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RECTOR

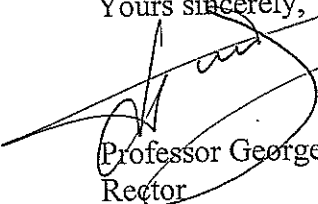
Patras, 22 February 2012  
Ref. No.: 3057

Dear Dr. Conole,

It is our great pleasure to extend the "Visiting Research Agreement" between the National Aeronautics and Space Administration (NASA) and the University of Patras, in the framework of which Dr Christos Georgiou, Professor of the Department of Biology at our University, will conduct research at NASA's Ames Research Centre (ARC) as a participant in NASA's Visitor Exchange Program.

We look forward continuing a productive co-operation between our University and NASA.

Yours sincerely,

  
Professor George Panayiotakis  
Rector



National Aeronautics and  
Space Administration  
**Headquarters**  
Washington, DC 20546-0001



March 16, 2011

Reply to Attn of:

**Office of International and Interagency Relations**

The Rector  
Professor George Panayiotakis  
University of Patras  
University campus, 26504, Rio  
University of Patras  
Patras-26500  
Greece

Dear Professor Panayiotakis:

The purpose of this letter is to enter into a Visiting Researcher Agreement between the National Aeronautics and Space Administration (NASA) and the University of Patras (hereinafter "the Parties"), to provide for Dr. Christos Georgiou, Visiting Researcher, a natural person and citizen of Greece and a Professor of Biochemistry at the University of Patras, to conduct research at NASA's Ames Research Center (ARC) as a participant in NASA's Visitor Exchange Program. This Visiting Researcher Agreement (hereinafter the "Agreement") defines the Parties' responsibilities and the terms and conditions of Dr. Georgiou's assignment at ARC.

NASA has ongoing research collaboration with Dr. Georgiou related to the production of oxidants and the stability of organics in desert soils. Working together has already resulted in one jointly co-authored publication and others are in preparation.

Soils on Mars are thought to accumulate superoxide radicals, as they are formed continually by UV radiation hits on basalt minerals. Yet, beyond electron paramagnetic resonance (EPR) spectroscopy, no other methods exist that detect and quantify superoxide radicals in soils. Our joint work with Dr. Georgiou will focus on two such assays that are based on the reaction of superoxide radical with hydroethidine and oxidized cytochrome c. They are unique in being able to test unambiguously for the presence of superoxide in a soil matrix with a high level of accuracy. Applications with soils from the Atacama Desert showed that the sensitivity of the assays is equal to or greater than that of EPR spectroscopy.

This is relevant to NASA because the Viking missions to Mars in 1976 carried three life detection instruments and a gas chromatograph-mass spectrometer (GCMS) for organic analysis. The results of these instruments were puzzling in at least two respects. First, was the absence of organics as measured by the GCMS. While the detection sensitivity of the instrument was ppb for organics, Rafael Navarro-Gonzalez and colleagues have

shown that the pyrolysis step limited the detection sensitivity in the soil to ppm levels. The second unexpected result was the rapid release of O<sub>2</sub> when soil samples were exposed to water vapor in the Gas Exchange Superoxide radical was recently proposed as a possible Mars oxidant. It is a very reactive molecule (half life 1 ms) and can degrade organics such as polychlorobiphenyls at low temperatures (60 – 75°C). Moreover, superoxide radical dismutates to molecular oxygen when exposed to moisture, so it can explain one of the Viking results. The possible formation of superoxide radicals on Mars was demonstrated by exposing labradorite to UV under a simulated Mars atmosphere.

In arid and semiarid regions, significant soil organic matter decomposition, soil nitrogen loss and plant litter degradation occurs during times when soil microorganisms are inactive. Although photochemical oxidation is implicated, detailed reaction pathways remain unknown. In soils from the Atacama and Mojave, we detected superoxide radical as well as its transformation byproducts metal superoxides and metal hydroperoxides, all of which are powerful oxidants and can destroy organics.

During this assignment under the Agreement, Dr. Georgiou (hereinafter “the Visiting Researcher”) will continue to collaborate with scientists at the NASA Ames Research Center under the direction of NASA/ARC Senior Scientist, Dr. Chris McKay.

#### **NASA AUTHORITY**

The authority for NASA to enter into this Agreement is the National Aeronautics and Space Act, 51 U.S.C. section 20113.

