City of Hope™

COLLABORATIONS

2006 Annual Report

COLLABORATIONS

"Great discoveries and improvements invariably involve the cooperation of many minds." ALEXANDER GRAHAM BELL

City of Hope is an organization strongly rooted in enlightened compassion. That compassion is expressed not only through the care of patients, but also through the daily quest for scientific breakthroughs. For cancer patients here and around the world, time is irretrievably precious. Our critical goal — to shorten the time from initial scientific idea to new practical treatment — inspires our researchers to work unselfishly with scientific and medical colleagues around the world. This shared vision and collaboration pays off in discoveries in basic science, translational research and, ultimately, life-changing and life-saving medical care.

Michael A. Friedman, M.D.

Philip L. Engel

When we think of history's great scientists, we often imagine them toiling in solitude until a major discovery thrusts them into the spotlight.

Modern-day biomedicine bears little resemblance to that of the past. Today, scientific researchers must join forces to speedily pursue cures for disease.

So quickly has the world's body of medical knowledge grown that a scientist cannot expect to know enough to function alone. Each must develop a niche of specialization — an area where the scientist reigns as an expert over a unique and complex domain; then, to aggressively advance science, researchers must form teams in which each member has critical knowledge to offer. Only then can ideas from the lab move speedily from cell culture to the clinic.

City of Hope symbolizes this collaborative movement; and as City of Hope moves ahead with its 2007-2013 strategic plan, collaborations take on even greater importance. The strategic plan guides the institution's expansion through key research, clinical and education programs while maintaining longstanding attributes, such as compassionate care, that are central to its mission.

The strategic plan will help City of Hope develop leading research programs in areas such as cancer biology, experimental therapeutics and population sciences, as well as strengthen clinical areas of excellence, including leukemia and lymphoma. It will build robust programs in areas such as lung, gynecologic and musculoskeletal cancers, among others. These aspirations are impossible without collaboration.

The work of Smita Bhatia, M.D., M.P.H., chair of the Division of Population Sciences, serves as just one of several examples you will see in the following pages of this report. Bhatia studies childhood cancer patients to deeply understand what happens later in their lives, long after cancer treatment. But studying only City of Hope's patients would provide too few research subjects to statistically discern the true effects of childhood cancer therapy. To fully understand these long-term effects, Bhatia must pool our patients with many others. She must link with physicians and researchers across the world.

Only by combining their experiences and unselfishly sharing their data can Bhatia and her colleagues gauge the long-term effects of cancer treatment. As a result, the collaborating researchers can better monitor cancer survivors' health and quality of life — and provide better guidance for patients throughout their lives.

Just like Bhatia, other City of Hope researchers are reaching beyond the bounds of their offices and labs to cooperate with scientists in California and around the globe. At the heart of their mission: uncovering the science behind the diseases and discovering better ways to prevent, diagnose and treat cancer, diabetes, HIV/AIDS and other serious illnesses.

We invite you to read about their stories, and those of their collaborating City of Hope colleagues, in this report.

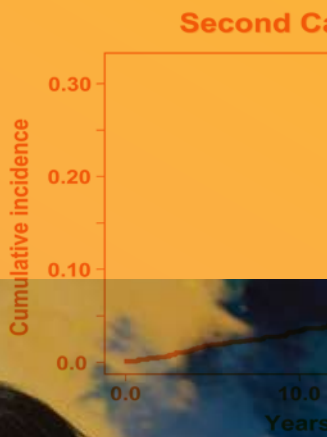
Philip L. Engel
Chair, Board of Directors
City of Hope

Michael A. Friedman, M.D.
President and Chief Executive Officer
City of Hope

Upper left:
Wendy Landier, R.N., M.S.N.,
City of Hope

Center:
City of Hope patients, like the young girl shown here, benefit from the collaboration between cancer researchers and clinical care providers.

Lower right:
Smita Bhatia, M.D., M.P.H.,
City of Hope



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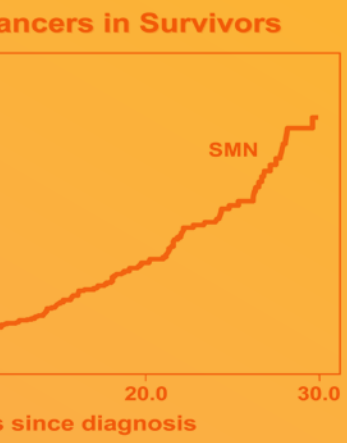


GUARDING YOUNG LIVES

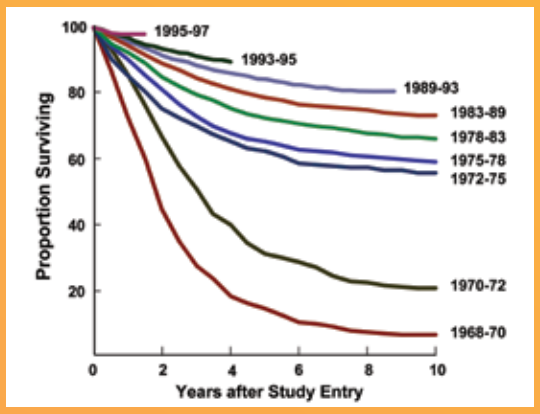
CHILDREN'S ONCOLOGY GROUP

The diagnosis of cancer in a child is overwhelming to families. Even after successful treatment, fears remain. Will it return? Will a different cancer arise later in life? What side effects can be expected — and can they be avoided?

Research has dramatically improved survival rates for children with cancer, from less than 25 percent in the 1960s to nearly 80 percent today. More than 250,000 childhood cancer survivors are living in the United States alone. But as they mature, two-thirds will suffer chronic problems and long-term complications, such as issues related to growth and development; one-third will have a problem that can be life threatening. Many will develop secondary cancers, either due to cancer treatment or underlying causes.

Because "late effects" may not arise until decades after treatment, and because pediatric cancers are fortunately rare, researchers and care providers must pool their resources and share their experiences to improve long-term outcomes. City of Hope researchers are national leaders in this effort.

Smita Bhatia, M.D., M.P.H., chair of the Division of Population Sciences at City of Hope, and medical director, Center for Cancer Survivorship, chairs the Late Effects Committee of the Children's Oncology Group (COG), a consortium funded by the National Cancer Institute.



COG brings together pediatric cancer experts from 238 hospitals in the U.S., Canada, Australia, New Zealand, the Netherlands and Switzerland. It facilitates the organization of large-scale, definitive multicenter research studies needed to improve treatments, practices and outcomes. Today, more than 90 percent of children with cancer in the U.S. are treated at COG-affiliated cancer centers, and about 70 percent participate in clinical trials.

Bhatia serves as principal investigator for a COG research study looking at key adverse events in childhood cancer survivors. Patients who develop a secondary cancer or other problem such as congestive heart failure or stroke are invited to participate in the study so that the causes of these complications can be investigated, potentially improving future treatments.

At City of Hope, cancer research is strongly integrated with clinical care, and nursing is a central focus of that strategy. Wendy Landier, R.N., M.S.N., serves as clinical director of the Center for Cancer Survivorship, and also leads the Nursing Clinical Practice/Survivorship Subcommittee of COG, where she serves as vice chair of the Nursing Discipline. As

Today, more than 90 percent of children with cancer in the United States are treated at Children's Oncology Group-affiliated cancer centers.

leaders within both City of Hope and COG, Landier and Bhatia have collaborated on landmark projects including the establishment of long-term follow-up guidelines for young cancer survivors and a resource guide for all COG centers to use in their own follow-up programs.

Participation in COG encourages alliances. Close ties have been established with researchers at St. Jude Children's Research Hospital, The Children's Hospital of Philadelphia, Memorial Sloan-Kettering Cancer Center and dozens of other institutions. A Web-based version of the long-term follow-up guidelines that can be tailored for individual patients will soon be launched in partnership with Baylor School of Medicine. As a pilot test center for the new system, City of Hope and its patients will benefit from instant access to the cumulative knowledge of pediatric cancer experts from around the world.

City of Hope pediatric patients benefit from the collaborative efforts of researchers at City of Hope and dozens of other institutions worldwide.

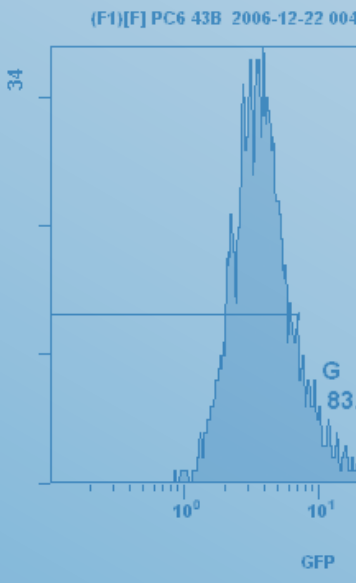
SPEEDING GENE THERAPIES

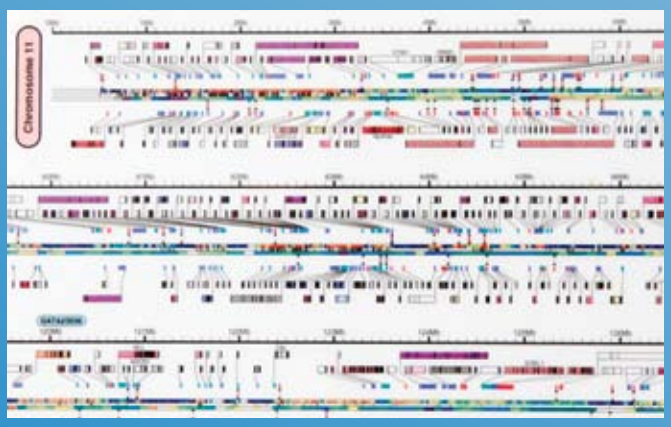
NATIONAL GENE VECTOR LABORATORY

The most powerful weapons against cancer, diabetes and other serious diseases cannot be seen. They are genes — bits of DNA that can be delivered to wayward cells, fixing problems at the source. Gene therapy holds huge potential for future cures. But refining these genetic tools, manufacturing them in quantity and getting them into clinical trials is a major challenge on all fronts: technical, analytical and regulatory.

