUCH MONEY WE CAN RAISE IN A YEAR AND HOW MUCH WE CAN EXPEND IN A YEAR. THERE'S NOTHING THAT PREVENTS US FROM STRETCHING OUT LEGALLY.

DR. HAWGOOD: THANK YOU.

CHAIRMAN KLEIN: DUANE AND THEN JOAN.

MR. ROTH: I AGREE THIS IS VERY USEFUL DATA AND ANALYSIS. BUT THE SUGGESTION I WOULD HAVE, THERE'S REALLY A COUPLE OF SUGGESTIONS HERE, BUT FIRST, THE REVIEW IS GOING TO TAKE PLACE THIS COMING --

DR. ROBSON: OCTOBER.

MR. ROTH: -- QUARTER, SEPTEMBER, OCTOBER. TAKE THAT IN ADDITION TO THIS DATA, AND ALSO A FIRM BELIEF THAT I HAVE IS THAT THE GOALS THAT ARE ORIGINALLY SET FIVE, SIX YEARS AGO NEED TO CONSTANTLY BE REVIEWED IN LIGHT OF NEW DATA, NEW SCIENCE, NEW INFORMATION AND UPDATED. STAFF KNOWS, AND ALAN AND I HAVE HAD THIS CONVERSATION, I NEVER BELIEVED THAT WE WERE LOCKED IN TO THAT SET OF GOALS. THAT WAS THE ORIGINAL SET OF GOALS, BUT I THINK WE'RE COMING UP ON FIVE YEARS, AND WE OUGHT TO REALLY THINK ABOUT IT IN LIGHT OF THINGS THAT BOB JUST SAID. IF THE SCIENCE IS MOVING FORWARD AND WE'RE DOING THINGS, LET'S RESET THE GOALS. MAYBE

THEY'RE STILL CORRECT AND MAYBE WE SHOULD STAY WITH THOSE, BUT I DIDN'T AND DO NOT BELIEVE WE SHOULD LOCK IN.

I THINK IF WE TOOK THESE TWO SETS OF DATA, THE REVIEW, I WOULD HOPE IN THE REVIEW THAT WE COVER THINGS INCLUDING ARE WE BEING EFFICIENT IN THE WAY WE'RE PUTTING GRANTS OUT AND MONITORING AND SO ON, AND HOW CAN WE USE THE LIMITED RESOURCES THAT WE DO HAVE IN A MOST PRODUCTIVE WAY. BUT TAKING ALL THAT INTO CONSIDERATION, THEN I THINK IT'S TIME FOR THIS BOARD TO DO WHAT WE DID ORIGINALLY AND COME TOGETHER AND SPEND SOME TIME TALKING THROUGH THE NEXT FIVE YEARS, AND THAT WOULD BE MY RECOMMENDATION.

DR. ROBSON: I THINK THAT IF YOU LOOK AT THE STRATEGIC PLAN, IT OUTLINES THAT THIS EXTERNAL SCIENTIFIC REVIEW SHOULD BE DONE THIS YEAR. AND PART OF THAT IS TO HELP EVALUATE THE STRATEGIC GOALS THAT WERE SET IN 2006.

MS. SAMUELSON: THANK YOU FOR THIS. THIS HAS BEEN, I THINK, VERY HELPFUL AND INTERESTING BECAUSE IT IDENTIFIED, I THINK, OTHER CHALLENGES THAT WE HAVE ASIDE FROM FINANCIAL THAT WE NEED TO GET GOING ON. THINGS THAT DUANE WAS TALKING ABOUT WE NEED TO ADDRESS AS SOON AS WE CAN IN ORDER TO WORK AS EFFICIENTLY AND EFFECTIVELY AS WE CAN.

I THINK IF WE ARE DOING THAT, IF WE'RE USING WHATEVER MOST NOVEL, MOST EFFICIENT EFFORTS POSSIBLE, MONEY IS NOT GOING TO BE THE ISSUE. WE'LL HAVE AS MUCH MONEY AS WE COULD WANT BECAUSE WE'LL FIND COLLABORATIONS INTERNATIONALLY. SURELY THERE ARE OTHER RESEARCH TEAMS WHO ARE CONFRONTING THE SAME ISSUES, THAT ARE FACING SOME OF THE SAME OBSTACLES AT THE SAME TIME, AND SO WE WOULD HAVE RETURNS ON THAT FINANCIALLY.

IF WE SET OUR CHAIRMAN LOOSE TO GET MATCHING FUNDS TO CONTINUE WORKING AS FAST ON OUR MISSION AS POSSIBLE, I'M SURE HE WOULD BE SUCCESSFUL. NOT ONLY THAT, I THINK IF IT WERE APPARENT THAT WE WERE THE MOST EFFECTIVE ON GETTING THE TRAIN TOWARD CURES TO THE STATION FASTER THAN ANYONE ELSE, WE'LL HAVE PEOPLE FROM ALL OVER THE WORLD BEGGING US TO TAKE THEIR MONEY BECAUSE THAT'S THE REASON IT PASSED WITH SUCH A MANDATE AND IT WOULD HAPPEN AGAIN.

DR. ROBSON: MY ONLY CAUTION ON THAT IS THAT, DESPITE THE SPEED IN WHICH STEM CELL SCIENCE IS MOVING, IT'S STILL A VERY NEW RESEARCH FIELD. AND A LOT OF THINGS ARE GOING TO CHANGE. IF YOU GO BACK JUST FOUR YEARS, YOU KNOW, IPS CELLS CAME ALONG. IT COMPLETELY CHANGED THE PARADIGM. THIS

YEAR WE'RE HEARING ABOUT DIRECT DIFFERENTIATION. COULD BE ANOTHER COMPLETE PARADIGM SHIFT. SO IF WE MOVE OUR PROGRAMS TOO FAST, ONE OF THE RISKS IN DOING THAT IS THAT IF THE TECHNOLOGY DEVELOPS, AND IT'S DEVELOPING VERY QUICKLY, WE WON'T BE IN A POSITION TO TAKE ADVANTAGE OF NEW TECHNOLOGIES THAT COME.

THE ONE SCENARIO I SHOWED THERE IS FOUR YEARS FROM NOW IS THE LAST GRANT.

