

**Request for Authorization to Establish a
Master of Professional Science (M.P.S.) in Toxicology (CIP 26.1004) at
University of North Carolina at Chapel Hill**

I. Program Highlights

- 42 credit hours
- Core science courses, toxicology seminars, and professional skills courses
- Industry practicum and capstone project required (for all Professional Science Master's programs)
- 14 full-time, 3-6 part-time students projected at steady state
- Minimal start-up costs include partial salary and benefits for PSM Director, salary for adjunct instruction of professional skills courses, some supplies and advertising.

II. BOG Academic Program Planning Criteria (UNC Policy 400.1)

- 1. Existing Programs (Number, Location, Mode of Delivery).** UNC Chapel Hill and North Carolina State University both have non-terminal master's level toxicology degree programs (CIP 26.1004) in place that do not directly admit students but are vehicles to award a master's degree, when appropriate, to students who must exit the PhD programs in toxicology. North Carolina State University offers a Professional Science Master's in Environmental Assessment, which includes some instruction in toxicology and is delivered online. The proposed UNC Chapel Hill program will be delivered face-to-face and, building on institutional strengths, would emphasize toxicological effects in human health.
- 2. Relation to Campus Distinctiveness and Mission.** UNC Chapel Hill's 2011 Academic Plan emphasizes interdisciplinary teaching and scholarship as a key strategic aim. The proposed program would be delivered through the existing Curriculum in Toxicology, which is highly interdisciplinary and collaborative between UNC Chapel Hill's School of Medicine, Gillings School of Global Public Health, and Eshelman School of Pharmacy. The program will also cooperate with established investigators at NIEHS, US EPA, the Hamner Institutes and others.
- 3. Demand (Local, regional, state).** The proposed program will target applicants interested in full-time training and short time-to-degree. Enrollment projections were conservatively based on inquiries received to date. The high demand for Professional Science Master's programs in general, however, is another indicator of student demand. In 2012-2013, the 18 PSM programs in NC drew 3,680 applicants and admitted 1,381 students. While the program differs in delivery mode and toxicological areas of emphasis, NC State's Environmental Assessment program's success in attracting applicants is also indicative of the strength of the potential applicant pool for the proposed program; NC State has received 147 applications in three years.
- 4. Potential for Unnecessary Duplication.** The proposed program and the NC State Environmental Assessment master's program differ substantially in instructional approach and potential applicants served.

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- 5. Employment Opportunities for Graduates.** A 2013 report of the NC Biotechnology Center shows our state ranks third in the nation in number of biotechnology companies, with over 500 companies employing more than 58,000 people. These companies are potential sites for internships, as well as future employers, of graduates of the proposed program. At the time of proposal, CareerBuilder, Glassdoor, Monster, and Careerjet each listed over 100 positions that program graduates would be qualified to fill. At the time of proposal, the Society of Toxicology listed 20 active postings (48% of all postings) for which graduates of the proposed program would be competitive, including positions of health scientist, product safety specialist, regulatory toxicologist, toxicology manager, and ingredient safety manager. External Advisory Committee members from GlaxoSmithKline and Syngenta also provided support letters indicating program graduates would qualify for upcoming open positions in their companies.
- 6. Faculty Quality and Number.** The UNC Chapel Hill Curriculum in Toxicology includes eighteen faculty, all currently participating in the PhD program in toxicology. Professional skills courses and seminars would be taught by experienced professionals including speakers from academia but also toxicologists working in non-academic settings.
- 7. Availability of Campus Resources (library, space, etc.).** No new library resources, facilities, or information technology infrastructure and services are needed to launch the program.
- 8. Relevant Lower-level and Cognate Programs.** Applicants are anticipated to hold bachelor's degrees in biology, biochemistry or chemistry. A pre-requisite course in biochemistry will be needed for successful completion of the proposed graduate courses and can be taken at UNC Chapel Hill. The program is expected to attract new bachelor's degree recipients as well as entry-level professionals already employed by industry in the Research Triangle Park.
- 9. Impact on Access and Affordability.** The addition of the program will provide access to early-career professionals in the Triangle area who are not seeking an online degree experience. The program is seeking an \$8,000 per student per year differential tuition amount, which was determined to be consistent with tuition charged for other Professional Science Master's programs nationwide and with existing professional graduate degree programs at UNC Chapel Hill. One national survey from 2011-2012 reported entry-level (3-5 years of experience) master's degree holders in toxicology had a mean salary of \$99,000 and median of \$110,000.
- 10. Expected Quality.** The program has buy-in and support of industry partners in the Research Triangle.
- 11. Feasibility of Collaborative Program.** The proposed program is a highly collaborative endeavor that spans the resources and expertise resident in three partnering schools within UNC Chapel Hill. UNC Chapel Hill, NC State and others already partner through statewide events such as the Careers in Toxicology workshop. UNC Chapel Hill plans to collaborate with NC State's Environmental Assessment program in delivery of its seminar series and professional skills courses. Specifically, NCSU faculty and program contacts could participate as presenters in the seminar series through use of real-time videoconferencing with option to tape and archive presentations for a wider distribution.
- 12. Other Considerations.** *Our Time Our Future* identifies Professional Science Master's programs, which meet identified industry needs, as an area of targeted growth in graduate education.

