

# RESEARCH *News*

## DIVISION of RESEARCH PROGRAMS *and* PARTNERSHIPS

### OUTSTANDING PROJECT PROFILE

*Michael J. Berry*, Professor of *Health and Exercise Science*, has been awarded \$668,254 from the National Institutes of Health to support his five-year program, *Exercise and Disability in COPD Patients*.

Chronic obstructive pulmonary disease (COPD) is a major cause of morbidity and mortality in the United States. Its primary symptoms are shortness of breath and exercise intolerance, which decrease physical activity, function, and health-related quality of life and increase self-reported disability. Since any improvements are lost if exercise therapy stops, data strongly support the benefit of, and need to promote, *long-term* adherence to physically active lifestyles for COPD patients. Unfortunately, even in asymptomatic populations, compliance rates with exercise programs are dismally low.

The primary goal of Dr. Berry's investigation is to determine if COPD patients who are randomly assigned to a lifestyle activity program will exercise more every week at 18 months than patients randomly assigned to a traditional exercise therapy program relying on centralized facilities and trainers and often limited in duration by factors extraneous to the patients' optimal health. The lifestyle intervention program phases out center-based activity over an initial three-month period, while teaching both groups and individuals how to keep up and regulate their daily physical activity. The investigation will also measure the impact of both long-term and short-term interventions on exercise capacity, physical function, self-reported disability, and health-related quality of life.

### MENTORS IN OUR MIDST

This semester, the Division of Research Programs and Partnerships hosted a number of luncheons at which Wake Forest faculty, from diverse fields but all successful in securing funds, shared their expertise with junior colleagues. We hope to transmit some of their valuable insights, if not their warmth, humor, and energy, to a larger audience.

At the NEW FACULTY LUNCHEON, *Abdessadek Lachgar*, Associate Professor of *Chemistry*, confided his "three biggest mistakes" in first applying for a grant. Since his most recent submission to the National Science Foundation was described by a reviewer as among the best-written grants he'd ever read, Dr. Lachgar has obviously learned a bit in the few intervening years.

The three early mistakes all concerned **communication**: not consulting the Provost and the grants office director about a project's matching-fund requirements; not discussing it with the sponsor's Program Officer (PO); and not showing the written proposal to colleagues for critique.

Dr. Lachgar advises that winning a grant takes time and persistence. A proposal is part of a process: finding and documenting a need; postulating methods, outcomes, and an evaluation; planning, including a timetable, staffing needs, and expenses; learning about potential sponsors; establishing contact with their POs; and writing and rewriting.

The best proposals share two features: they tackle timely issues and present them forcefully. Strike a balance



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between something sure and something new, he advised; back unique approaches by enough solid research to show a risk is worth taking. Methods must be explained and defended; objectives should be tangible, specific, measurable, and achievable. Good writing won't save a bad idea, but bad writing can kill a good one. Have your proposal read by colleagues both in your field, for content, and apart from it, for form. POs can illuminate the sponsor's priorities before you apply and how to respond to reviewer critiques to achieve success the second time around. They *are* your friends.

*Jeffrey Lerner*, Associate Professor of *History*, echoed Dr. Lachgar's thoughts on nurturing sponsor contacts and seeking feedback from colleagues within and outside the discipline. Dr. Lerner is just back from a year in Washington, DC, as one of 12 annual Junior Fellows at Harvard University's Center for Hellenic Studies.

His primary message was, "**Confidence is everything!**" Since, of course, you believe in your work and know it must be realized, your mission is to convey that urgency to reviewers. The proposal is not the place to suggest problems that may confound the project or to humbly beg indulgence for imagined shortcomings. Write the most convincing presentation you can and show it to colleagues who will critique it with intensity. If a proposal returns to him inscribed, "Loved it! Don't change a word," he will promptly send it to someone else.

Dr. Lerner worked hard to assess funding programs and applied to more than one. He contacted Program Officers, visited a few, and asked questions. He tried to get a sense of what they really wanted and how to tailor his proposal to their priorities. He attended Division of Research Programs and Partnerships' grantwriting workshops and availed himself of office services.

At the JUNIOR/SENIOR SCIENCE FACULTY LUNCHEON, *Christa Colyer*, Assistant Professor of *Chemistry*, told those thinking of applying for funds, "**Don't be afraid to ask.**" Contact the PO to learn, for example, if this idea is valid, or what topics are hot? Seek help from colleagues in areas where you're weak; consider collaboration. Apply to different sources for the same project. Ask colleagues to edit your proposal. Ask for specific reviewers.