#### **DESCRIPTION OF RESPONSIBILITIES**

NASA will use reasonable efforts to accomplish the following:

1. Provide the Visiting Researcher, at no cost, the following support:
  - Work space;
  - Office furniture;
  - Office supplies, including paper, pens, etc.;
  - Computer workstation, with access to the public Internet and e-mail;
  - Access to local and long distance, including international, telephone and facsimile services to the extent necessary to support the Visiting Researcher’s assignment; and
  - Normal workspace security.
2. Assign a technical point of contact at ARC (see below) to ensure that the Visiting Researcher understands his responsibilities, activities, and limitations and is fully briefed on safety, security, and any restrictions associated with the assignment;
3. Subject to the Visiting Researcher’s satisfying all J visa and NASA program requirements, provide for the issuance of a DS-2019 to the Visiting Researcher so

that he can obtain a J-1 visa to enter and remain in the U.S. for the period of the assignment; and

4. Provide for the review of research results submitted by the Visiting Researcher under this Agreement, and if approved for further distribution, stipulate any restrictions as to public release.

The University of Patras will use reasonable efforts to accomplish the following:

1. Ensure that the Visiting Researcher applies to the nearest U.S. Embassy/Consulate for a J-1 visa and obtains the appropriate visa and entry documentation prior to his entry into the U.S.;
2. Ensure that the Visiting Researcher understands and has agreed to comply with the terms and conditions of the Agreement, including the requirements associated with NASA's provision of DS-2019s for obtaining J-exchange visas, all U.S. State Department requirements associated with the J visa program, and the provision of all necessary personal information on the Visiting Researcher for NASA to approve access to NASA installations and complete a DS-2019;
3. Agree, and ensure that the Visiting Researcher agrees, that the products of the research conducted by the Visiting Researcher during this assignment are subject to NASA review and approval prior to further distribution, for purposes of verifying whether the document contains any technical, export-controlled, proprietary or other information properly restricted from public disclosure;
4. Ensure that all costs and expenses associated with the Visiting Researcher's assignment are provided for, including all transportation expenses to, from, and while in the United States, and all living and miscellaneous expenses while in the United States;
5. Ensure that the Visiting Researcher is covered by the minimum required medical/accident/repatriation insurance (consistent with 22 CFR 62.14) while working with NASA under this Agreement;
6. Provide written evidence that the Visiting Researcher has the minimum required insurance specified in Paragraph (5), above;
7. Provide written evidence that funding will be provided for the expenses specified under Paragraphs (4) and (5), above, including the source(s) and amount(s) of this funding;
8. Notify the NASA points of contact before the Visiting Researcher's scheduled departure from Greece to the U.S.; and

9. Obtain the insurance required under the section below, entitled "Liability and Risk of Loss."

### **POINTS OF CONTACT**

NASA and the University of Patras will designate the following individuals as points of contact for coordinating, administering, managing, and monitoring their respective responsibilities under this Agreement:

For NASA:

Programmatic point-of-contact:

Dr. Mary A. Voytek  
Senior Scientist for Astrobiology  
Science Mission Directorate  
NASA Headquarters, Room 3Y56  
Washington, DC 20546 USA  
Ph: (202)-358-1577  
Fax: (202)-358-3097  
E-mail: [mary.voytek-1@nasa.gov](mailto:mary.voytek-1@nasa.gov)

Point-of-contact for visa-related matters:

Mr. James B. Higgins  
Manager, Interagency Relations  
Export Control and Interagency Liaison Division  
International and Interagency Relations  
NASA Headquarters  
300 E Street, SW  
Washington, DC 20546-0001  
Ph: (202) 358-3861  
Fax: (202) 358-4080  
E-mail: [james.b.higgins@nasa.gov](mailto:james.b.higgins@nasa.gov)

Technical point-of-contact:

Dr. Chris McKay  
Senior Scientist  
Building 245 Room 212  
NASA Ames Research Center  
Moffett Field, CA 94035-1000  
Ph: (650)-604-6864  
Fax: (650)-604-6779  
E-mail: [chris.mckay@nasa.gov](mailto:chris.mckay@nasa.gov)



University of Patras Technical point-of-contact:

The Rector  
 Professor George Panayiotakis  
 University of Patras  
 University campus, 26504, Rio  
 University of Patras  
 Patras-26500  
 Greece  
 Ph: 2610 997120, 2610 997100  
 Fax: 2610 331711  
 E-mail: [rector@upatras.gr](mailto:rector@upatras.gr)  
[panayiot@upatras.gr](mailto:panayiot@upatras.gr)

### **FINANCIAL ARRANGEMENTS**

Each Party will bear the costs of discharging its respective responsibilities. Further, it is understood that the ability of the Parties to carry out their obligations under this Agreement is subject to the availability of funds, and in the case of NASA, appropriated funds. No provisions of this Agreement shall be interpreted to require NASA to obligate or provide funds in violation of the Anti-Deficiency Act.