The National Gene Vector Laboratory (NGVL) at City of Hope is helping make it happen. Located within the Center for Biomedicine & Genetics (CBG), the NGVL is the first large-scale facility for manufacturing biological therapeutics at an academic research center in the United States. Here, promising new genetic and cellular agents created by researchers can move into production rapidly, so that they can be entered into clinical trials without delay.

The two-story, 20,000-square-foot CBG facility was built in 2000 with the purpose of creating an unlimited array of novel therapeutics. Led by Larry A. Couture, Ph.D., the CBG currently produces islet cells that treat type 1 diabetes, monoclonal antibodies that fight cancer, engineered T-cells for immunotherapeutic clinical trials, cancer vaccines, viral vectors for gene therapy against HIV, and hematopoietic cell products to treat blood disorders. Process development is also beginning on two types of recombinant proteins, similar to the way City of Hope achieved a breakthrough in the development of synthetic human insulin nearly 20 years ago.

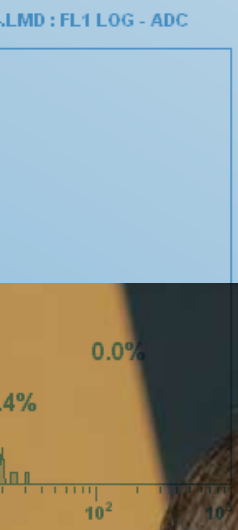




Lower left:
Larry A. Couture, Ph.D., City of Hope

Center:
City of Hope manufactures investigational novel therapeutics for researchers around the country.

Upper Right:
Michael C. Jensen, M.D. ,
Associate Chair,
Division of Cancer Immunotherapeutics and Tumor Immunology, City of Hope



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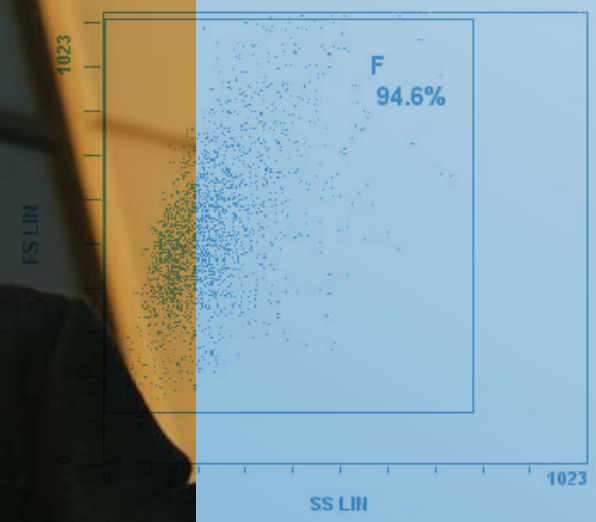
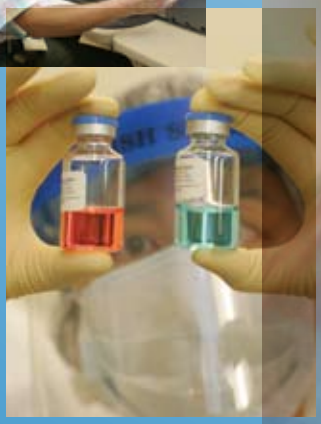
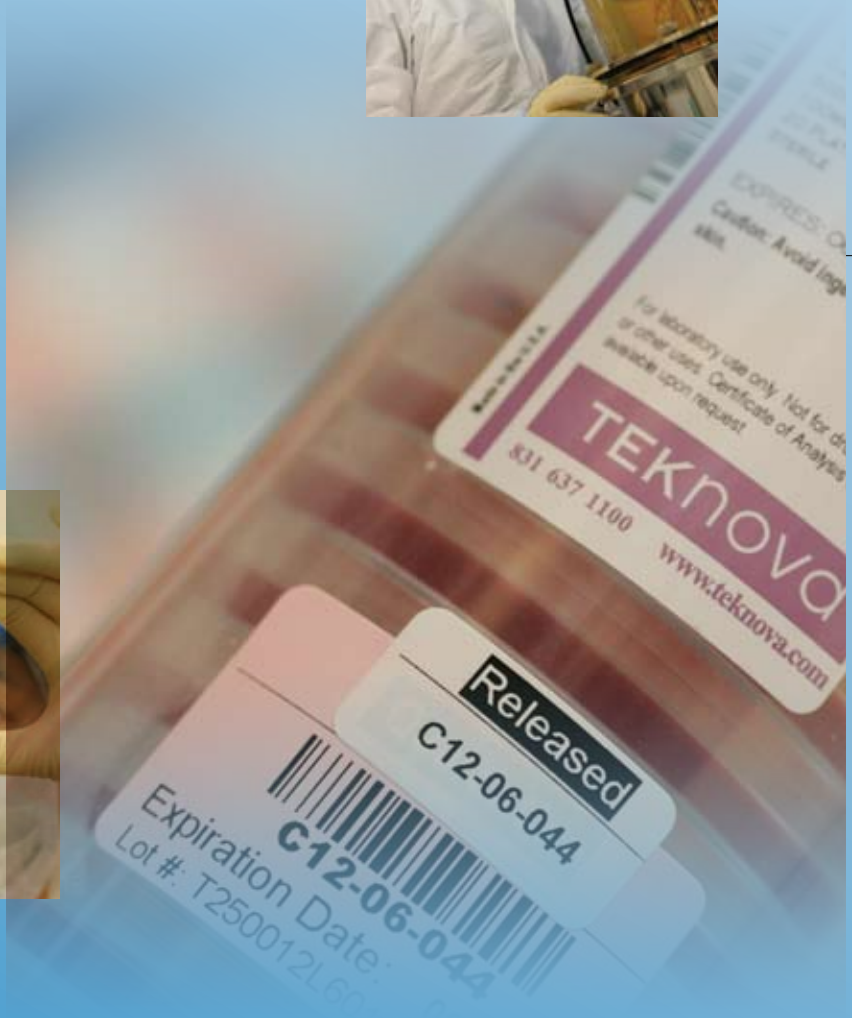






City of Hope's National Gene Vector Laboratory rapidly manufactures biological therapeutics so that these new therapies can move into clinical trials without delay.

1997

1998

CBG conceived
May 1998

CBG funded
July 1998

1999

Began construction
of CBG
January 1999

2000

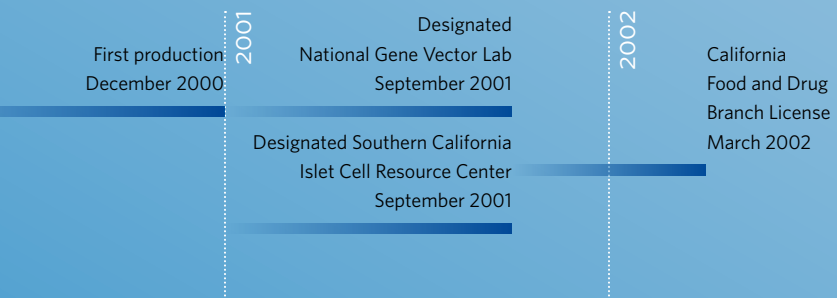
CBG completed
February 2000

City of Hope produces DNA plasmids for all qualified, federally funded laboratories nationwide.

The CBG's prolific output, scientific expertise and certification as a Good Manufacturing Practices facility led the National Institutes of Health (NIH) to commission it as an NGVL, one of only five such facilities in the U.S. today. Specifically, the laboratory produces clinical-grade DNA plasmid vectors for use in phase I and II clinical protocols. DNA plasmids, also called "naked DNA," are circular pieces of DNA carrying genes that can be transferred into cells with therapeutic effects.

Plasmids are in demand by researchers because unlike viral vectors, they have the advantage of producing little or no immune response. As the only NIH-supported plasmid manufacturer in the U.S., City of Hope's NGVL produces DNA plasmids for all qualified, federally funded laboratories nationwide. In addition, the facility also has produced a lentivirus vector and is a designated back-up site for the production of adenovirus gene therapy vectors.

With its robust manufacturing capacity and ability to quickly produce novel therapeutics at a small scale, the CBG provides a fast track for scientists seeking to move their research from bench to bedside. It also generates valuable collaborations between City of Hope and other institutions. With material from the NGVL, Jennifer Grandics, M.D., at the University of Pittsburgh has made rapid progress in antisense gene therapy that can inhibit cancer of the head and neck. At the University of Wisconsin, Douglas McNeel, M.D., Ph.D., is taking a promising DNA plasmid vaccine that fights prostate cancer into phase II clinical trials. In the search for better, faster cures, City of Hope is giving researchers across the country the genetic tools they need today.



