



FACTS about DIABETES

RESEARCH & CARE

California Biotechnology Companies are at the Forefront of Diabetes Research and Care

- **Diabetes is the seventh leading cause of death in California.** It is the primary cause of blindness, kidney failure and amputation, and is a significant contributor to heart attacks and strokes.
- **Over two million Californians** have diabetes, and another four million have pre-diabetes. By the year 2020, the prevalence of diabetes in California is expected to exceed four million people. Unfortunately, more than 25 percent of diabetes cases go undiagnosed.

Diabetes is a metabolic disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches and other foods into energy needed for daily life. The cause of diabetes continues to be a mystery, although genetics and environmental factors such as obesity and lack of exercise appear to play key roles.

There is no cure for diabetes, but there is hope.

Biotechnology is Revolutionizing Diabetes Diagnosis and Treatment

Biotechnology is revolutionizing the diagnosis of diabetes, particularly in identifying individuals who are at risk for developing the disease in the first place. Through biotechnology, scientists are now able to use a simple blood test to detect specific auto-antibodies in the body. The presence of these antibodies is a valuable marker to predict type 1 diabetes months, or even years, before its onset.

Perhaps the most significant contribution of biotechnology to diabetes treatment has been through the development of human insulin. Prior to the discovery and production of human insulin by the biotech industry, patients had to rely on insulin derived from pig and cow pancreases to treat diabetes. Oftentimes, animal insulin injections caused serious complications in the human body.

Through DNA technology, researchers have been able to synthetically produce insulin that is in every way identical to that produced by the human pancreas. This is not only much better suited to treat diabetes in humans than the animal insulin used in the past, but also provides versions that absorb faster and act quicker than traditional insulin injections.

Biotechnology researchers continue to look for methods to prevent diabetes and eventually find a cure. Their breakthrough research into the genetic aspects of the disease is astounding. Numerous biotechnology companies in California have approved or are developing nearly 60 diabetes and metabolic disorder-related treatments to diffuse this serious disease.



*Sergio Cuellar was diagnosed with Type II diabetes when he was 26 years old. As a Senior Program Director for a nonprofit organization, **Youth in Focus**, Sergio works with underrepresented youth and adult partners in the community toward youth-led action research, evaluation and planning to create the conditions for social justice and positive changes in kids' lives.*

Sergio Cuellar, age 30 Patterson, California

Diabetes runs in Sergio's family, so when he started experiencing typical diabetic symptoms such as extreme thirst and frequent urination, he immediately made an appointment to see his doctor. Even though Sergio had witnessed the effects of diabetes through family members, his own diagnosis came as a quite a shock.

Sergio's doctor administered a strict course of therapy: a low-carb diet, an intense exercise program and a state-of-the-art biotechnology treatment regimen that would lower his blood sugar levels by stimulating the pancreas to produce more insulin and decrease his chances of experiencing diabetes-related complications.

Initially, Sergio was discouraged by the limitations to his everyday life that diabetes caused. He was worried about the long-term effects of diabetes and was hesitant to participate in any of the activities he enjoyed for fear that he would aggravate the disease. Eventually, Sergio learned to manage his illness and keep his sugar levels stable by diligently maintaining his diet and exercise program and taking a cutting-edge biotechnology treatment for his diabetes.

Today, Sergio is in good condition and is able to live a normal and active lifestyle. If he misses his medication, he can instantly notice a change in the way he feels. He uses his experience with diabetes to not only help the kids he works with, but to get their advice as well.



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CALIFORNIA COMPANY	LOCATION	FDA-APPROVED TREATMENTS
Amylin Pharmaceuticals	San Diego	Symlin [®] for diabetes treated with insulin; Byetta [®] for lowering glucose levels
Pfizer La Jolla	La Jolla	Glucotrol [®] XL for lowering blood glucose levels; Exubera [®] for adults with type 1 and 2 diabetes
CALIFORNIA COMPANY	LOCATION	FDA-APPROVED DIAGNOSTICS AND DEVICES
Abbott Diabetes Care	Alameda	FreeStyle Flash [®] blood glucose monitoring system; CoZmonitor [®] insulin technology system; Precision Link [®] direct diabetes data management system
Bayer Corporation	Sunnyvale	A1CNow+ [®] , a pager-sized device for people with diabetes to monitor HbA1c
LifeScan a Johnson & Johnson Company	Milpitas	OneTouch [®] Ultra2 [®] Meter; OneTouch [®] UltraMini [™] Meter; among others
Medtronic	Northridge	MiniMed Paradigm [®] REAL-Time Insulin Pump and Continuous Glucose Monitoring System, Guardian [®] REAL-Time Continuous Glucose Monitoring System, CareLink [™] Therapy Management Software, Infusion Sets, CGMS [®] System Gold [™] : Continuous Glucose Monitoring System
Nektar Therapeutics	San Carlos	Inhaled insulin device used to transport Exubera [®]
CALIFORNIA COMPANY	LOCATION	IN DEVELOPMENT
Amgen	Thousand Oaks	AMG221 and AMG837 – to treat type 2 diabetes
Burnham Institute for Medical Research	La Jolla	Burnham faculty members are using a large-scale screening approach that employs a large number of compounds with varying chemical activities to locate those that can stimulate stem cells to become beta cells
Genentech	South San Francisco	Lucentis [®] for the treatment of diabetic macular edema
Geron Corporation	Menlo Park	Insulin-producing cells have been derived from human embryonic stem cells (hESCs); working to improve the yield of islet cells which characterize their secretion of insulin in response to glucose
Hollis Eden	San Diego	HE3286 to increase insulin sensitivity in type 2 diabetes
Isis Pharmaceuticals	Carlsbad	ISIS 113715 to increase insulin sensitivity in type 2 diabetes
Metabasis Therapeutics	La Jolla	MB07803 to increase insulin sensitivity in type 2 diabetes
Metabolex	Hayward	MBX-102 and MBX-2044 to address insulin resistance in people with type 2 diabetes; reduces edema without causing weight gain
Novocell	San Diego	Novocell is currently developing insulin-producing cells from hESCs to treat insulin-dependent Type 1 and Type 2 diabetics
Phenomix	San Diego	Dutogliptin to prevent increase in glucose levels
StemCells	Palo Alto	StemCells' Pancreatic Program is concentrating its efforts on type 1 diabetes, also known as juvenile or insulin-dependent diabetes
The Salk Institute for Biological Studies	La Jolla	Using modern gene chip technology, Salk and UCSD scientists have identified a number of genes that respond to insulin treatment in healthy cells, but don't respond in diabetic cells. Researchers have identified a protein called FINR that appears to disrupt this insulin relay

List is not comprehensive. Visit our web site at www.CaBiotech.org for more information.