Writing the ***PROFESSIONAL*** Statement for your Graduate School Application

Brainstorm

- What sets me apart from other applicants?
- How did I learn about this field?
- Why am I interested in this field?
- What experiences have stimulated and reinforced my interest?
- What experiences illustrate my preparedness for graduate school?
- Are there any gaps or discrepancies in my academic record?
- What skills or personal characteristics do I possess that would enhance my chances for success in this field?
- Have I overcome relevant obstacles in my life?
- What are my career aspirations?
- Why this school & program?

General thoughts

- Thoroughly describe your research experience
- Answer the questions that are asked
- Tell a story
- Give concrete examples
- Personalize each essay
- Concise is better than long-winded

The general structure

- The hook
- The substance
- The future

Polish your draft

- Have a friend or roommate read it as a first pass for grammar and typos
- Use the Writing Center at your school
- Use training directors, mentors, OITE career staff at NIH
- Have it read by someone who serves on an admissions committee

Common mistakes

- Poorly written
- Not tailored to the program
- Passive voice & wordy
- Trite
- Too long (>3 pages) or too short (1 page or less)
- Not enough intellectual depth
- Failure to answer the question asked
- Failure to explain weaknesses in your application
- Trying to impress the committee with big words
- Too much humor (or drama)

Professional Statement Example #1 (of 3)

When asked about future aspirations as a child, becoming a research scientist was furthest from my mind. First, I did not have the opportunity to interact with a research scientist and secondly, the media's distorted perception of a scientist's life molded a negative image regarding a scientific career. My journey to become a scientist can be traced back to the conclusion of my freshman year as an undergraduate. At this time I was asked to choose a major field of study. Although I still had reservations about choosing an appropriate career path, I chose to major in Biology because I performed well in high school scientific courses. Upon recommendation from an academic advisor, I applied to the FSU-MBRS Research Initiative for Scientific Enhancement (RISE) Program. The RISE program focused on providing students with formal training in: molecular techniques, presentation preparation, and research ethics. To my surprise I was accepted into this highly competitive program. In addition to the formal training, the RISE program allowed me to secure extramural research internships, travel, and present my research at several national conferences. This program would be the first of many stepping stones that provided not only the insight into a promising career in research, but a firm foundation that I will certainly be able to carry throughout my career as a scientist.

As an undergraduate I was privileged to work in several research labs. To my advantage, my research topics were diverse and reflected my broad interest in multiple areas of science. I was accepted into the Excellence in Cardiovascular Science (EICS) Summer Research Program at Wake Forest University School of Medicine. I spent two consecutive summers working in the department of Physiology and Pharmacology. Here I studied baroreflex function in mice and sheep under the guidance of Drs. Michael Callahan and David Averill, respectively. At this time I had not taken many collegiate level science courses. However, my training as a RISE scholar allowed me to quickly adapt to the intense research environment of a research 1 institution. In the summer of 2003, I engaged in my first research project with Dr. Michael Callahan and Dr. Tom Smith. The title of my project was "The Effects of Unilateral Carotid Artery Ligation on Baroreceptor Activity in Mice". We evaluated a surgical procedure commonly used on mice in cardiovascular studies to determine whether the procedure had any effect on baroreceptor activity in mice. By recreating the conditions of the surgery, and recording heart rate and mean arterial pressure of mice during multiple intravenous injections of pressure inducing drugs, we were able to show that there was no effect on baroreceptor activity in mice and that the surgical technique was indeed effective and efficient.

I returned to Wake Forest the following summer where I began preliminary work on another project entitled, "Baroreflex Function in Young Adult Sheep". Mentored by Dr. David Averill, we investigated baroreflex function in young adult female sheep that had been exposed in utero to a glucocorticoid steroid. We hypothesized that the pre-natal exposure to supraphysiologic levels of these steroids could ultimately lead to activation of the renin-angiotensin system, which in turn blunts baroreflex control of heart rate. We used similar techniques that were previously mentioned to assess baroreflex function in young adult sheep. Our results differed from other preliminary findings in male rats and dogs. We felt that gender may have had a role in the outcome of our experiments, so they were repeated at a later time in male sheep. Although our findings did not support our hypothesis, we were able to come up with more questions and possible solutions to tweak future experiments. Some of the more important skills that I gathered from my experiences at Wake Forest University included the importance of making appropriate

observations, and keeping accurate records. I also learned to expect the unexpected when conducting research. Lastly, I learned that there are not always clear "cut and dry" solutions to scientific problems. These learning experiences were very different from those that I received in the classroom. It was gratifying to know that I could apply what I had learned through course work and reading research articles to actual bench work aimed at addressing a scientific question.

