FOSTERING COMMUNICATION AND COLLABORATION

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PARENTHOOD: THE POSTDOCTORAL PERSPECTIVE

by Susan Chacko, Ph.D., DCRT

"Being a parent and a scientist are not mutually exclusive; however, working around the clock and being a good parent are."

—Patricia Walker, NCI

With the time spent in graduate school and postdoctoral fellowships lengthening, many scientists are having children—or at least starting to worry about when they will have children—while they are postdoctoral fellows. Finding themselves already in their 30s, with uncertainties about future prospects for jobs, funding, and tenure, they worry that their biological clock may stop ticking before they are securely settled and ideally situated to have children. As Robert Caudle, a senior staff fellow at NIDR, observes, "With today's job market for Ph.D.s, it is entirely possible that the current crop of postdocs will not be in secure jobs for many years yet."

> ... ALL THE POSTDOCS WHO ACTUALLY HAD CHILDREN FELT THAT POSTDOCTORAL RESEARCH WAS QUITE COMPATIBLE WITH PARENTHOOD. THEY ALSO FELT THAT THEIR MODE OF WORKING HAD CHANGED ...

To get some perspective on postdocs and parenting at NIH, *The NIH Catalyst* interviewed or received e-mail feedback from about 50 postdocs—60% women, 40% men, including parents and nonparents. Although many of those without children worried about whether they would be able to take time off to have a baby and care for it—and about how they could afford good childcare—all the

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THE JUGGLERS: HOW NIH SCIENTISTS BALANCE CAREERS AND FAMILIES

by Celia Hooper

It's a safe bet that no NIH scientists on the tenure track or who successfully win permanent positions here work a paltry 8 hours a day or a mere 40 hours per week. Competition in biomedical fields is tough, and expectations run high. Says NCI Lab Chief Anita Roberts, "I honestly think science is one of the most difficult professions to balance with having a family—it is not a 40-hour-a-week job. It's total involvement, and you have to work very hard to fit a family into that."

Celia Hooper

NCI scientists William and Maryalice Stetler-Stevenson with daughter Maggie. Dad is chief of the Extracellular Matrix Pathology Section, Pathology Lab; mom is a medical officer and chief of the Pathology Lab's Flow Cytometry Unit.

Yet despite her long hours and devotion to research, Roberts and her husband managed to raise two sons, Greg, now 27, who owns and runs a successful Jacksonville graphic design company, and Karl, now 25 and a third-year medical student at Indiana University in Bloomington.

Roberts took an unusual step in balancing parenting and career: a seven-year hiatus from research after her sons were born and in the middle of her postdoctoral career. But while Roberts' particular strategy is unusual for an NIH scientist, her dual success as parent and scientist is not.

For this article, we interviewed or received feedback from close to two dozen tenured, tenure-track, and staff scientists and physicians, including men and women; single parents; parents of infants, teens, and grown children; couples in which each spouse was an NIH scientist; couples who share equal responsibility for kids and career; and couples in which one parent or the other took the lead in parenting or cultivation of a career. Many of these parents cited common problems and similar techniques in juggling the demands of family and research. Many saw areas where they felt NIH should strive harder to be more family-friendly. But many also commended NIH for the support and understanding of

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Parenting At NIH: It Takes a Campus

Michael Gottesman

This volume of *The Catalyst* is devoted to "family values" at NIH. Believe it or not, the scientists and administrators who supervise and oversee research at NIH are themselves members of families and are sensitive and responsive to the needs of employees who likewise have family obligations. Many are parents and know the joys and vicissitudes of nurturing children. In this brief essay, I would like to share some of my own experience and address some of the concerns of parents at NIH.

My wife, Susan, and I have two children, who are now in their 20s. Both are graduate students—one in physics and one in medical school—and show all signs of becoming responsible, productive adults. They were brought up mostly in Bethesda (we have been here a total of 23 years) while Susan and I were postdoctoral fellows and young independent investigators at NIH. Our experience is mirrored by many other NIH scientists who have had children during their years of research training and early research independence.

I strongly believe that it is possible to be a good parent and a good scientist. In fact, there are many aspects of life at NIH and other research institutions that make it easier to be a good parent than in other, more structured environments. Although we all work very long hours, these are usually of our own design and can be as flexible as specific research requirements and supervisors allow. For Susan and me, a trip to check on a sick child or to stay home for a few hours while the other spouse worked in the lab was a matter of mutual agreement; we were fortunate to have understanding supervisors on the rare occasions when parenting responsibilities collided with laboratory requirements.

I strongly believe that it is possible to be a good parent and a good scientist. In fact, there are many aspects of life at NIH and other research institutions that make it easier to be a good parent than in other, more structured environments.

Additional advantages of raising children here include the excellent schools, and one of the joys of being an NIH parent is having the opportunity to interact with the local school system. NIH parents have traditionally contributed in a major way to the science education of our children and their classmates through appearances in local school classrooms (never uninvited!) and at Science Fairs. Scientists interested in contributing to their local schools should contact Gloria Seelman at NIH's Office of Science Education (6-0608).

I realize that it is not always possible to achieve the kind of scheduling flexibility my family enjoyed, either because one spouse has fixed work hours, the parent is single, or the supervisor or the nature of the work is unforgiving. It is appropriate for the NIH community itself to try, both informally and formally, to make parenting easier. Informal solutions to childcare problems include babysitting pools; shared responsibility for pick-up and delivery of children to daycare, school, or after-school activities; and the occasional visit of a child to a parent's office (but always under total supervision and never in areas where there are hazards). I am looking into the feasibility of developing a parents' list-serve where subscribers could swap childcare information and maybe even a few hours of babysitting with other NIH employees and their spouses.

NIH's formal solutions to childcare needs include the infant and preschool facilities on campus and the daycare center at Executive Plaza (6006 Executive Boulevard). Currently, all of NIH's centers are filled to capacity and have long waiting lists. NIH's Master Plan proposes expansion of some existing centers and two new daycare facilities on the north and east sides of the campus—to accommodate an additional 350 children—but it is unclear when the funds will be found to build these. One idea is that these facilities, in addition to providing routine daycare, would also provide temporary backup care when regular daycare arrangements fall through for an NIH parent. The possibility of an infirmary for sick children could also be considered, but it raises a number of more complex issues.

This issue of *The Catalyst* is intended to help generate discussion on campus about what NIH parents need to meet their obligations to their children as well as to their science. I am interested in hearing your ideas about how to improve life for NIH scientists who are parents.

Michael Gottesman
Deputy Director for Intramural Research

Catalytic Reactions

Below are comments we received in response to issues or letters raised in the September-October issue.

On the state of chemistry at NIH

I wish to compliment *The NIH Catalyst* for choosing to feature the sad state of chemistry at NIH in the September-October issue. My only quibble with this otherwise incisive and informative article is the reference to Ad Bax as "NIH's Most-Cited Chemist." In the interview on page 13, Bax's assertion that "NIH seems to be quite supportive of chemists, as far as I've been able to tell" contradicts the many NIH chemists quoted in the article. This is not so surprising, since Bax also makes it clear that he is *not* a chemist. (He is, however, a brilliant, world-renowned biophysicist.) That Ad Bax should be presented as a chemist is symptomatic of the low profile of chemistry at NIH.

—John Schwab, NIGMS

The latest issue of the *NIH Catalyst* is a déjà vu for us oldsters. Nobody formulated the need for chemistry in medicine better than Frank Westheimer in his introduction to the report that bears his name. The ACS publication "*Chemistry in Medicine* ," on which I collaborated with leaders of academe and industry many years ago, and DeWitt Stetten's "*NIH: An Account of Research in Its Laboratories and Clinics*" provide additional convincing demonstrations of the absolute leading role of the properly understood organic chemistry in its wider sense, which certainly has no need for the superfluous epithet "molecular."

If tradition were to play a more important role in the pursuit of science, we would not have to re-invent the wheel so often. The late Dr. Phil Handler, past president of the National Academy of Sciences, used to say, "If ever we came closer to understanding the mystery of life, it can be described and expressed in only one language, that of organic chemistry."

—Bernhard Witkop
NIH Scholar Emeritus, NIDDK

On questions about carpool stickers and parking

I feel compelled to reply to the letter from "Anonymous" who has "never seen more than one person get out of or into a car parked in a carpool space" and therefore concluded that these people "are obviously not carpooling." A very simple explanation is that these observed people were car pooling with other NIH employees who work in different buildings on campus. I was one of these people when I was at NIDR in Bethesda. I carpooled with somebody who worked in Building 31. Our routine was for me to drop her off in the morning at Building 31 and drive to Building 30 to park. The process would be reversed each night. Therefore, I would be observed exiting and entering alone each day a car parked in carpool spaces.

—Steven Akiyama, NIEHS

Having held both general and carpool stickers for the past 18 years, I've heard most of the complaints about the NIH parking crisis. No matter what color parking sticker one has, there are people who abuse the system. This is evident just by taking a stroll through most of the parking lots on campus. One will find in red, general, and carpool lots that there are cars with outdated stickers or cars with either the hanging tag or window sticker missing. Why is this? Because someone left their hanging tag in another car? Then why not park legally in Lot 41? Or with the red and carpool lots, are two cars being driven on one permit? How about the general parking areas where the same thing occurs, either no sticker or no tag? What can the excuses be since each car is issued a sticker and a tag? Could the rumors actually be true that employees are selling their parking places to non-NIHers who utilize the Metro system and would rather risk a rare ticket than pay parking downtown? How many visitors actually get to park in the lots designated for them? I've known more employees than I can count who never even register their cars on campus just to park in visitor lots.