Dr. Colyer, whose work has been funded by the North Carolina Biotechnology Center and the National Science Foundation, advises, "**Don't be your own worst reviewer.**" Move on several ideas, not just the one you've been nursing since graduate school. Have confidence in new ideas, your own ideas. Learn from bad *and* good reviews. Younger people,

she thinks, have a tendency to dwell on the negative judgments, even when a proposal is accepted. She read diametrically opposed reviews for both of two grants, one funded, one not, and we couldn't tell which was which.

*Mark Welker*, Professor of *Chemistry*, then shared his newly acquired experience as a *Program Officer* for the Organic Chemistry division at the *National Science Foundation*. Funding is distributed through core programs and special initiatives, which are earmarked by Congress. These initiatives are usually cross-divisional, and if your work meets their priorities, you should seize the moment. Initiatives are more likely to be interdisciplinary than core programs.

**Before submitting** a proposal, Dr. Welker advises applicants to **talk to and possibly visit the PO**. In the developmental stage, you might hear useful tips through personal contact that would not be committed to writing. While at the National Institutes of Health, POs can merely tell you why your proposal was triaged (unanimously judged "noncompetitive" and denied further review), at NSF, POs can ask for more reviews if they feel the ones in hand are cursory or insipid. It's better to make contact with the permanent program staff, but you don't need to talk to divisional directors.

Dr. Welker also suggests that the future applicant **volunteer to be a reviewer**. Send your CV to the PO to get on the panel in which you're interested and learn how the process is really conducted.

A proposal should have **two to three specific aims**, not eight. **Ask mentors to read it**, especially those recently funded by the sponsor. Ask the PO if you may read funded proposals and about typical budget items, i.e. how much for travel? At NSF, you'll get hammered if you don't make a strong case for the **broader impact** of your work, which especially means **training students**.

In regards to **budget**, ask for all the equipment you need up front in Year One. Dr. Welker admitted that in the past he hasn't asked for enough equipment. The NSF builds infrastructure through the people it believes in enough to fund, and panels seek good science, not bargains. The divisions handle equipment purchases differently; in chemistry, you may request up to \$80K for your own lab without any cost-sharing obligation. Reviewers don't care whether others will use the equipment, unless you're applying for instrumentation only; there, you must make the case that many laboratories will be enhanced.

NSF's **review process** solicits ad hoc mail reviews and convenes panels, usually combining the two. At NIH, you can't

suggest reviewers, but at NSF, you may suggest two to four, and if the review will be ad hoc, be sure to stipulate four. Since the PO can pick one to three, the extra can replace someone who has a proposal pending or a conflict of interest. If you list too many, however, the PO probably won't draw on any of the names you've given beyond three, however qualified. Also, tell the PO about anyone you don't want to review your work; you don't have to give a reason ("Unplugged the projector during my talk!").

If you have been declined time and again, it's wise to move on, but increased preliminary results or publications will improve your chances. Most POs send resubmissions to reviewers who scored you well, not poorly; use their comments to craft a more winning proposal.

Dr. Welker shared many of the same insights at the JUNIOR/SENIOR SOCIAL AND BEHAVIORAL SCIENCES FACULTY LUNCHEON. Professor *Earl Smith*, Chair of *Sociology* and Director of American Ethnic Studies, cautioned young faculty that grantseeking is a **quest with a big question mark** at the end. It demands expenditures of time and the collaboration, either active or passive, of many people. Typical scholarship – drafting journal articles, conference presentations, or book proposals – is more independent, whereas research grants require the support of the institution, the department, and the chair.

A sponsored researcher **serves two masters**: the funding source and the university. The work must be tailored to the sponsors' goals and fit the department's needs. Who receives the funding — the institution or the individual — how will it be paid — in installments or lump sums? How will the accounting be handled? Who owns the equipment; who will provide space and supplies? Perhaps most important, who owns the results?

Junior faculty thinking of applying for funding must consider these and other **critical questions**:

- Why do I want it?
- Do I have the time to work through two or more revisions?
- How will it count in tenure review?
- What's the department culture in terms of collegial support?
- What will I do? What will everybody else do? What if they don't? What if we can't?