CHAIRMAN KLEIN: JOHN.

MS. SAMUELSON: THANK YOU FOR ADDING THAT. NO ONE KNOWS THAT BETTER THAN I HONESTLY. PARKINSON'S RESEARCHERS WHO ARE BRILLIANT HAVE CURED LOTS OF MICE AND SOME PRIMATES. AND THEY WERE REGARDED FROM TWENTY YEARS AGO AS THE DISEASE THAT WOULD BE, QUOTE, UNQUOTE, CURED FIRST FROM CELLULAR TECHNOLOGY. I THINK MAYBE ALL OF THOSE GOALS ARE AMBITIOUS IN THE SENSE THAT MAYBE THEY DON'T ANTICIPATE AS MANY HURDLES AS THEY'RE ACTUALLY GOING TO HAVE, BUT I THINK IT'S NOT ABOUT WORKING FAST. IT'S ABOUT WORKING WITH A SENSE OF URGENCY EVERY DAY THAT THEN INFORMS VERY CAREFUL, VERY EFFICIENT WAYS OF TACKLING BIG PROBLEMS.

CHAIRMAN KLEIN: I THINK IT'S VERY IMPORTANT THAT WE NOT CONFUSE RESEARCH THAT MAY

CHANGE CELL TYPES WITH PROOF OF CONCEPT. IF WE CAN GET THROUGH PHASE II A OR II B WITH PROOF OF CONCEPT, EVEN THOUGH THEN THERE'S A PARADIGM SHIFT IN THE TYPE OF CELL YOU ARE GOING TO USE FOR THE BEST DELIVERY OF THAT THERAPY THAT WENT THROUGH PROOF OF CONCEPT, THE PUBLIC IS GOING TO UNDERSTAND THE CONTRIBUTION TO KNOWLEDGE GENERATED BY GETTING TO PROOF OF CONCEPT. AND IF WE HAVE A BROADER PORTFOLIO EARLY, WE HAVE A BETTER CHANCE, BASED ON HISTORICAL DATA, OF GETTING SOME PROOF OF CONCEPT AND SOME KNOWLEDGE GAINS THAT CONTRIBUTE BROADLY TO THE FIELD AND WILL CONTRIBUTE TO POTENTIALLY GOING BACK TO THE PUBLIC FOUR YEARS FROM NOW FOR ADDITIONAL FUNDS.

BECAUSE AT THE LEVEL OF CONTRIBUTION I SEE THIS AGENCY MAKING ACROSS A BROAD SPECTRUM IN KNOWLEDGE AND THE ADVANCEMENT, I'M ON THE OPTIMISTIC SIDE OF BELIEVING WE'LL HAVE SOME PROOF OF CONCEPT TRIALS UNDER WAY, MAY NOT BE CONCLUDED, BUT UNDER WAY, BUT I THINK, AS JOAN HAS SUGGESTED, THAT WE HAVE A VERY GOOD CHANCE OF THE PUBLIC RECOMMITTING TO THIS MISSION BECAUSE WE WILL HAVE DEMONSTRATED TREMENDOUS PROGRESS.

I THINK IT'S IMPORTANT TO NOTE THAT EVEN IF STUDYING STEM CELL RESEARCH OR DISEASE MODELS

DERIVED FROM STEM CELL RESEARCH LEAD TO SMALL MOLECULE THERAPIES, THAT'S GOING TO BE A CONTRIBUTION THAT THE PUBLIC WILL UNDERSTAND AND WILL REWARD THIS AGENCY FOR ACHIEVING. IT DOESN'T HAVE TO BE NECESSARILY PLURIPOTENT. THE INITIATIVE ACTUALLY USES THE WORDS "PLURIPOTENT OR PROGENITOR STEM CELL RESEARCH" AS THE GOAL TARGET BECAUSE I DIDN'T WANT TO NECESSARILY -- THERE WAS NO IDEOLOGY IN ANTICIPATING THAT IT WOULD ULTIMATELY HAVE TO BE PLURIPOTENT.

MS. SAMUELSON: I WOULD BE THRILLED WITH A CURE THAT DIDN'T INVOLVE PLURIPOTENT STEM CELLS AT ALL.

CHAIRMAN KLEIN: IT COULD BE ANYTHING IN THE SPECTRUM, BUT SMALL MOLECULE REWARDS FROM STUDYING STEM CELL DISEASE MODELS WOULD ALSO BE A TREMENDOUS REWARD THAT THE PUBLIC IS GOING TO RECOGNIZE. SO I WOULD SUGGEST THAT HAVING A BROADER PORTFOLIO EARLIER AND FOCUSING ON MATCHING FUNDS AND FOCUSING ON OTHER COLLABORATIVE SOURCES OF FUNDING BRINGING IN MONEY SO WE CAN MEET THAT TIMETABLE, BUT BUILD OURSELVES SOME ADDITIONAL CAPACITY WOULD GO TO ACCOMPLISHING BOTH OF YOUR GOALS.

DR. TROUNSON: I THINK WHAT WE'RE TRYING TO FOCUS ON IS THE NEED TO BE ABLE TO HAVE FUNDING

AVAILABLE WHEN SOME OF THESE TEAMS GET TO THE IND. AND I DO THINK A LOT OF THEM ARE GOING TO TAKE THREE YEARS, FOUR YEARS TO GET THERE. SO AT THE MOMENT THERE IS NO INVESTMENT MONEY OUT THERE, AND REALLY THE INVESTORS NOR THE PHARMACEUTICAL INDUSTRY IS NOT COMING IN UNTIL PROOF OF CONCEPT, WHICH IS AT THE END OF PHASE II, WHICH IS WHERE WE NEED TO TAKE IT.

IT WOULD BE A REALLY SHAME IF WE LEFT A LOT OF THE CLINICAL TRIALS AT THE IND OR PRE-IND STAGE WITH NO OPPORTUNITY FOR FUNDING. SO I JUST THINK WE OUGHT TO BE REFLECTIVE ON THAT, THAT THE VENTURE CAPITAL AND THE PHARMACEUTICAL INDUSTRY MAY NOT CONNECT BEFORE THE PROOF OF CONCEPT. THEY MAY GET INVOLVED IN A SMALL WAY OR THEY MAY HELP WHEN WE DEMAND THAT THEY DO EQUIVALENT FUNDING IN THE CLINICAL TRIALS. THEY MIGHT DO THAT. BUT I THINK CURRENTLY IT'S REALLY A VERY BARREN AREA.