Easy answers. No way. We could ask the NIH police to be more vigilant, but the system is flawed and there will always be people who take advantage of that fact. Maybe the carpool and red lots should be open to general-parking-sticker holders at an earlier time since many of these lots are already filled before the current rules now permit. Or how about going to the extreme of abolishing all classes of parking except disabled, visitors, and reserved and making parking first come, first served? Dreaming again, you bet. These are suggestions that will just add more fuel to this endless, raging debate, but since we are all in the same boat, a little more consideration of our fellow employees might go a long way.

—Anonymous

I was clearing my desk and came across the Catalytic Reactions call for information or thoughts on the parking situation here. In general, it has improved greatly since MLP8 opened up. One suggestion that is bound to be unpopular: How about assigning the summer students to parking in lot 41 (or Siberia, as we like to call it)? They generally work much shorter hours than the fellows (7–8 hours) and so they can find the time to add the extra 20–25 minutes to and from parking lot 41 to their workday.

Oh ... one other thought. Security in the parking garages is always high on our minds when we walk in there late at night ... . I think we should be told of "problems" in ANY of the garages on campus so that we don't get complacent.

—Krystyna R. Isaacs, NIMH

Corrections

On the Mark

In our September-October issue, the name of the research scholar pictured with NIH Director Harold Varmus was inadvertently omitted. She is Yvonne Mark, an HHMI-NIH research scholar in Dr. Varmus' laboratory.

Yvonne Mark, HHMI-NIH research scholar, with an NIH director.

Letter Perfect

We also omitted one letter from the e-mail address you need to subscribe to the DDIR's (biweekly) Bulletin Board. Send your message to: <listserv@list.nih.gov>. Your message should read: Subscribe DDIRBB-L Firstname Lastname ■

TIPS FOR CLINICAL MEDICINE RESOURCES ON THE INTERNET

by Dale Graham, Ph.D., DCRT, and the members of The WorldWideWeb Interest Group (WIG)

With this article, we launch a series on the most useful WorldWideWeb sites for biomedical researchers. To compile these lists of biomedicine's best bookmarks, we solicited nominations from the eclectic group of scientists who are members of NIH's WorldWideWeb Interest Group (see box). WIG members contributed more than 300 sites of biomedical interest, and we will be showcasing these sites by general topic in the months to come.

To access these sites, you will need a web browser such as Netscape Navigator or Internet Explorer. Once it has opened, select "Open Location" or "Open URL" from the File menu and type the Uniform Resource Locator (URL) you wish to visit in the box that appears. Typically, these URLs, or web site addresses, begin <http://>.

More than 130 sites were suggested by members of WIG that fell under the category of clinical medicine.* From these suggestions, we selected sites that seemed to be the most useful in terms of breadth and general interest. The URL for the sites listed in this article as well as other recommended pages is <http://mantis.dcrt.nih.gov/Sites/Clinical.html>.

The easiest way to browse all of these sites is by opening this URL and then clicking on the highlighted name of any sites of interest to you. This will take you directly to the site without having to type in its URL. If any of these sites strike you as pages you will want to visit again, be sure to add them to your hotlist of bookmarks. To add a bookmark to your list, pull down the menu under "Bookmarks" and click on the first item, "Add bookmark." If you are using Internet Explorer, the equivalent terms are "Favorites" and "Add Favorite."

Medical News Services

Two of the more interesting were Reuter's Health Information and the Science in the Headlines sites.

Reuters Health Information,
URL = <http://www.reutershealth.com/>

Reuter's site provides daily medical and health-related news written for the health-care professional. It includes a "Case of the Week" and links to medical sites reviewed by Reuters physician editors. Fully searchable news.

National Research Council's Science in the Headlines,
URL = <http://www2.nas.edu/new/index.html>

Each year, the National Research Council and the Institute of Medicine produce hundreds of reports that examine a range of issues from AIDS to obesity to science education, nuclear waste, and more. This site provides a daily summary of issues in the news with links to press releases and summaries of related reports written by volunteer committees of the nation's top experts.

On-line Journals

There are many on-line journals, especially in the specialty areas. The offerings at these kinds of sites vary widely, from full-text articles to just tables of contents. I have chosen just one site, from a most prominent journal with fairly robust offerings.

New England Journal of Medicine,
URL = <http://www.nejm.org/>

You might also wish to browse the NIH Library's web site, which has links to full-text articles available through special NIH subscriptions and not available elsewhere. Note: some of these journals do require that the user have a PC in order to use the Ovid system, so Mac and Unix users must wait until versions for their computers are released. We're told it is on the way. The URL for the NIH Library's on-line journals section is <http://libwww.ncrr.nih.gov/~imagemap/board?185,144#Online Journals and Books>.

Links to Medical Information

American Medical Association,
URL = <http://www.ama-assn.org/>

This is an award-winning site from medicine's largest professional association and major medical publisher. It features news and clinical research summaries from the *Journal of the American Medical Association* (*JAMA*), the AMA's nine specialty journals, and the AMA's newspaper, *AMNews*. *JAMA HIV/AIDS* offers daily news and peer-reviewed resources. A directory of medical societies and links to AMA-reviewed medical sites are included, as are searchable databases of Continuing Medical Education (CME) courses, residency programs, and more than 650,000 physicians, listed by name, specialty, and location. AMA's site also includes general announcements and texts of AMA speeches and abstracts, press releases, searches from *JAMA* , *AMNews* , and AMA specialty journals, plus advocacy information and hotlinks, catalogues, a medical student section, peer-reviewed journals, and an HIV information center.

Hardin's Directories

(there are two links to different areas of this one)

Martindale's Health Science Guide,
URL = <http://www-sci.lib.uci.edu/HSG/HSGuide.html>

These pages are for researchers interested in nursing, dental, and veterinary work or the Virtual Medical Center. Hardin's includes general biology site links, anatomy site links, and lots more. In fact, it's so big that it takes a while for the page to load. The site is jam- packed with medical resources.

Hardin Directory of Health Science,
URL = <http://www.arcade.uiowa.edu/hardin-www/subj.html>

The Hardin Directory of Health Science internet resources has a link to the above and to a guide to NIH grants as well as many other links.

Medscape,
URL = <http://www.medscape.com/>

Medscape is an award-winning, free medical web site designed for clinicians and interested consumers. Medscape features include: free Medline searching; original material plus thousands of full-text, peer-reviewed clinical articles from a growing list of contributing medical journals; and eight specialty topic areas; it offers interactive self-assessment features; on-line CME information; daily updates; and free, unlimited access.

MedNet Interactive,
URL = <http://www.mednet-i.com/>

MedNet Interactive<TM> is an on-line companion to COR Healthcare Resources' print publication, MEDICINE ON THE NET. MEDICINE ON THE NET is a key source for health-care professionals looking for information about medical resources on the Internet, with forums, "Consult the Expert" links, on-line subscriptions, and free sample issues of other COR publications.

Medicine Online Inc.,
URL = <http://www.mol.net/>

DCRT Offers Math Software And Expert Advice

by Lipika Samal

DCRT's Scientific Computing Resource Center (SCRC), a walk-in computing facility for NIH researchers, recently began offering support for mathematical software packages that perform functional analyses and symbolic manipulation, solve linear and nonlinear equations, and have exceptional graphics. The mathematics programs—Mathematica, Math Cad Plus, and MatLab—are useful in modeling biological processes and designing experiments. Indeed, observes Philip McQueen, SCRC mathematics coordinator, "as computer science, information science, and mathematics become more closely linked with biological research, mathematical software will continue to become increasingly valuable." Some programs, like the popular Mathematica, are available on Helix and Advanced Laboratory work stations.

SCRC, now entering its fifth year of operation, also provides software in other areas of scientific computing, such as image processing, molecular modeling, and statistical data analysis. Staff members with extensive knowledge of many of the programs' applications are available to assist users by appointment.

To the newcomer, SCRC, located on the first floor of Building 12A, may look like a room full of computers, but the facility offers much more than equipment. Expert consultants advise users on mathematics, statistics, image analysis, and scientific web publishing. Researchers work at Mac Quadra, PowerMac, Pentium, Silicon Graphics, and SUN work stations, running a variety of software packages, and can use the center's color printers, scanners, and other hardware, which many labs do not own. SCRC also supports programs such as NIH Image, a free public domain program used for gel densitometric analysis, and programs that facilitate tissue segmentation and cell counting.

P.L. Placek

DCRT's Philip McQueen explains KaleidaGraph to NIMH researcher, Daljit Kaur.

The center's computer scientists and engineers have also assisted researchers in the development of web sites. One beneficiary of their expertise is Lothar Hennighausen, a researcher in NIDDK's Laboratory of Biochemistry and Metabolism who studies the development, differentiation, and function of the mammary gland. Hennighausen recently joined forces with SCRC's Jai Evans to create a web site that disseminates information to researchers worldwide.

The site, which can be found at http://scrc.dcrt.nih.gov/~mammary, is "a true web presence," according to Luther Barden, head of the SCRC. Barden describes the site, which now gets about 200 visits a week, as "a journal, an encyclopedia, and a textbook all under one roof, where you can find everything from techniques to literature to reviews to histology." For other researchers hoping to create a scientific web site, SCRC can offer guidance and software and can temporarily host the site on one of SCRC's servers.