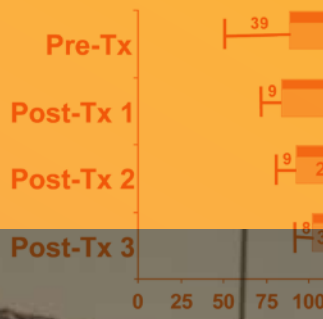
CBG MANUFACTURED PRODUCTS

MANUFACTURE DATE	PRODUCT NAME	PRODUCT TYPE
12/12/2001	IL-13	Plasmid DNA
1/14/2002	CE7R	Plasmid DNA
7/22/2002	293	Human Cell MCB
8/22/2002	293T	Human Cell MCB
4/17/2003	TM-LCL	Human Cell MCB
4/30/2003	L29.19	Plasmid DNA
5/23/2003	pTVG-hPAP	Plasmid DNA
1/29/2004	EGFRAS	Plasmid DNA
2/25/2004	T84.66 Diabody	Monoclonal Antibody
6/14/2004	Anti-CD19	Plasmid DNA
1/3/2005	pHIV7-shi-TAR-CCR5RZ	Plasmid DNA
1/12/2005	TM-LCL	Human Cell WCB
1/20/2005	pCgp	Plasmid DNA
3/21/2005	pCMV-Rev2	Plasmid DNA
5/12/2005	pCMV-G	Plasmid DNA
6/1/2005	Lentivirus	Viral Vector
6/20/2005	pHIV7-shi-TAR-CCR5RZ	Plasmid DNA
12/14/2005	Gene Modified T-cell	Engineered patient-specific cells
2/15/2006	Anti-CEA hT84.66 M5A/NHS-DOTA	Monoclonal Antibody
3/23/2006	pCB-AT-Zero	Plasmid DNA
4/25/2006	Zenapax	Monoclonal Antibody
5/2006	Lentivirus	Viral Vector
6/2006	pCMV-Rev2	Plasmid DNA
8/2006	Gene Modified T-cell	Engineered patient-specific cells
12/2006	CD19Rop epHIV7	Plasmid DNA

Upper left:
Fouad R. Kandeel, M.D., Ph.D.,
City of Hope

Center:
Genomic analysis of islet
function.

Lower right:
Donald C. Dafoe, M.D.,
Director, Pancreas Transplantion,
Cedars-Sinai Medical Center



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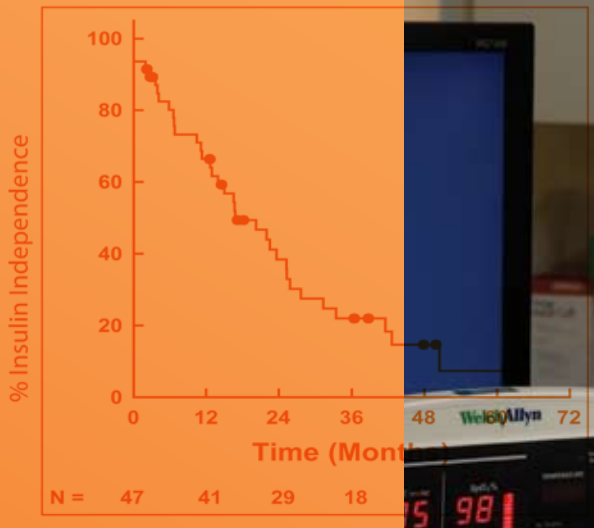
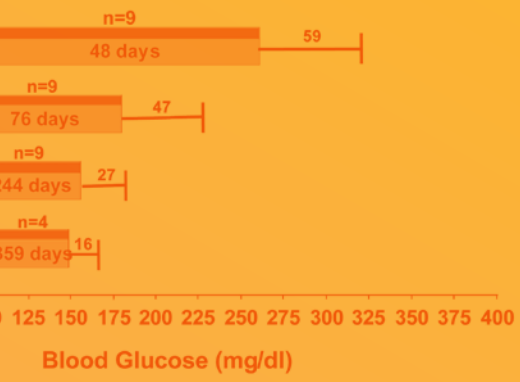


ADVANCING AGAINST DIABETES

ISLET CELL TRANSPLANTATION



The greatest challenge in medical research is to find a permanent cure for a life-threatening disease. For 5 million people around the world, that disease is type 1 diabetes.

Also called insulin-dependent diabetes, type 1 diabetes is an autoimmune reaction that destroys the beta cells of the pancreas. The result is a lifetime of insulin injections, threats of cardiovascular, nerve and kidney disease, and dangerous low-blood-sugar episodes. While healthy insulin-producing pancreatic islet cells can be transplanted from donor organs, donors are in short supply. And transplant procedures require special technology, immune-suppressing drugs and considerable expertise.

City of Hope is a leader in diabetes research, having pioneered the development of Humulin, the synthetic human insulin that was the first biotechnology product approved by the Food and Drug Administration, now used by millions of diabetics worldwide. That leadership continues with advancing islet cell transplantation.

City of Hope's renowned diabetes program, including its lifesaving work in islet cell transplant, is centralized in the Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center at City of Hope.

As one of only seven islet cell resource (ICR) centers funded by the National Institutes of Health, City of Hope performed the most islet transplants in the United States in 2004 and 2005 and has distributed the largest number of islets to basic science programs in the U.S. since 2004. City of Hope is the only currently funded ICR center in the western U.S. In 2006, the Juvenile Diabetes Research Foundation (JDRF) designated City of Hope

as a JDRF Islet Cell Transplant Center, making it one of only 14 in the nation and the only Southern California organization to receive this distinction.

Three clinical trials involving islet cell transplantation are under way at the City of Hope Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center led by Fouad R. Kandeel, M.D., Ph.D, director, Department of Diabetes, Endocrinology & Metabolism. One study seeks to improve upon the Edmonton Protocol, a widely adopted transplant procedure requiring two to three islet cell infusions. Multiple infusions and organ donors are needed because the drugs used to overcome transplant rejection are toxic to islet cells. As an alternative, the City of Hope phase I/II trial is employing a different immune suppression strategy together with the use of growth factors to expand the number of islet cells before and after transplantation. The goal is to develop a single infusion that can free patients from insulin dependence.

Kandeel also directs the Southern California Islet Consortium (SC-IC), a group of institutions sharing resources and expertise. Hosted by City of Hope, the SC-IC includes Cedars-Sinai Medical Center, Harbor-UCLA Medical Center, Loma Linda Medical Center, the Southern California Transplantation Institute, St. Vincent Medical Center, the Whittier Institute for Diabetes/Scripps Green Center for Organ & Cell Transplantation and the UCLA Center for Health Sciences. Because kidney disease is a complication of diabetes, the SC-IC's first multicenter clinical trial focuses on islet cell transplantation after kidney transplant. City of Hope performs the majority of transplant procedures for the consortium, handles regulatory requirements and trains physicians in islet cell techniques.

City of Hope hosts the Southern California Islet Consortium, which represents an integrated effort of multiple academic and transplant institutions to merge resources and efforts in islet transplantation research.

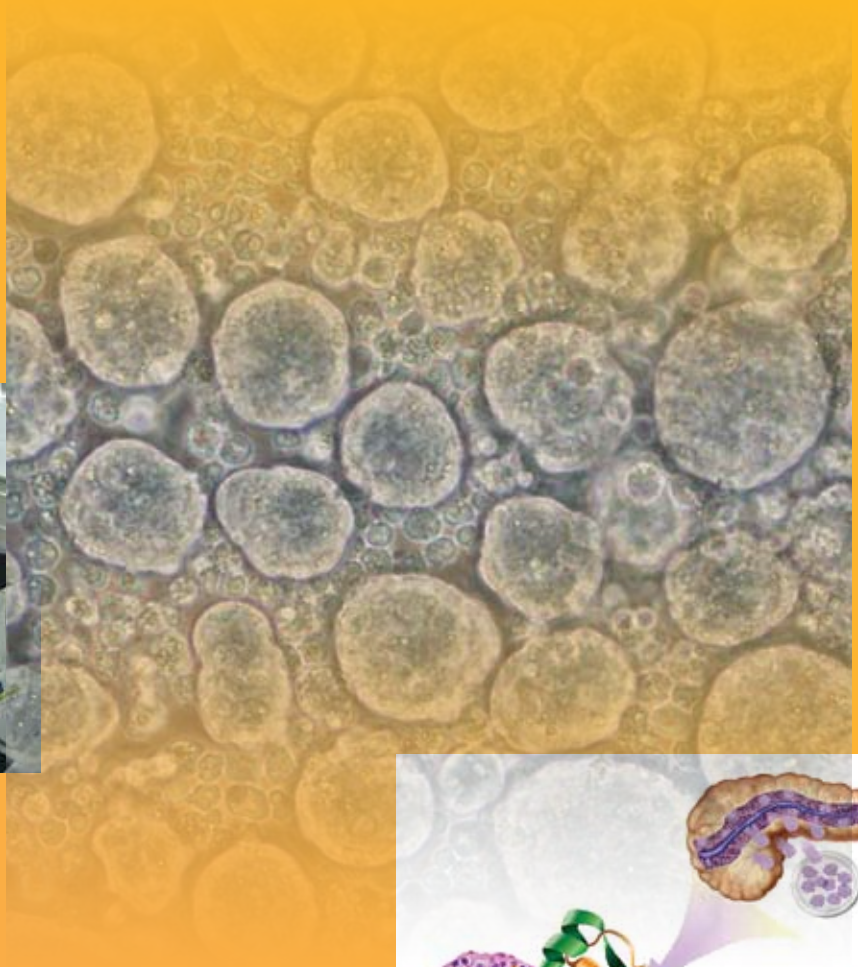
With diabetes on the rise worldwide, the absolute shortage of islet cell donors is stimulating the search for new islet cell strategies, including stem cells. Looking beyond diabetes, progress in immune tolerance achieved through islet cell research could pave the way for advances in solid organ transplants, cellular and gene therapies and treatments for autoimmune conditions, Parkinson's disease and many other conditions that would benefit from cell replacement.

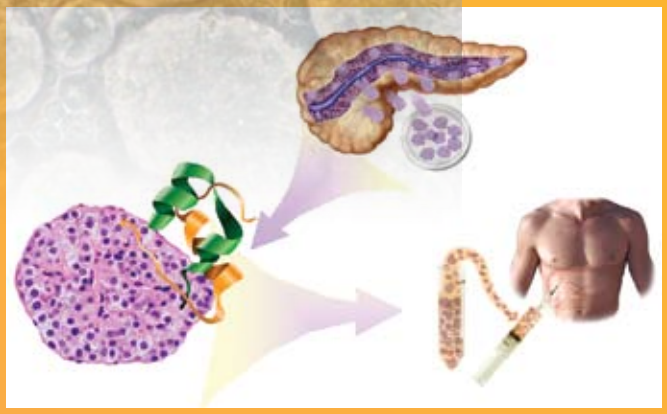
1940 — Rachmiel Levine, M.D., City of Hope, discovers pathophysiological basis of type 2 diabetes in 1949

1950

1960 — Samual Rahbar, M.D., Ph.D., City of Hope, discovers HgA1c in 1968

1970





City of Hope researchers work on islet cell isolation and distribution for clinical transplantation trials throughout the United States.

