

Shreyas S. Wagle

ESR 2 Fellow

Institution: Tel Aviv University

Group: Amir Research Group

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Meeting 1

Eindhoven, 26th March 2019



Martin Luther University,
Halle (Saale) (Germany)

MSc. Polymer Material Sciences

- Polymer Chemistry
- Material and Polymer Physics
- Physical Chemistry
- Reaction Engineering

Honours and Awards:

- STIBET Degree Scholarship for International Students
- Halle Young Polymer Scientist Scholarship for Excellent Academic Performance



Institute of Chemical Technology,
Mumbai (India)

B. Tech. Fibres & Textiles Processing Technology

- Textile Chemistry
- Fibre Sciences
- Organic chemistry
- Physical chemistry

Internships

- BASF, Turbhe (India) : Pigment Printing & Stretchable Prints
- Vishnu Dyeing and Printing, Mumbai (India)



Martin Luther University,
Halle (Saale), (Germany)

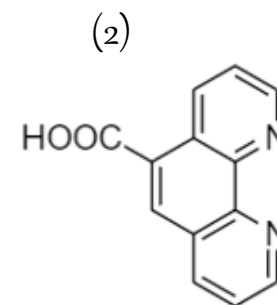
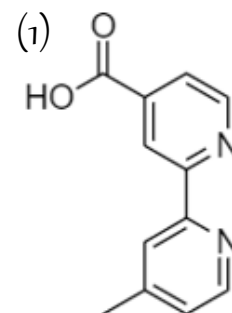
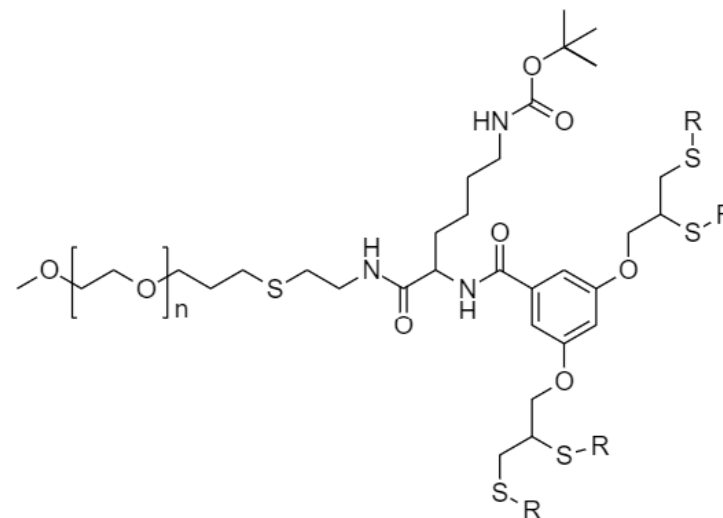
- Synthesis & encapsulation of the multivalent small molecules and fluorogenic dye to develop an optical damage-sensing and self-healing system based on Cu assisted azide-alkyne click reaction(CuAAC).
- Analytical techniques including NMR spectroscopy, SEM, TEM, IR, ESI –ToF mass spectrometry and UV/Vis spectroscopy.



Institute of Chemical Technology,
Mumbai (India)

- Synthesis of nanocellulose and nanocellulose containing HDPE films in an attempt to make biodegradable films with the aim of using in agro textiles
- Analytical techniques including IR and UV/Vis spectroscopy.

- Synthesized four monofunctional PEG(5k Da) hybrids with different alkyl groups in the dendrimers (Alkyl chain length= 6,7,8,12)
- Currently working to conjugate these hybrid with Cy3 and Cy5 dyes
- Synthesizing (1) 4'-Methyl-2,2'-bipyridine-4-carboxylic acid
(2) 1,10-phenanthroline-5-carboxylic acid
- Cell proliferation studies of polymer were performed on wild type cell lines of KPC (Pancreatic Cancer), MCF-7 (Breast Cancer) suggest no biological relevant cytotoxicity upto 1 mg/mL



NMR Spectroscopy 400 MHz



Waters Alliance HPLC/GPC (PDA+RI)