SCRC's own web page (http://scrc.dcrt.nih.gov/) gives up-to-date information about the center's services as well as links to outside sources, such as software tutorials, software manufacturer pages, and e-mail addresses for a wide network of support staff. "It's a great starting place for information about image processing, molecular modeling, and mathematical and statistical software at NIH," says Evans.

To use the facility, researchers may schedule an appointment by calling 4-DCRT or by e-mailing <4dcrt@nih.gov>. ■

Medicine Online Inc. is a WorldWideWeb guide directory of medical-related sites. A medical internet service provider for hospitals and the medical community, Medicine Online provides up-to-date medical resources, information, references, and connections for just about anyone in the medical field. Medicine Online is a link to access the world of medicine.

Links to Pharmacological Information

RXList, Internet Drug Index,
URL = <http://www.rxlist.com/>

RxList allows a "fuzzy" drug name search (you don't have to know how to spell it) of more than 4,000 U.S. products. The Top 200 Prescriptions (two-thirds of all prescriptions written) are linked to generic prescribing information. This drug search site, established by a pharmacist, contains a listing of over 4,000 drugs, including access to a fully searchable database of information on these drugs. This includes indications, side effects, and links tracking particular pharmaceuticals. Try testing out the search capabilities using the new obesity drug recently approved by the FDA: dexfenfluramine, known in the pharmaceutical trade as Redux.

PharmInfoNet,
URL = <http://pharminfo.com/>

Another Web site devoted to pharmaceutical information with links to data and information.

Consensus Development Conference statements,

URL = <http://text.nlm.nih.gov/nih/nih.html>

This site allows doctors to receive free CME credit for reading and taking a quiz (on-line) on the content of our Consensus Development Conference statements. There are two quizzes now and more on the way. ■

*Giving credit where credit is due, we received the majority of the suggested clinical medicine sites from Roger Fajman of DCRT.

Cybernauts Cast Net

The WorldWideWeb interinstitute Interest Group (WIG) meets the second Tuesday of the month at 2:30 p.m. in Lipsett Auditorium. The WIG web page has information about previous meetings, upcoming meetings, and other topics of interest to the NIH community. The URL for the WIG page is <http://mantis.dcrt.nih. gov/WIG/>. ■

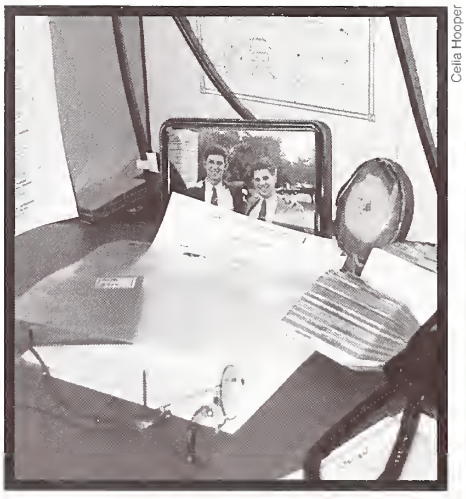
The Jugglers
continued from page 1

NIH supervisors and staff, the presence of on-campus daycare, and flexibility in hours on the job—all seen as essential for simultaneous success in the workplace and at home.

Many of the scientists interviewed for this article unapologetically give their families a high priority. NCHGR Scientific Director Jeff Trent plays an active, if not predominant, role in parenting his 17-year-old son and 13-year-old daughter. "It's critical to put as much effort into family as into science," says Trent. "The time you spend with your kids is more than amply rewarded compared with scientific endeavors." Trent, who over the past 12 years has coached his children's basketball and baseball teams, observes that beyond a certain point, additional hours at the lab or office become marginally productive. "Investment in family is infinitely more rewarding than doing one more experiment." NIDDK's Matt Rechler, chief of the Growth and Development Section in the institute's Molecular and Cellular Endocrinology Branch, says flat out that for right now, his two sons—roughly a year younger than Trent's children—"are my number one priority." Rechler, who coaches his 12-year-old's soccer team, says he "made a decision early on to be a hands-on parent, to be as actively involved with the kids as possible. The years go fast, and this is your shot."

Unfortunately, for many scientists this one shot as a parent coincides with their one shot at the big leagues in biomedical research. NHLBI's Cynthia Dunbar gave birth to two daughters, Alexa and Anna, while she was on the tenure track. With multiple outside job offers, Dunbar was even put up for tenure early. She breezed through (see Recently Tenured, p. 14). Anna is now one-and-a-half and Alexa almost four. Dunbar and her husband are also singers with the Choral Arts Society of Washington, D.C.

How did she do it? Dunbar says, "I had good childcare—a live-in nanny and a husband who had regular hours as a teacher." Whereas Dunbar's spouse, Charles Cerf, had less flexibility in his schedule, he also worked fewer hours than Dunbar, allowing her to return to the lab nights and weekends. Dunbar says she and her husband have always been in agreement that her career would come first while she was getting established, and Cerf backs up his verbal support with deeds—he runs the household, from shopping and paying bills to managing investments.



Celia Hooper

A mother's desk: The smiles of sons Greg and Karl grace scientist Anita Roberts' desktop.

Celia Hooper

NCI lab chief Anita Roberts displays tee-shirt designed by son Greg.

Dunbar says another key to her success was excellent support from NHLBI Scientific Director Edward Korn and her lab chiefs, first Art Nienhuis and then Neil Young. As at home, the support went beyond words. "I had good technical support in the lab, good postdocs, good animal caretakers, good research nurses, secretarial help, etc.," says Dunbar. She can also work at a home computer to write and answer e-mail. "There is lots of integrated support in this Branch—you're not isolated and confined to just one module and a technician." Branch chiefs trusted her to put in the needed hours of work and didn't clock the hours she was in the office.

Dunbar says that even with help from spouse and institute, there were challenges and problems. Her position as a commissioned officer precluded her taking family leave, stopping the tenure clock, or working part-time (see Leave box, p. 11). Now, with constant interruptions, both at home and at work, she feels less focused and able to do long-term planning than she was before the children arrived. She feels guilty that she doesn't spend more time with her girls and worries this will intensify as they get older and want her involvement in their activities. She says there were moments—during a difficult second pregnancy and then with a colicky infant—when "I thought I was not going to make it."

Teresa Jones, a tenure-track investigator in NIDDK's Metabolic Diseases Branch, is also under the intense double crunch of career and family demands. On Jan. 28 of this year, the stork presented Jones and her husband, Joshua Zimmerberg, chief of NICHD's Laboratory of Theoretical and Physical Biology, with fraternal twins, Joseph and Aaron. Like Dunbar, Jones and Zimmerberg hire a sitter in their home and stagger their work schedules during the weekdays, with one parent coming in early, the other staying late. But during the evenings and weekends, taking care of the twins keeps both parents out of the lab.

"We really both have to be there when the daycare person leaves," says Jones. "We used to have our nights free for science. Now they're for playing with the kids and putting them down to sleep. By then, you're too exhausted to review a paper or write," says Zimmerberg. Jones and Zimmerberg say the key for them is being highly organized and efficient during their workdays since "there's no option of going into emergency mode" on nights and weekends. Jones says things are working out. "At this point, I have good postdocs and things are moving ahead as well as can be expected. It's amazing how you can make your time count for more—how much more efficient you can be." Zimmerberg claims that having children and forced efficiency has actually helped his work. "This has been a stimulus for creativity . . . There's a joy that we got with our kids. It helps everything at work."

Supportive bosses—Allen Spiegel at NIDDK and Arthur Levine at NICHD—have helped, too. Jones says no one batted an eye when she had to take eight weeks out on bed rest before the twins were born and then took another eight weeks of leave after their birth. "People have been 200 percent supportive," she says. Zimmerberg took two weeks off, then started working slowly, mostly at home, for the

next four weeks after the babies arrived.

As for other resources, Jones says she has appreciated NIH's room for nursing mothers (see Nursing Moms' Room box, p. 9) and both Jones and Zimmerberg say home- computer access has been helpful. Zimmerberg says one thing NIH could do to be more family-friendly would be to help people get wired. "It would be really great to have high-speed ISDN connections so people who really need to move data between work and home could do that." When Zimmerberg asked for help, he was told that the government can't pay for anything connected with a person's home—even if it could improve their work productivity. (But this problem may actually be misinformation. Marvene Horwitz, deputy director of the Office of Human Resource Management says that home-computer lines can be, and have been, installed to help staff work from home.) Jones says she would like to see NIH set up a clearinghouse for information on childcare providers. Both she and Dunbar were lucky enough to inherit sitters from families that were moving or whose children no longer needed in-home care. But Jones has a postdoc with a one-year-old child who has not been so fortunate.

Similarly, many of the parents interviewed said finding high-quality childcare coverage has been hard. For higher-income parents of preschool children and families with more than one young child, in-home care appears to be the choice, but it still has its problems. NICHD Section Chief Peng Loh found two good au pairs, each caring for her now-4-year-old son, Adam, for a year. But this year, Loh went through three au pairs in three months. "It is a matter of luck sometimes, depending on who is available at the time."

