



Industrial Fellowship Program

Executive Summary

The North Carolina Biotechnology Center recently instituted a unique program to help academic scientists seeking careers in industry. The Center's Industrial Fellowship Program (IFP) provides two years of funding for Ph.D. life scientists working as employees within sponsoring companies. In addition to gaining industrial scientific experience, fellows will be oriented and engaged in non-technical business activities associated with technology commercialization.

With only approximately one-third of North Carolina's current 3,000+ postdoctoral fellows destined for a tenure-track academic research career, an increasing number of these scientists are considering careers in industry. However, the absence of industry experience impairs the ability of most academic scientists to successfully compete for these positions. The Biotechnology Center's IFP is intended to provide genuine industry experience to North Carolina scientists and prepare them for permanent employment in the state's life sciences industry. Additionally, fellows in this program will have access to other resources to enhance their ability to successfully function in the corporate scientific environment.

During the pilot program, five fellows will be employed in year one and an additional five fellows in year two by sponsor companies. The total annual cost of maintaining this program is \$260,000 in year one and \$527,800 thereafter. The North Carolina Biotechnology Center has committed to providing funding during the pilot phase to cover the costs of salaries and benefits for the fellows (more detail can be found in the accompanying insert).

The initial fellowship cycle confirms that there is tremendous interest in this program from sponsoring companies, candidate scientists, entrepreneurship program partners, universities and local, national, and international media. There is the intent to expand the program in future cycles to include transitional training and experience in other career tracks available to Ph.D. scientists such as regulatory affairs, clinical development, technology transfer, and intellectual property business development.

The Biotechnology Center is seeking to leverage the commitment to this program with additional funding resources from strategic partners to maintain and expand this program and provide continued economic benefit to North Carolina.

Background

North Carolina universities are training a large number of high-quality, Ph.D.-level scientists. From 2005 to 2006, NC universities conferred 280 Ph.D.s in the life sciences. Graduates with academic research career ambitions are obligated to obtain at least one postdoctoral fellowship before they are able to compete for junior faculty positions. A postdoctoral fellowship is in some ways the scientific equivalent of a medical residency in that the individual has the necessary education and degree, but requires additional training to establish specific expertise and demonstrate independence. However, only one-third of scientific trainees who complete at least one postdoctoral fellowship will ultimately be hired for a tenure-track academic faculty position and rarely by the university that provided the postdoctoral training.

Not surprisingly, many freshly minted Ph.D. scientists and postdoctoral fellows are considering futures in industry. However, unlike engineering, law, medicine and business training, academic scientific training does not provide exposure or experience in industry; moreover, few scientists come out of academia with a realistic understanding of the business factors that drive technology commercialization. Industry typically requires both postdoctoral training and industry experience for mid-level scientific positions, but few postdoctoral training programs exist in industry.

There are limited opportunities for these new scientists to gain entry-level R&D positions in the state's biotechnology industry. Small- and mid-size companies often limit their new scientific hires to technician or senior scientist positions due to financial considerations. Ph.D.-level trainees are typically over-qualified for technical positions and are not yet senior enough for

higher positions. This creates an economic-development bottleneck in which North Carolina risks losing the “rising stars” in the next generation of researchers because they cannot find industry positions matched to their level of training.

The Biotechnology Center’s IFP was created to address these issues and put promising North Carolina scientists to work in the state’s life sciences industry.

Impact and Strategic Positioning

This is a first-in-class leadership opportunity. To our knowledge, no other state-supported life sciences industry training program for R&D at this level exists anywhere in the world. Moreover, this program could later be expanded to include non-R&D professional training in other high-level technical areas (e.g., technology transfer, clinical development, regulatory affairs or intellectual property), which would further economic development and constitute another first-in-class activity for North Carolina.

The North Carolina Biotechnology Center’s Industrial Fellowship Program leverages and reinforces the existing strengths of the Center and its partners. With its industry leadership position, non-partisan status, facilitation expertise and economic development mission, the Biotechnology Center is in a tremendous position to introduce and manage this program. The Center has a strong history of establishing and funding collaborative training efforts between academia and industry, experience with placing and hosting business interns, and strong ties to university graduate schools and post-doctoral associations.