In the spring of 2004 I enrolled in a special problems course in toxicology. This was my first exposure to the field of neurotoxicology. I performed very well in the course and was invited to work in my instructor's lab the following semester. Under the mentorship of Dr. Shirley Chao, I worked on a neurotoxicology project entitled, "The Structural Impact of Diazinon and Molinate on Neurite Outgrowth in N1E-115 Neuroblastoma Cells". We were interested in observing how exposure to the organophosphate pesticides, diazinon and molinate, would effect neuronal development via inhibition of etylcholinesterase. We were able to positively correlate inhibition of neurite outgrowth with exposure to increasing concentrations of the pesticides. We attempted to correlate decreased neurite outgrowth with decreased acetylcholinesterase activity in the cells, however our results were inconclusive. Later evidence has suggested that there may be other mechanisms acting to influence neuronal development via cholinesterase inhibition. Besides learning new techniques, I gathered so much from this research experience including the importance of consistency in the laboratory and attention to detail. I also had the opportunity to present my work at the 2005 Annual Society of Toxicology meeting in New Orleans. Never before had I encountered an environment with so many talented individuals. What I enjoyed most was the eagerness that the scientists had to share their research with others from around the world. I love the fact that research is not only about conducting experiments, but that it is also about communicating results in a way that advances the field.

I continued to pursue my interest in research by completing another summer internship at Morehouse School of Medicine's Neuroscience Institute. I worked with Dr. Chiaki Fukuhara on a project entitled, "The Role of ERK-1/2 in the Synchronization of Circadian Rhythms in Rat-1 Fibroblasts". We investigated the role of extracelluar signal regulated kinase's (ERK-1/2) in the induction of circadian rhythms in Rat-1 Period1:Luciferase fibroblast cells after inhibiting phosphorylation of ERK-1/2 with PD098059, a specific inhibitor of a mitogen activated protein kinase immediately upstream of ERK-1/2. By using bioluminescence reporters, we were able to noninvasively demonstrate that ERK 1/2 is indeed involved in the entrainment/synchronization of the rhythms, but not in the continuation or maintenance of circadian rhythms in these fibroblast cells. While working at Morehouse I learned the importance of planning, and also communicating ideas about projects. I also learned that diversity in a lab can be extremely beneficial.

Even though I had a great deal of research experience as an undergraduate, I felt that I was not ready to enter a graduate program. I wanted to gain full-time research experience, improve my GRE scores, and strengthen my molecular biology background. Thus, I applied to the Duke University Post-baccalaureate Research Education Program (PREP). This program has allowed me to grow and mature as a researcher. While I am not a graduate student in the true definition, I am currently experiencing the day-to-day schedule of a graduate student. I am conducting full-time scientific research, auditing courses, attending seminars, and participating in workshops.

I currently work in the lab of Dr. Edward Levin at Duke University where we investigate the cognitive enhancing effects of nicotine. We hope to elucidate the nicotinic neuronal mechanisms that underlie cognitive impairment in patients with schizophrenia and Alzheimer's disease. My project involves the study of chronic infusion of nicotinic antagonists into the mediodorsal thalamic nucleus of young adult rats and observing the effects on working memory using the 16-arm radial maze and stereotaxic surgical techniques. In conjunction with studying nicotinic effects we also study antipsychotic drug interactions. This is important in that patients with the aforementioned diseases are often prescribed antipsychotic medications. Thus far, our results have revealed a significant decrease in working memory errors (improvement in cognition) in rats that received the alpha(4)-beta(2) specific antagonist, dihydro-beta-erythroidine (DHBE). These results differ from previous studies that show cognitive impairment when DHβE is locally infused in the hippocampus of rats. Our results are surprising, yet promising. I am thrilled about continuing the project and the possibility of publishing this work in the future.

My research experiences as an undergraduate and post-baccalaureate researcher have definitely provided me with the necessary tools to succeed as a research scientist. These experiences have also prepared me for the rigors of graduate school. Although I have blemishes on my academic record, I know that they do not accurately reflect my ability to think and perform as a cutting edge research scientist. I have proven on more than one occasion that I am able learn and apply my knowledge and skills in order to approach a scientific question. I am aware of the challenging nature of graduate coursework and I am fully prepared to aggressively exhaust all options and resources to ensure my academic success.