Several parents said Montgomery Childcare Connection, Inc., of Rockville (301 279-1773) had been a great help to them in locating in-home or institutional daycare. For a user fee of $22, this group works one-on-one with parents to locate convenient, age-appropriate all-day or after-school programs for children. The Maryland Department of Non-Public Schools (410 767-0100) maintains a complete list of private schools in the state.

Once primary daycare is lined up, there may still be problems. Numerous school closings, snow days, holidays, and caregivers' vacations—which rarely seem to coincide with government closings—can cause problems for parents with nannies or daycare that is not closely tied in with a federal schedule. "NIH should make more of an effort to have more flexible childcare facilities to accommodate school closings," says Loh. "Right now, unless you are enrolled in after-school care in Executive Boulevard, you cannot put your child there during school closings."

The NIH facility on Executive Boulevard is the Executive Child Development Center (ECDC), one of three childcare facilities that NIH houses (see Childcare and Schools at a Glance, p. 12). The program at ECDC, formerly housed in the Ayrlawn Building a few blocks from NIH, was known as the Nellie Ottenberg Memorial Childcare Center. The Parents of Preschoolers, Inc. (POPI), preschool in Building 35 and the Childkind, Inc., infant-care facility in Bldg. T-46 are run by parent-staffed boards of directors.

Parents who have recently and not-so recently had children in POPI and ECDC credit the centers as critical factors in their ability to succeed on the job, citing the excellent program and professional staff. NIDDK Section Chief Edith Miles and her husband, Todd Miles, also an NIDDK section chief, sent their sons to the POPI preschool the year it opened. Son David is now 27 and a graduate student at Stanford University in aeronautical engineering; son Eric is 25 and pursuing a master's in art at the Pratt Institute. "For me, worrying about childcare was the hardest part" of balancing career and family, Edith Miles says. "Once they had the preschool, things were better. A key question in parenting is, Are they getting quality care? I came to the conclusion that with good daycare and several hours of attention (from my husband and me) every night, plus the weekends, I didn't need to feel guilty."

Celia Hooper

Young NIH investigators collaborating on the playground outside Bldg. 35. POPI preschoolers, from left to right, are Peter Weng (son of Yi Ning, NCHGR, and Nanping Weng, NCI), Ella Petter (daughter of Ronit Petter, University of Maryland, and Ram Petter, NIAID), Sam Hooper (son of the author), and Nora Jendoubi (daughter of Rosaura Valle, CBER, and Moncef Jendoubi, NEI).

Health physicist Roger Broseus has been a single, custodial parent since his daughter—now 15 years old—was 4. Things were bumpy as he went through divorce, custody proceedings, and adaptation to single parenthood, and Broseus suspects his promotion may have been delayed because of the need to focus on family matters during this period. But when the dust cleared, the promotion finally came. "When I got my promotion, one of the first persons I told was Anne Schmitz," then head of the Ayrlawn Center, where his daughter went for before- and after-school care. "I told her, 'If you weren't there, I'd never have made it.' Good daycare allowed me to off-load concerns, and not worry about my daughter while I was at work." His experiences also led him to lend his male, single-parent perspective by serving on the NIH Daycare Oversight Board, which advises NIH on daycare.

But as good as the staff may be at these NIH-affiliated childcare facilities, there are also problems. The centers do not admit children when they are sick, forcing parents to have back-up care for sick children or to take the day off work. And many people feel the cost is too high, especially for infants; the waiting lists are too long, precluding new staff and visiting scientists from using them; and the on-campus facilities are too run-down. Paul Horton, director of the Division of Space and Facility Management in OD's Office of Research Services, says of the 15-year-old POPI facility, "We're really holding it together with love and prayers." The facility was carved out of the Building 35 cafeteria, while Childkind is housed in a temporary building. "They have a committed staff, but they endure makeshift arrangements, inadequate ventilation and toileting facilities," Horton says. He estimates that bringing the facilities up to snuff would cost $250,000 but thinks the improvements won't happen any time soon. "When [daycare] competes against research dollars, it is always at the bottom" of NIH priorities, Horton says, citing NIH's fundamental lack of "appreciation of the value of these daycare centers. It's like parking. No one complains until they can't find parking. Our daycare centers are no different—no one has taken up that flag."

Things may be changing on this front, however. A subcommittee of the Women Scientist Advisors, led by Maryalice Stetler-Stevenson at NCI, is now taking up the childcare issue. (Anyone interested in helping the WSAs address this issue should contact Stetler-Stevenson at <stetler@box-s.nih.gov>). Also, HHS Secretary Donna Shalala has directed NIH and other HHS divisions to form a committee to publicize and catalog programs that improve the work life of employees. NIH's Quality of Work Life Committee is chaired by OHRM's Horwitz.

Special childcare problems arise when scientist-parents must travel to professional meetings or site visits out of town, and this was one of the biggest problems cited by the parents interviewed for this article. The most typical solution for working parents is to stagger travel schedules with the other parent. Tenure-track scientist Helene Rosenberg of NIAID, with a 6-year-old son, 1-year-old daughter, and a husband who is a psychiatrist for the Veteran's Administration, says that she has had to reduce her travel schedule to the barest minimum. "I've gotten in the habit of not going to meetings. When I did, I had three levels of back-up [childcare]. That is a big problem." Stetler-Stevenson, a unit chief in NCI's Laboratory of Pathology says she and her husband, Bill, a section chief in the same lab, work around each other's schedules. "We don't schedule important work events at the same time. That way, if our daughter is sick, one can always stay home. I don't know how single moms do it."

> **"I'VE BEEN JUGGLING THINGS FOR SO LONG THAT I DON'T KNOW ANY OTHER WAY TO LIVE, AND BESIDES, I WOULDN'T GIVE UP MY RESPONSIBILITIES AS A PARENT FOR ANYTHING IN THE WORLD ..."**
>
> ***—Elizabeth Read***
>
> ***Clinical Center***

Single parents—as well as parents in two-parent families where both parents may be traveling—say their answers to the travel problem include hiring sitters, flying in parents or other out-of-town relatives, shortening the trip to one very long day, taking the children with them, or simply curtailing travel.

NIH scientists have mixed feelings about whether things are getting better or worse. Roberts, Miles and Dunbar all say it now takes scientists longer to get tenure or otherwise reach a point in their careers when it is possible to have children. Roberts is doubtful that many scientists today could take a seven-year hiatus from research and expect to return as she did. Yet at the same time, childcare options have increased, more spouses are prepared to shoulder their share of parenting responsibilities, parents may be able to substitute home computing for commuting, and supervisors—who may be active parents themselves—are more likely to be flexible in allowing parents to set their work schedules and sensitive about scheduling lab meetings at the last minute or when parents cannot easily attend. Says Hee Yong Kim, a section chief in NIAAA, wife of a former NIH scientist and mother of two sons, ages 14 and 10, "NIH was very good for us—quality daycare was nearby, most parents had a similar background (scientists or NIH people), and in most cases, people that I worked with were understanding and willing to accommodate my schedule."

While such accommodation may make the juggling act a little easier, the fact remains that scientist-parents, especially single parents (see Single with Children), must make sacrifices at home and at work. Elizabeth Read, a section chief in the Clinical Center, is custodial parent of two children—Maddy, age 14 , an honors student in ninth grade, and Sam, age 9, an enthusiastic fourth grader. Read says she has resigned herself to the exigencies of her life. "I feel that those of us who have extensive parenting duties are ultimately competing on an uneven playing field, and that those who don't have kids or those with partners or spouses who manage the homefront and kids on a full-time basis will always be able to work longer and harder and get ahead more quickly in the traditional sense." However, Read says, she doesn't have time to dwell on the inequities and no longer expects life to be fair. "I've been juggling things for so long that I don't know any other way to live, and besides, I wouldn't give up my responsibilities as a parent for anything in the world—my children have truly brought me the greatest joy in my life." ■

SINGLE WITH CHILDREN

If juggling careers and parenting is a double challenge for professional couples, it's at least a triple challenge for single parents. In addition to the usual problems finding adequate childcare and extra dilemmas in finding backup care when kids are sick or when parents must travel to meetings, single parents may have more financial worries and an intensified struggle trying to cram their lives into a 24-hour day.

Carol Thiele, a section chief in the Pediatric Oncology Branch at NCI, became a single parent just as she was coming up for tenure eight years ago. Her son Francesco is now 12. Important for her success was living close to NIH and to her son's excellent daycare—the program that is now the NIH-sponsored Executive Child Development Center—even if it meant settling for a smaller house in the pricey Bethesda housing market.

Thiele says the hardest thing for her as a single parent "was coming home after working and then having to help my son on school work." Her expectations of a more relaxed after-work life were based on the era she grew up in. "I am from a very traditional household where Mom would make a nice dinner every night." But in the home she runs, she says, "we do a lot of hot dogs and I don't worry that my house is not as clean." One thing that has helped on all fronts—from allowing her to enlarge her house to making family evenings more peaceful—was a salary adjustment won by the Women Scientist Advisors last year. "That was very important to me and enabled me to buy time—to get help to clean the house, to get more dinners out, to hire tutors, or to hire someone to stay with my son when I was out rather than just dumping him off at a friend's house." Basically, she adds, the salary adjustment "allows me to spend more fun time with my son."

A personal challenge for Thiele has been learning to ask for help. "I had to learn to stop thinking I had to do it all myself, (to realize) that you're not a bad person if you can't

do it all. But that applies to any scientist with children because our days are more rigid than other people's." To break out of untenable isolation, Thiele and many other scientist-parents say domestic networking is important—interacting with other parents from their children's school, church, or after-school activities or calling on the help of teachers, tutors, neighbors, and family.