SO I WANT TO BE SURE THAT WE'RE NOT SORT OF LEFT AT THE GATEWAY, THAT WE DON'T LEAVE OURSELVES AT THE GATEWAY WITHOUT BEING ABLE TO COMPLETE THE TASK AS SET OUT. NOW, I THINK YOU ALSO NEED TO REMEMBER THE REACTION OF THE BOARD TO THE *NEW YORK TIMES* WHEN THEY SAID WE'RE DOING ALL ADULT CELLS, WHICH WE WEREN'T. THERE IS A NOTION HERE THAT THIS WAS SET UP TO SORT OF GET THE TASK

COMPLETED FOR EMBRYONIC STEM CELLS. I THINK THERE'S STILL A STRONG NOTION OUT THERE IN THE COMMUNITY.

SO IF WE'RE GOING TO CHANGE IT, I THINK WE NEED TO BE SURE THAT WE'VE GOT THE COMMUNITY SUPPORT BEHIND US IN THAT RESPECT. SO CHANGING THE GOAL, I THINK WE NEED TO BE CAREFUL AND WE NEED TO GET OUR MESSAGES VERY MUCH IN THE RIGHT VEIN TO DO THAT. AND I THINK IT COULD BE HELPED, AS DUANE SAID, BY THIS REVIEW COMING UP. AND SOME OF THE QUESTIONS IN OUR MINDS WERE ABOUT THESE THINGS, SO WE WANTED TO BE PREPARED FOR THE REVIEWERS TO ASK US, WELL, WHAT DO YOU THINK YOU CAN ACCOMPLISH AND WHAT'S YOUR STRATEGIC NOTION WHEN IT COMES TO BE ABLE TO BE ENABLING BECAUSE THEY'LL BE JUDGING US ON THE CURRENT FIVE- AND TEN-YEAR GOALS. SO WE REALLY WANTED TO BE ABLE TO ANSWER THOSE QUESTIONS.

AND SO THERE WILL BE VIEWS THAT COME FROM THAT EXTERNAL REVIEW IN THIS AREA STRONGLY, BUT I DO THINK IT'S WORTH THE BOARD THINKING ABOUT TAKING THE TIME TO DISCUSS THIS AS A SORT OF LARGE SUBJECT OVER A DAY BECAUSE I THINK I WOULD NORMALLY SEE US MOVING INTO WHAT I THINK IS PHASE II. WE'VE INITIATED THESE PROGRAMS VERY EFFECTIVELY UNDER YOUR CHAIRMANSHIP, BOB, BUT I THINK THERE'S A STRONG FEELING THAT WE'RE MOVING INTO THE DELIVERY OF THOSE

ITEMS WHICH YOU'VE NOW GOT TO DO. STARTED GREAT, BUT NOW WE'VE GOT TO DELIVER IT.

SO I THINK SOME JUDGMENT WILL BE ON US ABOUT THE DELIVERY, SO THE MESSAGE OF WHAT WE'RE DELIVERING IS PRETTY CLEAR AT THE MOMENT. SO WE NEED TO BE STRATEGIC IN ENABLING US TO GET THERE. BUT THAT'S WHY I THINK IT'S WORTH A GOOD DEBATE, GOOD CONVERSATION TO KNOW EXACTLY WHAT WE SHOULD DO. AND MAYBE AFTER THAT EXTERNAL REVIEW WOULD BE THE APPROPRIATE TIME.

CHAIRMAN KLEIN: MR. SHEEHY.

MR. SHEEHY: WELL, I AGREE THIS IS A GOOD DISCUSSION TO HAVE, AND I DO HOPE WE HAVE A MORE FORMAL DELIBERATIVE PROCESS IN WHICH TO DO IT AND THAT WE'RE PRIVY TO A LOT OF SOURCES OF INFORMATION. SO THAT AS THE EXTERNAL REVIEW IS DISCUSSING THIS, WE'RE NOT PRESENTED WITH THE PACKAGE OF DIGESTED RECOMMENDATIONS, BUT WE CAN HEAR THE FULL SPECTRUM OF VIEWS THAT ARE EXPRESSED WITHIN THAT REVIEW SO THAT -- I DON'T WANT THE CONSENSUS VIEW. I WANT TO HEAR THE OUTLIERS AS WELL.

I DO SHARE, THOUGH, BOB AND JOAN'S OPINION THAT, FIRST OF ALL, THE NIH IS GOING TO -- IF WE SHOW UP WITH IND'S, THE NIH SHOULD BE FILLING A LOT OF THIS PHASE I, PHASE II CLINICAL TRIAL SPACE.

PLUS, FOR OUR REALLY SUCCESSFUL PROJECTS, WE WILL BE ROLLING THEM OVER -- I MEAN WE'RE GOING TO HAVE TWO DYNAMICS GOING ON WITH THE DISEASE TEAMS. THE ONES THAT ARE REALLY WILDLY SUCCESSFUL, AS WE PROPOSED, WE'LL ALLOW THEM TO TAKE PART OF THEIR FUNDING AND ROLL INTO PHASE I. WE WILL BE ALREADY SUBSIDIZING THEM WITH PART OF THE MONEY WE ALLOCATED FOR THEIR DISEASE TEAM.

ON THE OTHER HAND, FOR THOSE THAT ARE UNSUCCESSFUL, WE'RE GOING TO BE CUTTING THEM OFF, SO THAT MONEY IS GOING TO COME BACK TO US.

I ALSO NOTE IN OUR PROJECTIONS WE ASSUME FULL FUNDING, BUT WE HAVEN'T GENERALLY BEEN FULLY FUNDING ANY GRANT ROUND. AND BASED EVEN ON THE CONCEPTS THAT WE'VE APPROVED SO FAR, BASED ON EITHER TOOLS OR TECHNOLOGY OR EARLY TRANSLATIONAL II, WE'RE NOT GOING TO FUND THAT IF YOU LOOK AT THE NUMBER OF APPLICATIONS THAT ARE GOING TO BE SUBMITTED RELATIVE TO WHAT HISTORICALLY THE REVIEW GROUP AND OUR BODY WILL APPROVE, WHICH IS NEVER MORE THAN 30 PERCENT OF THOSE. SO I THINK BOTH OF THOSE NUMBERS ARE GOING TO COME IN LOWER.