While searching for graduate programs, I have found that the Biological and Biomedical Sciences Program (BBSP) at UNC offers many opportunities and is structured in a manor that will undoubtedly be beneficial. Currently my interests are in neurobiology, pharmacology, and behavior. More specifically, I am interested in studying the biological basis of addiction and the neurodegenerative effects of alcohol abuse. There are several investigators at UNC that study alcohol abuse and addiction using a variety of scientific approaches. These faculty members include: Drs. Clyde Hodge, Leslie Morrow, Fulton Crews, Joyce Besheer, and Kathy Sulik. Each of these investigators study substance abuse however they ask many different interesting questions. Overall, I feel that the aims of the BBSP directly correspond to my career ambitions. I am highly confident in my skills as a student and I look forward to gaining the additional expertise needed to become an authority in the field of neurobiology. After obtaining a Ph.D., I plan to apply for a post-doctoral position. I have aspirations of becoming the head of my own research lab at an academic or government institution. I would also like to mentor young students from underprivileged backgrounds and encourage their involvement in scientific research.

Professional Statement Example #2 (of 3)
Albert Einstein said, "Try not to become a man of success but rather try to become a man of value". Since the age of 18, I have lived as Einstein advised. I enlisted in the Air Force because I wanted to serve an objective other than my own. I was fortunate to be trained first as an Air Traffic Controller and then as an Optometry Technician. Both gave me the opportunity to grow professionally, but the bulk of my growth came after I graduated top of my class from Optometry School. It was during my career as an Optometry technician that I realized that I wanted to find a way to serve my fellow man through science.

While stationed at Lackland Air Force Base in Texas, I was responsible for the Air Force's largest optometry clinic (even though my rank did not warrant it). The base had four clinics, comprised of 12 doctors and 8 technicians. I earned the clinician's respect by showing poise and leadership in tough situations. In this position, I received the Colonel Donald Dunton Airman of the Year Award. Even though I am proud of all the medals and awards I won as soldier, I do not consider them an accurate representation of my value as a Black woman. What comes to mind, instead, are the many humanitarian missions I was fortunate to be a part of in places like Alaska and Holland. Giving medical services to patients who did not have access showed me that one person could make a big difference. I balanced life as a soldier, wife, and mother while pursuing my dream to be a scientist. However, after September 11, 2001, my plans were temporarily put on hold when I was ordered to report to Spangdahlem Air Base in Germany and support the war effort in Iraq. While stationed in Germany I furthered my interest in biomedical sciences by completing my AS in Ophthalmology.

I became a full time student after an honorable discharge from the Air Force in 2004. After finishing an AA at Tallahassee Community College, I enrolled as a biology major at Florida State University. I learned I could touch countless lives by researching diseases that have plagued humanity for decades. My first experience with research came as a Directed Individual Study (DIS) student in Dr. Wu Min Deng's molecular biology lab. Using *Drosophila melanogaster*, I studied how polarity in the oocyte is established and maintained. The first two semesters I concentrated on a novel gene in the nurse cell oocyte called Polyadenylated (POLY). POLY (role still unknown) has oogenic and wing margin defects. It is also temperature sensitive lethal. Our hypothesis was that POLY is a member of a Heterogeneous Nuclear RNA Ribonucleoprotein (HNRNP) complex because of the interaction with HRB27C377 and half-pint (hfp9). We found that one copy of HRB27C377 enhances the wing margin loss phenotype in POLY escapers. Furthermore, hfp9/POLY double mutants have a dynamic rough eye phenotype and a significant rescue of lethality. I made a FRT otu13 stock to look at the phenotype of the 104kd isoform. It is needed for mRNA localization and nurse cell dispersal. With the FRT otu13 stock, we showed POLY bound to HRB27C377 but we still do not know if it is specific or nonspecific. I then focused on studying the cell signaling processes between the follicle cells and the oocyte. The gene of interest was Belle. A key finding was that Belle mutants had mislocalized proteins. We then asked if the localization of the protein was dependent upon microtubules and used treatments like colcemide to destabilize the microtubules. Microscopic evaluation of stained ovaries revealed that Belle protein did not depend on the microtubules. Then I created Belle mutant clones to answer questions such as whether there is fusion in the membranes follicle cell/oocyte boundary layer. We also asked whether the defect was because of failure to lay down the chorion gene amplification product (essential for rapid eggshell

biosynthesis). We have not fully answered these questions but we did rule out the possibility of defective microtubules.

To prepare myself for a career in Microbiology and Immunology, I took courses in Microbiology, Virology, and Molecular Biology. I know that understanding gene regulation in HIV/AIDS, malaria, and tuberculosis can control these diseases. The University of North Carolina at Chapel Hill has taken the lead in this arena by being in the cutting-edge in communicable disease research. I am specifically interested in the research of Dr. Myron Cohen, Dr. Steven Meshnick, Dr. Aravinda de Silva, and Dr. Barbara Vilen. Dr. Vilen's work on B and T cell diversity in mammals is of great interest because I am fascinated with the human immune system. After I finish my PhD in Microbiology and Immunology, my long-term goal is to complete a Masters in Public Health. I plan to use the research skills and knowledge gained through a PhD to pursue creative public health solutions at either the Center for Disease Control or the World Health Organization. I envision my scientific career not just as a successful one, but also as one of value and I would be grateful for the chance to jumpstart it at UNC-CH.