Lynn Gerber, chief of the Clinical Center's Rehabilitation Medicine department, has been a single parent for five years—since her daughters Alex and Suzannah were 17 and 8, respectively. "The most difficult thing about being a single parent is to maintain a consistent level of excellence and effort over the long haul," Gerber says. "A person can always do one thing well. But when you have a high-powered job that requires you to be 'on' day after day after day, it's enormously demanding." And on the home front, she says, "you know that no one is going to relieve you—it's not a shared experience. There are no fallbacks. If you're lucky, you may be able to afford some daytime help, but otherwise, you're it, emotionally and physically."

Gerber wards off this world-weariness with a wide circle of friends and activities. "The antidote is to have multiple 'bank accounts,' each with different resources—professional feedback, interpersonal friends, children, spirituality—that you can draw upon; to paraphrase Mrs. Clinton, 'it takes a village to support a single parent,'" Gerber says. "For example, I am a tennis player. When I couldn't play after I hurt my knee, I would draw on other physical activities that I like, or other projects—like reading books. When I'm discouraged here at work, I get more involved with my reading group—another intellectual activity that is part of my life."

Celia Hooper

NCI Section Chief Carol Thiele showcases photo of family vacation with son Francesco and friends.

Gerber would like to see NIH and the Clinical Center strive to give women more flexibility in planning their careers around family, in using flextime and flexplace wherever possible and desired, and in allowing them to bring their children into the workplace.

Elizabeth Read, chief of the Cell Processing Section in the Clinical Center's Department of Transfusion Medicine has been a single parent for three years, since her children Maddy and Sam were 11 and 6. She says her greatest challenges as a single parent have been "never quite having enough time to do as good a job as one would like at work or at home, and not having enough 'down time' to unwind from either work or home responsibilities." Read says she attacks these problems on multiple fronts—recruiting out-of-town parents to sit when she must travel and when her daughter had chickenpox, networking with her children's teachers and parents of their friends, and recruiting her children's help. "In recent years, I have made a real point of teaching my kids organizational skills and taking more responsibility for their schedules, personal belongings, homework, and music practice. This has taken a lot of coaching on my part, but has paid off in the long run." ■

—C.H.

The Nursing Moms' Room

Overwhelming medical evidence now indicates that breastfed infants are healthier. So what's a lactating mother to do when she's at work and her baby's with a sitter? Pump milk in a crowded lab full of guys tinkering with lethal microorganisms and radioactive tracers?

Since last spring, the Clinical Center has had a better answer: Go to the Nursing Moms' Room. Located in a back room of the Occupational Medicine Unit on the sixth floor of the Clinical Center, the room provides a quiet, clean space where mothers can express breast milk. Expressed milk is refrigerated or frozen and then bottle-fed to an infant later. Pumping milk maintains its production.

Any NIH mother may sign in and use the room, which typically receives four to eight visits per day from current users. While response to the facility has been overwhelmingly positive, one mother told *The Catalyst* she would appreciate the installation of dividers to give mothers some privacy when more than one person is pumping, as well as a clean sink for washing out pumping equipment. Sinks adjacent to the Occupational Medicine Unit could potentially be splashed with infectious body fluids and should not be used. ■

—C.H.

THE POSTDOCTORAL PERSPECTIVE
continued from page 1.

postdocs who actually had children felt that postdoctoral research was quite compatible with parenthood. They also felt that their mode of working had changed after parenthood. The consensus was that "priorities change, but most parents learn to be more efficient" to compensate for the new constraints on their lives.

One of the biggest concerns among the postdocs surveyed was parental leave. Whereas staff fellows and senior staff fellows, like permanent NIH employees, are entitled to use accrued personal and sick leave and to take up to 12 weeks of unpaid leave under the Family Medical Leave Act, postdocs in other categories, such as visiting fellows and Intramural Research Training Authority (IRTA) fellows have no such guarantees (see Leave box, p. 11). For them, absences are at the discretion of their mentors. Guidelines from the Board of Scientific Directors suggest that supervisors grant IRTAs six weeks of excused absence for childbirth.

MANY ... FELT STRONGLY THAT A MORE FORMAL AND MORE GENEROUS PARENTAL LEAVE POLICY FOR POSTDOCS SHOULD BE ESTABLISHED AT NIH, ESPECIALLY FOR VISITING FELLOWS.

Many people surveyed felt strongly that a more formal and more generous parental leave policy for postdocs should be established at NIH, especially for visiting fellows. Although many supervisors extend the same benefits to visiting fellows as they do to IRTAs, policies for both groups are at the discretion of individual supervisors. Several women felt that the recommended six weeks of excused maternity absence for IRTAs was barely enough time off, especially for mothers who had cesarean sections. One parent pointed out that at six weeks, many infants are still feeding every two or three hours during the night, and nursing mothers are bound to be exhausted. This was echoed by another mother, who said she was constantly tired during the eight months that she breastfed her infant. She would have preferred to work part-time for a few months, she said, but there is currently no official option for part-time or unpaid leave for postdocs.

Even when a supervisor is willing to grant excused absence to an IRTA who has recently become a parent, there is no consistency in how this will affect the postdoc's five-year-maximum stay at NIH, and practices vary widely across institutes and laboratories. One fourth-year fellow at NIAID was offered up to six months of "stop time" by her supervisors so she could spend some time at home with her baby. Fellows in other institutes said that they were expected to return to full-time work within six weeks and were offered no stop-time, part-time, or excused absence options.

One reasonable, uniform approach, suggests NIDR's Caudle, would be to give all IRTAs and visiting fellows excused absences parallel to the leave accorded to the staff. Such a policy would allow male postdoctoral fellows, as well as female, to spend more time with their new babies.

Although all the parents surveyed endorsed, in principle, the idea of a "stop-the-clock" policy for postdocs to allow them to extend their total stays at NIH to compensate for time off to raise children, they also recognized that requesting the break would have drawbacks. Some respondents noted that requesting such extended absence was likely to affect the supervisor's perception of them as serious scientists. Most postdocs were also sympathetic to the supervisor's need to maintain lab productivity and thought that postdocs could lose touch with rapidly advancing research areas if they were absent for a year or more. Detlef Leipe, a fourth-year fellow at NLM, made the point succinctly: "The world at large does not have a stop-the-clock policy." Barbara Vance, a third-year IRTA at NCI with two children, observed, "It is naive to think that while your peers are in the lab and you are at home, you can keep up with them."

MONEY WAS ANOTHER MAJOR CONCERN OF POSTDOC PARENTS AND WOULD-BE PARENTS.

Money was another major concern of postdoc parents and would-be parents. Judy Ehrenstein, a librarian in the Montgomery County library system whose husband is an NIH postdoc, thinks that decisions about when to start a family are closely tied to economic feasibility. She pointed out that the salary earned by someone with a master's in library science (a degree that can be earned in a year of full-time study) is $30,000—more than the starting salary for an NIH basic research postdoc. One postdoctoral parent said that the low salaries in science had not bothered him until he had a child and realized firsthand the cost of childcare. Now he wonders whether he will continue as a scientist in the long run.

The financial concerns are understandable even if you look no further than the NIH childcare and preschool facilities on campus (see Schools at a Glance, page 12). The yearly cost for one infant at the Childkind facility is $10,260, about half the post-tax salary of a starting postdoc. Tuition at the Parents of Preschoolers Inc. (POPI) preschool in Building 35 is $7,020 per year, although some tuition support is provided for low-income families. Several parents felt that such childcare costs are prohibitive, and wondered whether a more graduated scale could be implemented. Caudle, whose wife is a childcare specialist, says that they would have been in serious financial trouble if they had had to pay for childcare. Another IRTA fellow states, "A postdoc salary basically prohibits you from having more than one child in daycare, so I understand why postdocs leave science when they have two children."

Waiting lists are an additional problem with campus daycare facilities. Some postdocs reported that they had to scramble to find alternative childcare in the window between their six weeks maternity leave and the three to six months it took them to get their child into one of NIH's infant daycare slots. Mary Haas, director of POPI, says there is typically an 18-month wait for one of the preschool's 65 places. About 200 children are currently on the waiting list. "It's a real problem for families coming here from abroad or who have just moved to the area," Haas says.

An alternative approach for two-income postdoc families may be in-home care. One NCI clinical fellow whose husband is also a physician thinks that their dual careers would have been impossible without their live-in nanny-housekeeper. "I feel very bad for non-M.D.s with limited salaries who have to struggle to bring the kids to outside daycare, rush home early to pick the kids up,

and struggle to manage housekeeping," the fellow says.

All the parents interviewed for this article felt that a supportive supervisor was a crucial ingredient in their attempt to combine research and parenthood. Most of the postdocs interviewed felt that their own supervisors were very supportive. Some, however, thought that supervisors often confused physical presence in the lab with productivity. They felt that a postdoc who spent more hours at the bench was viewed with more favor than one who might spend fewer—but more efficient and focused—hours in the lab. Some cited a general perception that a woman's productivity declined when she had a child, but all felt that this was a perception and not a reality.

