**Editorial comments/responses:**  
A) Thank you so much for submitting your revised manuscript and addressing all the editorial changes. All of your previous revisions have been incorporated into the most recent version of the manuscript. Please download this version of the Microsoft word document from the "file inventory" to use for any subsequent changes (File name: 51743\_R1\_010814).  
  
B) The editor has made the following changes to the manuscript.  
  
1) The editor moved the ethical statement from step 3 to the beginning of the protocol according to the JoVE format and changed the word “section” to “Protocol”.

**Response: OK**

2) In the step 1.1, the editor reverted back the changes to your original manuscript. The editor included “Assemble” before “prototype components..”. Additionally, the editor replaced “usable” with “to be used in”. The editor ended the parenthesis after micro-gravity to include “conditions” in to the sentence.

**Response: OK**

3) In step 1.1.3, the editor included “A” in the beginning of the sentence and replaced “that collects” with “to collect” and replaced “that will” with “preventing” and introduced “in” between compromise and flow.

**Response/Change(s): Needed rephrasing. Backpressure will compromise flow (which is prevented through our design).**

4) In step 1.1.3.2, the editor moved “Loose-fitting or..environment.” to the end of the statement and denoted it as a “NOTE” and began the step from “Cap the vials..”.

**Response: OK**

5) In step 1.1.4, the editor included “A” in the beginning of the sentence and replaced “that is usable” with “for use”.

**Response: OK**

6) In step 1.1.4.1, the editor included “such” before “that reliability clamps..”. Rephrased the sentence, “preserves..” to “Ensure it preserves..introduction”.

**Response/Change(s): Missing a subject noun? Added “it.”**

7) Similarly, in step 1.1.5, the editor included “A” in the beginning of the sentence.

**Response: OK**

8) In step 1.1.5.2.3, the editor placed “use” before 50 grams elastomer and deleted “should be appropriate”.

**Response: OK**

9) In step 1.1.5.2.6, the editor placed a “NOTE” before “Do not overbake PDMS.. drill/cut”.

**Response: OK**

10) In step 1.1.5.2.8, the editor replaced “A hand magnifier may help aim the needle.” With “Use a hand magnifier to help aim the needle” and rephrased “Holes should be drilled before..” to “Drill holes before..”.

**Response/Change(s):**

* **Fixed typo “1.1.5.8” -> “1.1.5.2.9”**
* **Otherwise OK**

11) In step 1.1.5.2.10, the editor rephrased “One end should be positioned within the PDMS, approximately 1 mm from the molded surface and the opposite end should stick out the back, non-molded side of the chip.” to “Position one end of the steel pin within the PDMS, 1mm from the molded surface, while the opposite end sticks out on the non-molded back side of the chip.”

**Response: OK**

12) In step 1.1.6, the editor placed an “A” before “Palm-sized miniature..” Similarly in step 1.1.7.2.

**Response: OK**

13) In step 1.2, the editor split the step in to a heading, 1.2 and a sub-step 1.2.1.Since the authors have included “[accel]” as Supp. Video 1 in their revision, In step 1.2.1 (previously 1.2), the editor replaced blue stamp “[accel]” with “Supp. Video 1” in parenthesis.

**Response: OK**

14) In step 1.3.1, the editor placed “A” before mechanism and deleted “may be” and replaced it with “is” and removed the parenthesis. And replaced “onboard” with “on”.

**Response: OK**

15) In step 1.3.1.1, the editor replaced “Utilized” with “Connect” and removed “to be connected”.

**Response: Not sure about this one. The power strip would not be connected to the aircraft power distribution until the rig is loaded onto the plane (which would not occur until the flight day). That’s why it was phrased as “to be connected” (since it is happening later).**

16) In step 1.4.2.2, the editor removed the numbers (1), (2), and (3) to comply with JoVE editorial format.

**Response: OK**

17) In step 1.4.2.4, the editor emphasized “NOTE:” and began the sentence with “The leg straps..” replaced “will be” with “is at”, and replaced “may not be” with “is not”.

**Response: Changed to plural (multiple straps for multiple operators).**

18) In step 2.2.2, the editor replaced “should be” and began the statement with “Ensure each person..”. and replace “performing” with “performs”, introduced “at” before “each demonstrations” and removed “performance”.