Partners outside of the Center – the Council for Entrepreneurial Development (CED), entrepreneurship programs at various business schools, the Burroughs Wellcome Fund (BWF), the Small Business and Technology Development Center (SBTDC), the North Carolina Regulatory Affairs Forum (NCRAF) and North Carolina’s Biotechnology Industry Organization (NCBIO) – have expressed support and willingness to provide professional development materials or to include these fellows in their professional development programs. Directors of university offices for graduate careers and postdoctoral services have responded to the program with enthusiasm and were helpful in disseminating information regarding the program to their Ph.D. students and postdoctoral fellows during the program’s pilot phase.

The North Carolina Biotechnology Center’s Industrial Fellowship Program is continually reshaped by the needs of its customers. The program was developed in response

to needs expressed by companies and numerous academic scientists attempting to enter the industry. The absence of genuine Ph.D.-level industry experience was determined to be the primary factor preventing the transition of these scientists into company positions. Companies consulted during the “ideation” stage of the program were reluctant to engage non-staff scientists on projects of significance and sensitivity. Therefore, it was important to create a program that engages the fellows as company employees, allowing them to work on commercially meaningful projects, rather than as interns or technicians with limited responsibilities. This concept has become an important differentiator, as it subjects the fellow to company standards of confidentiality, performance and behavior while offering the fellow access to company benefits and collateral professional opportunities such as professional development programs, co-inventorship on patents, and others. We will continue to solicit input from industry and alumni fellows. This will enable us to identify additional areas that represent opportunities for refining the program so that it remains responsive to all partners.

Program Structure

The program is managed by the North Carolina Biotechnology Center’s Business and Technology Development (BTD) unit. The Center currently provides grant funding to the selected sponsoring companies to cover fellowship salaries and benefits.

Fellowship Candidates

Eligible fellowship applicants must be Ph.D. graduates residing in North Carolina without prior doctoral-level industry experience. Applicants may currently be academic postdoctoral fellows. Candidates should show compelling scientific potential as evidenced by a strong presentation/publication record, invention disclosures and grant success.

Candidates should have genuine industry aspirations and a willingness to leave academia, since opportunities for publication and public presentation of data from commercial research work (important predictors of academic success) are likely to be limited in the corporate setting. Additionally, candidates should demonstrate an enthusiasm for research; a capacity for critical thinking; leadership, independence and initiative; strong communication skills; a recognition of deadlines and deliverables; and the ability to function as a “team player.”

Candidates agree to comply with company policies regarding confidentiality, intellectual property, employee behavior, deadlines, documentation, etc. If the fellow chooses to resign from the position prior to the completion of

the two-year project, the fellow must supply the sponsoring company and the Biotechnology Center with a 30-day written termination notice. Candidates should be aware that no extensions of the fellowship beyond two years are available and that the sponsor is not obligated to hire the fellow as a permanent employee at the end of the fellowship.

Company Sponsors

The applicant company must be a life sciences discovery company or a contract research company with R&D operations in North Carolina.

The sponsoring company selects and hires the fellow as a fixed-term employee. The fellow is co-mentored by a company senior scientist and the Center's Technology Development Director. The company provides the Center with periodic progress reports. As a company employee, the fellow has access to an approved employee benefits package and is subject to company policies on performance, behavior and confidentiality. The company has the responsibility for dispersing the funds provided by the Biotechnology Center to the fellow, processing taxes and other deductions, and returning any unused funds to the Center in the event that a fellowship is terminated. A 30-day termination notice by either party will be required.

The company must demonstrate a willingness to provide the fellow with responsibilities and growth opportunities as appropriate – scientific input, co-inventorship credit on patent filings, and travel to relevant meetings – and commit to the duration of the project. Additionally, the sponsoring company is expected to encourage and provide opportunities for the fellow to acquire awareness and skills in other non-scientific areas impacting technology commercialization to complement the primary scientific experience. These include intellectual property, regulatory affairs, entrepreneurship, business development, equity financing, presentation skills, market and market research, etc. (see Non-Scientific Professional Development & Partnerships below for details).

The company is under no commitment to hire the fellow as a permanent employee at the completion of the project. However, if the company does not hire the fellow as a permanent employee, it is hoped that the mentor will assist the fellow in transitioning to a permanent industry position elsewhere by sharing contacts and serving as a reference, as appropriate.

