

SRI MEENAKSHI GOVERNMENT ARTS COLLEGE FOR WOMEN(A),
MADURAI 625 002.

One Day International Webinar on
'Inspirations From Nature : Responsive Materials for Modern World'

Date. 3.8.2020

Time : 5 PM To 6 PM

Dr. S. Thayumanavan, Professor of Chemistry, Department of Chemistry, Molecular and Cellular Biology Program, Center for Bioactive Delivery, Institute for Applied Life Sciences, University of Massachusetts, Amherst, MA has delivered lecture on Inspirations from Nature: Responsive Materials for the Modern World.

Nanoassemblies that respond to external stimulus or a combination of stimuli are of great interest, because of their broad applications . The primary challenge concerns two factors: input(stimulus or stimuli) and output(response). The ability to tailor the molecular design to achieve materials that respond to a broad range of inputs, yielding a broad range of outputs has significant implications in a variety of areas.

He has discussed about supramolecular nanoassembled polymers, self assembly behaviour of the polymer, cross linking and nature inspired and need inspired nanoassemblies.

You tube link :

https://youtu.be/A5_MezJ_A7o


LIVE on Custom Live Streaming Service

You are viewing S. "Thai" Thayumanavan's screen

Inspirations from Nature: Responsive Materials for the Modern

S. Thayumanavan

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ARUL MOLU J

S. "Thai" Thayumanav

spot light

Dr.C.Me

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Nature's inspirations



ARUL MOLI J

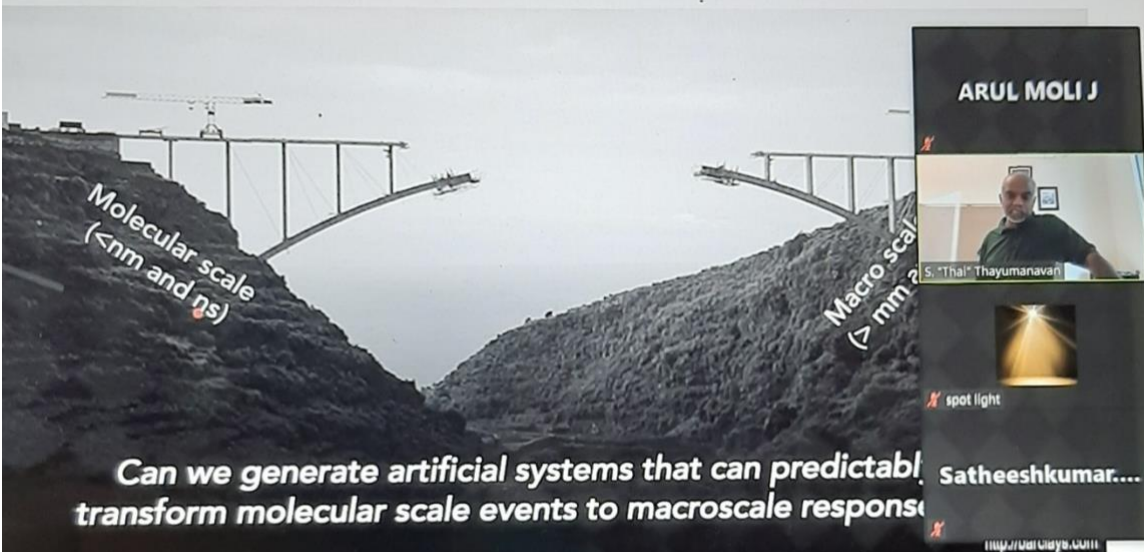


S. Thajil Thayumanavan

spot light

Satheeshkumar...

A materials chemistry grand challenge



Molecular scale (<math>< \text{nm and ns}</math>)

Macro scale (> mm)

Can we generate artificial systems that can predictably transform molecular scale events to macroscale responses?