**Response: OK**

19) In step 2.5.1, the editor removed the numbers (1), (2), and (3) to comply with JoVE editorial format. Placed “the” before “ground..” and “rig”. Corrected “toosl” to “tools”.

**Response: OK**

20) In step 3, the editor deleted “Here” and began the statement with “Day A is..”.

**Response: OK**

21) In step 3.3.1, the editor deleted “should be” replaced with “is” and began sentence with “Make sure the..”.

**Response: OK**

22) In step 3.4.2, the editor removed “(not shown)”. And rephrased the sentence to “Fit vials..”.

**Response: Moved word “holder”**

23) Since the authors have included “[float up]” as Supp. Video 2 in their revision, In step 3.5.2, the editor replaced blue stamp “[float up]” with “Supp. Video 2” in parenthesis.

**Response: OK**

C) Please approve the above changes made by the editor or please suggest changes accordingly.   
  
D) Please address the editorial comments below.   
  
1) In the introduction, you mention, “Yu-Chong Tai (Caltech)..”. Please address it as “Yu-Chong Tai and group at Caltech” or “Yu-Chong Tai and coworkers at Caltech” and delete has. Additionally, the editor suggests to remove “and has tested some of his technology in reduced gravity (unpublished).” as these claims cannot be supported by any reference. Unless, it’s critical to the authors to specify it, the authors can end at “..applications[referece]”. Please consider similar for the following statements.

**Response/Change(s):**

* **Yu-Chong Tai appears to have worked with other groups (outside Caltech including several private companies) as well as researchers in his own group. Does the (Caltech) in parentheses need to be eliminated? It simply acts as an identifier.**
* **Changed text to read “Yu-Chong Tai (Caltech) and colleagues have..” with other word changes.**
* **Added reference for Dr. Tai’s reduced-gravity testing, which was displayed in a poster presentation:**

**NASA Human Research Program Investigators’ Workshop (Houston, TX, Feb. 3-5, 2010)**

**Workshop link: http://www.dsls.usra.edu/meetings/hrp2010/**

**Direct link to abstract:** [**http://www.dsls.usra.edu/meetings/hrp2010/pdf/ExMC/1018Tai.pdf**](http://www.dsls.usra.edu/meetings/hrp2010/pdf/ExMC/1018Tai.pdf)

* **Does JoVE have a format for poster abstracts?**
* **Reference numbers adjusted**
* **Changed text as described for Paul Yager**
* **For the other “unpublished” experiments, they are specifically mentioned on the cited webpages, but are not apparent in any journals from what we can tell. Removed “unpublished” text.**

2) In step 2.3.5 you mention “[video of someone hitting a rig?]” Please indicate which video file this represents to and write it as a blue stamp as this is in the highlighted step. And please highlight it.

**Response/Change(s):**

* **Stamp removed**
* **If additional footage is needed in the video production, it is a possible candidate.**

3) Please try to avoid phrases such as “can be”, “should be”, “might be” etc and write the step in imperative tense, “Do this”, “Make this”, “Mix that”, etc. See example above. Please go through the manuscript steps to minimize such occurrences. For example in step 2.2.4.

**Response/Changes(s):**

* **Change at 1.5.4.2**
* **Change at 1.7**
* **Change at 2.2.1**
* **Change at 2.3.1**
* **Change at 2.3.3**
* **Change at 3.3.3**
* **Some of the examples are hard to change without losing clarity**

4) In the “Caution” statement mentioned under 3.1.3, instead of “test methods” did you mean “test samples”?.

**Response: The samples are tested before use for various pathogens. The testing methods utilized are highly sensitive and specific but are not 100% sensitive and specific. The phrase “testing methods” is intended.**

5) The “NOTE” under step 3.2 mentioned “Nanostrips”. Unless additional details are provided, this statement is likely to be more appropriate following step 3.4.7, to avoid any issue with continuity. Please consider replacing this statement. If possible please provide a reference as to what the authors are referring to.

**Response/Change(s):**

* **“Nanostrips” are a proprietary reagent we tested in flight but are not critical to the protocol here.**
* **Altered text in the 4 locations where “nanostrips” were mentioned.**

6) In step 3.6, you mention “high-g” if this is an abbreviation or alternate name for “high-gravitation”, for example, please define the terminology upon its fist occurrence.

**Response/Change(s):**

* **Clarification given in introduction**
* **“high-g” changed to “high-gravitation” in 3.6.**
* **“high-g” left as “high-g” in Discussion**