Dr. Welker later offered an interesting answer to the question of why acquiring a grant is desirable. The external grant provides funds for summer salary, student assistance, travel, and equipment, but he added that he gets more intellectual stimulation from writing a proposal and having it critiqued than he does from submitting journal articles.

*Will Fleeson*, Assistant Professor of *Psychology*, had five tips for prospective applicants. First, **get advice** – from the sponsor, your department chair, colleagues, seminars, and web resources (e.g., <http://www.niaid.nih.gov/ncn/pdf/howto.pdf>). Second, **know the sponsor**. Learn its priorities and beliefs. Ransack its website for guidelines, abstracts of funded proposals, and publications. Third, **know your reviewers**. If you can't choose them, at least identify who they may be. NIH, for example, posts study section rosters (<http://www.csr.nih.gov/committees/rosterindex.asp>). If one seems to be crammed with clinicians, you might be able to find another with more basic scientists. Learn their selection and review criteria by heart.

Fourth, **convince the sponsor** that yours is the proposal to fund. Match its priorities in describing yours; use buzzwords and headings from its guidelines. Make sure your idea is well articulated; the one-page project summary must enunciate what the external funds will do, why it must be done, and why you are the one who can do it. Methodology should be highly detailed; theory, only if you have the room. Make sure that your seriousness comes through.

Fifth, demonstrate that seriousness by **participating in the system**. Volunteer to be a reviewer. Attend grant-related seminars. Launch a profile with Community of Science, and subscribe to their email service. Subscribe to Lynn Miner's *Grantseeker Tips* and the NSF's *Custom News*.

Clearly, our speakers confirmed that those wishing to apply for a grant are well advised to start local. We look forward to the Humanities Junior/Senior Luncheon, scheduled for 20 February.

## OVERHEARD ON THE REVIEW PANEL: DOES THE BELL TOLL FOR THEE?

Our good Dr. X has been on the road reviewing proposals again and reports the following death-knell characterizations:

**“Dr. No”** Is he only a myth or holding *your* proposal right now? Hope you cited his work.

**“fishing expedition”** No clear plan but maybe a cure-all will turn up in the fullness of time.

**“stamp collecting”** Slightly vary the same old reliable experiments with limited vision.

**“clone-by-phone”** Call buddy at Big Time U for ingredients to make your favorite protein, with little investment of effort or imagination on your part.

**“nonhypothesis-driven”** Goodbye to all that . . .

Have you heard another good one that may caution us in composing a grant? Please share it by emailing Julie Edelson.

## 2002 BUDGETS FOR FEDERAL GRANTMAKERS

*Federal Grants and Contracts Weekly* 25, no. 45  
(12 November 2001)

*Grantseeker Tips* no. 73 (26 November 2001)

**NSF** Congress finally approved \$4.8 billion, an 8.2 percent increase, for the National Science Foundation. The White House had requested a 1 percent raise, but the science community's hard lobbying won out. NSF's total budget includes \$3.6 billion for research and related activities, with the rest earmarked for special purposes. The measure provides:

- \$508.9M for the biological sciences, up from \$485.4M last year;
- \$515.8M for the computer and information sciences, up from \$477.9M;
- \$467.5M for engineering, up from \$430.8M;
- \$610.7M for the geosciences, up from \$562.2M;
- \$922.2M for the mathematical and physical sciences, up from \$850.8M; and
- \$168.9M for the social, behavioral, and economic sciences, slightly more than last year's \$164.4M.

Appropriators emphasized certain priorities:

- \$75M for plant genome research on economically significant crops;
- \$75M for colleges and universities to purchase research equipment; and
- \$180M for an information technology initiative, up from \$155M.

NSF's education and human resources programs will receive \$875M, up 89.4M. The administration's request for a \$200M math and science partnerships program, which would have added \$100M to existing program funds, was scaled back to \$160M, preserving ongoing programs.

**NIH** For several years, NIH has been on a campaign to double its annual budget, from \$16 to 32 billion. In 2002, it will reach \$23 billion. Once it hits the \$32B mark, however, it will increase only a nominal 2-3 percent annually. Other NIH budget information for 2002:

- 9,158 new and competing renewal research grants will be awarded;
- \$2.5B for AIDS-related research;
- \$50M for new women's health initiatives;
- \$40M for a new bioengineering institute.