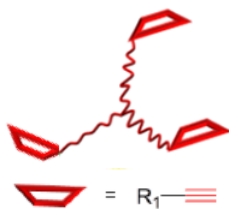


Philips Tecnai F20 TEM

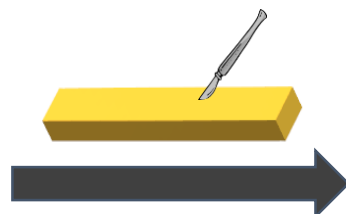
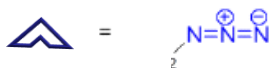
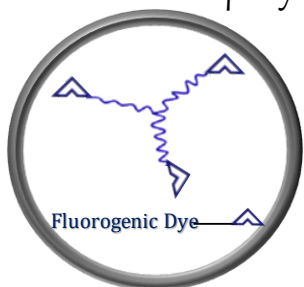




Dispersed throughout the matrix



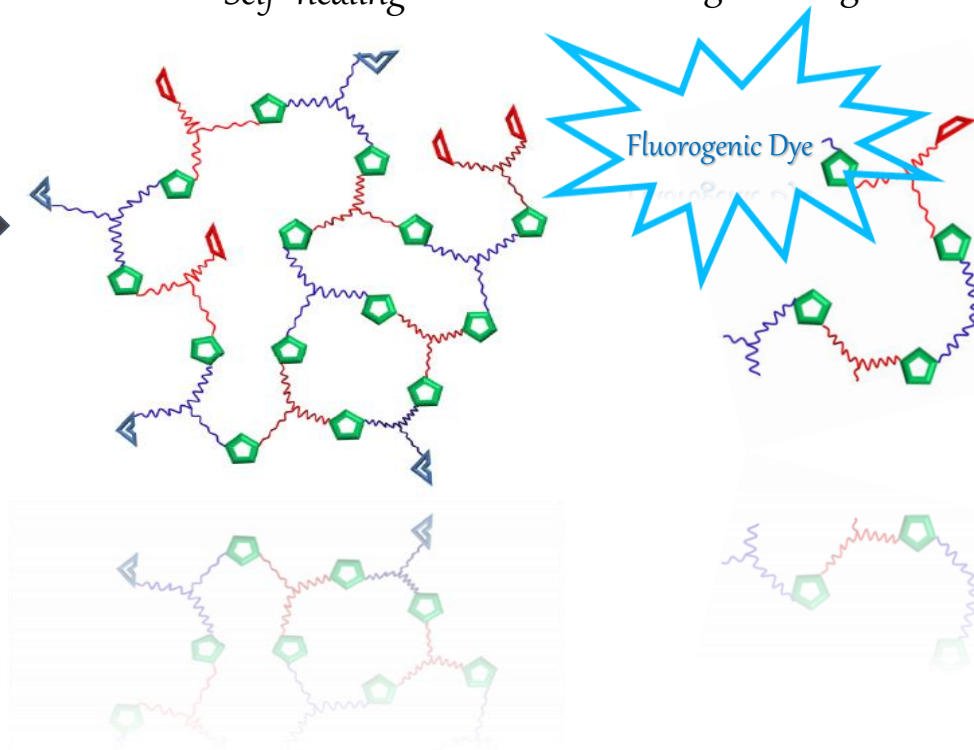
Embedded in the epoxy matrix

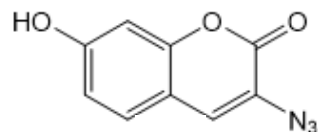


Cu(I) catalyst

Self-healing

Damage Sensing

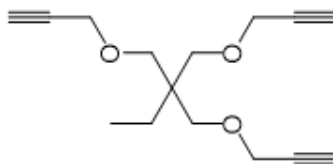




