

## James Watson: Basing ‘war on cancer’ on genome research diverts resources

Since President Richard Nixon asked Congress for \$100 million to declare a “[war on cancer](#)” in 1971, [hundreds of billions](#) of dollars worldwide have been dedicated to research unlocking the mystery of the various forms of the disease, and how to treat it. But some suggest the war may be being fought on the wrong front.

Certainly our understanding of genetics, cellular growth and cancers has grown exponentially. We know how cancer can be linked to mutations of genes that either encourage abnormal cell growth, or wreck the internal system of checks and balances that normally stymie that growth. We have narrowed the number of those genes down to [several hundred](#). And, we know about genes that can halt abnormal development. We’re inserting them into cancerous cells in trials. Perhaps most significantly, we’re at a stage in which cancer specialists prefer to refer to cancers by genetic makeup, instead of by the traditional organ of first appearance.

But for many cancers, none of this is working. To be sure, overall cancer death rates have decreased, by 1.8 percent a year for men, and 1.4 percent a year for women in recent decades. But death rates from some cancers have remained stubbornly constant, while others have risen. Additionally, the [National Cancer Institute](#) estimates that the number of people with cancer will increase from 14 million to 22 million over the next 20 years.

The thing about war is: if you’re fighting and the enemy’s numbers are increasing (or at least not dropping very much), victory probably isn’t near.

### A spreading, migrating issue

One issue might be the fact that primary tumors—cancers that first appear in the body, and are recognized by that location, be it the liver, lung, brain or colon—aren’t the reason most people die from cancer. Most people die because of cancer cells that break off from primary tumors, and settle in other parts of the body. This process of metastasis is responsible for 90 percent of cancer deaths. However, only [5 percent](#) of European government cancer research funds, and [2 percent](#) of U.S. cancer research funds, are earmarked for metastasis research.

So far as much as we understand the genetics of primary, initial tumors, we know far less about the cancers that truly kill. And to James Watson—the molecular biologist, geneticist and zoologist, best known as one of the co-discoverers of the structure of DNA in 1953—that’s a central problem with cancer research. In a “manifesto” published earlier this year in [Open Biology](#), Watson asked for another war:

The now much-touted genome-based personal cancer therapies may turn out to be much less important tools for future medicine than the newspapers of today lead us to hope. Sending more government cancer monies towards innovative, anti-metastatic drug development to appropriate high-quality academic institutions would better use National Cancer Institute’s

(NCI) monies than the large sums spent now testing drugs for which we have little hope of true breakthroughs. The biggest obstacle today to moving forward effectively towards a true war against cancer may, in fact, come from the inherently conservative nature of today's cancer research establishments.

Watson, who shared a Nobel Prize with Francis Crick and Maurice Wilkins for discovering the structure of DNA, is well known for his pronouncements, which often have been labeled immodest, insulting and worse. But in this case, he also may be right.

### **What do other scientists say?**

Mark Ptashne, a cancer researcher at Memorial Sloan Kettering Cancer Center in New York, agrees that money is being misspent on the wrong kind of drugs. Cancer cells are smart enough to work around the drugs. And cancer cells that have migrated and reformed (metastasized) may [be quite different from](#) their original parent tumor cells. Still other cancers have metastasized, but [from where is unknown](#). Finally, in the brain, most adult tumors there are metastatic. This all means that even if a treatment is effective for a primary cancer, it likely won't be for a metastatic one.

Metastasis is [extremely complicated](#). Very slowly, institutions are starting to look more closely at metastasis, and provide more research funding for it. But, as the [Memorial Sloan Kettering Cancer Center warned](#), it could take a long time before treatments arise. But it's probably going to take more than 2-5 percent of government cancer research funding.

Dig in for a long war.

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