THE OTHER THING IS JUST TO DO THE NUMBERS GAME, AND WHAT SPACE DO WE REALLY OCCUPY SUCCESSFULLY. NOW, MY UNDERSTANDING IS THIS EARLY

TRANSLATIONAL AND THIS DISEASE TEAM MODALITY, THE SPACE THAT WE HAVE FILLED, AND I THINK DR. OLSON IS GONE, BUT I THOUGHT SHE WAS VERY COMPELLING IN HER DESCRIPTION OF ALL THE TYPES OF ACTIVITIES THAT WE'RE FUNDING IN THIS SPACE THAT MOST PEOPLE DON'T FUND SO COMPLETELY, THIS MAY BE THE UNIQUE SPACE FOR US. I'M NOT SURE THAT PHASE I, PHASE II CLINICAL TRIALS, THAT WE NEED TO BE PUTTING AWAY MONEY NECESSARILY FOR THAT WHEN WE SEEM TO BE DOING -- UNTIL WE KNOW IF WE CAN DO THAT WELL, I THINK WE'RE GOING TO -- WE SEEM TO BE DOING THIS WELL, AND I THINK WHAT WE NEED TO DO IS HAVE AN AMPLE AMOUNT OF IND'S.

AND I PERSONALLY BELIEVE, ESPECIALLY IF WE START CREATING THE RIGHT TYPES OF ECONOMIC ANALYSES, LIKE WHAT HAS REALLY BEEN THE IMPACT OF THE 1.3 BILLION THAT WE HAVE PUT INTO THE ECONOMY? IF YOU TAKE THE 500 MILLION THAT WE'VE ACTUALLY SPENT TO DATE AND THE 800 MILLION IN MATCHING FUNDS FOR FACILITIES, I THINK THE ECONOMIC IMPACT OF THAT IS ENORMOUS. I THINK THIS IS A MAJOR ECONOMIC ENGINE IN THE STATE.

WE WERE CRITICIZED FOR IPERIAN GETTING A GRANT, BUT IPERIAN, WHICH WAS STARTED BY HARVARD RESEARCHERS, IS HERE, NOT IN MASSACHUSETTS BECAUSE

WE HAVE MONEY. THOSE ARE JOBS IN THE BAY AREA THAT WOULDN'T BE HERE WITHOUT CIRM. SO THE ECONOMIC IMPACT OF THIS AGENCY, THE SOPHISTICATION OF THE ADVOCACY COMMUNITY, I THINK, WILL BE SUPPORTIVE IF -- IF WE SAY WE'VE GOT PLENTY OF MONEY TO GO ON FOREVER, IT'S HARD TO TALK TO THE VOTERS ABOUT REFUNDING US. HOWEVER, IF WE'RE MAKING -- IF WE HAVE A BASKET OF IND'S QUEUED UP READY TO GO INTO CLINICAL TRIAL AND WE SAY LET'S GO, AND THIS IS WHAT WE'VE ACCOMPLISHED IN TERMS OF NEW COMPANIES, IN TERMS OF FACILITIES, IN TERMS OF INVESTIGATORS WHO ARE WORKING, IN TERMS OF THE RESEARCH CAPACITY THAT WE'RE BUILDING AT UNIVERSITIES ACROSS THIS STATE, I THINK WE HAVE A GOOD ARGUMENT. THIS ECONOMY IS NOT GOING TO BE LIKE IT IS RIGHT NOW FIVE YEARS FROM NOW OR FOUR YEARS FROM NOW.

DR. BRODY: I DON'T KNOW WHETHER IT'S BEEN DISCUSSED BEFORE, BUT IN THE HEALTHCARE BILL THE OBAMA ADMINISTRATION PASSED WAS A RIDER INTRODUCED BY SENATOR SPECTER CALLED THE CURES ACCELERATION NETWORK WHICH WILL PROVIDE UP TO $500 MILLION FOR MOVING THINGS ACROSS THE VALUE VALLEY OF DEATH. IT'S UNCLEAR YET HOW THE NIH IS GOING TO IMPLEMENT THIS. ALTHOUGH IT'S AUTHORIZED, THE BUDGET HASN'T BEEN APPROVED. BUT MY GUESS IS THAT THIS WOULD

BE -- THESE WOULD BE THE KIND OF FUNDS THAT WOULD HELP US DEAL WITH THE PHASE I AND PHASE II AND EVEN SOME OF THE PRE-PHASE I WORK.

CHAIRMAN KLEIN: THAT'S EXACTLY RIGHT. IT HAS AN INDEPENDENT BOARD THAT REPORTS TO THE SECRETARY OF HEALTH AND HUMAN SERVICES INSTEAD OF THE NIH FORMALLY. AND SENATOR TORRES AND I HAVE BEEN DISCUSSING THIS AS WELL AS DUANE ROTH IN THERE HAVE BEEN OUTREACH TO MEMBERS OF THE WHITE HOUSE TO DEAL WITH THE QUESTION OF WHAT POLICY DIRECTION THEY'RE GOING TO TAKE AS WELL AS TO THE SENIOR LEADERSHIP ON THE COMMITTEES IN THE HOUSE AND THE SENATE THAT ARE INVOLVED. IT'S A VERY -- IT'S AUTHORIZED. AS YOU SAY, THERE'S NO FUNDING YET, SO THE POLITICS OF THE FUNDING ARE VERY IMPORTANT.

I EXPECT IN THE NEXT YEAR OR SO THE VICE CHAIRS MIGHT FIND THEMSELVES DEEPLY INVOLVED IN THAT PROCESS, BUT IT'S DEFINITELY A SOURCE OF LEVERAGE. AND I THINK WE'VE ESTABLISHED A TREMENDOUS REPUTATION THROUGH THE WORK OF THE BOARD, THE WORK OF DR. TROUNSON AND SCIENTIFIC STAFF FOR EFFECTIVELY MOVING THIS FIELD FORWARD. CERTAINLY IT'S BROADER THAN STEM CELL RESEARCH, BUT I THINK WE WOULD BE WELL POSITIONED TO GET A SUBSTANTIAL SHARE OF THAT CONTRIBUTED TO THE PHASE I, PHASE II A, II B AREA.