3-azido-7-hydroxycoumarin

Reaction Yield = 8.2 %

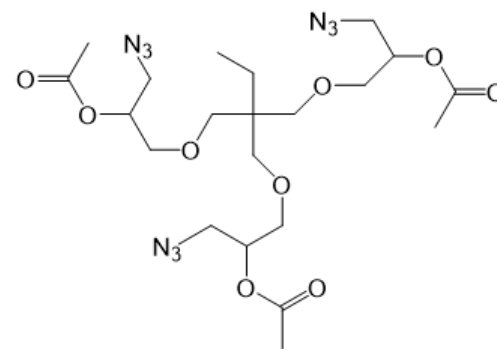
Purity = 99 %



Trimethylolpropane tripropargyl ether

Reaction Yield = 62 %

Purity = 97.5 %

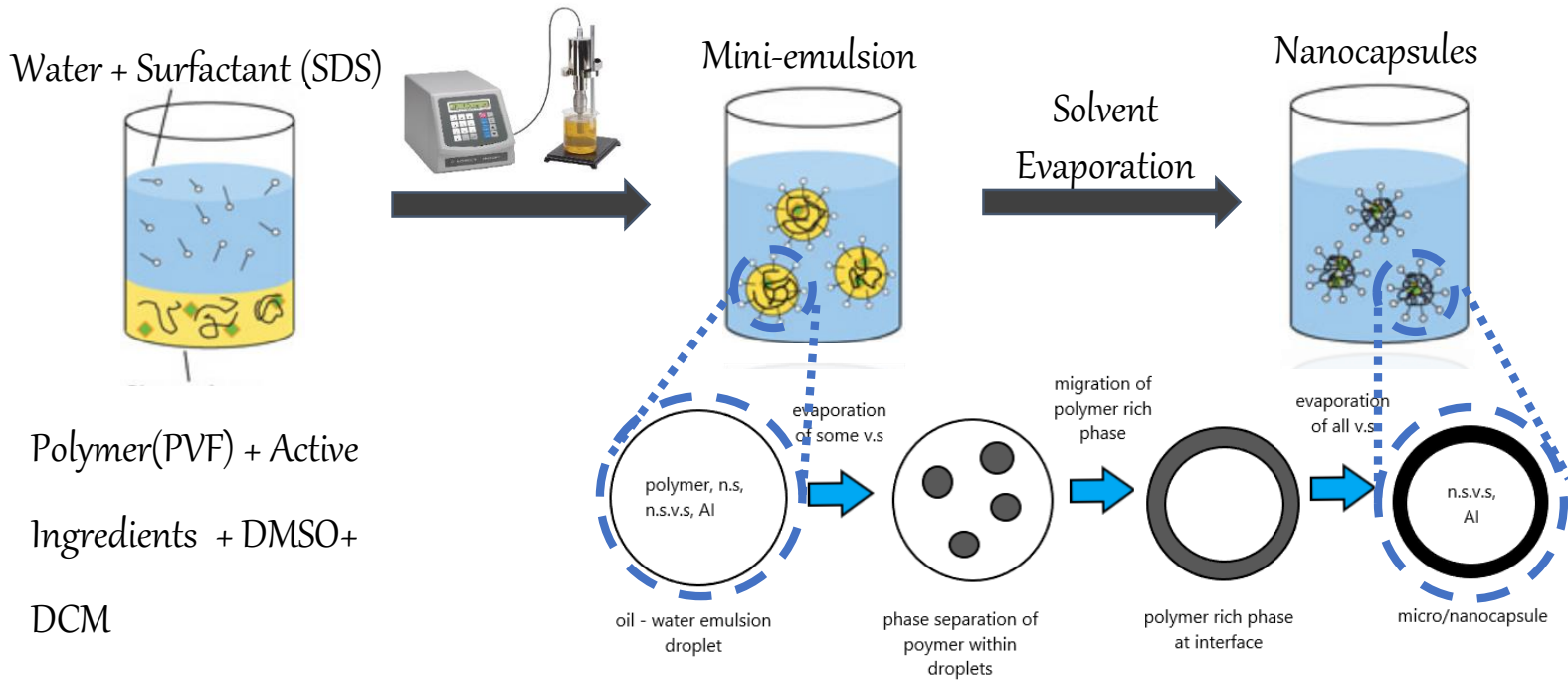


Aceylated Triazide*

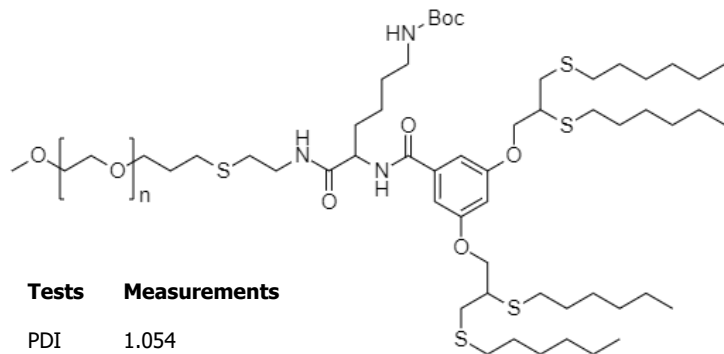
Reaction Yield = 43 %

Purity = 72.3 %

* ((2-((2-acetoxy-3-azidopropoxy)methyl)-2-ethylpropane-1,3-diyl) bis (oxy))bis(3-azidopropane-1,2-diyl) diacetate

