Statement of Purpose Amit Sharma

My interest in science can be traced back to my secondary school years. I had a cousin who was a graduate student of physics and would often talk about cosmos, black holes, test-tube babies and other scientific advancements in simple words. I was amazed by these facts and was inspired to be a scientist in the future. From small chats with my cousin to science fiction movies and books, are the range of factors that contributed to strengthen my interest in science. Eventually, I opted for +2(high school) in science and later joined Bachelor of Veterinary Science and Animal Husbandry program at Tribhuvan University.

I joined veterinary science studies for undergrad that boosted my curiosity in multiple aspects of animal biology and application of that knowledge to increase the productivity of animal production. I got familiar with anatomy, physiology, developmental biology, diseases and their treatments in many animal species. Microbiology, pathology, pharmacology, biochemistry, and medicine were others fields that I was trained as a veterinary student. Apart from core veterinary science subjects, we were trained in animal husbandry fields like; livestock management, animal nutrition, animal breeding, fisheries, and research extension etc. I got familiar with biological processes in development of diseases, different infectious/non-infectious diseases, and treatment of these problems in animals; from Cattle to fish. The potpourri of subjects in veterinary science studies showed me the importance of the interdisciplinary approach to science and motivated me towards further education.

I did an internship at the National Avian Disease Investigation Laboratory (NADIL), Chitwan, Nepal. I used to perform the postmortem examination of poultry species cases that came to the lab followed by the microbial examination, rapid test kits and sometimes PCR to reach the confirmatory diagnosis. Molecular tests have revolutionized the diagnostic methods in both human and veterinary medicine and I realized the importance of these techniques at NADIL. I also completed my thesis research there titled “Seasonal prevalence of poultry diseases and their interaction with IBD and Mycotoxicosis in Chitwan, Nepal”. The internship research gave me hands-on experience in poultry disease diagnosis, treatment, and research skills.

As a student of MS- Aquaculture/Aquatic Science at Kentucky State University (KSU), I have been involved in aquaculture studies and research for the past three semesters. Fish morphology and physiology, reproduction, diseases, nutrition and genetics courses during my graduate studies have increased my skills/knowledge in this field. I am interested in biomedical fish model reproduction, gamete physiology/molecular mechanisms, genetics, and genomics research and wish to continue further research work in these topics.

I did my graduate thesis research titled “Evaluation of spawning aids for induced spawning of largemouth bass, *Micropterus salmoides*. The research involved comparison of novel synthetic gonadotropin-releasing hormone GnRHIIa (D-Arg^{6}-Pro^{9}-NHet) with commercially available human chorionic gonadotropin in artificial propagation of largemouth bass. Ovulation parameters like; total eggs released, eggs released/kg body weight, latent period and eggs/g etc. were measured in female largemouth bass injected with different inducing agents. Sperm concentration, sperm motility, and fertilization rate were investigated for males. I learned broodstock management,

spawning techniques and routine hatchery techniques for fry production of different fish species as part of the research and lab work. I am also involved in maintaining, feeding, spawning and research of largemouth bass, paddlefish, Koi, catfish, tilapia etc. at our facility at KSU.

I learned sperm quality assessment (concentration/motility), routine sperm cryopreservation techniques, microscopic observation of fish embryo development after fertilization etc. during my research. Flow cytometry, microspectrophotometry, computer-assisted sperm analysis (CASA), DNA extraction, PCR and agarose gel electrophoresis are some skills I have gained here at KSU. I really enjoy molecular techniques and find these very useful as a researcher.

I visited LSU Comparative Biomedical Science department in summer 2018 and had a tour with Dr. Cheng on CBS facility and his lab. I was there for training at Aquatic Germplasm and Genetic Resource Center (AGGRC), LSU. I found different research works on biomedical sciences undergoing in CBS department very interesting. I had a short meeting with Dr. Yoshimura and got familiar with his research works on cyclic AMP signaling pathways. The visit and interaction has motivated me to join the CBS department as a doctoral student. I am keenly interested in pursuing studies on diabetes research, Calcium channels, cell signaling mechanism and molecular study of sperm cell activation, cryopreservation and gamete physiology. I find Dr. Cheng's lab a fit for me because of his research interests and in addition; collaborative research with Aquatic Germplasm and Genetic Resource Center (AGGRC). Working under his supervision will allow me to use my academic knowledge and skills from both veterinary science and aquaculture background. In the age of interdisciplinary research and biomedical fish models, I am confident that my backgrounds will help me for completion of CBS Ph.D. program.

I seek to be a good researcher in the field of biomedical research in the future. I want to contribute to the rapidly developing science of molecular biology, cellular mechanisms, and development/use of biomedical fish models. The wide scope of biomedical research and molecular technologies across different disciplines excites me. Industry leading and cutting-edge research in the field of biomedical science at LSU is a perfect fit my research and career goals.

I can be an excellent Ph.D. student of biomedical science at LSU using knowledge and skills from my veterinary science background and MS- Aquaculture/Aquatic Sciences along with my keen interest in biomedical research. Knowledge and training in a multitude of subjects during veterinary science studies and specialized subjects, research activities in Master's in Aquaculture/Aquatic Sciences will help me a lot for this Ph.D. program. I feel comfortable working independently to solve research problems and enjoy learning new scientific tools. I assure that my skills and hardworking nature will benefit the research at CBS department, LSU. Research works at the CBS department will equip me with the expertise to delve deeper into biomedical research. I am confident that the Ph.D. in Biomedical and Veterinary Medical Science at LSU will make me an excellent researcher, academician and an expert in biomedical research. After finishing the Ph.D. program at LSU, I plan to return to my home country Nepal where I seek to pursue a career as a professor/researcher at a university. I hope I will get this Ph.D. position so that I can fulfill my research, career goals and contribute to science.

Thank you.