MR. TORRES: ON THAT POINT TO DR. BRODY, ALSO THE MEMBERSHIP GROUP IS GOING TO BE VERY CRITICAL TO US.

DR. REED: I JUST WANTED TO FOLLOW UP ON JEFF SHEEHY'S COMMENT ABOUT REALLY EMPHASIZING THE ECONOMIC IMPACT OF CIRM-SPONSORED RESEARCH. I DON'T KNOW WHAT STATISTICS WE'RE ALREADY KEEPING ON THIS, BUT I THINK IT'S AN AREA THAT WE CERTAINLY SHOULD EXAMINE. AND I SUSPECT WE'LL HAVE MUCH TO TOUT AS THE DATA COME IN. I SUSPECT MANY OF THESE CIRM GRANTS WILL ACT AS SPRINGBOARDS, FOR EXAMPLE, TO OTHER GRANTS, PARTICULARLY FROM THE NATIONAL INSTITUTES OF HEALTH. AND THAT'S AN AREA WHERE WE CERTAINLY HAVE AN OPPORTUNITY TO SEE MORE OF OUR FEDERAL DOLLARS COMING BACK TO THE STATE OF CALIFORNIA.

THE GOVERNOR HAS COMMENTED ABOUT HOW I THINK IT'S ONLY ABOUT 80 CENTS ON EVERY DOLLAR THAT CALIFORNIANS SEND TO WASHINGTON ACTUALLY COMES BACK TO OUR STATE. ONE OF THE AREAS, THOUGH, THAT WE DO EXCEL IN AS A STATE BECAUSE OF OUR STRONG SCIENCE IS NIH, AND WE RECEIVE THE MOST OF THOSE GRANTS OF ANY STATE IN THE COUNTRY. I BELIEVE THIS FUNDING THAT WE'RE GIVING OUT IS GOING TO LEAD TO MANY OPPORTUNITIES THAT CAN CATALYZE BRINGING FURTHER

FEDERAL DOLLARS IN AS WELL AS, AS THINGS PROGRESS TO CLINICAL STAGE, ATTRACTING INVESTMENT DOLLARS, DOLLARS FROM MULTINATIONAL PHARMACEUTICAL COMPANIES AND OTHERS THAT WILL SUPPORT CLINICAL TRIALS AND BRING YET OTHER ECONOMIC BENEFITS TO THE STATE.

SO I'M SURE THERE'S GOING TO BE AN ENORMOUS POSITIVE ECONOMIC IMPACT OF THE DOLLARS THAT WE'RE CURRENTLY INVESTING IN THIS TECHNOLOGY. AND WHATEVER WE CAN DO TO TRY TO CAPTURE DATA ABOUT THAT TO BE ABLE TO MAKE THAT CASE I THINK WILL HELP TO SUPPORT ARGUMENTS DOWN THE ROAD THAT THIS SORT OF ACTIVITY COULD BE WORTH CONTINUING THE FUND AFTER THE NEXT FOUR-YEAR PERIOD IS COMPLETED.

DR. ROBSON: I AGREE WITH YOU COMPLETELY. WE HAVE AN ECONOMIC IMPACT STUDY ONGOING. I'D HOPED TO HAVE IT COMPLETED BY NOW. IT'S BEEN DELAYED A LITTLE BIT, BUT WE SHOULD HAVE THAT FOR YOU FAIRLY SOON. AND WE'VE BEEN LOOKING AT NOT JUST THE -- WE'VE BEEN LOOKING AT BOTH THE ECONOMIC IMPACT OF THE COMMITTED MONIES AND WHAT THAT WILL BE AND ALSO THE HEALTH BENEFITS. WE HAVE A TEST CASE THAT WE'RE LOOKING AT ON THE HEALTH BENEFITS, THE SAVINGS TO THE STATE BASED ON THAT.

THE OTHER POINT THAT YOU RAISED ABOUT COLLECTING WHAT ESSENTIALLY IS INFORMATION ABOUT HOW

OUR MONEY IS LEVERAGED IS A VERY IMPORTANT ONE. AND WE'VE BEEN -- WHEN WE'VE BEEN GOING ON SITE VISITS TO LOOK AT THE NEW FACILITIES WHEN THEY'RE GETTING READY TO OPEN OR WHEN WE HAVE MEETINGS, CONVERSATIONS WITH THE HEADS OF THE VARIOUS STEM CELL INSTITUTES, I'VE BEEN TALKING TO PEOPLE ABOUT THIS ALL THE TIME, THAT WE NEED THEIR HELP TO TRY TO IDENTIFY THAT LEVERAGED MONEY. IF SOMEONE COMES AND WORKS IN A NEW FACILITY, THEY GO GET AN NIH GRANT BECAUSE THEY HAVE ACCESS TO THAT FACILITY, WE NEED TO CAPTURE THOSE DOLLARS AND FIND OUT ABOUT THEM.

SO WE ARE WORKING WITH THE INSTITUTIONS AROUND THE STATE TO TRY TO FIND WAYS TO COLLECT AS MUCH OF THAT INFORMATION AS POSSIBLE.

CHAIRMAN KLEIN: SO, DR. TROUNSON, I THINK WE SHOULD PARCEL THAT INTO TWO PACKAGES. ONE, WE HAVE A NARROW FOCUSED ECONOMIC ANALYSIS THAT'S FOCUSING ON JUST AN INITIAL SMALL MOLECULE TRIAL, BUT WE ARE MONTHS AWAY FROM HAVING THE INFORMATION ON THE GENERAL ECONOMIC IMPACT. THAT'S A SECOND PART OF THIS THAT'S REALLY DOWNSTREAM. HOPEFULLY WE COULD MOVE IT ALONG ON A TIMETABLE THAT WOULD BE AVAILABLE FOR THE STRATEGIC REVIEW.

DR. ROBSON: I'M HOPING MONTHS IS AN OVERESTIMATE. I'D LIKE TO TAKE THE S OFF OF THAT.