Biotechnology Center Role

The Center is funding this pilot program and is making directed efforts to obtain additional funding for the program (see Long-Term Vision and Funding of the Program below). Participating companies are reimbursed

monthly by the Biotechnology Center to cover the costs of the fellows' salaries and benefits.

BTD staff will: (i) structure and manage the program, (ii) gather proposals from applicant companies, (iii) approve the benefits packages offered by sponsoring companies, (iv) work with university postdoctoral and graduate student organizations statewide to identify candidates, (v) forward proposals to the trainee pool, (vi) interview fellows and industry mentors for degree of fit and commitment to training opportunity, (vii) provide co-mentoring, (viii) provide access to professional development materials and programs, (ix) assess progress through review of annual reports, (x) market the program to the community, (xi) develop success metrics with which to gauge the effectiveness of the program, and (xii) continue to consult with companies to assure that the program is responsive to the scientific workforce needs of industry. The Center will convene periodic review meetings of fellows and mentors to assess the performance of the program and discuss ways to make it more effective.

Application Process

Companies interested in sponsoring a Biotechnology Center fellow submit non-confidential position descriptions to BTD through the online application page (www.ncbiotech.org/fellowship). Applications must outline the desired scope of work, qualifications and representative activities associated with the position, describe opportunities for professional development in non-technical areas (e.g., contributing to patent filings and regulatory document submissions, business development, and market research), identify a senior scientist who will serve as an internal scientific mentor for the fellow and provide a sample employment package (including benefits) for review.

BTD staff then engages additional industry scientists to help review the proposals and select five for funding. Approved proposals are circulated to university postdoctoral offices, graduate student organizations and an existing pool of postdoctoral candidates across the state. Applications from fellowship candidates are collected by BTD staff and distributed to the selected sponsor companies, who will make the final hiring decisions. BTD staff is available to meet with fellowship candidates and sponsoring companies, as needed, to assess degree of fit and assure adequate oversight to the fellow.

Non-Scientific Professional Development & Partnerships

The North Carolina Biotechnology Center seeks to bring additional value to the experience of the fellows by providing non-technical training and experience during the fellowship. The Center feels that an important component of an industry transitional training is to heighten the fellow's awareness of important business drivers that significantly influence technology commercialization. These drivers include intellectual property, regulatory affairs, entrepreneurship, business development, equity financing, market and market research, and developing presentation skills.

The Center will provide fellows with access to its Library to facilitate market research, competitive intelligence, or other projects suggested by the sponsor. The Center will also provide ancillary materials (e.g., the *Guide to Working in Industry* and *BTD's Primers* series) as appropriate. In addition, the Biotechnology Center will seek to include its fellows in relevant conferences, workshops and forums.

Sponsoring companies are expected to provide opportunities for the fellow to participate in non-scientific activities related to their work such as writing patent claims, contributing to regulatory submissions, exploring markets for new applications of a technology, business development or customer meetings, or other similar activities, as appropriate.

Other partnerships are being established that will add additional dimension to the training experience. These include:

Burroughs Wellcome Fund (BWF)

The Burroughs Wellcome Fund has offered to make a number of its educational publications (topics include scientific staffing and careers, lab management, and presentation skills) and related seminars available to Center fellows at no cost. Additionally, the fellows have been invited to participate in meetings with BWF's postdoctoral fellows.

Council for Entrepreneurial Development (CED)

We are in discussion with CED about subsidized access to Biotech Forums, conferences or courses for Biotechnology center fellows.

Small Business and Technology Development Center (SBTDC)

SBTDC is willing to allow North Carolina Biotechnology Center fellows to attend its various SBIR workshops and business seminars at reduced or no cost.

University entrepreneurship programs

Discussions are under way with the business schools at the University of North Carolina at Chapel Hill and Wake Forest University to allow Center fellows to attend life sciences-oriented entrepreneurship courses. These discussions will be initiated with other universities as necessary.

University postdoctoral associations and careers offices

Many of these offices have agreed to help market the program and include Center fellows in seminars relating to technology commercialization, career development, etc.

North Carolina Regulatory Affairs Forum (NCRAF)

NCRAF members will offer a Regulatory Affairs overview presentation to fellows once per year. Other opportunities (attendance at NCRAF-sponsored meetings or courses) are in discussion.

For more information regarding the Industrial Fellowship Program, please contact:

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