1980

Yoko Fujita-Yamaguchi, Ph.D., City of Hope, discovers cell insulin receptor in 1982

Arthur Riggs, Ph.D., and Keiichi Itakura, Ph.D., both from City of Hope, produce synthetic insulin from genetically engineered bacteria in 1978

1990

Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center dedication in 1997

City of Hope designated as a Juvenile Diabetes Research Foundation Islet Cell Transplant Center in 2006

2000

Establishment of the Southern California Islet Cell Resource Center in 2001

2010

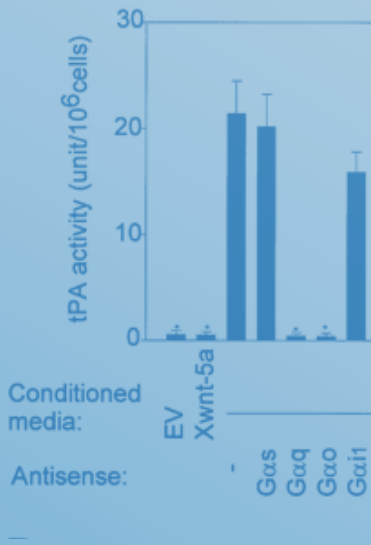
Stem cell transplantation without immune suppression for treatment of diabetes in the future

DESIGNING SMARTER DRUGS

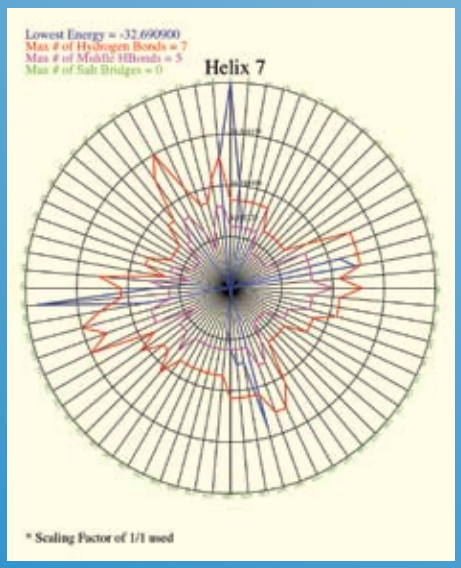
MODELING G-PROTEIN COUPLED RECEPTORS

Many drugs in use today were created by "trial and error" methods that result in a compromise: The drugs work, but carry risks of unwanted side effects. Yet clues to designing smarter pharmaceuticals with fewer side effects are hidden within the three-dimensional structures of biomolecules that these drugs turn on or off.

Among the most important therapeutic drug targets in the human body are G-protein coupled receptors (GPCRs) a large, diverse group of proteins that play crucial roles in health and disease. Woven through cell membranes, GPCRs act as signal posts, sensing changes in the environment and directing the cell to respond. By binding with neurotransmitters, hormones, immune substances, odorants and other molecules, GPCRs influence growth, metabolism, brain response and other central life processes. GPCRs called chemokine receptors are also implicated in the spread and growth of many cancers, including those of the lung, breast, prostate and colon. With rising rates of age-related and environmental cancers, better-targeted "magic bullet" GPCR drugs would have widespread benefits.



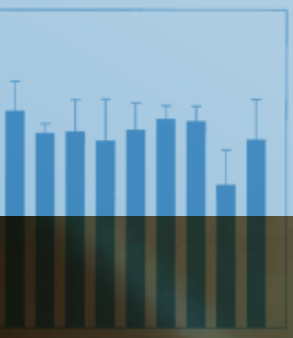
In fact, half the drugs in use today target GPCRs, activating or inhibiting them. They are used to lower blood pressure, combat allergies, treat depression, calm arthritis, heal stomach ulcers and block pain. Yet their actions are often too broad, leading to side effects that can be serious, even dangerous.

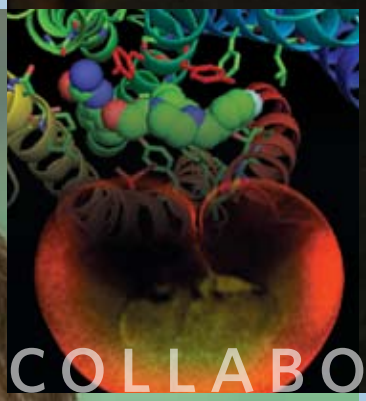


Upper right:
Nagarajan Vaidehi, Ph.D.,
City of Hope

Center:
3-D computer models of proteins help researchers more quickly investigate Wnt signal transduction pathways involved in development and disease.

Lower left:
Randall T. Moon, Ph.D.,
University of Washington





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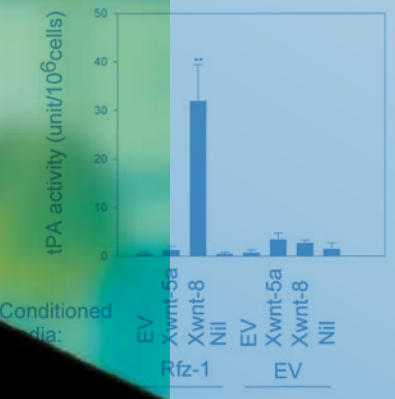


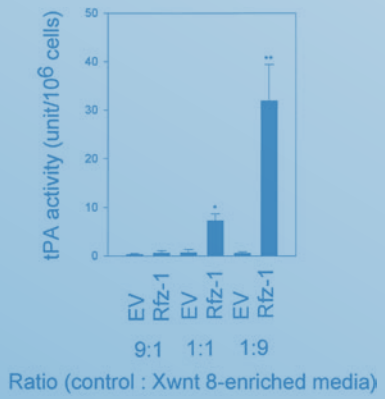
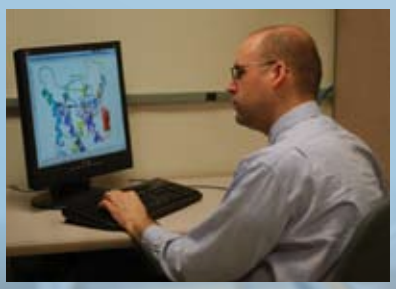


Photo by Elizabeth Lowry, 2006
University of Washington Medicine



Teams of chemists, physicists and computer scientists work to produce virtual GPCR models, then validate and refine them to ultimately bring much-needed GPCR drugs to patients.

Interest in protein structures is attracting pharmaceutical companies and universities across the globe to work with City of Hope.

Designing the next generation of GPCR drugs requires data on the three-dimensional structure of each receptor protein. But because membrane-bound proteins are hard to crystallize, their structures cannot be visualized directly. One solution is to construct virtual models of these receptor proteins using computational methods based on the fundamental laws of physics. It is a challenge that takes teams of chemists, physicists and computer scientists to solve.

At City of Hope's Division of Immunology, Nagarajan Vaidehi, Ph.D., is leading the charge. Starting with basic atomic forces, she and her colleagues predict the theoretical 3-D structures and binding sites of small molecules within GPCRs. Each structure requires months to generate, using dozens of computers. Then, further experiments are needed to validate and refine the model.

But while the structures may be theoretical, the need for progress in GPCR drugs is real. Interest in GPCR structures is attracting pharmaceutical companies to work with City of Hope, and promotes collaborations with the universities of California, Texas, Pittsburgh and North Carolina, California Institute of Technology, Jet Propulsion Laboratory, New York University and Imperial College London, among others.

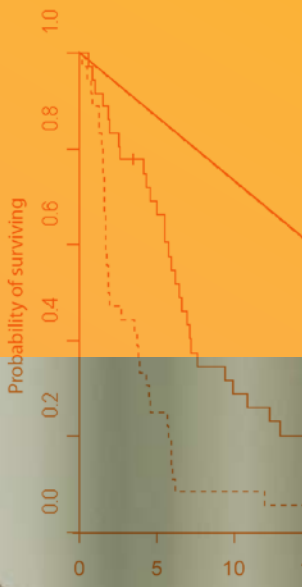
At the University of Washington, scientist Randall T. Moon, Ph.D., had evidence that a certain GPCR was involved in cancer, but needed to understand its structure, as well as identify small molecules that could turn the receptor on or off. Working together with Moon, Vaidehi's team predicted the receptor's structure and rapidly identified 20 possible modulators from a database of hundreds of thousands of molecules — one of which may be a perfect fit.

