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14. ABSTRACT The funding supported a symposium held on October 22nd and 23rd 2015 at the Advanced Science Research Center at the City University of New York. The symposium focused on the current state-of-the-art of smart materials, supramolecular chemistry, and adaptive nanotechnology. 10 Invited speakers in these fields highlighted their current research in key topics areas including: materials that express transient function; materials that show compositional adaptation; materials that display emergent functionality; new analytical tools that allow for measurement in real-time of dynamic materials; and theoretical studies of dynamic materials. In addition, a poster
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Report Title

Final Report: Active and Adaptive Materials Symposium

ABSTRACT

The funding supported a symposium held on October 22nd and 23rd 2015 at the Advanced Science Research Center at the City University of New York. The symposium focused on the current state-of-the-art of smart materials, supramolecular chemistry, and adaptive nanotechnology. 10 Invited speakers in these fields highlighted their current research in key topics areas including: materials that express transient function; materials that show compositional adaptation; materials that display emergent functionality; new analytical tools that allow for measurement in real time of dynamic materials; and theoretical studies of dynamic materials. In addition, a poster session provided an opportunity for graduate students and early career researchers to present their research. This multidisciplinary symposium served as a platform to discuss future directions of active and adaptive systems. It was attended by 103 scientists from

Enter List of papers submitted or published that acknowledge ARO support from the start of the project to the date of this printing. List the papers, including journal references, in the following categories:

(a) Papers published in peer-reviewed journals (N/A for none)

<u>Received</u>	<u>Paper</u>
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TOTAL:

Number of Papers published in peer-reviewed journals:

(b) Papers published in non-peer-reviewed journals (N/A for none)

<u>Received</u>	<u>Paper</u>
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TOTAL:

Number of Papers published in non peer-reviewed journals:

(c) Presentations

Number of Presentations: 0.00

Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Non Peer-Reviewed Conference Proceeding publications (other than abstracts):

Peer-Reviewed Conference Proceeding publications (other than abstracts):

Received Paper

TOTAL:

Number of Peer-Reviewed Conference Proceeding publications (other than abstracts):

(d) Manuscripts

Received Paper

TOTAL:

Number of Manuscripts:

Books

Received Book

TOTAL:

Received

Book Chapter

TOTAL:

Patents Submitted

Patents Awarded

Awards

Graduate Students

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Post Doctorates

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Faculty Supported

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Names of Under Graduate students supported

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Student Metrics

This section only applies to graduating undergraduates supported by this agreement in this reporting period

The number of undergraduates funded by this agreement who graduated during this period:

The number of undergraduates funded by this agreement who graduated during this period with a degree in science, mathematics, engineering, or technology fields:.....

The number of undergraduates funded by your agreement who graduated during this period and will continue to pursue a graduate or Ph.D. degree in science, mathematics, engineering, or technology fields:.....

Number of graduating undergraduates who achieved a 3.5 GPA to 4.0 (4.0 max scale):.....

Number of graduating undergraduates funded by a DoD funded Center of Excellence grant for Education, Research and Engineering:.....

The number of undergraduates funded by your agreement who graduated during this period and intend to work for the Department of Defense

The number of undergraduates funded by your agreement who graduated during this period and will receive scholarships or fellowships for further studies in science, mathematics, engineering or technology fields:

Names of Personnel receiving masters degrees

<u>NAME</u>
Total Number:

Names of personnel receiving PHDs

<u>NAME</u>
Total Number:

Names of other research staff

<u>NAME</u>	<u>PERCENT SUPPORTED</u>
FTE Equivalent:	
Total Number:	

Sub Contractors (DD882)

Inventions (DD882)

Scientific Progress

Technology Transfer

Active and Adaptive Materials Symposium CUNY ASRC

The grant provided financial support for a symposium focused on active and adaptive materials. The symposium was held on October 22nd and 23rd 2015 at the Advanced Science Research Center at the City University of New York. The symposium focused on the current state-of-the-art of smart materials, supramolecular chemistry, and adaptive nanotechnology. Leading academic researchers in these fields highlighted their current research in key topics areas including: materials that express transient function; materials that show compositional adaptation; materials that display emergent functionality; new analytical tools that allow for measurement in real time of dynamic materials; and theoretical studies of dynamic materials. In addition, a poster session provided an opportunity for graduate students and early career researchers to present their research. This multidisciplinary symposium was successful in serving as a platform to discuss future directions of active and adaptive systems.

Featuring an international group of speakers, including Dr. Paul Chaikin from New York University, Dr. Stoyan Smoukov from the University of Cambridge (UK), Dr. Lee Cronin of the University of Glasgow, Dr. David G. Lynn of Emory University, Dr. Jan van Esch from Delft University of Technology and Dr. Samuel I. Stupp of Northwestern University, the program focused on a number of different research fields in life-inspired nanomaterials.