Research priorities include genetic medicine; clinical research

leading to new treatments, infrastructure, and enabling technologies; and eliminating disparities in healthcare.

**NASA** Appropriations increased for science at the National Aeronautics and Space Administration, but funding for the International Space Station, which has amassed \$4B in recently discovered cost overruns, was trimmed and will be transferred to core biology and physics research accounts.

**EPA and DOE** Environmental Protection Agency research and development gains about 3.8 percent over fiscal 2001. Energy Department R&D will increase 3.1 percent overall.

**ED** The Education Department's grants forecast for fiscal 2002 lists more than 100 competitions, but deadlines and funding estimates are unavailable for about 37 percent. ED appropriations have been delayed in part by lack of a firm budget and by a contentious reauthorization process for K-12 programs. ED is also running behind because of last year's moratorium on grant announcements. It worked down to the wire to make awards by the end of FY 2001, and some programs are just now putting 2002 plans in place. See [www.ed.gov](http://www.ed.gov); Finding Grants and Contracts; Forecast of Funding Opportunities-ED Discretionary Grant Programs.

## ENERGY DEPARTMENT'S LIFE SCIENCE WING PLANS NEW SOLICITATIONS

*Federal Grants and Contracts Weekly* 25, no. 48  
(10 December 2001)

Funding increases will permit the Energy Department's Office of Biological and Environmental Research (OBER) to mount new competitions in several areas, including:

- *Genomes to Life*: With a \$10M increase, the program will broaden its scope beyond genome sequencing to provide an integrated and predictive understanding of biological systems critical to DoE. The competition plans to offer a few large collaborative grants, representing partnerships between universities and the private sector.
- *Low-Dose Radiation*: A competition for research on the effects of low-dose radiation may reflect a joint effort with NASA.
- *Carbon Sequestration*: A \$3M solicitation focuses on mitigating atmospheric carbon. OBER also plans an ocean carbon solicitation, stressing carbon and nitrogen cycles.
- *NABIR*: The Natural and Accelerated Bioremediation Research program will focus on the basic science needed to clean up radionuclides and metals at DoE waste sites, but staff and program advisers have suggested a broader role.



DoE Director Ari Patrinos told advisers that given future budget uncertainty, the state of biological and environmental science is “reasonably good.” “We are in a period of significant transition,” marked by a refocusing of DoE mission areas, but OBER investments are broadly related to many areas, including national security.

Contact: Consult the OBER website at [www.sc.doe.gov/production/ober/ESD\\_top.htm](http://www.sc.doe.gov/production/ober/ESD_top.htm)

## **NEW ED PROCEDURES WELCOME NOVICE APPLICANTS**

*Federal Grants and Contracts Weekly* 25, no. 47  
(3 December 2001)

The Education Department has amended its grant rules to increase chances for new applicants. The change takes effect 31 December, just in time for most 2002 competitions. Specifically, program managers can:

- run separate competitions featuring brief applications for inexperienced grantseekers, including competitions for seed grants;
- provide targeted set-asides; and
- award extra consideration or points under regular competitions.

Novices are defined as those who have not held a federal discretionary grant in five years. Ed’s goal is to broaden the applicant pool and to improve opportunities for small and new organizations.

## **NO OPTION: AGENCIES HASTEN E-GRANT PROCEDURES**

*Federal Grants and Contracts Weekly* 25, no. 46  
(19 November 2001)

Terrorist attacks have speeded federal plans for electronic grant management. Federal agencies have been pressured to provide the option, but soon electronic submission will probably be mandatory, said John McGowan, project manager for electronic research administration at the National Institutes of Health. Recent suspensions of travel and mail service demonstrated the vulnerability of routine grant practices, when NIH and other agencies were forced to rely on electronic application review. McGowan said the NIH will pilot electronic research grant submission in about a year.

Implementation of E-grants is one of 22 elements in the Bush administration’s new E-government strategy. Agencies have been working for several years on the Federal Commons, a central gateway for grants and other transactions but have

been hampered by lack of funding and the diversity of individual agency approaches. The White House Office of Management and Budget aims to harness internet-related technologies to streamline processes across agencies, reduce paperwork, improve management, and apply commercial best practices.