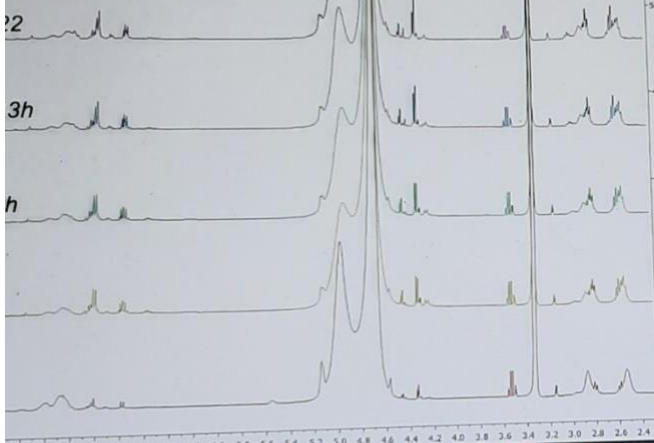
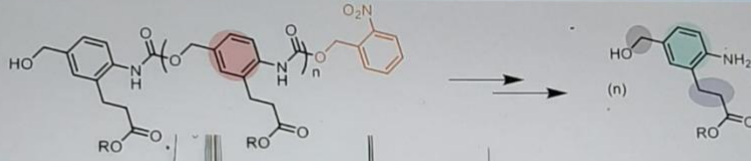
ARUL MOLI J

S. "Thai" Thayumanavan

spot light

Satheeshkumar...

Monitoring polymer degradation after UV illumination



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S. "Thai" Thayumanavan

spot light

M. Priyadharsini

Monitoring polymer degradation after UV illumination

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Chemical reaction scheme showing the degradation of a polymer chain under UV illumination, resulting in a smaller molecule (n).

Stacked NMR spectra showing the degradation of the polymer over time:

- Polymer_UV2h_22h
- Polymer_UV2h_13h
- Polymer_UV2h_5h
- Polymer_UV2h
- Polymer_0h

Chemical structures of the polymer and its degradation product (n) are shown. The polymer structure includes a hydroxyl group (HO), a nitro group (NO₂), and a carboxylate group (ROO). The degradation product (n) is a smaller molecule with a hydroxyl group (HO) and an amino group (NH₂).

Graph showing % Degradation vs Time (min):

Time (min)	% Degradation
0	0
~1	~5
~2	~10
~3	~45
~4	~60
~5	~75
~6	~80

Video call interface showing participants: ARUL MOLI J, S. "Thai" Thayumanavan, spot light, and M.Priyadharsini.

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Self-assembly behavior of the polymer

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Chemical structures showing the self-assembly behavior of the polymer in water:

- P2 solution in water
- PDADMAC solution in water

The diagram illustrates the self-assembly of the polymer (P2) in water, showing the formation of a micelle-like structure. The polymer structure includes a hydroxyl group (HO) and a carboxylate group (COO). The PDADMAC solution in water is shown as a separate component.

Video call interface showing participants: ARUL MOLI J, S. "Thai" Thayumanavan, spot light, and M.Priyadharsini.

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Self-assembly behavior of the polymer

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Dropwise addition of PDADMAC to P2

P2 solution in water

PDADMAC solution in water

Volume %

Size (d. nm)

— P2 + PDADMAC

— P2

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Cross-linking initiated by HRP

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- High solubility of substrate in

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Chat 62

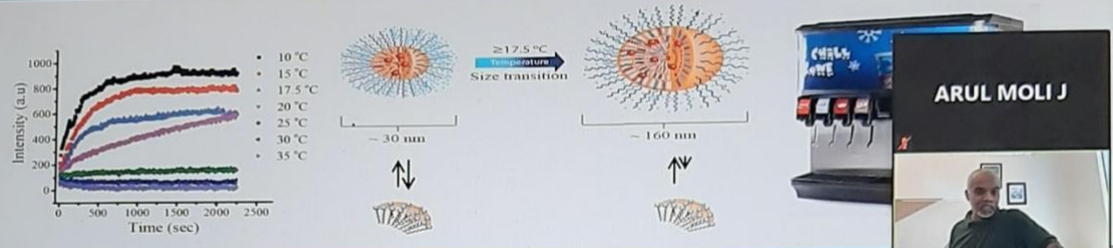
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Nature-inspired and need-inspired nanoassemblies



ARUL MOLI J

S. "Thal" Thayumanavan

M.Priyadharsini