# Cancer Treatments
## Cures Within Reach

*by Simon Tchekmedyian, MD*

New advances in cancer therapy are based on a better understanding of cancer at a molecular level. We finally are identifying the genetic alterations affecting cancer cells. Cancer cells have multiple gene mutations that lead to abnormal growth and a tendency to invade and spread. Newer technologies allow researchers to define these genetic alterations.

A recent study analyzed over 13,000 genes in 11 breast cancers and 11 colorectal cancers and suggested an average of 11 mutated genes per cancer actually contributed to the development of the cancers. Most of these genes were not known to be involved in the cancer process until now. We can utilize this knowledge to more accurately locate cancer cells and pinpoint their vulnerabilities. This way, we can uncover cancer earlier and attack it with precision.

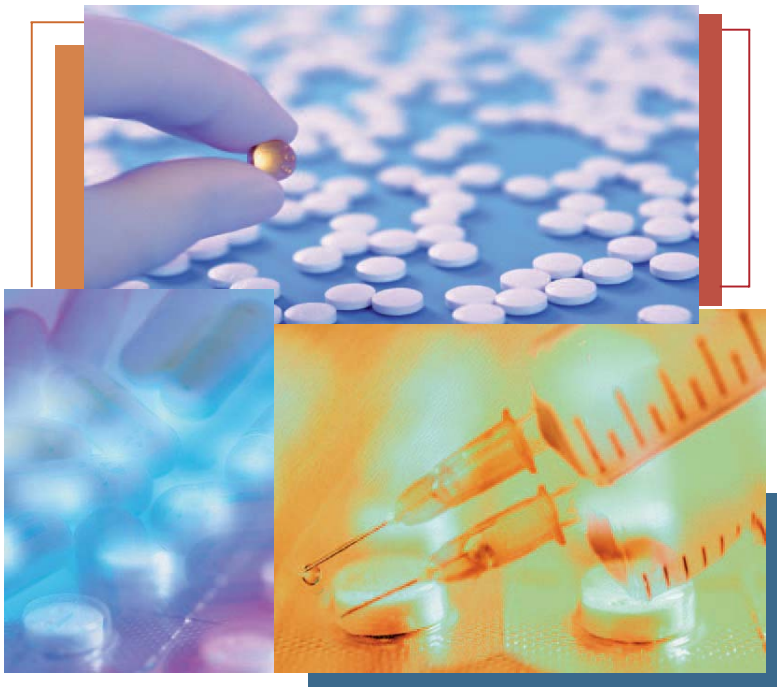
Research also reveals a great amount of interaction between cancer cells and the normal tissue cells around them. Cancer cells need nutrients and blood vessels from surrounding tissues to grow and spread. Normal tissues around the cancer cells, therefore, can also be a target of therapies that indirectly suppress the cancer.

Some cancers capture certain substances or molecules at a higher rate than normal tissues. This tendency allows us to use tests such as PET scanning to see them wherever they are in the body. This technique is also known as molecular imaging. Cancers may also leave an imprint in various parts of the body, including the circulating blood. Blood tests can measure trace amounts of substances released by the cancer, also known as cancer markers. Some well-known cancer markers are the CEA, PSA, CA19.9, CA15.3, and CA125.

By integrating this knowledge, we can achieve better diagnosis and therapy. Teamwork between basic researchers and clinicians is essential, and leads to "translational research," meaning that doctors who are discovering the genetic and molecular basis of cancer work together with doctors who directly treat the patients. Through this cooperation, basic research is translated more quickly into better therapies. That is the nature of the Translational Oncology Research International (TORI) Network led by Dr. Dennis Slamon at UCLA. As participants in this network, we continue to work to decipher the nature of cancer and bring about better diagnoses and curative therapies.

The Forty-second Annual Meeting of the American Society of Clinical Oncology took place in Atlanta, Georgia in June 2006. Here are some highlights from the meeting and additional recent developments.

**Multiple Myeloma:** A study of patients whose age was from 65 to 75 years compared three different treatments: 1) mild chemotherapy and prednisone; 2) mild chemotherapy, prednisone, and the medication thalidomide; and 3) very high-dose chemotherapy with autologous stem cell transplantation. The results revealed that patients who received treatment (2) fared better and, therefore, this treatment was superior. The high-dose treatment and transplantation had more side effects and did not improve the results. The medication thalidomide was associated with increased risk of blood clots, and therefore the use of blood thinners, if not contraindicated, was recommended. Recently, Revlimid®, a new medication related to thalidomide, was approved also for use in multiple myeloma.



**Chronic Myelogenous Leukemia**: The treatment of this disease has been revolutionized by the advent of the medication Gleevec™, which is very effective. Researchers have tested dasatinib, a new oral medication that targets multiple enzymes known as kinases, in the leukemia cells. Dasatinib (Sprycel®) can be effective when Gleevec™ stops working.

**Kidney Cancer:** Sunitinib (Sutent®) is an oral medication that attacks multiple sites on kidney cancer cells and stromal tumor (GIST) cells. The medication was compared to a more standard treatment with interferon. The response to sunitinib was superior. Sunitinib side effects included diarrhea, high blood pressure, and inflammation of hands and feet; but most of these side effects were relatively mild. Diarrhea, however, was fairly frequent. Sunitinib is clearly an important new option in the management of patients with advanced kidney cancer. Recently Sorafenib (Nexavar®), with similar mechanisms of action, was also approved for kidney cancer treatment.

**Breast Cancer:** A very important international study was presented with regard to patients whose cancer is HER-2 positive. These patients received either a mild oral chemotherapy (capecitabine) alone or the same oral chemotherapy in combination with the new medication lapatinib. The patients had received previous therapies for advanced HER-2 positive breast cancer and were not improving. Patients receiving lapatinib did better than patients on oral chemotherapy alone. Lapatinib is available through our clinical trials (see page 13).

Another study in patients with breast cancer suggested that relatively young women who have breast cancer known as triple negative (estrogen receptor negative, progesterone receptor negative, and HER-2 negative) may have an increase in the probability of carrying a familial genetic mutation (BRCA1) that increases the likelihood of developing breast cancer.

A study from the United Kingdom compared tamoxifen for five years after treatment of breast cancer to two to three years of tamoxifen followed by two to three years of an aromatase inhibitor medication. This study showed that switching to an aromatase inhibitor was associated with better results at five years.

A study based on the Iowa Women's Health Study in which 41,000 women were followed showed that higher physical activity was associated with a 10% reduction in the risk of breast cancer. Physical exercise should be part of our counseling for patients at risk of breast cancer or recovering from breast cancer treatment.

**Colorectal Cancer:** Vectibix™ (panitumumab) was just approved by the FDA for the treatment of

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