

Targeted Diseases

The LSU Health Science Center Gene Therapy Program has embraced the mission to develop novel strategies for the treatment and prevention of genetic and infectious diseases, as well as certain types of cancer. Our research targets such common diseases including:

- Asthma is a chronic disease that affects the airways of the lungs. Those afflicted with asthma experience inflammation of the inside walls of the airways, making the airways very sensitive and narrowing, preventing the flow of air to the lungs. Symptoms are wheezing, coughing, chest tightness, and trouble breathing, especially at night and in the early morning. Asthma cannot be cured, but most people with asthma can control it experiencing few and infrequent symptoms. Ten percent of Louisiana households with children have at least one child with asthma. An estimated 200,000 adults in Louisiana suffer from asthma, and African Americans are more likely to have asthma than whites: 6.7% vs. 5.9%.
- Breast cancer is the second common type of cancer among women after skin cancer. Each year, more than 211,000 American women are diagnosed and over 40,000 Americans die from breast cancer. In Louisiana, nearly 4,000 new cases are detected annually, and 730 women die each year. African American women have lower incidence of breast cancer but higher cancer specific mortality rate due to late stage diagnosis.
- Cystic Fibrosis is the most prevalent and fatal genetic disorder affecting the Caucasian population: one out of every 3200 live births. As many as 80 to 95% of CF patients succumb to respiratory failure due as a result of progressive lung damage.
- HIV/AIDS infection with HIV (Human Immunodeficiency Virus) can weaken the immune system to the point that the system has difficulty fighting off certain infections, known as opportunistic infections. The immune system of a person with AIDS has weakened to the point that medical intervention may be necessary to prevent or treat serious illness. AIDS is the leading cause of death for young American between the ages of 25-44. Statistics reported for the State of Louisiana as of December 31, 2006, include 26,354 diagnosed cases of HIV/AIDS: 15,212 persons are living with HIV/AIDS while 7,928 have AIDS. Nationally, Louisiana ranked # 6 in AIDS cases and #10 in cases reported.
- Krabbe's Disease is a rare, inherited disorder affecting the central and peripheral nervous system. Most often affecting infants, it occurs in 1 out of every 100,000 births, and manifest when both parents carry the recessive gene. It is characterized by the presence of globoid cells (cells with more than one nucleus), the breakdown of the protective myelin coating, and the destruction of brain cells. The result is the progressive destruction of the nervous system.

- Lung cancer affects over 210,000 Americans every year, and it is the leading cause of cancer deaths in U.S. men and women. Lung cancer may be spread to the lymph nodes, or to other organs or tissues of the body, such as the bones, brain, or liver. In Louisiana, 3,160 new cases will be detected; 2,930 men and women will die from lung cancer.
- Prostate cancer is the second leading cause of cancer death among men in North America. Each year, more than forty thousand men die of prostate cancer in the United States because their cancer cells have spread to other organs, especially bones, beyond the prostate gland. This spreading or metastasis is currently untreatable. Therefore, there is an urgent need to develop new approaches that effectively prevent and eradicate prostate cancer metastases to improve the quality of life and long-term survival of these patients. In Louisiana, 3,690 new cases are detected and 480 men will die from prostate cancer. Deaths rates for African - American males are disproportionately higher than white males: 68% vs. 29%.
- Tuberculosis (TB) is a highly contagious, air-borne disease affecting the respiratory system. TB is a leading cause of death for people living with HIV/AIDS, due to their weakened immune system. Each year about 1.7 million people worldwide die from TB, though it is curable. The rapidly increasing HIV epidemic could also increase the number of HIV-related TB cases. The vast majority of cases occur in the developing world, with the highest rates per capita in Africa. Louisiana ranks #8 nationally for new cases. In 2006, 207 new cases were detected.