

I. SUGGESTED TITLE

Post-doctoral fellow in Infectious Diseases

II. POSITION FUNCTIONAL STATEMENT

The incumbent will perform research using microbiological, molecular and cellular techniques as well as collaborating with others to perform neuro-cognitive assessments to neuroinflammation and its effects on cognitive function, particularly in the context of aging. This position requires working with Biosafety level (BSL) 2 microbial pathogens, hazardous chemicals, laboratory mice before and after infection with BSL 2 pathogens, as well as other biohazards including cells in tissue culture. Successful completion of duties requires working with mice (including aged mice), necropsy, specimen preparation to obtain the cells and molecules to be studied, operating analytical instruments including qPCR, gene and bead array, flow cytometry and interpretation (including statistical testing) and presentation of experimental results. Additionally, troubleshooting problems is inevitable, and the basic ability to calculate proper volumes, weights, cells, etc. accurately is necessary. The incumbent must work and conduct experiments in an independent fashion, report results and procedures truthfully, learn new techniques, and make necessary protocol adjustments. Prior experience with the required duties and techniques is highly preferred.

III. DUTIES

EF #1 (%= 65) Performs experiments using microbiological, cellular, and molecular biological techniques and assays.

A. Cellular techniques include but are not limited to preparation of single cell suspensions from organs obtained at necropsy such as brain, bone marrow, blood, and spleen, incubation of cells with antibodies for flow cytometric or microscopic analysis, culture of cells / organs in vitro with stimulants (e.g. cytokines, LPS, live and killed bacteria) and chemicals (e.g. antibiotics, detergents, fixatives) as needed for the experiments at hand.

B. Microbiological techniques include but are not limited to growing bacteria in culture, handling bacteria and bacterially infected cells and tissues in safe fashion, homogenizing infected tissue, and performing quantitative bacterial counts on agar plates.

C. Molecular techniques include, but are not limited to isolation of DNA/RNA from biological specimens e.g. cells, tissues, and organs, performing reverse transcription and real-time PCR, gene array experiments knock-down/knock-in of genes in vitro.

D. Analysis of neuro-cognitive tests including but not limited to submerged radial arm maze, Open field activity, Elevated Plus maze, Phenotyper behavioral test.

E. In Silico analysis of gene expression data

F. Written presentation and analysis of results, e.g. manuscripts and grants

G. Learn nuances of working with aged mice

Each of these work domains requires a sound knowledge of the rationale for the experiment and the basic operating principles of techniques used to perform the assay. It is critical that the incumbent performs mathematical calculations with calculator or computer to calculate, tabulate, and analyze results to adjust volumes/quantities of reagents as necessary and record results in an organized and legible fashion. The incumbent must be able to recognize potential problems with the execution of experiments, and adjust accordingly. It is imperative that the incumbent reports results and procedures truthfully.

EF #2 (%= 15) Handles laboratory mice in a safe and humane fashion and is able to perform or learn techniques such as intraperitoneal and intravenous injections and infection with BSL 2 bacteria, transcardiac perfusion, euthanasia, necropsy with sterile collection of tissues including blood, brain, liver, spleen, and bone marrow. The incumbent must keep accurate records of numbers of mice available for use and that are infected, maintain experimental supplies in the animal care facility, facilitate animal orders, and effectively communicate with staff in the animal care facility regarding animal orders, health, and housing.

EF #3 (%= 10) Assumes responsibility for ensuring that the solutions, chemical, and materials necessary for upcoming experiments are ready. This includes, but is not limited to correct preparation of standard laboratory reagents, solutions, bacteria and bacterial culture media as well as the ability to operate standard laboratory equipment safely and correctly. Such items included, but are not limited to, calibrated pipettes, pH meters, microplate readers, microscopes, centrifuges, and autoclaves. This will also require the incumbent to maintain accurate and current records of stored chemicals and biological materials, and initiate the ordering of animal, biological materials, chemicals, and reagents in a timely fashion so that research is not interrupted by lack of reagents. The incumbent should facilitate the repair of broken or malfunctioning equipment.

EF #4 (%= 5) Maintains accurate and complete records of all experiments and procedures performed in a fashion that allows the PI to read and understand the results with a minimum of verbal explanation. Enters data into spreadsheets and databases on Macintosh and PC-style computers. The incumbent must practice integrity in the reporting, analysis, and interpretation of all experimental procedures, processes, and results.

