

Counting the cost

Budgeting wisely can be critical to a young lab's early success. Kendall Powell finds out how to stretch funds for maximum effect.

Christina Hull knows that it takes money to make money. She's starting a small business with some venture capital which she must "convert into results before the investors pull the plug". But in this case, the small business is her molecular biology lab at the University of Wisconsin, Madison, and the venture money comes from her start-up package and a Burroughs Wellcome Career Award transition grant.

"It is a small business and it needs to be treated that way," Hull says of an academic laboratory. Researchers ought to think of research funding as being like a venture-capital financing package, says Hull, who took up her faculty position 20 months ago.

Michael McClure, semi-retired from a 23-year career at the National Institutes of Health, couldn't agree more. "Success is actually tied more to your business acumen than to your intellectual ability" in ultra-competitive research, says McClure, president of Frontiers Fund in Durham, North Carolina, which supports career development for young scientists.

Although many postdocs have written fellowship proposals, most have never set or spent their own research budget. The change triggered by a start-up or major grant budget can be overwhelming. Both new and established investigators say that, with a bit of forethought, postdocs making the transition can learn to get the biggest bang from initial research bucks. Leveraging sources of funding against each other can move research, and subsequent funding, forward.

START YOUR ENGINES

The first considerations should be made while negotiating a job offer. Candidates should review potential lab space and submit a 'wish list' to the department chair.

"Write down exactly what you think you will need. And I mean everything," says Markus Babst, a cell biologist at University of Utah in Salt Lake City. "If you forget something important, then you will be paying for it yourself later." Don't assume that anything in the department is available to share, he says, or that things such as water-purification systems are in place. Don't worry about going overboard, he adds — the chair will expect to review the list and scale it back as necessary.

To minimize start-up costs, consider the infrastructure, core facilities and expertise that are already in-house, ready to be used, says Elias Arnér, a medical biochemist at the Karolinska Institute in Stockholm. His colleague Marie Wahren-Herlenius,

a rheumatologist, agrees. She points out that this strategy can also align your lab with senior labs that typically attract more good talent than they can take.

Candidates needing their own mass spectrometer or fancy microscope must delicately negotiate it before signing on the dotted line, says Matthias Mann, director of the Center for Experimental BioInformatics at the University of Southern Denmark in Odense. "It's kind of like a courtship situation," he notes, but a delay or misunderstanding could mean years of downtime.

If you need major lab space renovations, these should be included in your job offer. Get over any uneasiness about 'talking money' and asking for things in writing — candidates "should know that's the game", Babst says.

McClure adds that new faculty members should take advantage of the transition time to plan their lab's future. Write a list of everything you will need and try to identify how each piece will be provided. Think about when to submit your first grant proposal and which agency programme will best fit your project. Finally, try to anticipate how to match start-up funds with a first grant budget to maximize spending and minimize funding gaps.

Strategies for spending start-up funds range from conservative to liberal. Hull warns colleagues not to penny-pinch too much. "It's tempting, but it won't get your lab going," she smiles. Babst, who spent three years in the biotech industry, agrees that scrimping doesn't always pay

dividends later. "I learned that time is the key, not money. If it will help in getting results, then I will spend it," he says. After set-up costs, he took the remainder of his start-up funding and calculated how many employees he could pay for two years. "I won't have much left at the end," he admits, but he thinks he will be better positioned to secure a grant.

Both Hull and Babst hired experienced lab technicians, gambling that the investment would pay off in efficiency. Arnér, on the other hand, never hired a technician and says that advising students keeps him closer to the data. Salaries dominate budgets, so investigators should decide first on who they need.

Things that increase efficiency, such as pre-mixed culture media or a better pipette, may be worth the extra money. "A lot of beginners are simply too cheap," says Babst. But with big-ticket items, it is okay to scrimp. It might save thousands of dollars, which can be used to cover unanticipated costs. "Don't buy the Rolls-Royce if you can do it with a Hyundai," he says.

Babst bought freezers from LabTrader, an online



Mike McClure says it is important to plan a new lab's future carefully.

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H. PRINZ/CORBIS **Getting the sums right: make a complete list of everything you need, don't be hesitant to talk about money and ensure you have everything in writing.**

company that sells second-hand scientific equipment. He asked colleagues if cheap equipment models worked well or not. Hull struck up discount deals with vendors and scavenged equipment from a retiring lab.

Cost-sharing helps eke out that first major grant budget and sometimes earns points with reviewers. Although the grant-review process has placed less scrutiny on individual budget items recently, there are still some general rules to follow.

“Do not develop a budget without talking to someone who has done it before — ever,” says Rebecca Moen, assistant director of the office of research administration at Duke University School of Medicine in Durham. Get a senior colleague in your field or department to look at the project and decide what you really need, she says. Moen says budgeting from the bottom up will make a budget easier to defend to reviewers.

Some agencies have turned to modular grants in which an investigator applies for a certain number of \$25,000 budget increments. But McClure says it is still not appropriate for new investigators to ask for major equipment. Making unreasonable requests or ignoring programme limits could easily doom a proposal.

“It is critical to know what the granting agency will support and what it won't,” says Raelynn Potts, the administrative officer for the Scientific Computing and Imaging Institute at University of Utah. Budget items should be inherently obvious to the benefit of the grant and not just a technical wish-list, she says.

She encourages investigators to nurture relationships with a departmental or university grants officer such as herself, as well as with the granting agency's programme officer, whose job is to answer questions.

First-time grant applicants should try to match

future lab tasks to people. It is difficult, she says, but paying an unexpected salary is near-impossible. And don't forget to factor in sizeable items such as service contracts, employee benefits and tuition for students.

Most departments track researchers' budgets through accounting, but ultimately investigators must monitor spending. “Most researchers want to think about budgets as linear, but the spending on a grant ebbs and flows,” says Potts.

Hull says her career award allowed her to take risks in spending to get her lab going and in the research projects she chose. The Burroughs Wellcome programme was designed to provide bridging support to postdocs with a five-year, \$500,000 award that can be carried to their first faculty positions.

McClure says transition or career-development awards give young researchers power to shift money around. “Learn quickly that no research career is supported by a single source,” he says. “The cost and size of what you are doing change over time.”

Arnér and Wahren-Herlenius note that, in Europe, young investigators usually fund their first two to three years with multiple smaller grants from private sources before applying for larger grants from government research councils. Arnér suggests writing several grants a month in the beginning and Wahren-Herlenius says stay organized with a calendar of deadlines.

McClure suggests arranging large grants so that they overlap in time a bit to avoid any funding gaps. Then, he says, “decorate the base funding with one-year awards” of \$75,000 or so whenever possible. “A proper chief executive will find resources in any amount at any time,” he notes. Getting funded is a never-ending process, he says. “But it becomes easier.” ■

Kendall Powell is a freelance science writer in Broomfield, Colorado.

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