CHAIRMAN KLEIN: NORMALLY I'M ON THE CONSERVATIVE SIDE.

MR. ROTH: I WANT TO FOLLOW JOHN REED'S COMMENT UP BECAUSE WE BROUGHT THIS UP PREVIOUSLY. ALSO IN THOSE CALCULATIONS, AND IT SHOULDN'T BE SORT OF AD HOC, I THINK WE HAVE TO FORMALIZE HOW WE GET THIS INFORMATION.

DR. ROBSON: IT'S DIFFICULT INFORMATION TO COLLECT, CAN BE.

MR. ROTH: ALMOST A REQUIREMENT FROM THE GRANT RECIPIENTS THAT THEY DO SEND US A REPORT. AND IF WE NEED TO, WE SHOULD BUILD THAT IN. BUT VENTURE CAPITAL AND FOLLOW-ON PHARMACEUTICAL INVESTMENT SHOULD EQUALLY COUNT THERE. IF THIS ENABLES THAT, IT WOULDN'T HAVE HAPPENED WITHOUT THIS EARLY MONEY. THAT WAS THE WHOLE POINT OF DOING THIS.

DR. ROBSON: PHILANTHROPY AS WELL. THEY SHOULD ALL BE CAPTURED. SO I THINK THE HEADS OF THE STEM CELL GROUPS AROUND THE STATE ARE GOING TO BE VERY INSTRUMENTAL IN HELPING US COLLECT THESE DATA.

CHAIRMAN KLEIN: I THINK YOU ARE GOING TO SEE SOME ANNOUNCEMENTS IN THE NEXT 90 DAYS, MAYBE SOONER, ABOUT SOME VENTURE CAPITAL MOVEMENT IN THIS SPACE, WHICH IS ENCOURAGING. BUT WE REALLY DO HAVE TO WORK ON MATCHING FUNDS AND LEVERAGE. AS DR.

BRODY SAYS, I THINK THERE'S SOME EXCELLENT OPPORTUNITIES TO INTERFACE WITH SOME NEW FEDERAL INITIATIVES. AS MR. SHEEHY HAS SAID, THERE'S SOME TREMENDOUS OPPORTUNITY TO INTERFACE WITH THE NIH ON FUNDING PART OF THESE TRIALS. AND WE KNOW SOME OF THE LEADERSHIP THERE WANTS TO DO THIS AND LOOKS TO CALIFORNIA. THEY'VE BLATANTLY TOLD US CALIFORNIA IS IN THE LEAD; WE WANT TO WORK WITH YOU.

SO WE HAVE A LOT OF OPPORTUNITIES HERE, BUT IT'S A GOOD COLD-WATER REALITY CHECK TO LOOK AT THE OPTIONS. AND SO I THINK WE THANK YOU FOR THAT.

ARE THERE SOME OTHER COMMENTS AT THIS POINT? ARE THERE COMMENTS FROM THE PUBLIC?

MS. SAMUELSON: I WOULD HOPE THAT WE HAVE TIME IN THE AGENDA OF OUR MEETINGS OVER THE NEXT SIX MONTHS TO REALLY ROLL OUR SHIRT SLEEVES UP ABOUT THIS. THERE ARE SO MANY DIFFERENT AREAS TO COVER AND FOCUS ON AND LOTS OF ISSUES PRESENTED, AND I DON'T KNOW HOW WE WILL DO IT WITHOUT SOME UNIMPEDED TIME HERE AND THERE.

CHAIRMAN KLEIN: I'LL MAKE SURE WE SCHEDULE THAT. AND I SHOULD SAY TOO THAT WE PASSED THROUGH THE BUDGET DISCUSSION AND THESE DISCUSSIONS, BUT AT THE FOUNDATION OF THE INFORMATION AND THE AGENCY WE HAVE BOTH MARGARET AND CHILA WHO DO

TREMENDOUS AMOUNT OF WORK TO GET US TO GOOD NUMBERS, AND WE SHOULD HAVE STOPPED ALONG THE WAY ON THE BUDGET DISCUSSIONS TO THANK THEM FOR THEIR TREMENDOUS CONTRIBUTION.

(APPLAUSE.)

CHAIRMAN KLEIN: ADDITIONAL COMMENTS EITHER ON THE LINE OR ANY COMMENTS ON THE LINE? ALL RIGHT.

MR. TORRES: MELISSA HAS A STATEMENT TO READ.

CHAIRMAN KLEIN: MELISSA. LET ME TALK LOGISTICS HERE FOR A MOMENT. BECAUSE THERE'S SOME DIFFICULT PLANES, THE PLANE SCHEDULES FOR SAN FRANCISCO ARE BACKED UP AND PEOPLE ARE HAVING TO CHANGE THEIR PLANES, I THINK WE'VE GONE THROUGH THE AGENDA. WE HAVE A VOTE THAT IS FOR OUR OPEN ROLL CALL THAT'S IN PROGRESS. I'M GOING TO KEEP THE BOARD MEETING OPEN, AND I WILL BE HERE FOR SOME TIME WAITING FOR THAT INDIVIDUAL, COUNSEL WILL BE HERE, SENIOR STAFF WILL BE HERE. BUT FOR THOSE MEMBERS THAT NEED TO LEAVE BECAUSE OF THE TRANSPORTATION ISSUES, WE'VE COVERED OUR AGENDA. WE ARE TREMENDOUSLY APPRECIATIVE OF THE BOARD MEMBERS WHO MADE SPECIAL EFFORT TO BE HERE.

WHEN THE LATE VOTES ARRIVE, I PROMISE TO

TAKE THEM TO LUNCH AFTER THEY'VE VOTED AND CLOSE IT. AND IF I PAY FOR LUNCH, I PROMISE IT WILL BE NOT ENOUGH MONEY TO INFLUENCE THEIR VOTE.

MS. KING: THIS IS A STATEMENT FROM JOHN SIMPSON FROM CONSUMER WATCHDOG, WHO, AS MANY OF YOU KNOW, ATTENDS QUITE A FEW OF OUR MEETINGS, BUT WAS UNABLE TO ATTEND TODAY ANY OF OUR LOCATIONS, AND HE ASKED THAT THIS BE READ DURING THE MEETING.

