DAGSI Research Topic Template

1. **Research Title:** Microbiome modulation to optimize human performance

2. **Individual Sponsor:**
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3. **Academic Area/Field and Education Level**
   Microbial Ecology/Microbiology/Bioinformatics/Nutrition
   MS or PHD level

4. **Objectives:** Uncover the mechanism(s) by which plant-forward diets lead to improvements in fitness, cognition, and fatigue resiliency, through modulation of the gut microbiome.

5. **Description:**
   "Eat more fruit and vegetables!" "Get more sleep!" "Do more exercise!" These suggestions are as relevant today as when we heard them as children. The issue for our warfighters is that often they do not have the luxury of doing all, or even any, of these. Potentially as a consequence of this, the US Military is struggling to maintain health for active-duty personnel; a 2022 report from the RAND Corporation has indicated that 60% of Air Force airmen are overweight or obese; and warfighters are experiencing cognitive and psychological fatigue as they process and integrate exponentially more information in less time than a generation ago. Recently, three viable research areas have identified paths towards a solution to these issues: (i) increased plant consumption yields positive health impacts and increased athletic performance; (ii) bacteria in your digestive system (gut) have influence on cognition, performance, and mood; and (iii) the gut microbiome can be modulated through dietary interventions. This topic integrates these research areas: we would like to determine the effect of a diet rich in plant-derived produce on warfighter performance, specifically focused on fitness, cognition, and fatigue resiliency. Results of this research will help identify low cost, simple nutritional interventions that provide enhanced physical and cognitive performance, personalized for Airmen and their unique needs. Moreover, empirical data will be generated that will provide a foundational basis for studying the physiological responses in humans that result from plant-forward nutritional interventions.

6. **Research Classification/Restrictions:** None

7. **Eligible Research Institutions:** All DAGSI eligible institutions

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