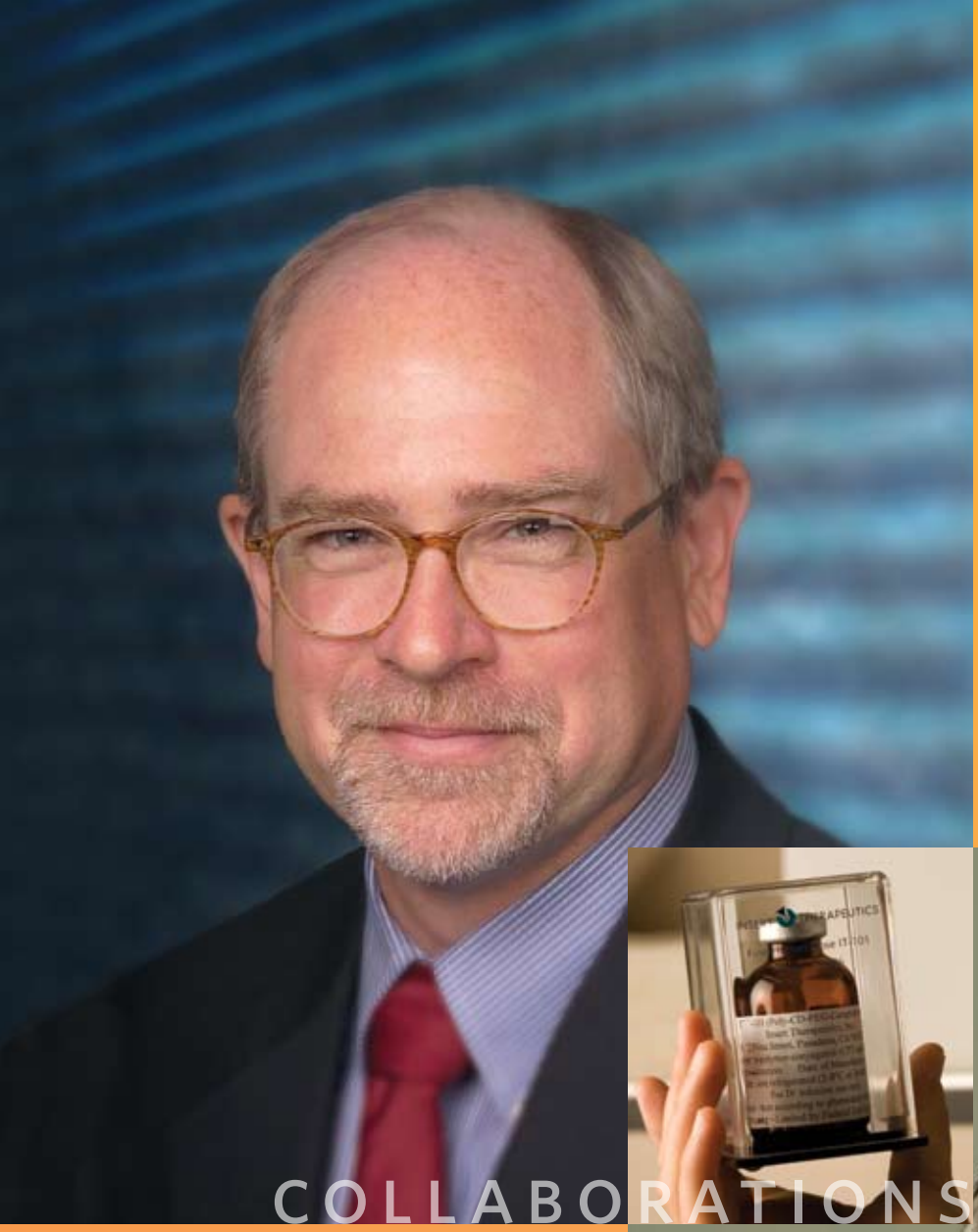
Upper left:
Mark E. Davis, Ph.D.,
Warren and Katharine Schlinger
Professor of Chemical Engineering,
California Institute of Technology

Center:
Human dose vial of ribonucleotide
reductase inhibitor used in the first
clinical trial.

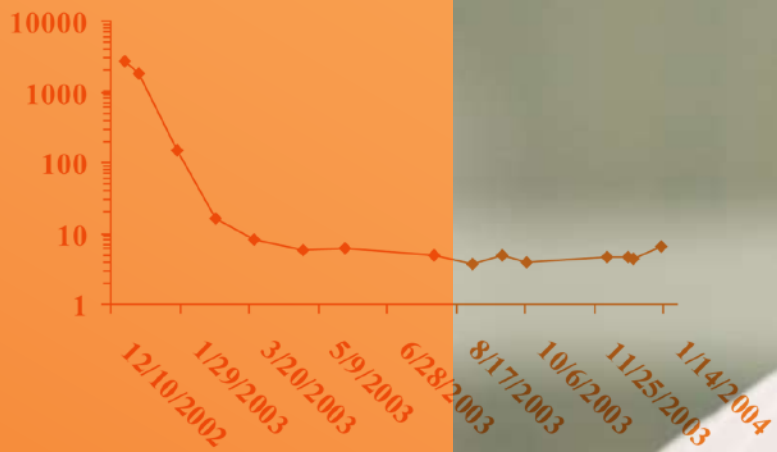
Lower right:
Yun Yen, M.D., Ph.D., City of Hope

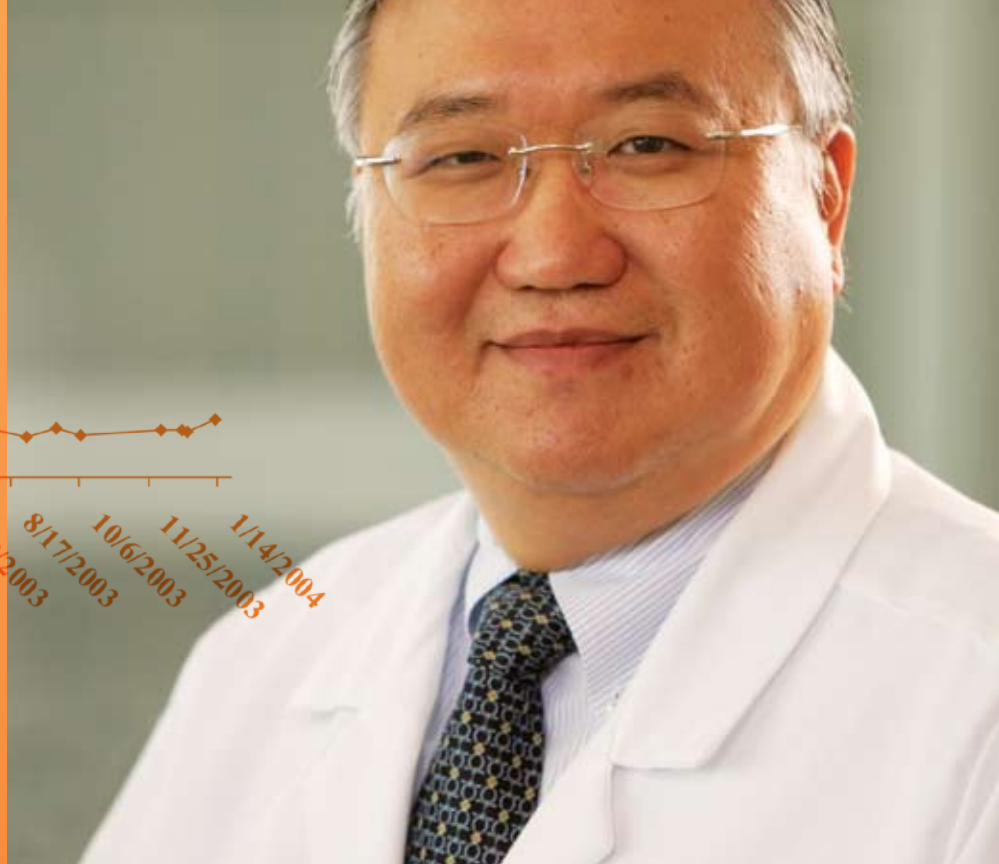
Photo courtesy of California Institute of Technology





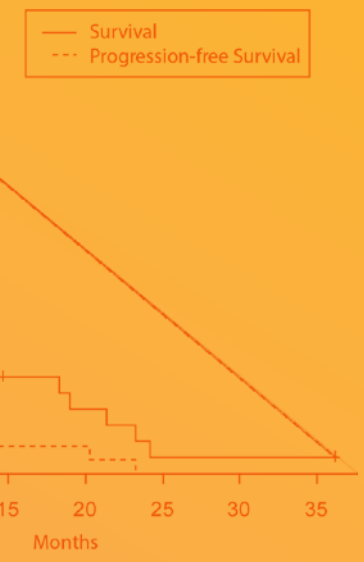
COLLABORATIONS





DEFEATING DRUG RESISTANCE

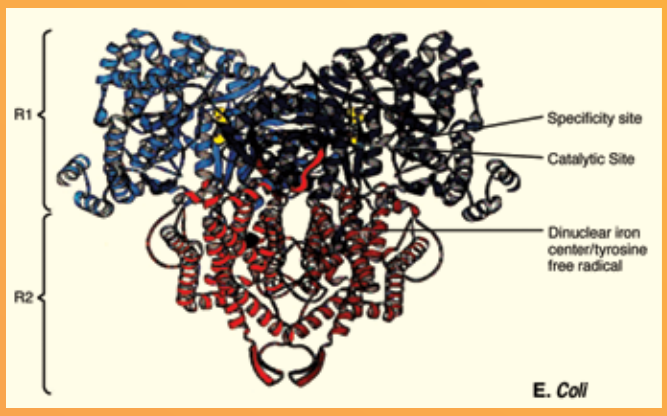
RIBONUCLEOTIDE REDUCTASE INHIBITORS



Many cancer drugs seem to work well at first. But too often, the disease returns. And when it does, it can hit even harder and faster than before. Many cancers actually develop resistance to chemotherapy. Finding a way to defeat this drug resistance is a significant step toward finding a cure.

At City of Hope, Yun Yen, M.D., Ph.D., director of Clinical and Molecular Pharmacology and co-leader of the Developmental Cancer Therapeutics Program, believes the answer may be found in an enzyme that cells use naturally to repair and restore themselves. The enzyme ribonucleotide reductase (RR) converts ribonucleotides into the building blocks of DNA, an essential part of the normal process of cell growth, including the ability to fix damaged genes. But in cancer cells, RR production can go into overdrive, allowing cancers to survive attacks by chemotherapy and promoting the spread of new malignant cells that can invade healthy tissues.

For 17 years, Yen's research has focused on understanding the gene that codes for RR and how the enzyme itself helps cancer spread. One well-known chemotherapy drug, hydroxyurea, is known to work by inhibiting RR. But if surviving cancer cells learn to resist the drug, it can lead to recurrence. Today, Yen's group is pressing to find more effective anticancer agents, including combining newer RR inhibitors with gemcitabine, the only drug approved for pancreatic cancer.



Yen discovered the mechanism by which cancer cells become resistant to gemcitabine — a finding that is actively being exploited in the search for new cancer drugs.