EF #5 (%= 3) Maintain all required training and compliance certificates. Training includes but is not limited to animal, animal BSL 1&2, IACUC, Laboratory safety (general, BSL 1&2), hazards (blood borne, fires, communication, TB, DOT shipping), and other compliance training (e.g. HIPPA, Sexual harassment) as required.

EF #6 (%= 2) Maintains the laboratory in a clean and orderly functional condition. Communicates and interacts with collaborators, staff, and associates in a respectful and helpful fashion.

IV. EDUCATION (appendix B)

Ph.D in a biologic science is required. An applicant with a degree in a non-biological science, e.g. chemistry would typically require post-graduate experience to gain expertise in the techniques required.

V. SKILLS AND EXPERIENCE (appendix C)

The incumbent must have a solid background in the sciences, e. g. biology, chemistry, neurobiology, immunology and microbiology to perform the duties listed above. Moreover, the incumbent should have sufficient practical experience, likely 2-3 years; to ensure competence in most, if not all of the areas listed. An absolute requirement is that the incumbent is motivated to perform his/her work with diligence, consistency, and is able to concentrate on the duties at hand. It is essential that the incumbent is reliable and performs his/her duties as asked and agreed to. In general, the incumbent must have a fluent command of verbal and written English to allow easy and accurate transfer of information between themselves, co-workers, and the PI.

The incumbent must be able to complete all training and certifications required by the institution.

VI. WORKING CONDITIONS (appendix D)

The laboratory is indoors on the third floor of the O'Donoghue Research Building. Neuro-cognitive testing will be performed in the BRC 1376 in the laboratory of Dr. William Sonntag. Mice are housed in the second floor of the BSMB. The only outdoor activity would be for the incumbent to walk to another building in the course of his/her activities. On occasion the incumbent will need to enter the walk-in cold room and incubator for short periods of time. The incumbent will handle biohazards including biosafety level 2 bacterial pathogens and toxic chemicals on a regular basis. There is the possibility of using radioactive material. Some laboratory equipment such as shaker baths and centrifuges create low level vibrations

VII. PHYSICAL AND MENTAL REQUIREMENTS (appendix E)

Ability to interpret information: The incumbent will be in an environment with extremely costly equipment, some of which this individual will use on a daily basis. Some of the chemicals and biological materials are hazardous to humans. Any procedure that is carried out incorrectly due to lapses of judgment can pose a serious health hazard to the incumbent and co-workers, as well as yield incorrect data that may divert the research onto an unfruitful path resulting in loss of time, effort, and money. Methodological errors will introduce difficulties in performance of experiments and interpretation of results. Lack of integrity in performing experiments and recording the data would seriously damage the reputations of all persons and offices involved with the incumbent. This would damage the credibility of OUHSC as an institution of higher education and research. Therefore, the incumbent has a great degree of responsibility for the proper functioning of the research laboratory, and thus in accomplishing the research mission of OUHSC.

Ability to see, hear, and speak: The incumbent will be working with hazardous chemicals and biological materials. Any procedure that is carried out incorrectly due poor receptive communication or incorrect reading of labels can pose a serious health hazard. Good eyesight is required for microscopy and for precise measurement using equipment. Good vision and good hearing are needed for safety around equipment with moving parts.

Ability to move head, arms, fingers, in a coordinated fashion including body posturing while standing and sitting: The incumbent must possess a sufficient amount of manual dexterity to perform sterile work, to prevent contamination of cultures, work with small live animals, and to ensure his/her own safety as well as that of their co-workers. Excellent fine motor skills are required for precise measurements and instrumentation. The incumbent must possess a sufficient amount of manual dexterity to perform sterile work, to prevent contamination of cultures, and to ensure their own safety as well as that of their co-workers. Good motor skills, coordination and balance are required for lifting, reaching, and carrying items within and between laboratories.

The incumbent must not be susceptible to fainting, dizziness or seizures. The incumbent will be working around biohazards and must not be given to dropping reagents that pose a health hazard to him/her or to their co-workers.

The ability to sit is required for extended periods during experiments.

Good physical stamina is required to perform all the tasks in a safe and careful manner. Aside from the high degree of coordination, alertness, concentration, there is the need to carry out repetitive hand/arm motions during experiments. However, the aerobic and strength demands are minimal. Some lifting, walking, and moving of equipment as well as handling of small animals is required. The ability to do daily cleanup work in the lab is required.

Other: The work requires lack of allergies or phobias to rodents and bacteria. On occasion, the incumbent may need to be in the lab in the evenings or on weekends to complete experiments that do not fit into traditional daytime hours.

VII. LICENSURE (appendix F)

NONE

Appendix A. Organizational Chart