The major challenge is to create procedures that meet the needs of different grantees doing business across 26 agencies. Standardized formats must work for states and cities, which receive most discretionary funding, and for universities and nonprofits. An interagency group has drafted a model application, and a single electronic site may become a hub for all grant announcements. As of 1 October, federal agencies are required to post contract announcements worth more than \$25K on the FedBizOpps website, and E-grant planners are studying the possibility of integrating grant announcements as well. (See <http://www.fedbizopps.gov>).

## **SPRING DEADLINES FOR INTERNAL FUNDS**

Archie Fund for the Arts & Humanities - 15 February 2002

Cross-Campus Collaborative Research Support Fund - 1 March 2002

Science Research Fund - 15 February 2002

Social and Behavioral Sciences Research Fund - 1 March 2002

## **FELLOWSHIP AID FROM RESEARCH PROGRAMS AND PARTNERSHIPS**

Applicants for extramural fellowships officially require no assistance from the Division of Research Programs and Partnerships. You can apply to a program without raising the blinds, and no one need know you had the temerity to ask for research support except your references and the mail carrier.

However, there are several reasons you might want to apply through the university rather than independently. First and foremost, if the nonprofit university can receive the grant, you don’t have to pay taxes on it. Second, the office is happy to help you search for programs that match your qualifications and interests, to find examples of funded proposals, to read and offer suggestions on your written drafts, to assist with any budget matters and answer policy questions, and to photocopy and mail the necessary documents to the sponsor by deadline.

Also, contrary to rumor, we do not maintain a big book of failures. Instead, we offer partnership and professionalism, and we hope you will avail yourselves.

# WFU FUNDED RESEARCH

August Through November

## WAKE FOREST UNIVERSITY FUNDED RESEARCH AUGUST THROUGH NOVEMBER 2001

### ANTHROPOLOGY

Ken Robinson

- *Archeological Survey, Visitors Center, Jones Lake State Park, Bladen County, NC, \$1,503, Warren County*
- *Archeological Survey, 245-acre Landfill, Catawba County, NC, \$4,881, McGill Associates*
- *Archeological Survey, Whittier Sewer System Improvements, Jackson and Swain Counties, NC, \$11,907, McGill Associates*
- *Archeological Survey, Pleasant Gardens Sewer Systems Improvement Area, McDowell County, NC, \$4,943, McGill Associates*
- *Phase I Archeological Survey, 50-acre Housing Development, Banner Elk, Watauga Co, NC, \$4,970, Ingalls*  
These surveys will identify any archeological sites, assess their significance, and make recommendations regarding their avoidance or protection.
- *Archeological Study, Hugh Torrance Store and House Historic Site, Mecklenburg County, NC, \$8,464, Hugh Torrance Society*  
Areas where infrared imaging indicates the presence of archeological features will be investigated.
- *Allison-Deaver House and Historic Boylston Road, Transylvania County, NC, \$17,459, Transylvania Historical Society*  
The Allison-Deaver house is one of the oldest surviving historic houses in western North Carolina, dating from the early 19th century. WFU archeological laboratories, as part of their Public Archeology Program, will excavate and document foundations located near the house, which could be the remains of an earlier house or dependency building, and document the trace of what is believed to be the old Boylston Road, which passes close to the house.

- *Cultural Resources Screening Study, Forsyth County, NC, \$877, HNTB North Carolina*  
Wake Forest Archeology Labs will undertake a study of land affected by the widening of Country Club Road in Winston-Salem.

### ART

Victor Faccinto, *Producing an Exhibition, Catalogue, and Educational Programs Featuring Works of the 2000-2001 NC Arts Council Visual and Film/Video Artist Fellowship Recipients*, \$10,000, NC Arts Council

Funds support the implementation of the exhibition, held at Wake Forest's Scales Fine Arts Center in fall 2001.

### BIOLOGY

Gloria Muday, *Fucus as a Model System to Study the Role of Auxin Transport and the Actin Cytoskeleton in Gravity Response*, \$20,000, NASA

The simple embryo of the brown algae, *Fucus*, provides a model system to examine cellular responses to gravity.

William Kirby Smith, *Alpine Tree Stability: Mechanisms of Conifer Tree Seeding Establishment*, \$81,082, NSF

This study offers a mechanistic understanding of an upper alpine treeline zone of the south-central Rocky Mountains, as seedlings of the two dominant conifers become established away from the forest edge. Although seedling establishment may be the most selective of all life stages and critical in determining distribution patterns in many species, ecophysiological measurements on newly emerged seedlings in the field are rare and alert us to global warming's threat to biodiversity.