Smaller numbers of respondents had other concerns, including the need for sick-child care on campus. Such back-up care, typically paid for by those who used it, has become a coveted "perc" provided by high-profile corporations and upscale law firms that cannot afford to lose key personnel when their kids are too sick to go to school or daycare. Two postdocs mentioned NIH's lack of private or comfortable rooms where breastfeeding mothers could express and save milk to be fed later to their infants. (They clearly hadn't heard of the "pumping room". See Nursing Moms' Room, page 9.)

Postdoc parents at NIH said personal resources were vital in juggling the responsibilities of work and parenthood. These included a supportive spouse or parents, domestic help, careful organization, and sheer physical energy. Several postdocs said the relatively flexible time schedule of researchers could also be counted as an advantage to parents. An NIEHS IRTA who does not yet have children said that her work hours depended on how she designed her experiments—a flexibility unavailable in most other jobs—and that she had chosen to be in research for this reason.

But more typically, postdoc respondents felt that other aspects of science, namely the low incomes and competitive job market, conspire to make biomedical research careers hostile to raising families. Intensely aware of the competition in science, and of the need to be productive as a postdoc in order to land that elusive "real" job, many postdocs echoed the opinion of NCI's Vance: "Science is competitive. If you can't play—or even if there's a perception that you can't play—it will hurt your chances of getting that faculty position." ■

Family Leave Policy

Clinical fellows, staff fellows and senior staff fellows are covered by the same provisions as regular Civil Service employees for annual leave, sick leave, and holidays. They can use accumulated annual leave for the birth or adoption of a child; and accumulated sick leave during pregnancy and confinement due to the birth (the period of incapacitation being determined by an employee's physician) or for adoption-related purposes. They may also use up to 12 weeks of unpaid leave in accordance with the Family Medical Leave Act and sick leave for family care or bereavement, in accordance with the Family Friendly Leave Act.

Visiting associates and visiting scientists (appointed for at least 13 months) are also covered by the Civil Service and Family Medical Leave Act provisions.

Intramural Research Training Authority (IRTA) and Visiting fellows do not earn or accrue annual or sick leave (but are excused on federal holidays); however, training preceptors and sponsors may excuse fellows for reasonable cause such as ill health and personal emergencies, and may grant a reasonable period annually for vacation, personal relaxation, and cultural exchange. On December 4, 1996, the Scientific Directors provided guidance, agreeing to set six weeks as their recommended minimum for excused maternity absence for visiting fellows and IRTAs, with two weeks of excused absence for new fathers. The legality of this recommendation is being reviewed and the policy is subject to supervisor/sponsor discretion, as well as future changes. Although stipends and health insurance allowance continue through such periods of excused absence, the period of the fellowship award is not extended due to lost time in training.

Tenure-track investigators in the Civil Service are also governed by the Family Medical Leave Act. By making prior arrangements, tenure-track investigators may stop or slow the clock on the six years they are allotted on the tenure track. With the written approval of the laboratory or branch chief, the tenure clock may be stopped for up to one year to allow a candidate extended family or sick leave. The tenure clock may be stopped to accommodate leave and/or leave without pay for reasons such as childbirth, adoption, major illness, or family emergency. The tenure clock will not be stopped for normal annual or sick leave. Candidates should have documentation of stop-the-clock leave on file at the time leave is taken, or shortly thereafter. With prior approval from the laboratory or branch chief, the tenure clock may also be adjusted to permit candidates to work part-time to allow them to care for children or other family members. The adjustment in the tenure track will be proportionate with the reduction made in working hours and salary. Thus, if a scientist arranges to hold a half-time appointment for his or her first two years as a tenure-track candidate, completing the tenure track with a full-time appointment, he or she would be evaluated for tenure seven years after entering the tenure track, but with six years cumulative time on the job. Adjustments in the tenure clock may not be made after the fact, and cannot postpone tenure evaluation more than 10 calendar years past the date a candidate began the tenure track.

Commissioned Corps members are in a completely different personnel system. Although they essentially have unlimited sick leave, they are not subject to the Family Leave Act and cannot elect to work part-time to accommodate new family responsibilities or for other reasons; thus, stopping or slowing the tenure clock is not an option without inactivating from the Corps. ■

Local Childcare Facilities And Schools At A Glance

Name (hours)	Location	Capacity (staff)	Ages Enrolled	Cost	Waiting List	Contact
NIH Facilities						
Childkind, Inc. (7:30 a.m–6:00 p.m.)	Bldg. T-46	33 infants (12 FT, 5 PT)	2 mos.–3 yrs.	$885/mo. (for <2s) $670/mo. (for 2–3s)	Yes; wait varies by age	Lee Ettman 6-8357
Parents of Pre-Schoolers, Inc. (POPI) (7:30 a.m.–6:00 p.m.)	Bldg. 35	65 kids (9 FT, 5 PT)	2.5 yrs.–K	$585/mo.*	200 (≈ 18 mos.)	Mary Haas 6-5114
Executive Child Devel. Center (ECDC) (7:30 a.m.–6:00 p.m.)	6006 Exec. Blvd., Rockville (on Campus Shuttle rte.): school buses to Luxmanor Farmland, Tilden schools	220 kids, incl. 18 infants (20–26FT, 20 PT)	6 wks–14 yrs., incl. all-day K, pre- and post-school care, summer camp, and school holidays	$975/mo.* (infants) $676/mo.* (2s) $585/mo.* (3–6s) $303/mo.* (1st–7th, pre-and post-school care	10 for infant slots 30 for K 40 for 2s 70 for 3–4s 26 for older	Anne Schmitz 6-9411
Private Before- and After-School Programs						
Rockville Day Care Assn. (7:30 a.m.–6:00 p.m.)	Bradley Hills Elem., Bethesda Ashburton Elem., Bethesda	50 (6) 30 (4)	K–5th pre- and post-school care, incl. school holidays, all-day K; summer program	$465/mo. (all-day K) $320/mo. (pre- and post-school care 1st–5th) $500 (4-wk summer program)	Yes	Tracy Tchirkow 493-5113 Patty Niven 493-5710
Kenwood Park Children's Center (7:00 a.m.–6:00 p.m.)	7300 Whittier Blvd., Bethesda; buses from Bradley, Wood Acres, Banockburn, Carderock, Burning Tree, Bethesda Elementary Schools	85 (14)	Preschool–5th, incl. K enrichment, pre- and post-school programs, program, all in cooperation with Bethesda Acad. of the Performing & (music, movement, drama)	$705/mo. (preschool) $310/mo. (K enrichment) $380/mo. (1st–5th pre- post-school care) $825 (4-wk summer program)	Yes (ave. wait ≈ 6 wks.)	Jane Seffel 229-6687
Private Schools						
St. Jane de Chantal (7:00 a.m.–5:30 p.m.)	9525 Old Georgetown Rd., Bethesda	510 (21 FT, 5 PT)	K–8th, incl. all-day K, pre- and post-school care; no summer program	$2,500/yr. for one child, $200 less for Catholics; price breaks for 2nd and 3rd sibs in school	≈10 for K; new wait list started each Feb. at open house; pref. to parishioners and siblings of attendees	Elizabeth Hamilton 530-1221
Georgetown Preparatory School, Inc.	10900 Rockville Pike, Bethesda	425 (50 FT, 5 PT)	Boys, grades 9–12; after-school sports, arts, summer prog. for foreign students	$12,400/yr.*; 20% have scholarships	Competitive admissions (accept 150 of ≈ 350; applications due Feb. 1)	Michael Horsey 214-1215
Sidwell Friends Lower School	Beverly Rd. at Edgemoor Lane, Bethesda	280 (40)	Pre-K–4th; after-school care at MiddleSchool; summer programs	$11,851/yr.* 21% have scholarships	Highly selective admissions; applications due Jan. 15	Admiss. Office (202) 537-8111
Sidwell Friends Middle and Upper Schools	3825 Wisc. Ave., D.C.	775 (105)	5th–12th after-school care; variety of summer programs	$13,801/yr.*	Highly selective admissions; apply by Jan. 15	Admiss. Office (202) 537-8111
Stone Ridge School	9101 Rockville Pike, Bethesda	673 (76)	Pre-K–12th; after-school program; summer program in the works; girls only, 1st–12th	$9,575/yr.* (full day, pre-K–6th); $10,350/yr.* (7th–8th); $10,995/yr.* (high school)	Often, especially for grade 9; open house Nov. 2–3; applications due Feb. 1	Sandra Dubinsky, Christine Thornton 657-4322
St. Francis Episcopal Day School	10033 River Rd., Potomac	235 (42)	Pre-K–5th; after-school program (K–5th); summer camp for pre-K–5th	$2,500/yr.* (PT pre-K) to $7,650/yr. (1st–5th); after-school* care additional	Selective admissions; application process Nov. through Feb.	Janet Brewer 365-2642

This table lists some of the programs available in the Bethesda area. It is not exhaustive, and inclusion of a program does not constitute an endorsement. Childcare Connection Inc. of Rockville (301 279-1773) maintains an exhaustive list of in-home and institutional childcare programs for infants through teenagers. (Abbreviations: FT: full time; PT: part time; K: kindergarten; incl.: including.)

*Some financial aid available.

Recently Tenured

Cynthia Dunbar *received her B.A. and M.D. degrees at Harvard University, then completed internal medicine residency training at Boston City Hospital. She joined the Clinical Hematology Branch of the NHLBI in 1987 as a medical staff fellow. Aside from a year at the University of California at San Francisco, where she received further clinical training in hematology-oncology, she has been at the NHLBI ever since. She is currently director of the Hematology Fellowship Training Program and active in clinical branch activities in bone marrow transplantation, as well as her laboratory activities.*

Celia Hooper

Cynthia Dunbar with photo of daughters, Anna and Alexa Cerf.

