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## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Notice of Centennial Challenge Vascular Tissue Challenge

[Notice: (19-047)]

**AGENCY:** National Aeronautics and Space Administration (NASA)

**ACTION:** Notice.

**SUMMARY:** This notice is updating the Centennial Challenge Vascular Tissue Challenge that was published June 13, 2016, Document Number 2016-13795. The Vascular Tissue Challenge is open and teams that wish to compete may now register. Centennial Challenges is a program of prize competitions to stimulate innovation in technologies of interest and value to NASA and the nation. The Vascular Tissue Challenge is a prize competition with a \$500,000 prize purse for teams that can successfully create thick, human vascularized organ tissue in an in vitro environment while maintaining metabolic functionality similar to their in vivo functionality throughout a 30-day survival period. NASA is providing the prize purse. The Methuselah Foundation's New Organ Alliance is the Allied Organization managing the competition.

**DATES:** This is a “first to demonstrate” competition. Teams must submit their intent to compete by September 30th, 2019, and all trials need to be completed by the Trial Deadline of September 30th, 2020.

**ADDRESSES:** The Vascular Tissue Challenge will be conducted and judged at the laboratory facilities of the participants.

**FOR FURTHER INFORMATION:** To register for or get additional information regarding the Vascular Tissue Challenge, please visit: <https://www.neworgan.org/prizes/vascular-tissue-prize/>.

For general information on the NASA Centennial Challenges Program please visit:

<http://www.nasa.gov/challenges>. General questions and comments regarding the program should be addressed to Monsi Roman, Centennial Challenges Program, NASA Marshall Space Flight Center Huntsville, AL 35812. Email address: [hq-stmd-centennialchallenges@mail.nasa.gov](mailto:hq-stmd-centennialchallenges@mail.nasa.gov).

## **SUPPLEMENTARY INFORMATION:**

### **Summary**

Competitors will be asked to produce an in vitro vascularized tissue that is > 1 centimeter in thickness in all dimensions at the launch of the trial and maintains >85% survival of the required parenchymal cells throughout a 30 calendar day period. Tissues must provide adequate blood perfusion without uncontrolled leakage into the bulk tissue to maintain metabolic functionality similar to their in vivo native cells. Histological measurement of the quality and amount of functional performance will be required to determine survival of parenchymal tissue. Teams must demonstrate 3 successful trials with at least a 75% trial success rate to win an award. In addition to the in-vitro trials, teams must also submit a Spaceflight Experiment Concept that details how they would further advance an aspect of their tissue vascularization research through a microgravity experiment that could be conducted in the U.S. National Laboratory (ISS-NL) onboard the International Space Station.

### **I. Prize Amounts**

The total Vascular Tissue Challenge prize purse is \$500,000 (five hundred thousand U.S. dollars). First place will receive \$300,000 (three hundred thousand U.S. dollars). Two runners-up may be awarded \$100,000 (one hundred thousand U.S. dollars) each. Entries must meet specific requirements detailed in the Rules to be eligible for prize awards.

### **II. Eligibility to Participate and Win Prize Money**

To be eligible to win a prize, competitors must:

- (1) Register and comply with all requirements in the rules and Team Agreement;
- (2) In the case of a private entity, shall be incorporated in and maintain a primary place of business in the United States, and in the case of an individual, whether participating singly or in a group, shall be a citizen or permanent resident of the United States; and
- (3) Not be a Federal entity or Federal employee acting within the scope of their employment.

### **III. Official Rules**

The complete rules for the Vascular Tissue Challenge can be found at:

<https://www.neworgan.org/prizes/vascular-tissue-prize/>.

Cheryl Parker

NASA Federal Register Liaison Officer

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