

T32 Supplement: Description for Pharmacological Sciences Training Program

Logic Model: Logic models represent shared relationships among program resources, activities and outcomes. It supports program planning (e.g., illustrate how the program leads to outcomes) and evaluation (e.g., identify questions to ask). Per the T32 Supplement, logic models will be used to inform evaluation design.

Figure 1: UNC Pharmacological Sciences Training Program. (If we have [inputs], we can do [activities], which will result in [outputs] that impact [outcomes].)

PROBLEM STATEMENT	PROCESS			OUTCOMES	
<p>There is an increased emphasis on new methods in genetics (e.g. CRISPR), animal models of disease and pathophysiology (e.g. chemogenetics and DREADDs), drug discovery (biased agonism), proteomics (kinome profiling), and new approaches to therapy (stem cells and gene therapy). A diverse cohort of graduate students is needed to conduct cutting-edge and rigorous research in broad areas encompassing the pharmacological sciences.</p>	<p>Inputs: resources that go into a program— what we invest</p>	<p>Activities: events used to produce desired outcomes— what we do</p>	<p>Outputs: direct, tangible results of activities—what we get</p>	<p>Short-Term: desired impact of the program —what we achieve</p>	<p>Long-Term: desired impact of the program —what we achieve</p>
	<p>Personnel: faculty in the Department of Pharmacology and other departments, centers, and schools at UNC-CH</p> <p>Institutional Support: support for OGE, faculty, faculty development, diversity & inclusion, student mental health resources, core facilities, etc.</p> <p>Department of Pharmacology: staff, summer fellows program, retreat, etc.</p> <p>Facilities: clinical facilities, research laboratories, office suites</p> <p>Recruitment: OGE recruitment (e.g. diverse backgrounds); BBSP and MTSP application review</p>	<p>Recruiting, Selection, Matching: BBSP (pre-PSTP for most) = Orientation (1-week), First-Year Group, Communication Training, RCR Training (7 sessions), Research Rotations (3x11wk), Coursework (1+/semester), Thesis Lab selections (DGS, fac advisor, Chair, Program Director) MTSP (pre-PSTP for 0-2/yr) = enter as med students, join FYG, complete 2 summer research rotations & 2 years of med school prior to joining lab/PhD</p> <p>PSTP (years 3-4 of PhD): Welcome to the Program: Mayfest to build community among students, fellows, faculty. Training (didactic): lecture-based (incl. biostats, rigor & reproducibility), seminars, grant-writing course Training (research): doctoral written and oral exams, dissertation defense Individual Development Plans: completed by trainee and discussed with thesis advisor Career Devt: coordinate with OGE to provide access to career</p>	<p>Capacity: 9 to 11 students/yr, with average time-to-degree of 5.5 years</p> <p>Trained Faculty: most have already participated in mentoring course and have attested to its effectiveness</p> <p>Research Environment: supportive and multi-faceted training environment designed to address the complex challenge of student training, in a constantly evolving biomedical research enterprise; the goals of the PSTP and its member faculty are fully aligned with that of trainees</p> <p>Competent Graduates: Diverse cohort of scientists by equipping them with critical-</p>	<p>Successful Career Placement: Graduates leverage new skills to identify and secure positions in academia and industry after graduation; 31% of graduates obtained extramural funding</p> <p>Enhanced Professional Network and Improved Reputation: a benefit of 40+ year legacy of T32 training is a vast network of alumni who now serve as recruiters and goodwill ambassadors for pharmacology at UNC</p> <p>Improved Mental Wellbeing: Student and faculty resources being further developed</p> <p>Increased Diversity: maintain or increase number of trainees from underrepresented groups (currently 23%)</p>	<p>The knowledge, practical experience, skills and mentoring acquired by students will be invaluable into the foreseeable future in biomedical research of universities, government laboratories, and the pharmaceutical and biotechnology industries, as well as in careers in all science-associated fields.</p>

	<p>Curriculum: didactic, research training plans, career development</p> <p>Time: Expected duration after joining program from BBSP or MSTP is 2-3.5 years</p>	<p>development, wellness, and intern opportunities</p> <p>Dissertation Committee: 4 faculty (incl. committee chair), plus thesis advisor</p> <p>Other: Lab to Life (3-6 prez by former trainees in non-academic careers); TA service optional</p> <p>Department Retreat: annual retreat with keynote and talks from grad students and postdocs</p> <p>Program Management: Graduate Education Executive Committee meets frequently to discuss improvements</p> <p>Faculty Recruitment, Mentoring, and Training: annual meeting with Dept Chair, semi-annual with Faculty Devt Committee, 8-hour training with OGE</p> <p>Evaluation: survey, outcome tracking</p> <p>External Review: 1x/7yr</p>	<p>thinking, comp, and comm skills and providing exposure to career opportunities</p> <p>Research Products: Publications (ave 4/yr, ~2 as first-author)</p> <p>Diversity: Several awarded prestigious HHMI/Gilliam Fellowship for Advanced Study</p>	<p>and continue to produce competitive applicants for HHMI/Gilliam Fellowship for Advanced Study</p>	
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<p>Assumptions: <i>beliefs we have about the program, including how we think the program will work (e.g., best practices, past experience and common sense)</i></p> <ul style="list-style-type: none"> • There is a very high level of interaction, sharing of resources, and collegiality between different graduate training programs at UNC; research collaborations lead to innovation and provide a rich training environment for students • Faculty are bound together across various units by shared interest in aspects of therapeutic development, human disease, and improving human health • Program includes well-established and early stage scientists; efforts focused on increasing faculty diversity • PSTP faculty have demonstrated commitment to training and mentoring, fostering supportive environment, excellence in research, extramural funding, and ability to broaden and strengthen research-training opportunities

<p>Contextual Factors: <i>environment/conditions that influence implementation and outcomes, including conditions which we have little or no control over</i></p> <ul style="list-style-type: none"> • PSTP has very little overlap in scientific emphasis with other current training programs at UNC • The OGE administers the BBSP and helps track student data, information on responsible conduct of research, and current diversity recruitment initiatives • BBSP and TIBBS plays a critical role in recruiting top students to UNC, ImPACT offers career development opportunities, and various graduate programs offer certificates pertinent to biomedical trainees • Employment options for life science PhD graduates have changed dramatically over the last 30-40 years, with <16% of PhDs obtaining a tenure-track position in academia