Collaborative research is accelerating progress in overcoming drug resistance. Within City of Hope, David Horne, Ph.D., director of the Synthetic Chemistry Core Facility, and Yate-Ching Yuan, Ph.D., manager of the Biomedical Informatics Core Facility, are designing new compounds with the ability to inhibit RR. These are tested at City of Hope's High Throughput Screening Core, directed by M.L. Richard Yip, Ph.D. The core facility is a resource where newly synthesized chemicals and thousands more from a library of molecules can be screened rapidly to assess whether they hold potential as possible treatments.

Meanwhile, Yen is also working with John Rossi, Ph.D., Lidow Family Research Chair in the Division of Molecular Biology, to investigate the use of small interfering RNA (siRNA) to "silence" the genes that produce RR through a mechanism called RNA interference (RNAi). Rossi is using the RNAi approach to fight HIV, and this approach is one of the most promising new investigational therapies for many diseases. The 2006 Nobel Prize in Medicine was awarded for the discovery of the RNAi mechanism.

Scientists at City of Hope and Caltech are collaborating to develop nanoparticles that can deliver drugs directly to cancer cells.

Taking the siRNA strategy a step further — to a level reminiscent of science fiction — City of Hope researchers are pursuing an inter-institutional project with Mark E. Davis, Ph.D., Warren and Katharine Schlinger Professor of Chemical Engineering at the California Institute of Technology, and a local start-up company called Calando Pharmaceuticals. Davis has engineered nanoparticles made of polymers that can deliver drugs directly to cancer cells.

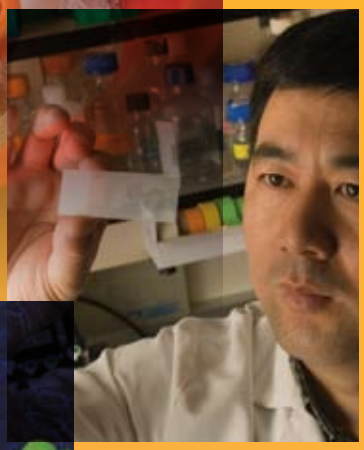
Preclinical studies conducted by Calando Pharmaceuticals suggested that nanoparticles containing siRNA to inhibit RR can serve as safe, effective drug-delivery vehicles. Plans for a clinical trial with cancer patients are already under way.

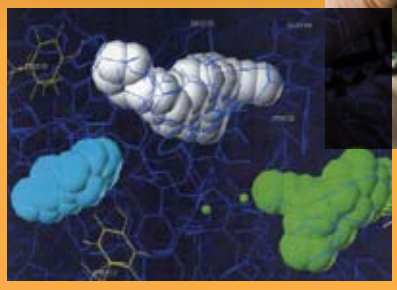
2004

Brainstorming session with Mark E. Davis, Ph.D., CalTech, and Yun Yen, M.D., Ph.D., and Stephen J. Forman, M.D., both from City of Hope

2005

Animal study
June 2005





City of Hope researchers pursue intra- and inter-institutional projects to find more effective anticancer agents.

2006

Preclinical study
December 2005

FDA approval given for clinical trial
March 2006

First patient enrolled into clinical trial
July 2006

Three-dose-level testing
December 2006

2007

Abstract submitted at American Society of Clinical Oncology annual meeting
January 2007

UNITING AGAINST INFECTION

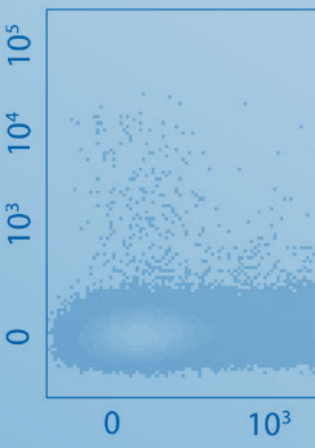
CYTOMEGALOVIRUS VACCINE

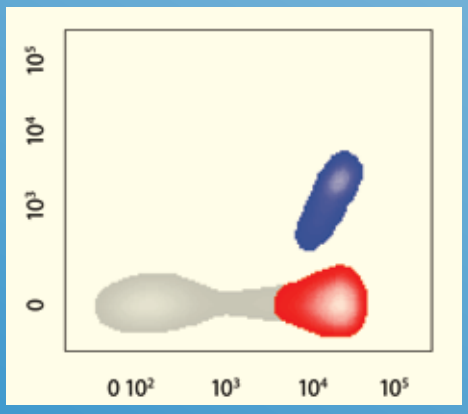
Stem cell and organ transplants offer hope to patients with cancer and other serious illnesses. But for the transplant to succeed, the patient's own immune system must be suppressed to reduce the chance of transplant rejection. And that opens the door to infection.

Too often, patients whose immune systems have been weakened fall victim to cytomegalovirus (CMV), a common herpes virus that can be found in 50 to 80 percent of adults in the United States. Normally, infections are mild; afterward, the virus remains dormant, held in check by a healthy immune system. But after a transplant or other immune-compromising event, CMV can reactivate, causing pneumonia and other deadly diseases. About half of bone marrow transplant patients develop active CMV infections; the virus also is a major cause of death in organ transplant patients.

The list goes on: CMV harms dialysis patients, causes blindness in HIV patients and is the leading congenital infection in newborns. CMV is responsible for hundreds of infant deaths and thousands of serious birth defects in babies annually. The Institute of Medicine has called the development of a CMV vaccine a national medical priority.

While antiviral drugs can be effective against CMV, they are undesirably toxic. As a much-needed alternative, City of Hope scientists have teamed up to develop a CMV vaccine, based on years of accumulated research. Their efforts took a giant leap forward in 2006, when the Food and Drug Administration approved the first human clinical trial of a synthetic CMV vaccine.



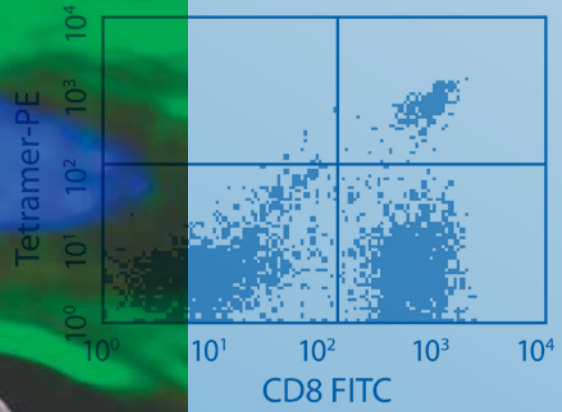


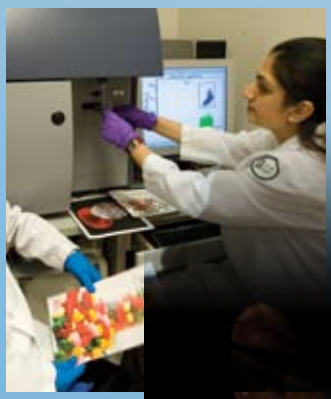
Upper right:
Don J. Diamond, Ph.D.,
City of Hope

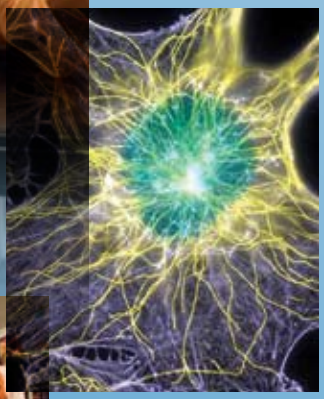
Center:
Cytomegalovirus and
red blood cell.

Lower left:
John A. Zaia, M.D.,
City of Hope

COLLABORATIONS







Scientists and physicians work together on a phase I clinical trial to gather data on safety, metabolism and other parameters of the CMV vaccine.

At the heart of the vaccine is a peptide molecule that originated at City of Hope and is now being produced for further studies by the National Cancer Institute.

Don J. Diamond, Ph.D., director of the Laboratory of Vaccine Research, is heading a project in which two formulations of the vaccine are being tested, each with and without a biochemical regulator called an adjuvant. At the heart of the vaccine is a peptide molecule that originated at City of Hope and is now being produced for further studies by the National Cancer Institute (NCI).

In the phase I clinical trial, currently under way, healthy adult volunteers are being given the vaccine in one of its forms to gather data on safety, metabolism and other parameters. Parties collaborating in this groundbreaking project include Corinna La Rosa, Ph.D., assistant research scientist, and Simon F. Lacey, Ph.D., associate research scientist in the Division of Virology, John A. Zaia, M.D., chair of the Division of Virology, and Stephen J. Forman, M.D., Francis and Kathleen McNamara Distinguished Chair in Hematology and Hematopoietic Cell Transplantation. Coley Pharmaceutical Group is contributing the adjuvant. SAIC-Frederick and the NCI sponsored the development of early data, and the Pasteur Institute furnished preclinical models used in establishing the potency of the vaccine.

In the next phase, transplant donors will receive the vaccine to evaluate whether immunity to CMV can be transferred along with their bone marrow or other tissues. Meanwhile, Diamond and his colleagues are pressing ahead with a second-generation vaccine engineered by Zhongde Wang, Ph.D., M.D., assistant research scientist in the Division of Virology, to combat congenital CMV, with broader applicability in transplant recipients; the project has received long-term funding from the NCI. The National Institute of Allergy and Infectious Diseases and Bernard Moss, M.D., Ph.D., chief in the Laboratory of Viral Diseases, have provided a crucial component to this project, which is anticipated to assist in regulatory approval.

PARTNERS IN HOPE

A landmark number of endowed chairs, bequests, generous gifts and grants in 2006 accelerated City of Hope's quest to develop treatments and cures for those suffering from devastating diseases. The generous giving reflected the ongoing confidence of supporters in the organization's mission.