Professional Statement #3 (of 3)
As an undergraduate biology student, I learned that majoring in the sciences could lead to countless opportunities in life. Dentists, doctors, researchers, lawyers; the list was endless. Knowing I needed to narrow these career choices I began looking for opportunities. At the beginning of my sophomore year, I was hired as a biomedical research assistant. The laboratory studied the role of sperm in fertilization leading to an overall goal of the development of a male contraceptive. It was here that I discovered my interest in research. Over the next two years I spent as much time as possible in the lab. PCR, western blotting, and RNA isolations were the basis of my research. As a result of my skills and attention to details, I became an intricate member of the lab team. With graduate school in my future plans research experience and preparation were essential. After graduating from the University of North Carolina at Chapel Hill (UNCCH)

I chose to broaden my research experience and joined Dr. Kole's at UNC-CH. Cancer treatment was the main focus of this lab, a subject that quickly grasped my attention. My research focused on the protein tumor necrosis factor (TNF). Many people are familiar with the drug Enbrel used for the treatment of arthritis. Enbrel intercepts ligands that bind to TNF receptors causing an inflammatory response. Inhibiting this response limits the pain and suffering caused by arthritis. Although Enbrel has been shown to be an effective drug, it must be administered frequently to patients. We created an oligonucleotide that functions similarly to Enbrel except our drug could be injected into patients and self replicate thus inhibiting the TNF receptors responsible for the inflammatory response in patients. Our drug would allow patients to have more freedom from both constant injections and arthritis pain. Through this project I was able to perform cell culture and in vivo studies. My findings and ideas were shared with other lab members during laboratory meetings. Novel discoveries in our lab strengthened my decision to pursue a doctorate of philosophy degree in the biomedical sciences. My laboratory experiences allowed me to become a skilled collaborator. Besides the TNF project, I was responsible for other smaller projects that worked in collaboration with organizations such as the National Institute of Health (NIH). Effective communication was essential ensuring all parties involved understood new developments and future research direction. Working with investigators at the National Institute of Health taught me collaboration skills and how to work with a team. These skills add to my qualifications for becoming a graduate student. I am prepared for collaborations that are an essential part of science research.

Laboratory interest in academia led to my success as a technician. My principal investigators were impressed with my ability to learn quickly and independently applying what I had learned to new situations. After my first year of working as a research technician I enrolled in an introductory pharmacology class to jumpstart my graduate career. Success in the laboratory was always effortless, while analyzing scientific literature in the classroom posed more of a challenge. Enrolling in this graduate level class allowed me to showcase my academic strength. Although my undergraduate credentials were average, the laboratory skills and collaboration techniques I had gained during my two years as a research technician led to my academic success at the graduate level. My knowledge expansion was not limited to graduate level classes. I attended numerous research seminars; the vast majority focused on cancer treatment and prevention.

In addition to new techniques I learned at the bench, I was also certified to work with animal subjects, performing injections and necropsies. My small molecules project with NIH displayed my ability to work with animal subjects. With limited supervision from my principal investigator, I tested small molecules in two different cell lines to determine an effective concentration for injecting in mice. My problem solving skills were used in this experiment since there was very little known about the molecules. I constantly had to test new concentrations to ensure that my results were accurate. After an effective concentration for injecting was determined, I made dosing solutions and performed injections and animal necropsies. During the experiment I found that the molecules were toxic at the level I was injecting. This finding put my problem solving skills to work again. I later determined the most effective dose and solvent for treating the mice. My problem solving skills and lab experience make me an excellent candidate for graduate school at the University of North Carolina at Chapel Hill.

Entering a field in graduate school where I can build on previous knowledge will allow me to reach my full potential as an independent researcher in the future. Interacting with graduate students, post-doctoral fellows, and clinicians in the laboratory has given me a realistic perspective on my career goals. One investigator I would like to work with is Rudy Juliano who works on therapeutic drug design and delivery. I am also interested in Blossom Damania's research investigating viral proteins with Blossom Damania's laboratory. Pursuing a doctorate of philosophy in the Biological and Biomedical Science Program the University of North Carolina at Chapel Hill will allow me to reach my career goals. Ultimately, I would like a career as a researcher, eventually becoming a principal investigator, educating others working towards the treatment and prevention of diseases.