After the first day's symposium sessions, Dr. Cronin led a talk titled "The Evolutionary Genesis Machine", a discussion on how chemists may go about creating new types of truly synthetic life, put on in coordination with the NYC Skeptics Society. Talks from Dr. Elisa Riedo of the ASRC and The City College of New York, Dr. Adam Braunschweig of the University of Miami and Dr. Andreas Walther of Aachen University highlighted the second day's session. The complete program is included below.

Students and postdocs presented their work in 8 contributed talks and 36 posters. The lively poster sessions were well attended and resulted in a number of new collaborations and opportunities.

We are grateful that the symposium was attended by Dawanne Poree and Wendy Mills from ARO.

Metrics:

- 1 Total delegates - 104
 - 1 No of students - 36
 - 2 No of post docs - 24
 - 3 No. of faculty - 24
 - 4 Other - 8
 - 5 Additional walk-ins not registered in advance - 12
- 2 Number of countries: 5
 - 1 USA - 9 states (MA, MD, NY, PA, FL, CA, GA, IL, KY)
 - 2 UK

- 3 Israel
- 4 Netherlands
- 5 Germany
- 3 Number of speakers: 19
 - 1 Keynotes - 2
 - 2 Invited - 9
 - 3 Contributed - 8
- 4 No. of posters: 36
- 5 No. of sponsors: 8 (Soft Matter, Nature Nanotechnology, Materials Horizons, Perkin Elmer, Journal of Applied Polymer Sciences, New York City Skeptics, Chem, Advanced Science)

Program

Thursday October 22nd

- | | |
|-------------|---|
| 9:00 | Registration
Poster set-up
Welcome and Opening Comments/ Gillian Small/ Vice Chancellor
for Research and Executive Director of ASRC |
| 9:30-9:45 | Rein V. Ulijn
CUNY ASRC
Bio-Inspired Supramolecular Materials |
| 9:45-10:30 | Samuel I. Stupp
Northwestern University
Out-of-equilibrium BIOMIMETIC Systems |
| 10:30-11:00 | Dissipative Self-assembly
Jan Van Esch
Delft University of Technology |
| 11:00-11:30 | Coffee Break |
| 11:30-12:00 | Random Organization, Hyperuniformity and Photonic Bandgaps
Paul Chaikin
New York University |
| 12:00-12:20 | A Supramolecular Shield to Overcome A β 42 Toxicity
Silvia Sonzini
University of Cambridge
On Probing Molecular Conformation of Microtubules by Second-
Harmonic Generation |
| 12:20-12:40 | Hyungsik Lim
Hunter College
Catalytic Shakers and Swimmers: Control of Vesicle Membrane
Permeability and Chemotaxis of "Matchstick" Colloids |
| 12:40-1:00 | Corinna Preuss |

The University of Warwick
Lunch
1:00-2:10 Poster Presentations
Can Chemistry go MENTAL*?
2:10-2:55 Lee Cronin
University of Glasgow
Enzymatic Synthesis of Size Controlled, Water Soluble Quantum
2:55-3:15 Dots
Bryan Berger
Lehigh University
Geometrical Basis for Symmetry Breaking and Multi-functionality
3:15-3:45 Stoyan Smoukov
University of Cambridge
3:45-4:15 Break
Transient Peptide Nanostructures
4:15-4:30 Charalampos Pappas
University of Strathclyde & CUNY Advanced Science Research
Center
Engineering With Biomolecular Motors
4:30-5:00 Henry Hess
Columbia University
Dual-phase Evolution and the Emergence of Materials Genomes
5:00-5:30 David G. Lynn
Emory University
5:30-7:30 Reception with Poster Presentations
7:30-8:30 The Evolutionary Genesis Engine
An Evening with Lee Cronin

Friday October 23rd

9:15-9:45 Elasticity and Friction of 1D and 2D Systems: from DNA to
Graphene
Elisa Riedo
CUNY Advanced Science Research Center & CCNY
9:45-10:15 Time-Programmed Self-Assemblies and Dynamic Materials
Andreas Walther
Aachen University
10:15-10:35 Light-emitting Self-assembled Peptide Nucleic Acids Exhibit Both
Stacking Interactions and Watson-Crick Base Pairing
Or Berger
Tel Aviv University
10:35-10:55

Quantifying Signal Propagation and Conformational Changes in
Allosteric Proteins
Vanessa Ortiz
Columbia University

10:55-11:15 Active Colloids via Controlled Dewetting
Stefano Sacanna
New York University

11:15-11:45 Coffee Break

11:45-12:15 Seek, Destroy and Heal: Enzyme-Responsive Nanoparticles as In
Vivo Targeted Delivery Systems
Nathan Gianneschi
UC San Diego

12:15-12:45 Correlated Structure and Photophysics in Supramolecular
Polymer Films
Adam Braunschweig
University of Miami

12:45-1:00 Closing Remarks
Rein Ulijn