

## NRSA Question, 2020

### **Directions:**

In writing your proposal, you can consult the tips provided by the NIH for writing proposals ([http://grants.nih.gov/grants/writing\\_application.htm](http://grants.nih.gov/grants/writing_application.htm)). For this exam you only need to consider significance, innovation and approach. Remember that the reviewers need to be convinced that you have a grasp of the topic and that you convey your research plan clearly. Even though the research may involve complex relationships you still need to express your ideas as simply as possible. Your answer, not including references, should be no longer than 7 single-spaced printed pages using Times New Roman, font size of 11 points, and a line spacing of 1.15..

The first page should contain the Specific Aims; this will include your overall hypothesis, an overview of the problem and the specific issues that you will address. Specific aims pages typically have 2 or 3 specific aims. You are limited to 1 page for your specific aims.

The Research Strategy (the bulk of the proposal) should follow the order specified below. Each section starts with the appropriate section headings: 1) Significance (explain the importance of the problem and/or barriers to progress in the field that the proposed project addresses, how will your studies improve knowledge in the area of research). 2) Innovation: (What is unique about your proposal, what novel techniques will you use?), 3) Approach (What measurements will you make, What is your model for studying your problem? What are the strengths and potential weaknesses of your model? Discuss expected outcomes, potential problems, alternative strategies, and benchmarks for success anticipated). Cite published experimental details in the Research Strategy section and provide full references in the References Cited section.

### **Problem to be addressed:**

Emerging published data show that some COVID-19 patients develop neurological disorders such as loss of sense of smell and taste, impaired respiration due to brainstem infection and impaired mental status. Develop a specific hypothesis that accounts for the nervous system deficits and how virus might access the brain, and prepare a proposal to test this hypothesis using a rodent model. Key questions to consider are why are only certain regions of the brain affected and what are the toxic mechanisms by which COVID-19 damages CNS neurons? Using this information, propose a potential treatment that might protect the vulnerable neurons and describe how you would test the efficacy of this treatment? This hypothesis-driven proposal should focus on understanding (i) how the virus infects cells in the brain and (ii) the underlying mechanisms that lead to neurological deficits.