The year was one of unprecedented generosity. City of Hope supporters gave more than $122 million, the most ever raised in a single year. Bequests, or donations made through wills and trusts, also surpassed previous levels, totaling nearly $34 million. The dedicated efforts of thousands of individuals, foundations, corporations and volunteer groups and auxiliaries nationwide contributed to this remarkable year, ensuring that key City of Hope research, education and treatment programs continue to grow and progress.

Furthering a partnership that began nearly a quarter century ago, a $20 million gift from the Arnold and Mabel Beckman Foundation established the Arnold and Mabel Beckman Center for Cancer Immunotherapeutics and Tumor Immunology. This modern, 108,000-square-foot facility will blend basic science with clinical studies and focus on immunotherapy, a treatment that uses the immune system to fight cancer and other diseases.

In making their gift, Arnold and Mabel Beckman Foundation leaders pledged $15 million to match a $15 million gift made by an anonymous donor, and another $5 million to spur additional gifts. Other significant support for the facility in 2006 included a $2 million bequest from the estate of Diana Chudacoff Levin.

The project also received a commitment from the National Office Products Council, the executive advisory board of the National Office Products Industry, which pledged $5 million from the industry group's annual fundraising campaigns through 2009 to support the Arnold and Mabel Beckman Center. Consequently, $500,000 of the industry group's 2006 contributions was earmarked for the National Office Products Industry Cellular and Tumor Immunotherapies Center, which will be located on the third floor of the Arnold and Mabel Beckman Center.

The Arnold and Mabel Beckman Center also will house City of Hope's Center for Graduate and Professional Studies, which benefited from a $750,000 grant to establish and equip the Ralph M. Parsons Foundation Teaching Laboratory.

Other important foundation support during the year included a $511,130 grant from The UniHealth Foundation to enhance nursing training, a $500,000 grant from the Skirball Foundation to support

Mabel and Arnold Beckman

T-cell therapy research for lymphoblastic leukemia, a $500,000 grant from The Henry L. Guenther Foundation to purchase a 3T magnetic resonance imaging machine, and $450,000 from the W.M. Keck Foundation to fund research to understand the molecular mechanisms underlying cancer and develop new therapies that would destroy lymphoma cells without harming normal cells.

Another critical program, transfusion medicine, benefited from the altruism of longtime Home Furnishings Industry group supporter Michael Amini, chairman and chief executive officer of Amini Innovation Corporation, who contributed a $6 million gift. The three-story Michael Amini Transfusion Medicine Center will consolidate City of Hope's blood collection and processing programs and provide a modern, comfortable environment for patients, donors and staff.

Michael Amini

The funding of several new endowed chairs throughout the year bolstered research efforts, as well. An unexpected bequest of more than $5.8 million from a Laguna Beach, Calif., couple whose family member was treated at City of Hope in the 1960s established the Edward and Estelle Alexander Chair in Information Sciences. As the first holder of the new chair, City of Hope Cancer Center Associate Director Joyce C. Niland, Ph.D., will continue leading City of Hope's collaborations with other cancer centers to create a global information model to speed future biomedical research.

Stephen J. Forman, M.D., was named as the first holder of the Francis and Kathleen McNamara Distinguished Chair in Hematology and Hematopoietic Cell Transplantation, established by a $2.5 million gift from Kathleen McNamara, a patient of Forman's, and her husband, Francis "Chip" McNamara.

Another $2.5 million gift from the family of late City of Hope patient and prominent Las Vegas builder Martin Collins established the Pauline and Martin Collins Family Chair in Urology. The first holder is Timothy Wilson, M.D., director of the Department of Urology & Urologic Oncology and the Prostate Cancer Program.

Furthering years of commitment to City of Hope, Sheri Biller, vice chair of the board of directors at City of Hope, and her husband, Les, were inspired to enhance the institution's patient support services. Aiming to create a single place where patients and families can turn for help in coping with cancer, the Sheri & Les Biller Family Foundation pledged $2 million to establish the Sheri & Les Biller Patient and Family Resource Center.

Continuing their steadfast support, more than 30 industry groups generated tens of millions of dollars through fundraising

endeavors such as *Spirit of Life*® galas and golf tournaments. The Home Furnishings Industry raised a record $10 million, including the $6 million Amini gift, during their annual fundraising effort. The National Office Products Industry's "Give. Hope." campaign yielded more than $6.2 million, while the Hardware/Homebuilding Industry raised more than $3 million. Members of the food and drug industries groups in the western United States and Arizona raised more than $4.8 million. And, furthering more than three decades of support, the Music and Entertainment Industry generated more than $3 million through its annual campaign.

Additional entertainment industry support came through promotional spots recorded by nine-time Grammy-winner and breast cancer survivor Sheryl Crow. The spots began running nationwide in fall 2006 through airtime donated by Premiere Radio Networks and Movie Tunes, raising City of Hope's profile across the country. The ads reached more than 190 million radio listeners and played in 16,500 movie theaters in the United States.

Through alliances with national brands including 3M, Hansen's, Kellogg's, Office Depot, OfficeMax, Mattel, Sanford and Unilever, cause-related marketing programs raised a total of nearly $4 million for City of Hope. Staples, one of the organization's largest cause-marketing participants in 2006, created customer-donated programs that garnered nearly $1 million and generated invaluable national visibility for City of Hope.

Epitomizing the commitment of City of Hope's thousands of auxiliary members nationwide, decades-long supporter Morris (Morrie) Darnov and his daughter, Sharon, generously donated a combined gift of $2 million in memory of Natalie Darnov, Morrie's wife and Sharon's mother. For more than four decades, Natalie and Morrie Darnov served as dedicated members of Los Angeles' Gift of Life Chapter. Morrie remains an active chapter member.

More than 22,000 participants in nine cities around the nation raised more than $2.5 million in an effort to eradicate the most prevalent cancer in women through City of Hope's national campaign, Walk for Hope to Cure Breast Cancer. Increased team participation and support from national sponsors such as Wells Fargo, 3M Post-It Sticky Notes, Hilton HHonors, *Good Housekeeping* magazine, Orbitz and Sandals/Beaches resorts, as well as cash sponsors Bamboo, Anne Michelle and Sebastian Body Double, all contributed to a successful Walk season.

Estelle and Edward Alexander


Quartz

FINANCIALS

Patient Information

(For fiscal years beginning October 1 and ending September 30)
(dollar amounts in thousands)

Charges for Patient Services	2006	%	2005	%
Medicare	$ 231,246	25.4%	$ 178,393	24.3%
Indemnity insurance	2,975	0.3%	8,266	1.1%
Managed care contracts	523,300	57.3%	422,939	57.4%
Subsidized care	155,332	17.0%	126,633	17.2%
Total	$ 912,853	100.0%	$ 736,231	100.0%

Payments Received for Patient Services	2006	%	2005	%
Medicare	$ 56,503	17.1%	$ 47,212	17.5%
Indemnity insurance	2,123	0.6%	3,296	1.2%
Managed care contracts	225,299	67.8%	199,242	73.7%
Medi-Cal and other	48,270	14.5%	20,463	7.6%
Total	$ 332,195	100.0%	$ 270,213	100.0%

Patients Treated (based on admissions)	2006	2005
New patient referrals	6,419	6,148
Patients treated during year	17,695	16,894
Admissions	4,934	4,643
Patient days	49,330	43,745
Clinic and infusion visits	109,603	102,605
Bone marrow transplants (BMT)	605*	460*

*includes BMT performed at City of Hope • Banner Good Samaritan

City of Hope and Affiliates Combined Statements of Financial Position

(For fiscal years beginning October 1 and ending September 30)
(dollar amounts in thousands)

ASSETS

Current Assets	2006	2005*
Cash and cash equivalents	$ 49,473	$ 51,041
Investments	71,072	53,437
Patient accounts receivable, less allowances for uncollectible accounts of $3,377 in 2006 and $2,010 in 2005	64,415	52,971
Grants and other receivables	15,187	9,288
Donor restricted unconditional promises to give, net	10,588	11,867
Prepaid and other	28,291	15,322
Total current assets	$ 239,026	$ 193,926
PROPERTY, PLANT AND EQUIPMENT, net of accumulated depreciation of $273,123 in 2006 and $242,257 in 2005	$ 371,440	$ 366,246

Other Assets		
Investments	$ 9,133	$ 5,334
Board-designated investments	161,234	136,002
Bond trust funds	41,774	12,367
Escrow funds	–	1,699
Donor restricted assets	128,989	94,236
Other assets	11,870	10,532
Total other assets	353,000	260,170
TOTAL ASSETS	$ 963,466	$ 820,342

*Certain reclassifications were made to the 2005 financial statements to conform to the 2006 presentation.

(For fiscal years beginning October 1 and ending September 30)
(dollar amounts in thousands)

LIABILITIES AND NET ASSETS

Current Liabilities	2006	2005*
Accounts payable and accrued liabilities	$ 72,281	$ 98,545
Long-term debt, current portion and accrued interest	14,015	10,349
Total current liabilities	86,296	108,894
LONG-TERM DEBT, net of current portion and unamortized discount of $2,131 and $2,259 as of September 30, 2006 and 2005, respectively	241,144	191,613
ANNUITY AND SPLIT-INTEREST AGREEMENT OBLIGATIONS	19,670	19,037
Other	7,036	5,608
Total liabilities	$ 354,146	$ 325,152

COMMITMENTS AND CONTINGENCIES

Net Assets		
Unrestricted	$ 457,589	$ 382,940
Restricted	151,731	112,250
Total net assets	609,320	495,190
TOTAL LIABILITIES AND NET ASSETS	$ 963,466	$ 820,342

*Certain reclassifications were made to the 2005 financial statements to conform to the 2006 presentation.

