Fiscal Year: FY 2019  
Task Last Updated: FY 02/04/2019

<table>
<thead>
<tr>
<th>PI Name:</th>
<th>Kaplan, David L. Ph.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Title:</td>
<td>Silk Composite Biomaterials for Shielding Medications in Space</td>
</tr>
<tr>
<td>Division Name:</td>
<td>Human Research</td>
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</tbody>
</table>

**Program/Discipline:** TRISH--TRISH

**Joint Agency Name:** Yes

**Human Research Program Elements:** None

**Human Research Program Risks:** None

**Space Biology Element:** None

**Space Biology Cross-Element Discipline:** None

**Space Biology Special Category:** None

**PI Email:** david.kaplan@tufts.edu

**PI Organization Type:** UNIVERSITY

**Organization Name:** Tufts University

**PI Address 1:** Department of Biomedical Engineering

**PI Address 2:** 4 Colby Street

**PI Web Page:**

**city:** Medford  
**State:** MA  
**Zip Code:** 02155  
**Congressional District:** 5

**Comments:**

**Project Type:** GROUND  
**Solicitation:** 2018 TRA BRASH1801: Translational Research Institute for Space Health (TRISH) Biomedical Research Advances for Space Health

**Start Date:** 01/01/2019  
**End Date:** 12/31/2020

**No. of Post Docs:**  
**No. of PhD Degrees:**

**No. of PhD Candidates:**  
**No. of Master’s Degrees:**

**No. of Master’s Candidates:**  
**No. of Bachelor’s Degrees:**

**No. of Bachelor’s Candidates:**  
**Monitoring Center:** TRISH

**Contact Monitor:**  
**Contact Phone:**

**Flight Program:**

**Flight Assignment:**

**Key Personnel Changes/Previous PI:**

**COI Name (Institution):** Kluge, Jonathan Ph.D. (Trustees of Tufts College)

**Grant/Contract No.:** NNX16AO69A-T0411

**Performance Goal No.:**

**Performance Goal Text:**
| **Task Description:** | The goal is to utilize silk protein, an US Food and Drug Administration (FDA) approved protein biomaterial, in composite material formats, to shield and protect a range of medications – addressing topic #5 in Biomedical Research Advances for Space Health (BRASH) 1801 – New materials for shielding medications. We will utilize novel formulations of the silk protein in composite formats with inorganic particles, as both pouch and as part of the material, to demonstrate broad protection of a range of drugs during exposure to environmental extremes using accelerated testing, mechanistic insights and modeling, and functional assessments. The outcome will be new composite material systems that provide broad-ranged protection, a preliminary model for predictive outcomes, and publications. |
| **Rationale for HRP Directed Research:** | |
| **Research Impact/Earth Benefits:** | |
| **Task Progress:** | New project for FY2019. |
| **Bibliography Type:** | Description: (Last Updated: 02/01/2019) |