### **LIABILITY AND RISK OF LOSS**

Each Party hereby waives any claim against the other Party, employees of the other Party, the other Party's related entities (including but not limited to contractors and subcontractors at any tier, grantees, investigators, customers, users, and their contractors or subcontractor at any tier), or employees of the other Party's related entities for any injury to, or death of, the waiving Party's employees of the employees of its related entities, or for damage to, or loss of, the waiving Party's property or the property of its related entities arising from or related to activities conducted under this Agreement, whether such injury, death, damage, or loss arises through negligence or otherwise, except in the case of willful misconduct.

Each Party further agrees to extend this cross-waiver to its related entities by requiring them, by contract or otherwise, to waive all claims against the other Party, related entities of the other party, and employees of the other Party or of its related entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement. Additionally, each party shall require that their related entities extend this cross-waiver to their related entities by requiring them, by contract or otherwise, to waive all claims against the other party, related entities of the other party, and employees of the other party of its related entities for injury, death, damage, or loss arising from or related to activities conducted under this Agreement.

The University of Patras agrees either to obtain insurance coverage to hold harmless NASA and its related entities for liability arising from subrogated claims of the

University of Patras and the Visiting Researcher, or by any University of Patras entities as subrogees based on damage arising out of activities under this Agreement, or to waive these claims if the University of Patras has capacity to do so. NASA agrees to waive subrogated claims of the Government of the United States against The University of Patras and the Visiting Researcher based on damage arising out of the performance of this Agreement.

Nothing in this section shall be construed to create the basis for a claim or suit where none would otherwise exist.

### **EXCHANGE OF TECHNICAL DATA AND GOODS**

It is understood by the Parties that it is neither Party's intent to transfer to the other any proprietary or export-controlled goods, information, or technical data in implementing this Agreement. However, should it become necessary, during the course of implementing this Agreement, for one Party to transfer to the other such goods, information, or technical data, the receiving Party will ensure that its personnel limit use and disclosure of such goods, information, or technical data to only those purposes necessary for the performance of tasks assigned under this Agreement. In the event any such goods, information or technical data are authorized by NASA for transfer to the Visiting Researcher, and from the Visiting Researcher to the University of Patras, the University of Patras agrees to abide by the terms of any markings thereon and, if no markings are indicated thereon, not to use, disclose, or retransfer the goods, information, or technical data for any purpose other than specifically authorized by NASA, and in the absence of any particular restrictions, only for the purposes of implementing this Agreement.

Each Party further agrees to comply with all applicable U.S. export control laws and regulations.

### **PATENTS AND INVENTION RIGHTS**

Title to inventions made by the Visiting Researcher while working under this Agreement shall vest with NASA in accordance with the National Aeronautics and Space Act, 51 U.S.C. section 20113 (b). However, the University of Patras may petition NASA to waive title in accordance with 51 U.S.C. Section 20135 (g) and as prescribed by NASA regulations (See 14 CFR Part 1245). "Made," as used in this clause, means conception or first actual reduction to practice. When title is waived, the U.S. Government shall retain an irrevocable, nonexclusive, nontransferable, royalty-free license for the practice of such invention throughout the world by, or on behalf of, the United States or any foreign government in accordance with any treaty or agreement with the United States. When the U.S. Government retains title, the University of Patras is granted a revocable, nonexclusive, royalty-free license in each patent application filed in any country on a subject invention and any resulting in which the U.S. Government acquires title. The University of Patras is required to ensure that the Visiting Researcher reports to ARC

personnel responsible for patent matters any invention made in the performance of work under this Agreement.

### **PUBLIC INFORMATION**

The Parties retain the right to release public information regarding their own activities under this Agreement. The Parties shall coordinate with each other in advance concerning releasing to the public information that relates to the other Party's responsibilities or performance under this Agreement.

In the event that the Visiting Researcher publishes papers, articles, or results based on or from the activities conducted under this Agreement, the University of Patras will ensure that such papers, articles or results will be submitted to NASA for review and approval prior to release, so that NASA will have the opportunity to verify whether the document contains any technical, export-controlled, proprietary or other information properly restricted from public disclosure.