"I APOLOGIZE THAT I WAS UNABLE TO ATTEND TODAY'S ICOC MEETING. I APPRECIATE THIS STATEMENT BEING READ INTO THE RECORD ON MY BEHALF.

"WHEN CONSUMER WATCHDOG BEGAN ITS STEM CELL PROJECT ALMOST FIVE YEARS AGO, I NAIVELY EXPRESSED CONCERNS THAT THE PROGRAM WOULD BE HIJACKED BY THE BIOTECH INDUSTRY. THAT HAS AT LEAST SO FAR NOT HAPPENED. RATHER, IT HAS BEEN DOMINATED BY ACADEMIC RESEARCH INSTITUTIONS WHOSE REPRESENTATIVES HOLD THE LARGEST NUMBER OF SEATS ON THE BOARD.

"I BELIEVE THE TREND IS TROUBLING ENOUGH TO ASK WHETHER THE PLAYING FIELD IS LEVEL FOR ALL APPLICANTS. I BELIEVE THERE ARE GROUNDS FOR CONCERN.

"HERE ARE SOME SUGGESTIONS TO IMPROVE THE SITUATION. A TASK FORCE SHOULD BE CONVENED TO

CONSIDER WHY COMPANIES HAVE FARED SO POORLY AND WHAT SHOULD BE DONE. ALL SESSIONS MUST BE PUBLIC.

"A WORKSHOP SHOULD BE SCHEDULED WITH INTERESTED COMPANIES TO DISCUSS WAYS TO IMPROVE THEIR APPLICATIONS. IT MUST BE OPEN TO THE PUBLIC.

"AN EFFORT SHOULD BE MADE TO RECRUIT SCIENTIFIC REVIEWERS WITH SUBSTANTIAL EXPERIENCE IN RESEARCH PROGRAMS CONDUCTED BY BUSINESSES.

"CIRM MEETINGS THAT CURRENTLY INCLUDE ONLY GRANTEES SHOULD BE EXPANDED TO INCLUDE ALL LEGITIMATELY INTERESTED PARTIES. CURRENTLY YOU HAVE AN ANNUAL CONFERENCE FOR ALL GRANTEES. THIS MUST BE OPEN TO INCLUDE ALL GRANT AND LOAN APPLICANTS EVEN IF THEY WERE UNSUCCESSFUL. IF THERE IS A CONCERN ABOUT EXPENSES, UNSUCCESSFUL APPLICANTS COULD BE CHARGED A MODEST FEE. WHAT BETTER VENUE TO LEARN WHAT MAKES A SUCCESSFUL APPLICATION THAN A CONFERENCE THAT INCLUDES CIRM'S AWARDEES?

"IT WOULD ALSO CREATE OPPORTUNITIES FOR DEVELOPING COLLABORATIONS. CURRENTLY CIRM CONTINUES TO SUFFER FROM THE IMAGE THAT IT IS A CLOSED CLUB. OPENING CONFERENCES TO ALL APPLICANTS AND EVEN OTHER INTERESTED PARTIES WOULD HELP CORRECT THAT. THANK YOU FOR YOUR CONSIDERATION. JOHN M. SIMPSON."

CHAIRMAN KLEIN: THANK YOU VERY MUCH. I'D

JUST LIKE TO SAY THAT I DON'T THINK THE BIOTECH INDUSTRY AT LARGE HAS FEELINGS THAT ARE REFLECTED IN THAT STATEMENT. AS SOME OF YOU MAY KNOW, I RECEIVED A REWARD FROM BIOINTERNATIONAL CONFERENCE THIS YEAR, THEIR HUMANITARIAN AWARD. BUT WE ARE IN CONSTANT COMMUNICATION WITH THEM. DUANE CERTAINLY IS VERY ACTIVE IN THAT ORGANIZATION.

I CONFERRED WITH THEIR STAFF ON THE RIDER IN THE HEALTHCARE BILL THAT PROVIDED ORIGINALLY A BILLION DOLLARS OF TAX CREDITS TO BIOTECH. I HAD SUGGESTED TO THEIR STAFF AND THEIR SENIOR MANAGEMENT THAT SINCE SMALL BIOTECH COMPANIES, WHICH WERE CRITICAL IN OUR FIELD AND MANY FIELDS OF BIOMEDICINE, COULDN'T REALLY USE THESE TAX CREDITS, THAT THEY SHOULD REALLY FOCUS ON NEGOTIATING AN EXCHANGE PROVISION, WHICH THEY DID. AND THAT EXCHANGE PROVISION WHERE YOU CAN CASH IN THAT BILLION DOLLARS IS BEING IMPLEMENTED CURRENTLY.

SO I HAVE MEETINGS WITH -- A MEETING WITH STEVE SHERWIN THAT IS BEING SCHEDULED TO ADVANCE OUR COLLABORATION. I KNOW DUANE WORKS ON IT. WE HAVE PROGRESSED WITH THE LOAN PROGRAM. HOPEFULLY WE WILL MAKE ADDITIONAL PROGRESS IN THE NEAR FUTURE WITH EMBRACING THAT PROGRAM. BUT I WOULD LIKE TO SAY THAT IT WOULD ALSO BE HELPFUL TO AGGREGATE SOME OF

THE INFORMATION WE HAVE INTERNALLY WHERE BIOTECH COMPANIES ARE NOT THE PI OR CO-PI, BUT THEY ARE PARTICIPANTS IN OUR GRANTS BECAUSE WE HAVE MANY MORE BIOTECH COMPANIES THAT ARE INVOLVED IN THESE GRANTS THAN THOSE THAT ARE COUNTED NOMINALLY BY THEIR LEADERSHIP POSITION AS PI'S AND CO-PI'S. I THINK THAT WILL GIVE A BETTER VIEW.

NEVERTHELESS, WE HAVE AN IMPORTANT JOB TO DO. I THINK JEFF SHEEHY AND ART TORRES AND MANY OF US HAVE DISCUSSED HOW IMPORTANT IT IS TO EMBRACE BIOTECH AND GET THEM DEEPLY INVOLVED IN COLLABORATING WITH US. MATCHING FUNDS ARE GOING TO BE VERY IMPORTANT FROM THEIR RESOURCES, AND WE DEFINITELY NEED TO MAKE MORE AGGRESSIVE PROGRESS.