The current research in my laboratory and clinical research program focuses on improving our understanding of functional characteristics of pluripotent hematopoietic stem cells (PHSCs) and using that knowledge to improve the transfer of exogenous genes into these cells in order to treat a wide variety of congenital and acquired human diseases. The PHSC has been an obvious prime target for gene therapy applications because of the ease of collecting these cells (not just from bone marrow but, more recently, also from peripheral blood and cord blood sources); because it is now possible to maintain and manipulate the cells ex vivo with hematopoietic growth factors; and because retroviral vectors can be used to transfer genes to murine PHSCs at relatively high efficiencies.

During my postdoctoral studies in Arthur Nienhuis' laboratory from 1987 to 1990, we used retroviral gene transfer techniques in the murine model to study the consequences of overexpression of cytokine genes such as IL-3 and IL-6. Besides helping us refine techniques to improve gene transfer efficiency into murine stem cells, these studies also provided insight into the possible roles of autocrine growth factor production in myeloproliferative diseases and leukemias, and further work defined a possible intracellular autocrine pathway for IL-3 signaling.

The Clinical Hematology branch has one of the few nonhuman primate hematopoietic transplantation facilities in the world, and in 1991, we began to use this model to work toward human trials of retroviral gene transfer directed at PHSCs. The primate experiments showed that the efficiencies of gene transfer to repopulating stem cells appeared to be much lower than the mouse model, and important safety data were obtained when we found that the presence of recombinant, replication-competent helper virus could lead to aggressive T-cell lymphomas in monkeys heavily immunosuppressed by the transplantation procedure. In the laboratory, we began to explore the optimal conditions for safe, practical, and efficient gene transfer to human progenitor cells. We found that vector transduction of purified CD34+ progenitor cell populations over the course of 72 to 96 hours in the presence of IL-3, IL-6, and stem cell factor (SCF) produced high (30-90%) transduction efficiencies of either bone marrow or peripheral blood progenitor cells, assayed either by standard semi-solid media colony assays or by long-term culture assays designed to study more primitive cells.

Thus, in 1992-1993, we initiated the first genetic marking trial of hematopoietic progenitor and stem cells in adult patients who were undergoing autologous transplantation for multiple myeloma or breast cancer, in collaboration with our NHLBI clinical service, investigators in the Medicine Branch of NCI, and the Department of Transfusion Medicine of the Clinical Center. The goals of the study were to assess the feasibility of using these techniques in humans before attempting trials with potentially therapeutic genes, and to compare bone marrow and "mobilized" peripheral blood cells as sources for gene transfer targets. If marking was successful, it would also begin to answer important questions about transplantation biology, including the relative kinetics and durability of reconstitution after transplantation with cells from the bone marrow compared with peripheral blood.

The first phase of the trial has been completed, and the good news is that we found long-term marking of all lineages with cells derived from PHSCs in some patients but, unfortunately, at levels (less than 0.1-1%) that are unlikely to be clinically useful for most therapeutic applications. Cells derived from both the marrow and peripheral blood grafts contributed to the short- and long-term marking. No marked relapses of breast cancer or myeloma were seen, and no toxicity or helper virus generation was detected.

We have continued the clinical trials with modifications of the transduction conditions to try and improve these results and have also examined several factors in the laboratory to improve the efficiency of transfer. One area of interest has been a potentially negative role of other cytokines or regulators of hematopoiesis during ex vivo culture and transduction. Transforming growth factor-β (TGF-β) and macrophage inflammatory protein-1′ (MIP-1′) had previously been shown to inhibit the growth of certain progenitor populations ex vivo, but their effect on true PHSCs had not been studied. In a murine competitive repopulation model, we found that TGF-β but not MIP-1′ significantly inhibited PHSCs cultured ex vivo under conditions commonly used for retroviral transduction. More interestingly, we found that adding an antibody that neutralizes TGF-β in an ex vivo culture improved PHSC activity, suggesting that autocrine or paracrine production of this mediator may be part of the difficulty in keeping PHSCs alive ex vivo and in stimulating them to divide so that they can be transduced by retroviral vectors.

Ongoing studies will examine the effect of this manipulation on gene transfer efficiency in the murine and primate models. We are also using the primate model and gene marking techniques to study ex vivo culture conditions that have been reported to allow actual expansion of primitive human cells. These conditions clearly produce an increase in total cell numbers and progenitor numbers, but the effect on true PHSCs is not known, and may even be negative, as these culture conditions may push true stem cells to terminally differentiate. We have also been developing new vector systems that will allow immediate selection of transduced cells without the need for prolonged culture in selective media. Another project is to develop vectors that would transduce nondividing cells.

We are also continuing clinical studies to improve assays of gene transfer. Current in vitro assays for human stem cells are inadequate and nonpredictive, and the animal models, especially the mouse, have not allowed quantitative predictions. Ongoing small-scale trials of the transfer of the glucocerebrosidase gene into hematopoietic cells of patients with Gaucher Disease (in collaboration with investigators at NINDS) and transfer of the multidrug resistance gene to patients undergoing autologous transplantation with breast cancer (in collaboration with NCI researchers) may not yet benefit these specific patients, but they should prove invaluable in learning more about the behavior of stem and progenitor cells after transplantation in these different situations and help direct further improvements of gene transfer techniques.

Thomas Leto *received his Ph.D. from the University of Virginia in 1980 and did postdoctoral work at Yale University before joining the Laboratory of Clinical Investigation of NIAID in 1988. He is now a senior investigator in the Laboratory of Host Defenses, NIAID.*

Imma Barrera

Thomas Leto

My interests are in the area of protein structure as it relates to function, with a focus on the formation of intracellular protein complexes. My research at NIAID has applied these interests to clinically relevant host defense systems in phagocytic blood cells. We have been studying an enzyme, NADPH oxidase, that generates reactive oxidants that kill invading microbes. This multi subunit enzyme assembles from membrane and cytosolic

components during cellular activation; its importance in host defense is evident in patients with chronic granulomatous disease (CGD), whose inherited deficiency in oxidant production renders them susceptible to bacterial and fungal infections. CGD is the result of a defect in any one of four essential components of the oxidase.

In my early work at NIH, my colleagues and I identified the genes that encode two cytosolic oxidase components (p47-phox and p67-phox) affected in a majority of autosomal-recessive CGD patients. Much of our progress in understanding the NADPH oxidase relied on the development of gene expression systems that we used to restore the defective enzyme from CGD patients. These advances provided the impetus for ongoing CGD gene therapy studies in the Laboratory of Host Defenses.

In addition to its direct clinical relevance, this system has provided fertile ground for investigators interested in signal transduction and cellular activation. We recognized that within the deduced structures of p47-phox and p67-phox there are duplicated sequence motifs of about 60 amino acids, called Src homology 3 (SH3) domains. These motifs are found in a variety of intracellular proteins that participate in diverse signaling cascades in organisms ranging from yeast to humans. On the basis of clues from these other systems, we deduced the role of the oxidase SH3 domains in activation of this enzyme. SH3 domains are recognition modules for proline-rich target sequences and, in the case of the oxidase, we identified several specific SH3 targets within other oxidase components. Our work demonstrated that the SH3 domains are major links that bring this enzyme complex together during cell activation.

We have since found several ways to interfere with oxidase assembly based on disruption of SH3 interactions. In one case, we showed that a single proline mutation can cause CGD by blocking movement of cytosolic components to the membrane. We also showed that another SH3 domain-containing protein (p40-phox) inhibits the enzyme, and we have recently discovered a proline-rich natural peptide called PR-39 that can inhibit the oxidase when added to whole cells.

We hope that these molecular details will be used some day to design drugs that block undesirable effects of inflammation on "innocent bystander" host tissues which occur as phagocytes produce oxidants intended to kill pathogens. Many disease states, such as septic shock, arthritis, neurodegenerative diseases, atherosclerosis, cancers, and aging, are thought to result, in part, from inappropriate over-production of reactive oxidants during chronic or acute inflammatory processes. The oxygen-dependent defense system we are studying has apparently been around for a long time, evolutionarily speaking, since we have evidence for conserved oxidase counterparts in the plant kingdom. It will be interesting to see whether the plant enzyme is regulated by conserved signal-transduction systems. Future work will also explore other possible roles of phagocyte oxidants, such as intercellular communication during wound healing.

James Dee Higley *received his Ph.D. from the University of Wisconsin, Madison, in 1985 and did postdoctoral work at the university and at NIH before joining the Laboratory of Clinical Studies of NIAAA and the Laboratory of Comparative Ethology, NICHD. He became a fellow in the Laboratory of Clinical Studies, NIAAA, in 1991 and is now a research psychologist in that laboratory.*

Violence and alcoholism are endemic public health problems affecting Americans and their families. My principle research has focused on the neurobiology of these two problems in a nonhuman primate model. The research subjects are rhesus macaques that are selectively bred for high or low central nervous system (CNS) serotonin functioning. This research had its genesis in our discovery that CNS serotonin turnover, as measured by low concentrations of the major metabolite of serotonin, 5-hydroxyindoleacetic acid (5-HIAA), in cerebrospinal fluid (CSF), is highly heritable. Subsequent studies showed that early experiences also play a major role in CNS serotonin functioning, with parental neglect reducing CSF 5-HIAA concentrations to levels lower than those in subjects receiving normative parental care. These early rearing experiences appear to cause reductions in CNS serotonin that persist from the neonatal period into adulthood.


