

muscle during exercise and strength training. There is also interest in exploring the mechanical forces and biochemical environment that weaken connective tissue, in studying the long- and short-term effects of anabolic steroids, and in developing improved sporting equipment.

"I realize that sports medicine is a kind of throwaway subject in many peoples' minds,"

says Mote, "but it does provide a classic setting for studying trauma and injury, because many injuries are repetitive. They happen to people over and over again in the same way."

The arthritis institute is currently supporting about 35 grants at a cost of \$1.2 million. Next year's funding level will approach \$1.6 million. "We're not talking really big bucks,"

says Gordon. "But we're trying."

Whether this commitment will attract new researchers is not certain.

Says Andriacchi: "If you're faced with a choice of helping a crippled person get up from a wheelchair or helping a jock get back on the playing field, I can understand how people wouldn't give sports medicine the highest priority." ■ **WILLIAM BOOTH**

OMB Stalks the "Burgeoning Growth of Biomedicine"

For decades, NIH has received more money than the President wanted to spend; OMB's assault on this tradition has not even chipped the edges

WHEN Senator Lowell Weicker, Jr. (R-CT), really wanted to insult a witness at a congressional hearing, one budget writer remembers, he would say, "Why don't you go work for OMB?"—the President's Office of Management and Budget.

OMB is the most powerful actor in money matters outside Congress, but it never got any praise and hardly a kind word from Weicker. Instead, it was hit with a rhetorical storm between 1983 and 1986 when Weicker chaired the Senate appropriations subcommittee on health and human services. He clashed repeatedly with the Administration over its plans for domestic agencies, particularly for the National Institutes of Health (NIH).

Despite an order from fellow Republicans in the White House to hold domestic accounts in check, Weicker made a firm commitment to the real growth of NIH. Thus began the battle of the 1980s, a struggle in which OMB so far has lost every round.

The House, under Democratic control and led by Representative William Natcher's (D-KY) appropriations subcommittee, voted increases for NIH. The Republican Senate followed suit, joining force with its own appropriations committee and not OMB.

In this way, NIH slipped the Administration's budget harness each fall and bolted free of potential restraint called for in the President's budget from the preceding January. The NIH budget grew remarkably, just

when the White House meant to rein it in. Then in 1986 the Democrats regained control of the Senate. Since then the President's low budgets have departed further from real spending levels. One Capitol Hill aide confesses he stopped reading them.

OMB officials in nearly every Administration have been loath to talk to the public or the press. However, in an off-the-record interview with *Science*, officials at OMB reflected on the long-running contest with Capitol Hill and discussed something of the OMB philosophy about the budget.

Reviewing this history, a budget official agreed recently that biomedical research seems to have a life of its own. Every year since 1970, NIH has received more money from Congress than the President asked for. Going back to 1933, NIH financial records reveal only 8 years when the institutes did not get as much as or more than the Executive Branch sought. Michael Stephens, aide to Representative Natcher, says, "I would be surprised if those 8 years were not the result of some statistical anomaly." The reason for the pattern is simple, he adds: "Congress has a different list of priorities than the Executive, and biomedical research has always been high on it."

The pattern is evident again this year. On 5 August, the 1988 appropriation for labor and health agencies passed the House, providing \$6.6 billion for NIH, a 10.5% increase over last year and 26% more than OMB wanted.

OMB's role in the whole process, as seen by the staff, is to serve as a brake on the "burgeoning growth of biomedical research." OMB staffers see themselves as soldiers in a long campaign to control federal domestic spending. If they fail this time, they say, perhaps they will get their point across a few years from now. Their general orders are (i) not to interfere with growth in the military budget, (ii) not to increase taxes, (iii) to stay within the debt limitation rules of the Gramm-Rudman-Hollings law, and (iv) to apply policy or ideological themes set by the President.

They speak of the "iron triangle" they confront in public health and of the need to challenge it. They say that the triangle in this case—consisting of the disease-specific lobbies and recipients of biomedical funds, the managers of the funds at NIH, and the congressmen who appropriate the funds—is very strong.

But OMB feels the government has a duty to question the use of biomedical funds, since it provides about 85% of them. About 70% of the money spent on research grants, according to OMB, pays for salaries. In OMB's view, that translates into mortgages, cars, groceries, hi-fis—not just medicine. Dean's salaries are above the \$100,000 level.

OMB stresses that the average cost of a research grant is growing at more than 10% a year, higher than the rate of inflation. In addition, OMB has challenged funding bills that set minimum levels for the number of new research grants. Because each new grant represents at least a 3-year commitment, the drain on the federal Treasury grows in the out-years as the promise is kept. OMB has proposed two clever gimmicks, regarded as devious by some, to slow the rate at which this commitment grows (*Science*, 6 March, p. 1129). In both cases, the effort failed.

Congress and OMB seem to have reached a standoff on the research grants quarrel. For the first time in several years, the House appropriation bill sets no minimum number of new and competing grants, although the committee's report suggests that the money "should be used" to fund 6500 new grants. At the same time, the bill flatly bans the gimmick OMB tried this year to control

grants, the "forward funding or multiyear funding" scheme, which would have forced NIH to hold on to a certain portion of 1987 money for spending in 1988.