### CHEMISTRY

Angela Glisan King, *SCIMAX*, \$87,083, NSF, Urban Systemic Program in Science, Mathematics, and Technology Education  
*SCIMAX (SCIENCE AND MATH EXCELLENCE)* is a community-driven, K-16 partnership to ensure that all students graduating from Winston-Salem/Forsyth County Schools are able to pursue postsecondary studies and/or careers in science and mathematics.

S. Bruce King, *Reactions of Hydroxyurea with Sick Cell Hemoglobin*, \$206,479, NIH

The project aims to explain the reaction between hydroxyurea and sickle cell hemoglobin in order to design new and better treatments.

Richard A. Manderville, *Activation of Ki-ras During Transplacental Carcinogenesis*, \$25,347, EPA Year One

This phase of a cross-campus collaboration with M.S. Miller (PI, Cancer Biology) and A.J. Townsend (Biochemistry) will characterize the metabolism of 3-methylcholanthrene (MC) following exposure to fetal tissue, enabled by the Chemistry department's recent acquisition of an LC/MS facility.

### ECONOMICS

Sylvain Boko, *Democratic Reform and the Transition to Market Economy in Africa*, \$12,500, NSF

This pilot study focuses on four African countries to test the hypothesis that if fiscal decentralization is enacted in the context of a strong, transparent, and credible institutional and political framework, it need not derail structural reforms at the national level.

### GRADUATE SCHOOL

Gordon Melson, *Graduate Research Fellowship Award*, \$18,000, NSF

Fellowship stipends support graduate student research in the sciences.

### HEALTH AND EXERCISE SCIENCE

Michael J. Berry, *Exercise and Disability in COPD Patients*, \$668,254, NIH

See "Outstanding Project Profile" in this issue of *Research News*.

Shannon L. Bozoian Mihalko

- *Adherence Enhancement Intervention with Type 2 Diabetic Patients with Chronic Renal Insufficiency*, \$15,000, Public Health Sciences

This pilot study will test an intervention to improve patient adherence to health protocols within a larger randomized trial of diabetics with chronic renal insufficiency, an understudied population. The intervention is based on social cognitive theory and addresses physical activity, diet, medication adherence, and glucose self-monitoring.

- With Paul Ribisl, Gary Miller, and the School of Medicine, *Recovery Strategies following Breast Cancer Treatment (RESTORE)*, \$220,555, Department of Defense

This randomized clinical trial will test an exercise intervention to reduce the incidence of lymphedema

and to enhance the health and well-being of women, aged 40 and older, recently treated for breast cancer.

Paul Ribisl, *SHOW (Study of Health Outcomes of Weight-loss) Look Ahead*, \$168,882, HHS

This multicenter, randomized clinical trial aims to discover whether sustained weight-loss interventions improve the health of obese individuals with type-2 diabetes mellitus.

### MATHEMATICS

John V. Baxley, *Twenty-first Southeastern-Atlantic Regional Conference on Differential Equations*, \$7,500, NSF

Funds deferred the travel expenses of advanced graduate students and recent PhD recipients and partially covered the expenses of four internationally recognized invited speakers to the annual conference, which took place at Wake Forest University on 2-3 November 2001.

### PHYSICS

Martin Guthold

- R10826, *A Novel Method to Identify, Isolate, Amplify, and Analyze Individual Molecules with Desirable Binding Properties*, \$35,000, Research Corporation

The project's novel methodology will identify and isolate individual RNA or DNA molecules with desirable binding properties from highly diverse oligonucleotide libraries. The isolated, single oligonucleotides will then be amplified, sequenced, and characterized. This unique method has important implications for drug discovery.

- *Novel Methodology to Screen for Her-2-Specific Aptamer*, \$20,000, American Chemical Society, WFU School of Medicine

The project aims to discover compounds that may be used as cancer therapeutic drugs. One is a dual-action cancer therapeutic that consists of a module that will recognize Her-2 receptors and another that carries the payload, doxorubicin, and delivers it to cancer cells.

Daniel B. Kim-Shapiro, *Stopped Flow Optical Rotary Dispersion Spectrometer*, \$130,875, NIH

The instrument developed by Dr. Kim-Shapiro and industrial colleagues will help biomedical researchers to design functional proteins and to treat diseases where misfolded proteins may play a role.

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