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Health

Six Miracle Cancer Survivors

Robert Langreth, 02.12.09, 9:00 AM ET

An experimental drug helped [Sharon Belvin](#), who was diagnosed with melanoma in her lung when she was 22 and spent two years in standard treatment. The drug is called ipilimumab, and it aims to trigger the immune system against cancer.

Within four months, her lung tumors started to shrivel. By late 2006, they were gone. Today Belvin, now 27, is off all treatment. She spends her time with her husband and 1-year-old daughter, Lilly Elizabeth, whom she calls "a miracle baby, after all we have been through."

Why do some patients beat the odds? Some go on experimental medicines that help them, but few others. Others take novel combinations of approved drugs that are too toxic for most to endure. The most mysterious cases of all are so-called spontaneous remissions, where tumors vanish without any treatment. Only a handful of such cases are reported in the medical literature each year.

[In Pictures: Six Miracle Cancer Survivors](#)

Each year, 566,000 Americans die of cancer. In 2004, cancer treatments cost \$72 billion, according to the most recent National Cancer Institute report. And by all accounts, they have since soared.

That some patients respond better to certain drugs than others is a focus of furious scrutiny at top labs. The reasons include everything from the immune system, to the particular mutations in a given tumor, to the sensitivity of stem cells inside a tumor to treatment.

One big reason why some patients do better than others is that their tumors may have particular sets of mutations that make them exquisitely sensitive to one drug or another. These rare responders tell us that "there are some unique, relatively tumor-specific mutations that must be occurring in these cancers that are therapeutically exploitable," says oncologist Ronald Natale of Cedars-Sinai Medical Center in Los Angeles.

Researchers are just beginning to discover the gene mutations that influence drug response. For example, about 10% of lung cancer patients have certain mutations in a protein called EGFR that make them far more likely to respond to Genentech's Tarceva. Meanwhile, oncologists showed last year that about 40% of colon cancer patients whose tumors have a mutation in a gene called kras never respond to the popular Erbitux from Eli Lilly.

Some researchers are even working to personalize treatment by implanting tumors directly from patients into lab mice and then seeing which drug combinations work best. This method, says Johns Hopkins University oncologist David Sidransky, may allow drug companies to perform trials of drugs on mice with human tumors to help pinpoint which drug combinations will work best against which types of tumor mutations.

Scientists are also finding tantalizing evidence that the immune system sometimes kicks in to play a role in combating cancer. This has been hotly debated for decades--and indeed many scientists remain unconvinced. But rare cases of spontaneous remission sometimes do occur, particularly in melanoma, kidney cancer and a few other tumors.

That's what [Charles Burrows](#) experienced. In November 2005, he was diagnosed with terminal liver cancer and given two months to live. Then, three months later, without any treatment, his tumor simply vanished. The case was so unusual that his doctors published it in a medical journal last year. Says Burrows, "I won a lottery, and I don't understand why."

While numerous explanations have been proposed for these mysterious remissions, one of the likeliest is that the body's immune system gets involved.

A spontaneous remission is "either divine intervention or the immune system," says Jedd D. Wolchok, an oncologist at New York's Memorial Sloan-Kettering Cancer Center. It's also possible that ordinary cancer survivors, people who beat the disease after getting radiation, chemotherapy or surgery, get an assist from their own immune systems.

Big drug companies, including Pfizer, Bristol-Myers Squibb and Sanofi-Aventis, are doggedly pursuing drugs that aim to boost the immune system to fight cancer. GlaxoSmithKline is in final-stage tests of a vaccine to prevent lung cancer from coming back after surgery.

Easier said than done, of course. Some patients, apparently, need only a small trigger to propel a massive anti-cancer attack. With most others, the cancer cells fight back successfully and even co-opt immune cells to aid their growth. Some tumors may simply be more visible to the immune system than others. In addition, there are numerous molecular brakes inside the body that keep the immune system from rampaging out of control; cancer cells evade the immune system by manipulating these brakes.

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