OMB officials insist that they do not get involved in making decisions on scientific emphasis or merit, but stick strictly to numbers. The nation simply cannot afford to spend as much as Congress would like, OMB argues. Although OMB has failed over and over in the past 5 years to turn this message into fiscal fact, it claims to have shaped the debate and put the spotlight on issues that need attention, such as the rate of inflation in grant costs, the correct way to count NIH's grant liabilities (by the total number of grantees), and the drain on research imposed by institutional "indirect cost" fees.

Representative Natcher, who plays a low-key but powerful role in appropriations, blames OMB for the Administration's failure to support biomedical research more generously. In a congressional debate on 5 August he said: "I do not believe that President Reagan knows that some of these reductions are in [his own budget]. . . . No President I have served with, and I have served with seven of them, none of them knows all of these items and agencies."

In fact, NIH, more than other science agencies, is somewhat cut off from the executive decision process. NIH is not asked to make a direct presentation to OMB. The director of NIH presents a budget to the assistant secretary for health, who usually cuts it and sends it along to the secretary of health and human services, who cuts it and presents it to OMB. It can be difficult to communicate across this great bureaucratic divide. However, OMB staffers do make selected visits to the NIH campus to get information firsthand.

An author of OMB's recent grant-limiting proposals, NIH budget examiner John Glaudemans, is regarded as both brilliant and arrogant. Representative Natcher's staff viewed him as an able adversary, "razor sharp," one staffer said. "As much as people in the scientific community love to attack the guy, I've got to say one thing: he knew how to do his job, and his job was to cut the heck out of the NIH budget," says Bradie Metheny of Delegation for Basic Biomedical Research, who adds that he maintains "real respect" for Glaudemans. "He's as clever as they come." He is said to have claimed special insight into NIH because his father works there. Glaudemans recently was promoted to another post within OMB and no longer handles the NIH account directly.

This fall when the Secretary of Health and Human Services makes his budget pitch—including a recommendation for NIH—the

numbers will go first to Richard Jacob, a new man on the job. From him, the budget passes to Barry Clendenin, director of OMB's Health and Social Services division, then on to David Kleinberg, a deputy associate director, thence to the deputy director, and finally to the director, James C. Miller III.

The OMB presents the whole budget, with options laid out, to the President in November. Decisions are made and agencies are given 3 days to appeal. Final changes are limited by the printing schedule, which calls for publication in the first week of January.

It is a complex and multilayered process in which at least three budget years are being

actively reviewed at any given moment. In recent times, the process has been confounded by the wide gaps between the President's low budget assumptions for NIH and the high, actual levels of funding provided by Congress. Because new budget levels are tied to the previous year's appropriation, and because appropriations now come very late in the year (sometimes November), the budget-writing business has become increasingly difficult and, at the same time, unrealistic.

But no matter how complex and thorny the barriers may have become, NIH thus far has been able to find its way to the Treasury. ■ **ELIOT MARSHALL**

Biologics Gain Influence in Expanding NCI Program

Forged in the political climate that surrounded early enthusiasm for interferon as a general cancer treatment, the NCI's biological response modifier program continues to evolve

INTERLEUKIN-2, a potent biologic agent that stimulates a spectrum of immune responses, today generates a mixture of optimism and controversy as a cancer therapy. Some patients with advanced or drug-resistant tumors respond to interleukin-2 (IL-2). But it can be highly toxic, and critics believe that its promise has been overstated.

Interferon alpha is not the universal magic bullet against cancer that it seemed to be 10 years ago. But interferon is particularly effective against hairy cell leukemia and also seems to be useful against low-grade lymphoma, chronic myelogenous leukemia, and Kaposi's sarcoma, a form of cancer common in patients with AIDS.

Tumor necrosis factor, a protein-like compound, also stimulates a variety of immune responses. About 15 years ago, researchers demonstrated its ability to kill tumor cells in animals. Now they find that, in the presence of interferon gamma, the antitumor effects of both biological compounds increase.

These are among about a dozen biological agents that have become the focus of the

National Cancer Institute's (NCI) newest research effort in cancer treatment, the Biological Response Modifier Program. The mandate of this \$40.4-million endeavor is to identify natural compounds that can be used to increase the body's response to cancer. The program came into being as an administrative entity in 1981 through a combination of intense political pressure and scientific readiness. Today, NCI researchers outside the program also study the active biological compounds, bringing the estimated total funding in this area to the \$168.6-million mark for 1987. In addition, researchers at the National Institute for Allergy and Infectious Diseases are seeking therapeutic roles for some of the compounds in treating patients with AIDS.

"After many years of fitful research in the area of biological therapy dating back to the last century, it finally appears as though biological therapy is joining surgery, radiation therapy, and chemotherapy as a legitimate tool in the cancer specialist's armamentarium," said program director Daniel Longo at a 1985 meeting of the National Cancer Advisory Board. He refused to be