Rebecca Kolberg

James Higley

One of the more important findings from my laboratory is that differences in CSF 5-HIAA concentrations between individuals are highly stable, showing consistent stability beginning as early as day 15. Interindividual differences in CSF 5-HIAA concentrations in infancy were found to predict interindividual differences in adulthood. Such findings suggest that two individuals with differing CNS serotonin reactivity may respond quite differently to the same stimuli. Furthermore, this propensity may be trait-like, with long-term, predictable differences.

Reduced CNS serotonin functioning has deleterious effects on the acquisition of social competence in the developing and adult primate. Human studies have shown that men with low CSF 5-HIAA concentrations are more likely to engage in violent behaviors, abuse alcohol, and engage in other antisocial behaviors. Paralleling these findings in humans, rhesus macaques with low CSF 5-HIAA concentrations engage in impulsive violent behavior, consume alcohol at high rates, have few social partners, and engage in high risk behavior. They are more likely to be ostracized from their social groups and die at an early age, often from violence. In a recent study, we found that CNS testosterone augments the effect of reduced CNS serotonin functioning on violence, although subjects with high CSF 5-HIAA concentrations were unlikely to engage in violence even if they had high testosterone, a finding that suggests that testosterone may produce competitive and aggressive motivations, but the intensity and timing of the aggressive or competitive response may be under serotonin control. Indeed, pharmacological treatment using serotonin reuptake inhibitors reduces aggression and other impulsive behaviors. Interestingly, subjects with high CSF 5-HIAA concentrations are more likely to become socially dominant, a measure of competent social behavior in nonhuman primates. Unlike subjects with low CSF 5-HIAA concentrations, subjects with high CSF 5-HIAA concentrations have little trouble falling asleep at night.

Early rearing experiences, such as parental neglect, not only reduce the responsiveness of the serotonin system, they also affect behaviors that are under serotonin control, such as aggression and alcohol consumption. For example, monkeys reared in social settings with other age-mates but no adults present (peer-reared monkeys) are more likely to be removed from their social groups for aggressive injuries requiring medical treatment. They consume alcohol at rates twice as high as subjects reared with their parents. Female peer-reared monkeys often abuse or neglect their infants, a behavior hardly ever seen in females reared by their parents. Peer-reared monkeys seldom become socially dominant.

Studies of human sons of alcoholic fathers show that they have a reduced response to the pharmacological effects of alcohol. Recently, we investigated the possibility that this well-replicated effect may be mediated by reduced serotonin functioning. We found that monkeys with low CSF 5-HIAA concentrations require more pentobarbital anesthesia to maintain unconsciousness, and when they are given identical dosages of alcohol, they are rated as less intoxicated than subjects with high CSF 5-HIAA. When they are anesthetized with halothane and tested using PET scans, subjects with low CSF 5-HIAA concentrations show higher whole-brain arousal, particularly in the frontal cortex region. These findings suggest that one of the reasons that subjects with low CSF 5-HIAA are at risk to abuse alcohol and drugs may be because they drink at higher levels to induce the same effect as subjects with high CSF 5-HIAA. ■

Neuroscience Lectures : Recent Past and Near Future

The 1996–97 Neuroscience Lecture Series is off and running. The series, which is sponsored by NINDS, NIDCD, and NIMH, imports neuroscience researchers to Lipsett Auditorium for the lecture, held at noon on Mondays. A reception for the speaker is held after each talk in the lobby area outside Lipsett. A new feature of the series this year is a web site that includes links to the lab homepage for many of the speakers. View the page at <http://intra.ninds.nih.gov./neuroseries> and you can read up in advance on the speakers' areas of investigation—as well as find out about any last-minute changes in the schedule. Continuing Medical Education credits are awarded for attending the lectures.

The following talks are scheduled for early 1997:

- January 6: Allen Ryan, "Regulation of Sensory Cell and Neuronal Development in the Inner Ear"
- January 13: Richard Morris, "The Role of Hippocampal Synaptic Plasticity in Memory: the Automatic Recording of Attended Experience"
- January 27: Michael Greenberg, "Neurotrophin and Neurotransmitter Regulation of Gene Expression and Neuronal Adaptive Responses"
- February 3: Joseph Glorioso, "Gene Transfer to the Nervous System Using HSV Vectors" ■

Cartoonist Takes a Time Out for Other Creations

Cartoonist Alex Dent, shown here, is taking this issue off for a very good reason. It is our great pleasure to dedicate this "Parenting" issue of *The NIH Catalyst* to Alex and his wife, Lakshmi Sastry-Dent, who became parents on August 30, 1996, when their son, Ram, was born. ■

Celia Hooper

Cartoonist Alex Dent explaining how it is.

Scholars-In-Residence Nominations

Senior NIH staff members (section chief and above) and interinstitute interest group heads are invited to submit nominations for Fogarty Scholars-in-Residence appointments for the July round of reviews. Nominations are due April 11. Information on the Scholars-in Residence Program and nomination procedures may be obtained from Jack Schmidt, Director, Division of International Advanced Studies, FIC (496-4161; fax:496-8496; e-mail: <schmidtj@box-s.nih.gov>). ■

Survival Skills for NIH Fellows

The NIH Fellows Committee, in conjunction with the Office of Research on Women's Health, the Office of Education, and the Intramural Scientific Directors, is pleased to announce the1997 schedule for the workshop series entitled "What They Never Taught You in Graduate School: A Series of "Survival Skills Workshops."

The objective of this series, directed by Michael Zigmond and Beth Fischer, of the University of Pittsburgh, is to assist members of our community of fellows in acquiring critical skills not generally included in scientific training, such as negotiating a job offer and publishing research articles.

Although the workshops are open to all fellows at NIH, seating is limited to 250 people on a first-come,first-served basis. The first four sessions, held this fall, addressed job seeking; the next four are listed below:

January 27: "Being a Professional Scientist," an address to fellows on campus by NIH director Harold Varmus; 3:00 p.m., Masur Auditorium, Building 10.

February 24: "Grantspersonship"; 8:00-11:30 a.m., Lipsett Amphitheater, Building 10.

March 24: "Writing and Publishing Research Articles"; 8:00-11:30 a.m., Lipsett Amphitheater, Building 10.

May 19: "Teaching: A Brief Introduction"; 8:00-11:30 a.m., Lipsett Amphitheater, Building 10.

For additional information, call 402-1914; a description of the entire series can be found at <ftp://helix.nih.gov/felcom/index.html>. ■

NICHD Scientists Garner 1996 Lasker Award

In recognition of their impact on children's health, John Robbins and Rachel Schneerson, of the Laboratory of Developmental and Molecular Immunity, have been awarded the 1996 Albert Lasker Clinical Medical Research Award. Robbins and Schneerson developed a conjugate vaccine against *Haemophilus influenzae* type b (*NIH Catalyst*, August 1993) that has virtually eliminated meningitis and other serious infections caused by this organism. They shared the award with two other scientists who worked independently of them, Porter Anderson and David Smith.

The Hib vaccine is the first conjugate vaccine to come into widespread use and is estimated to save hundreds of lives each year. Hib infections used to be the leading cause of acquired mental retardation in the United States. ■

A Welcome. . .

To Fran Pollner, who has just joined us as managing editor of *The NIH Catalyst*. Pollner is a veteran science writer, most recently on staff at *U.S. Medicine*. As a freelance writer, she has written for the NIH Office of Science Policy and Legislation, the Drug Abuse Council, the American Society of Microbiology, *The Journal of NIH Research*, and the *Harvard Health Letter*. For eight years, Pollner staffed the Washington, D.C., bureau of *Medical World News*. She was also Washington bureau chief for the *Medical Tribune* and a staff reporter for the International Medical News Group. ■

CALL FOR CATALYTIC REACTIONS

In this issue, we are asking for your reactions in four areas: Just Ask!, how NIH can improve the quality of our work lives, whether and how we should invest in childcare facilities on campus, and the vacationing Hot Methods Clinic. **Send your responses on these topics or your comments on other intramural research concerns to us via e-mail: <catalyst@od1em1.od.nih.gov>; fax: 594-3592; or mail: Building 1, Room 334.**

In Future Issues...

- Nifty NIH Inventions
- Molecular Pathogenetics
- Reorganizing NIH
- Hot New Clinical Trials

1) Just Ask! will be returning next month. What burning questions or problems blocking the efficient conduct of research would you like us to dig into in future issues?

2) At the direction of HHS Secretary Donna Shalala, an NIH committee is now developing a strategy for improving NIH work life. What would you recommend?

3) The Hot Methods Clinic will return soon. What updates can you provide on previous Hot Methods? What techniques would you like to see covered in the future?

4) The physical condition of the outdated NIH daycare facilities on campus is not up to code and could cost $250,000 to fix. Are these facilities important? Is the investment worthwhile? Or should NIH be making a larger investment in on-site daycare?

The NIH Catalyst is published bi-monthly for and by the intramural scientists at NIH. Address correspondence to Building 1, Room 334, NIH, Bethesda, MD 20892. Ph: (301) 402-1449; e-mail: catalyst@od1em1.od.nih.gov

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