

Biotechnology for the 21st Century workshop

Dear Dr. Cavalcanti,

It is with great pleasure that we invite you to participate in a unique workshop to be held August 10-12, 2010 in Alexandria, VA, USA, at the request of The Technical Cooperation Program (TTCP). TTCP is an international organization that collaborates in defense, scientific and technical information exchange; program harmonization and alignment; and shared research activities for five member nations (US, UK, Canada, Australia and New Zealand). TTCP promotes sharing of information amongst member countries in 11 traditionally "defense" S&T thematic working groups, (e.g., Aerospace Systems; Command, Control, Communications and Information Systems; Chemical, Biological and Radiological Defense, etc).

This workshop, "Biotechnology for the 21st Century", reflects a push by TTCP to look outside its conventional working group boundaries to explore areas of S&T that are not traditional defense department research topics, but hold the promise of both new opportunities, and, possibly, identification of new defense threats.

After discussion with your international colleagues, the end result of this meeting will be a report for TTCP that articulates the current state of science in the topical areas selected, delivers prioritized near- and long-term opportunity areas as well as potential defense threat areas for possible defense science and technology consideration.

The workshop will be organized around three broad topics in biomedicine/biotechnology which will break into smaller groups with specific foci (see attached topic list and draft agenda). Presentations will provide "state of the science" background information for participants. Breakout groups will be lead by creative leaders in the field. Speakers and invited participants will be asked to consider both potential opportunities and threats for defense science and technology establishments to consider.

You have been identified and recommended as a uniquely creative and innovative scientist who has the ability to see the big picture. Your expertise will help inform and guide the defense science and technology establishments of the member countries, with the possibility of future funding programs to address these priorities. We invite you to be a speaker for an overview of Molecular Machines. Your expertise in this area, as well as your proven ability to think 'outside the box', recommend you highly for this role. What is required is preparation of a 30-40 minute 'state of the science' talk. The organizers would be grateful if you accept our invitation to participate. If you are unable to accept this invitation, we welcome your recommendations for other 'big thinkers' in this topical area whom you would recommend to fill this spot. In addition, if there are specific individuals you think we should invite to participate in this workshop, we welcome those suggestions as well.

A small stipend to offset your travel expenses will be available, funded by the Office of Naval Research. We look forward to a response no later than June 14, 2010.

Sincerely,

Linda Chrisey, Ph. D., Office of Naval Research, Team Bio Lead
Trevor Douglas, Ph.D., Professor and Director, Center for Bio-Inspired Nanomaterials
Walter Kozumbo, Ph.D., Air Force Office of Scientific Research, Bioenergy Program

[attached topic list and draft agenda]

Workshop format: 2.5 days

Day One, 8/10/10:

Morning :

Brief overviews by TTCP and/or OXR reps (15 mins)

- Explanation of the workshop – why are we here, what do we hope to accomplish
- Meeting logistics (facilities, discussion group assignments, writing assignments)

Session I Systems Biology

- Overview of Systems Biology talk (30 mins)
- Systems Biology : for medicine (30 Mins)
- Systems Biology for non-medical areas, such as environmental or biofuels (30 mins)
- Nano-/micro robots in body/environment (30 mins)
- Methods for collecting and analyzing molecular signals at high resolution/high throughput, and information management (30 mins)

Afternoon:

Session 2 Molecular machines at the nano and micron scale (medical or non-biomedical)

- Overview of Molecular Machines talk (30 mins)

- Characterization of biological machines (30 mins)
 - o Imaging
 - o Structure
 - o Assembly
 - o Function
- Design and manufacture of molecular machines (to include biotic or synthetic routes) (30 mins)
- Navigation/targeting/locomotion/coordinated behaviors of molecular machines (e.g., within the human body) (30 mins)

Day Two, 8/11/10:

Morning:

Session 3 Biotic/Abiotic* Interfacial Interactions

- Overview of Biotic/Abiotic Interfacial Interactions (30 mins)
- Multi-scale forces and structures controlling biotic/abiotic surface interactions and how to characterize them (30 mins)
- Hybrid materials (that combine living or biomolecular elements with non-living materials) 30 mins)
- Controlling/mitigating interactions in natural biotic/abiotic systems (e.g., immune response, in vivo biofouling; 30 mins)
- Integrating biotic and abiotic components/systems (e.g., 'wiring' cells to silicon, nanobionics, inserting abiotic materials into cells; 30 mins).

* "Biotic" can mean living, cellular, sub-cellular or biomolecular components

Afternoon:

- Parallel breakout sessions for Topics 1, 2 & 3 (3.5 hrs, includes short break)

Dinner? (No host, or possible to include in venue)

Evening

Joint Discussion Session – rapporteurs from individual breakout groups report out (15-20 mins each), to be followed by combined discussion of topics

Day Three, 8/12/10:

Morning

- Discussion wrap-up
- Overview talks by agency program managers interested in workshop subjects
- Final writing session for breakout session scribes

2nd evening for discussions /wrap-up

3rd day writing & program manager overviews?