City of Hope Combined Statements of Activities

(For fiscal years beginning October 1 and ending September 30)
(dollar amounts in thousands)

Revenues	2006	2005
Net patient service revenues	$ 332,195	$270,213
Contributions and net special event revenues	124,867	85,645
Royalties and research grants	151,884	123,754
Other	32,330	23,995
Total revenues	$ 641,276	$503,607
Expenses		
Program services	$ 441,862	$370,107
Supporting services	83,780	82,437
Total expenses	525,642	452,544
Operating income	115,634	51,063
Change in net unrealized (loss) gain on investments	(998)	6,755
Loss on interest rate swap agreement	(506)	–
FEMA grant used for eligible construction projects	–	272
Changes in net assets	114,130	58,090
Net assets, beginning of year	495,190	437,100
Net assets, end of year	$ 609,320	$495,190

City of Hope Combined Statements of Cash Flow

(For fiscal years beginning October 1 and ending September 30)
(dollar amounts in thousands)

Cash Flows from Operating Activities	2006	2005
Changes in net assets	$114,130	$ 58,090
Adjustments to reconcile changes in net assets to net cash provided by operating activities:		
Depreciation and amortization	31,333	24,103
Unrealized (loss) gain on investments	998	(6,755)
Other changes in operating assets and liabilities	(59,830)	(17,321)
Total adjustments	(27,499)	27
Net cash provided by operating activities	$ 86,631	$ 58,117
Cash Flows from Investing Activities		
Proceeds from sales of property, plant and equipment	$ 416	$ 786
Additions to property, plant and equipment	(36,212)	(56,707)
Change in investments	(95,632)	(21,560)
Net cash used in investing activities	$(131,428)	$ (77,481)
Cash Flows from Financing Activities		
Net cash provided by financing activities	$ 43,229	$ 33,066
Net increase in cash and cash equivalents	(1,568)	13,702
Cash and cash equivalents, beginning of year	51,041	37,339
Cash and cash equivalents, end of year	$ 49,473	$ 51,041

PROGRAMS AND FACILITIES

COMPREHENSIVE CANCER CENTER

A National Cancer Institute (NCI) Cancer Center since 1981, City of Hope received the prestigious "comprehensive" designation from the NCI in 1998, and it was renewed in 2004. This designation makes City of Hope one of only a few such centers in the United States that combines all facets of cancer research and care with the highest standards of excellence. An additional component of the NCI designation includes community outreach, education and population-based research. City of Hope's recently created Division of Population Sciences addresses this by focusing on understanding the origins of cancer, as well as research to better comprehend long-term outcomes of treatment. City of Hope also sponsors community outreach and education forums targeting both health-care professionals and the public. Through all of these activities combined, NCI-designated cancer centers, like City of Hope, play an important role in their communities, influencing standards of cancer prevention and treatment.

BECKMAN RESEARCH INSTITUTE

With a staff of more than 545, including nearly 80 principal scientists, City of Hope's Beckman Research Institute is one of the nation's premier centers for groundbreaking biomedical research. City of Hope scientists undertake fundamental investigations in molecular genetics and cellular biology; they study normal and abnormal biological processes, including mutagenesis and DNA repair, cell differentiation and early development, inter- and intracellular signaling, RNA processing and genome structure. These scientists have achieved major advances in recombinant DNA technology, monoclonal antibodies, gene therapy and radioimmunotherapy. The divisions of Biology, Immunology, Neurosciences, Molecular Medicine, Molecular Biology, Virology and Cancer Immunotherapeutics and Tumor Immunology, and the departments of Gene Regulation and Drug Discovery, Surgical Research and Radiation Biology provide the framework for the institute's work.

NATIONAL MEDICAL CENTER

The National Medical Center is the place where more than 138 physicians representing 25 board-certified specialties help bring City of Hope's research full circle. Here, new and promising treatment options are made available to patients long before they become available in the community. At any given time, City of Hope conducts more than 300 clinical studies, involving 40 percent of its eligible patients. The national average is less than 5 percent.

Helford Clinical Research Hospital at City of Hope, which opened in 2005, began a new chapter in City of Hope's mission of bringing cures to people battling cancer and other life-threatening illnesses. This state-of-the-art facility is the culmination of decades of scientific, clinical and fundraising efforts. It embodies the organization's medical and technological expertise and treatment approaches.

CENTER FOR BIOMEDICINE & GENETICS AND THE SYLVIA R. & ISADOR A. DEUTCH CENTER FOR APPLIED TECHNOLOGY DEVELOPMENT

Made possible by generous support from the National Office Products Industry, the Center for Biomedicine & Genetics (CBG) is licensed by the state and federal government to produce pharmaceutical-grade therapeutic compounds. This provides a cost-effective way to expedite the delivery of experimental biological therapies to patients. City of Hope established the CBG to ensure that its technological innovations are efficiently translated from the research lab to the clinical setting, while allowing scientific and clinical investigators the

freedom to test and refine the most promising new therapeutics. As a National Gene Vector Laboratory, the CBG is also responsible for the production of plasmid DNA vectors for federally funded gene therapy research. In recognition of their generous gift, the first floor of the CBG facility is named the Sylvia R. & Isador A. Deutch Center for Applied Technology Development.

GENERAL CLINICAL RESEARCH CENTER

The General Clinical Research Center (GCRC) at City of Hope, a partnership with the University of Southern California, is one of only 59 centers nationwide funded by the National Center for Research Resources of the National Institutes of Health. The GCRC provides an optimal setting for medical investigators to conduct safe, controlled, state-of-the-art inpatient and outpatient studies. GCRC resources include highly trained research personnel, a core laboratory, a bioinformatics system and a metabolic kitchen. The GCRC research staff includes nurses, dietitians, biostatisticians, skilled technicians and administrative personnel to help investigators by facilitating the day-to-day research process and assisting the research patients in a supportive and efficient environment.

GRADUATE SCHOOL OF BIOLOGICAL SCIENCES

For 13 years, City of Hope's accredited Graduate School of Biological Sciences has provided a unique training ground for tomorrow's scientists. It offers postgraduate training in molecular biology, immunology, molecular medicine and neurosciences, including academic classes and intensive laboratory research. Working toward the completion of their doctoral degrees, students have access to state-of-the-art facilities and shared resources to facilitate their research and are able to collaborate alongside faculty who are experts in their fields.

CITY OF HOPE • BANNER GOOD SAMARITAN BONE MARROW TRANSPLANTATION (BMT) PROGRAM

In partnership with Banner Health System, City of Hope has built a successful satellite BMT program in Phoenix, serving area residents. This joint program has been designated as a member of the Southwest Oncology Group, one of the largest of the National Cancer Institute-supported cancer clinical trials cooperative groups in the United States. This provides patients with access to key clinical trials and research protocols.

SOUTHERN CALIFORNIA ISLET CELL RESOURCE CENTER

Housed in the Leslie and Susan Gonda (Goldschmied) Diabetes and Genetic Research Center, the Southern California Islet Cell Resource (SC-ICR) center is one of only seven islet cell resource (ICR) centers funded by the National Institutes of Health. City of Hope performed the most islet transplants in the U.S. in 2004 and 2005 and distributed the largest number of islets to basic science programs throughout the U.S. since 2004. During the most recent funding period of the ICR program, City of Hope was the only center funded in the western U.S. In May 2004, City of Hope became the first islet transplant center without a whole organ transplantation program to become a member of the United Network of Organ Sharing. Additionally, in 2006, City of Hope was designated an islet cell transplant center by the Juvenile Diabetes Research Foundation, making it one of only 14 institutions in the U.S. to receive this distinction and the only one in Southern California. The center also offers a total-care diabetes and endocrinology program and has helped millions of diabetics worldwide who benefit from synthetic human insulin developed through research conducted at City of Hope.

RESEARCH AND CLINICAL DIVISIONS, DEPARTMENTS AND PROGRAMS

COMPREHENSIVE CANCER CENTER RESEARCH PROGRAMS AND FACILITIES

Cancer Biology
Cancer Control and Population Sciences
Cancer Immunotherapeutics
Developmental Cancer Therapeutics
Hematologic Malignancies

BECKMAN RESEARCH INSTITUTE DIVISIONS

Biology
Cancer Immunotherapeutics and Tumor Immunology
Immunology
Molecular Biology
Molecular Medicine
Neurosciences
Virology

NATIONAL MEDICAL CENTER DIVISIONS/ DEPARTMENTS

Anesthesiology
Diagnostic Radiology
- Nuclear Medicine

Hematology & Hematopoietic Cell Transplantation
- Hematopoietic Stem Cell and Leukemia Research

Information Sciences
- Biomedical Informatics
- Biostatistics
- Clinical Research Information Management

Medical Oncology & Therapeutics Research
- Aging and Cancer Research Program
- Clinical and Molecular Pharmacology

Medical Specialties
- Cardiology
- Diabetes, Endocrinology & Metabolism
- Gastroenterology
- Infectious Diseases
- Neurology
- Psychology
- Pulmonary and Critical Care Medicine
- Supportive Care & Palliative Medicine

Pathology
- Anatomic Pathology
- Clinical Pathology
- Transfusion Medicine

Pediatrics
Population Sciences
- Behavioral Oncology
- Center for Cancer Survivorship
- Center of Community Alliance for Research & Education
- Clinical Cancer Genetics

- Etiology
- Nursing Research and Education
- Outcomes Research/Intervention

Radiation Oncology
- Clinical Radiation Oncology
- Radiation Biology
- Radiation Physics

Surgery
- General and Oncologic Surgery
- Neurosurgery
- Orthopaedic Surgery
- Plastic and Reconstructive Surgery
- Surgical Research
- Thoracic Surgery
- Urology and Urologic Oncology

NATIONAL MEDICAL CENTER DISEASE-SITE PROGRAMS

Brain Tumor Program

Breast Cancer Program
- Rita Cooper Finkel and J. William Finkel Women's Health Center

Diabetes, Endocrinology & Metabolism
- Gene Regulation and Drug Discovery
- Islet Cell Transplantation Program

Gastrointestinal Cancer Program

General Clinical Research Center

Genitourinary/Prostate Cancer Program

Gynecologic Cancer Program

Liver Cancer Program

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