there is hope that the 20% of grants su2c is setting aside for outside-the-box research will yield something semimiraculous.

The strategy is often compared to that of the Manhattan Project, which produced the first atom bomb, or the Apollo program, which put astronauts on the moon. Some worry that it oversimplifies things. “This isn’t an engineering problem,” says the NIH’s Harris. “It’s a problem in which we know only parts of the solution.”

But more communication among scientists is always better than less, and besides, there may be more engineering to beating cancer than people realize. MIT, which knows a thing or two about designing things, is building a $100 million research center that will put together biologists and chemists with engineers skilled in such arts as nanofabrication. “We are going to breed a group of people who are totally aware of the modern tools and computational powers of engineers,” says Sharp.

MIT plans to make dream-team proposals, which Sharp views as a chance to loose the forces of science on the particularly diabolical forms of cancer. One of MIT’s strategies is to build nanomolecules that, when injected into the body, can hunt for cancer cells, bind to them and deliver therapies directly to the bad cells; or to build nanomolecules that could locate abnormal genes and silence them. “It’s MIT,” says Sharp. “We shake and bake.”

None of this absolves the rest of us from our own behavior. Think of all those fools standing in front of office buildings and restaurants grabbing a cigarette. Think of our national epidemic of obesity, which researchers believe has many links to cancer.

Cancer has become a little too familiar to us, too much a part of our social fabric. We embrace it with runs and walks and climbs and bike rides that bring people together to raise funds and hopes and share their grief. “It’s tough. We are a very optimistic organization,” and all of our materials are about living every day to the fullest and living strong and fighting cancer. But at the end of the day, if you look at what’s happened, some would argue that we haven’t been that successful,” says L.A.F.’s Ulman.

At a Livestrong ride, run and walk in the Philadelphia area, some 5,000 people took part on a beautiful summer day to raise $3 million for the L.A.F. “These aren’t fun runs,” says Armstrong. “They are very emotional, tearful times.” Some participants had cancer; some were survivors. And most of those who rode or bore on their backs the names of dead relatives, a rolling graveyard passing through the placid Pennsylvania countryside.
Diagnosis
There is no screening test for brain cancer, and symptoms such as headache, blurred vision and seizure are often the first signs.
21,810 new cases in the U.S. expected in 2008; 32% five-year survival rate

TREATMENT
Surgery, radiation and chemotherapy are the standard anticancer measures. But because growths in the brain are difficult to reach with these methods, researchers are testing a number of potentially more effective ones, including harnessing immune cells via vaccination, heating up the tumors and cutting off the cancer’s blood supply using targeted drug therapies.

Outlook
New treatment options have only recently started to emerge, but a better understanding of the molecular mechanisms behind brain cancer could push survival from months to years.

Liquid Cancers

**BRAIN**

Diagnosis
No screening exists, so only 7% of cases are detected early. The rest are spotted when pain or other symptoms occur.
37,680 new cases in the U.S. expected in 2008; 5% (if spread) to 20% (if localized) five-year survival rate

TREATMENT
Surgery can remove some of the cancer, but because it is often found late, chemotherapy and radiation are rarely enough. Doctors have a poor understanding of what drives pancreatic cancer, which means that even the latest targeted drugs are ineffective. Most research efforts are focused on finding better ways to detect the disease sooner so the tumor can be removed before it spreads.

**PANCREATIC**

Diagnosis
Doctors are investigating whether X-rays or spiral CT scans are better at finding lung cancers early.
215,020 new cases in the U.S. expected in 2008; 15% (if spread) to 49% (if localized) five-year survival rate

TREATMENT
Until targeted drug therapies emerged in the past decade, traditional cancer therapy could do little for lung-cancer patients. But certain forms of the disease depend on blood-vessel and growth-factor agents, all of which can now be inhibited with anticancer drugs. Other compounds that block insulin growth factor are being studied.

**LUNG**

Diagnosis
Routine blood tests can reveal the hallmark of the disease—an abnormal number of white blood cells.
44,270 new U.S. cases expected in 2008; 21%-75% five-year survival rate, depending on type

TREATMENT
In 2001, gleevec, the most powerful new anticancer treatment to come along in decades, was introduced. Its first target—chronic myeloid leukemia, a difficult-to-treat blood cancer. By disabling a signaling pathway inside the cancer cell, Gleevec does what chemo and radiation can’t: attack the tumor from the inside out. That proved effective for other leukemias as well; some childhood versions now have an 81% five-year survival rate.

**LEUKEMIA**

Diagnosis
Swollen lymph nodes may be the first sign of this most common variety of lymphoma, which can occur in 30 different forms.
66,120 new cases in the U.S. expected in 2008; 63% five-year survival rate

TREATMENT
Chemotherapy is an old reliable, but highly specialized antibodies that target proteins coating the cancer cell’s surface are proving effective killers as well. While leukemias are destroyed from the inside out, lymphomas appear to be vulnerable to the traditional attack on the outer flanks—provided that the antibodies are designed to find the right lymphoma targets.

**LYMPHOMA**

**NON-HODGKIN’S**

Diagnosis
Swollen nodes in the neck or chest are a first sign. It may be revealed during X-rays for flulike symptoms.
8,220 new cases diagnosed in the U.S. annually; 85% five-year survival rate

TREATMENT
Alternating rounds of radiation and chemotherapy are the most effective treatment option. During the disease’s early stages, radiation focused on the affected lymph nodes may prevent the lymphoma from spreading.

**HODGKIN’S**

Diagnosis
Non-Hodgkin’s lymphoma is now predominantly treatable, owing to early detection and judiciously applied therapies.