RH19-9

Attachment 1 – Research Topic Template

1. **Research Title:** Bioinformatics Tool Development
2. **Individual Sponsor:**

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3. **Academic Area/Field and Education Level**

   Biomedical Engineering/Computer Engineering/Mechanical Engineering/Modeling and Simulation (MA/MS or PhD level)
4. **Objectives:** To develop a transfer function or functions representing the differences observed in the neck response between cadaver models, human models undergoing bracing, and manikin neck models during Gx and Gz impacts. This will be used in the development of a finite element model (FEM) evaluating neck force loading variation with and without bracing.
5. **Description:** While anthropometric test dummies (ATDs) have been a great tool for testing, understanding and developing injury criteria for human injury there are well known limitations to this approach due to lack of biofidelity of these ATDs in certain aspects. One example of this is that Manikins and Post Mortem Human Subject (PMHS) data utilized to develop neck injury currently used to determine probability of injury is based on non-bracing or no muscle activation. However, during an egress event pilots are taught to brace prior to ejecting. Thus, to more accurately determine the risk of neck injury during egress a correlation analysis and FEM representing the differences in linear and angular forces observed during bracing and non-bracing events would be a valuable tool for improved human injury probability models.
6. **Research Classification/Restrictions:** Research will be performed at the unclassified level.
7. **Eligible Research Institutions:** All