### **COPYRIGHT**

For works of authorship first created by the Visiting Researcher during the implementation of this Agreement, the University of Patras grants to the U.S. Government, and to others acting on its behalf, a royalty-free, nonexclusive, irrevocable worldwide license in such works to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the U.S. Government.

NASA anticipates that final results of the activities under this Agreement will be made available to the scientific community through publication in appropriate journals or other established channels as soon as practicable and consistent with good scientific practice. In the event such reports or publications are copyrighted, NASA and University of Patras shall have a royalty-free right under the copyright to reproduce, distribute, and use such copyrighted work for their purposes.

### **OWNERSHIP OF EQUIPMENT**

All equipment transferred by the Parties under this Agreement will remain the property of the originating Party unless specified otherwise in this Agreement. Each party agrees to return any of the other party's equipment in its possession to the other party at the conclusion of the project.



### **SAFETY AND SECURITY**

1. If the Visiting Researcher acquires information that is not generally available to those outside NASA, then University of Patras acknowledges and agrees that the Visiting Researcher may not use this information to further a private interest or for the special benefit of a business or other entity in which the Visiting Researcher has a financial or other interest.
2. University of Patras acknowledges and agrees that the Visiting Researcher may not directly or indirectly use or allow the use of the U.S. Government property of any kind, including property leased to the Government, for other than activities approved of by NASA, and that the Visiting Researcher shall protect and conserve U.S. Government property, including equipment, supplies, and other property entrusted or issued to the Visiting Researcher.
3. University of Patras acknowledges and agrees that the Visiting Researcher will comply with all U.S. Government regulations and management issuances related to safety, security, and other installation matters that are in effect at U.S. Government installations to which the Visiting Researcher has access while under this Agreement.
4. University of Patras acknowledges and agrees that the Visiting Researcher will be required to sign a Technology Control Plan. The Technology Control Plan will, among other things, govern the Visiting Researcher's working hours, access to information, and access to NASA facilities while under this Agreement.

### **APPLICABLE LAW**

U.S. Federal law governs this Agreement for all purposes, including, but not limited to, determining the validity of the agreement, the meaning of its provisions, and the rights, obligations and remedies of the Parties.

### **CONSULTATIONS AND DISPUTE RESOLUTION**

The Parties agree to consult promptly with each other on all issues involving interpretation, implementation or performance of the Agreement. An issue concerning the interpretation, implementation or performance of this Agreement shall first be referred to the appropriate points of contact named above for the Parties. If they are unable to come to agreement on any issue, then the dispute shall be referred to the Agreement signatories or their designated representatives for joint resolution.

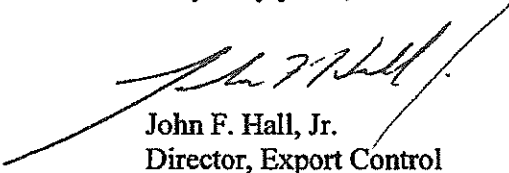
### **ENTRY INTO FORCE, DURATION, AMENDMENT, AND TERMINATION**

This Agreement shall enter into effect upon the date of an affirmative, written reply from an authorized representative of the University of Patras accepting the terms and conditions proposed in this letter. The Visiting Researcher will begin his visit at ARC

after this Agreement enters into effect and on or about April 1, 2011; and the Agreement shall remain in effect until April 1, 2012, unless terminated by either Party upon at least one (1) month written notice. The Agreement may be extended or amended by mutual written agreement of the Parties.

If the above terms and conditions are acceptable to the University of Patras, I propose that this letter, together with an affirmative, written reply from an individual empowered to enter into agreements for University of Patras, constitutes an Agreement to accommodate the assignment of University of Patras Visiting Researcher at NASA/ARC.

Very truly yours,



John F. Hall, Jr.  
Director, Export Control  
and Interagency Liaison Division

cc:  
HQ/SMD/M. Voytek  
ARC/245-1/C. McKay

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*ΠΡΥΤΑΝΗΣ*

*RECTOR*

Patras, 17 March 2011  
Ref. No.: 4853

Dear Dr. Conole,

We would like to inform you, that, we agree with the terms and conditions referred to in the "Visiting Research Agreement" between the National Aeronautics and Space Administration (NASA) and the University of Patras, in the framework of which Dr Christos Georgiou, Professor of the Department of Biology at our University, will conduct research at NASA's Ames Research Centre (ARC) as a participant in NASA's Visitor Exchange Program.

We look forward towards a productive co-operation between our University and NASA.

Yours sincerely,



Professor George Panayiotakis  
Rector