MR. TORRES: I JUST WANT TO ALSO APPLAUD THE WORK THAT DUANE HAS DONE AND OUR STAFF IN REACHING OUT WITH VARIOUS WORKSHOPS WITH BIOTECH COMPANIES THROUGHOUT THE STATE TO MAKE SURE THAT THEY UNDERSTAND HOW TO DEAL WITH THE PROCESS.

THE OTHER ISSUE THAT WE'VE DISCOVERED IS THAT MANY OF THE BIOTECH COMPANIES AREN'T AS GOOD A GRANT WRITER AS OUR PUBLIC INSTITUTIONS BECAUSE THEY'RE NOT USED TO IT, QUITE FRANKLY, AND DON'T HAVE TO FOR THE MOST PART.

I THINK SOME OF THE ISSUES THAT JOHN HAS

RAISED ARE SERIOUS ISSUES THAT WE NEED TO REVIEW OBVIOUSLY. BUT THE ONE ISSUE THAT CONTINUES TO IRK ME IS THAT ANYONE WHO SITS HERE DURING THE REVIEW OF THESE GRANTS AND SEES PEOPLE THAT HAVE TO BE REMOVED FROM THE ROOM BECAUSE THEY HAVE TO RECUSE THEMSELVES FROM VOTING ON GRANTS, AND MANY OF THEM ARE ACADEMIC INSTITUTIONS, JUST BELIES THE FACT THAT THIS IS AN OLD BOY'S OR AN OLD GIRL'S CLUB. IT'S VERY MUCH RESTRAINED IN TERMS OF THE CONFLICTS OF INTEREST THAT APPLY TO ALL OF THE BOARD MEMBERS, BUT MOSTLY TO THE ACADEMIC INSTITUTIONS.

AND SECONDLY, IT'S ALSO MISUNDERSTOOD BY MUCH OF THE PUBLIC, ALTHOUGH WE NEED TO DO MORE EDUCATION ON THAT, IS THAT NONE OF THE MONEY THAT WE SPEND CAN BE SPENT OUTSIDE OF CALIFORNIA. SO NATURALLY THE TALENT ARE GOING TO BE CALIFORNIA INSTITUTIONS, ESPECIALLY ACADEMIC INSTITUTIONS. SO I THINK WE NEED TO DO MORE HOMEWORK ON EDUCATING THE PUBLIC, BUT ALSO MORE HOMEWORK ON EDUCATING THE PUBLIC AS TO ACTUALLY GOES ON WHEN VOTES ARE TAKEN HERE FOR SPECIFIC GRANTS AND HOW PEOPLE THAT ARE TIED TO A SPECIFIC GRANT THROUGH AN ACADEMIC INSTITUTION AREN'T ALLOWED AT ANY POINT OF THE PROCESS TO TAKE PART AND MUST RECUSE THEMSELVES TO AVOID ANY APPEARANCE OF CONFLICT BOTH PERCEIVED AND

LEGAL.

CHAIRMAN KLEIN: OKAY. SO I'M GOING TO KEEP THE ROLLS OPEN, BUT EVERYONE ELSE CAN GO TO LUNCH. AND BRING ME SOME ICED TEA, BUT THANK YOU FOR YOUR DEDICATED SERVICE AND THANK THE STAFF. WE SHOULD ASK THAT EVERYONE JUST GIVES A FINAL ROUND OF APPLAUSE TO MELISSA, THE CHAIR'S STAFF, ALL OF THE STAFF.

(APPLAUSE.)

(A LUNCH RECESS WAS TAKEN AT 12:49 P.M.)

MR. TORRES: MARCY FEIT.

MS. FEIT: THIS IS MARCY.

MR. TORRES: MARCY FEIT, THIS IS ART TORRES. HOW ARE YOU?

MS. FEIT: HI. DO YOU NEED A VOTE?

MR. TORRES: YES, I DO. AND THIS IS HOW WE'RE GOING TO PROCEED. I'VE BEEN WAITING FOR YOU HERE.

MS. FEIT: HOLD ON A MINUTE. I WANT TO MAKE SURE I'M ON THE PHONE. HOLD ON.

MR. TORRES: MARCY, WE ARE NOW ON ITEM 10, WHICH HAS BEEN PUT ON CALL, WHICH IS THE BUDGET FOR CIRM, WHICH I'M SURE YOU'RE FAMILIAR WITH. HOW DO YOU VOTE?

MS. FEIT: IT'S YES.

MR. TORRES: MARCY FEIT RECORDED AS YES.

MS. KING: FOR THE RECORD, SENATOR TORRES, THAT MOTION CARRIES.

MR. TORRES: THAT MOTION CARRIES. THANK YOU, MARCY. HAVE A WONDERFUL WEEKEND.

IS THERE A MOTION TO ADJOURN? I SO MOVE. THE MEETING IS ADJOURNED.

(THE MEETING WAS THEN ADJOURNED AT 02:08 P.M.)

REPORTER'S CERTIFICATE

I, BETH C. DRAIN, A CERTIFIED SHORTHAND REPORTER IN AND FOR THE STATE OF CALIFORNIA, HEREBY CERTIFY THAT THE FOREGOING TRANSCRIPT OF THE PROCEEDINGS BEFORE THE INDEPENDENT CITIZEN'S OVERSIGHT COMMITTEE OF THE CALIFORNIA INSTITUTE FOR REGENERATIVE MEDICINE IN THE MATTER OF ITS REGULAR MEETING HELD AT THE LOCATION INDICATED BELOW

SHERATON SAN DIEGO
1380 HARBOR ISLAND DRIVE
MARINA TOWER, HARBOR ISLAND I
SAN DIEGO, CALIFORNIA
ON
WEDNESDAY, JUNE 23, 2010

WAS HELD AS HEREIN APPEARS AND THAT THIS IS THE ORIGINAL TRANSCRIPT THEREOF AND THAT THE STATEMENTS THAT APPEAR IN THIS TRANSCRIPT WERE REPORTED STENOGRAPHICALLY BY ME AND TRANSCRIBED BY ME. I ALSO CERTIFY THAT THIS TRANSCRIPT IS A TRUE AND ACCURATE RECORD OF THE PROCEEDING.

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