III. Summary of Review Processes

Campus Review Process and Feedback. UNC Chapel Hill follows a two-stage review similar to the system requests to plan and to establish; therefore, the proposed program was reviewed and approved twice by the faculty bodies and deans office of the academic sponsor (School of Medicine), the Graduate School, Provost, and Chancellor. All reviews for the program were favorable. No opposition was stated against the proposal. The campus review process allows for the Provost or Chancellor to forward new degree proposals to the Faculty Council for further discussion if warranted, but that step was not deemed necessary in this case. Throughout the two-stage review process, the proposal was strengthened to include additional detail about industry ties and structure of the PSM Advisory Board, to confirm curricular structures and degree requirements, to clarify the administrative support of the Graduate School and budget needs, to detail collaborative efforts with other toxicology-related degree programs in the state, and to provide market data related to student demand and employment prospects.

UNC General Administration Review Process and Feedback. Prior to UNC Graduate Council review, UNC Chapel Hill responded to questions from UNC General Administration staff on demand evidence, collaborative opportunities, and resource needs. The proposal was then reviewed by twenty-three faculty and graduate program administrators from seven UNC campuses. Reviews consistently noted strong program alignment with UNC Chapel Hill's mission and the potential to leverage local business relationships. With one exception, reviews in all categories were either "acceptable" or "acceptable with some considerations." The review of "not acceptable unless significant deficiencies are addressed" was received regarding the demand evidence presented and that it was too generic to PSMs and not specific enough to the demand for toxicology program graduates. UNC Chapel Hill provided information from the Bureau of Labor Statistics, where toxicologists are included in the "Medical Scientists, except Epidemiologists" category projected to experience 13.3% growth from 2012-2022 (355,000 new job openings nationwide). NC Department of Commerce sources (www.ncworks.com) also returned dozens of open positions such as Toxicologist Manager, Environmental Exposure Scientist, Laboratory Sales Manager-Toxicology, and others. UNC Chapel Hill noted that skill sets for these positions included "excellent project management and teamwork skills" and "excellent interpersonal, written/oral communication and presentation skills," which are the types of professional skills developed through PSM programs. The bulk of UNC Graduate Council review comments were regarding the curriculum design and delivery, specifically about structure of the seminar series, the biochemistry course as an admission requirement, and use of adjuncts to deliver the professional development courses. UNC Chapel Hill provided the detailed course description for the seminar series, which is moving through campus approvals. They also clarified that professional skills courses provided through the PSM Office are intended to serve students enrolled in different MPS tracks planned and will provide broad exposure to skills adaptable to a variety of job settings.

Benefits of program approval include addition of an industry-responsive program that leverages collaboratively the toxicological expertise across UNC Chapel Hill. The director of the NC State Environmental Assessment program provided a letter of support for the proposal. For these reasons, we do not recommend any alternatives to implementing the degree program. UNC Chapel Hill anticipates that the proposed degree program will not impact applications to its PhD

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program but should monitor enrollment trends and impact of the new program on other degree program enrollments. While the UNC Graduate School has committed some of the resources necessary for implementation in the first years, the differential tuition is required to launch and sustain the program. In the event that the differential tuition request is not approved, UNC Chapel Hill has indicated that the program will not be implemented.

IV. Recommendation

It is recommended that the Board of Governors approve University of North Carolina at Chapel Hill's request to establish a Master of Professional Science (M.P.S.) in Toxicology degree program (CIP 26.1004) effective April 2014 for fall 2014 admissions.