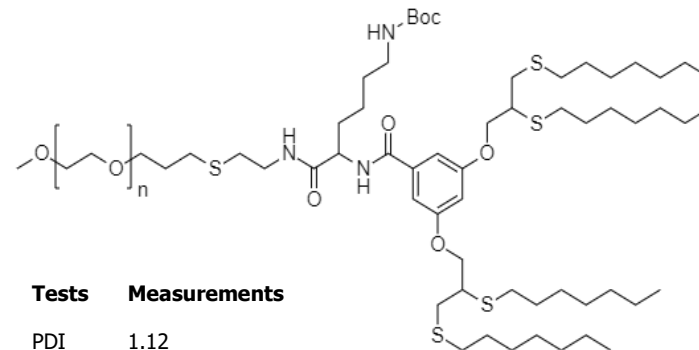


PEG-C6 Hybrid



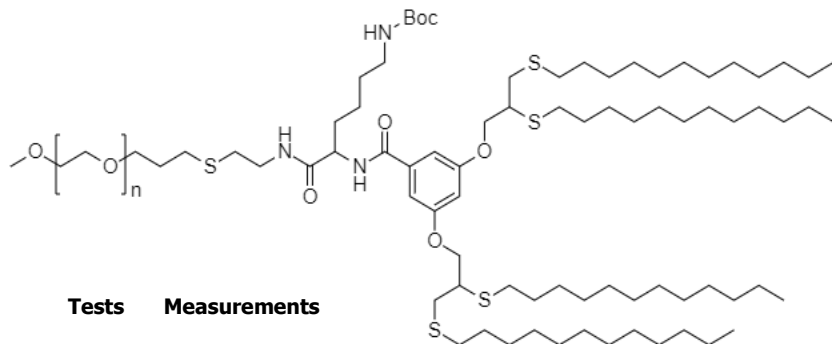
Tests	Measurements
PDI	1.054
DLS	19.6 ± 3.0 nm
CMC	4±2 μM

PEG-C7 Hybrid



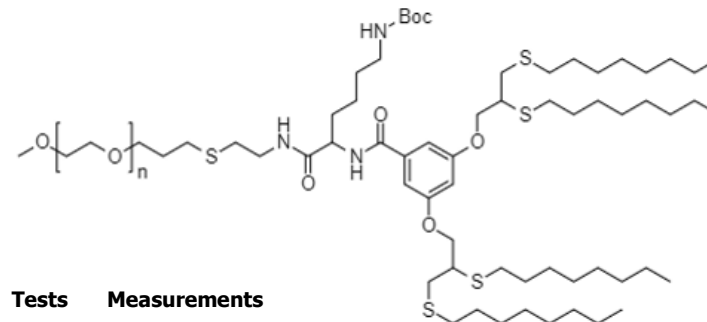
Tests	Measurements
PDI	1.12
DLS	23.7 ± 1.4 nm
CMC	4±2 μM

PEG-C12 Hybrid



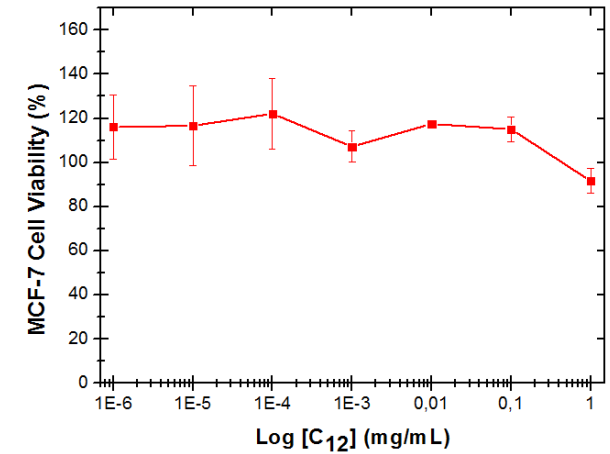
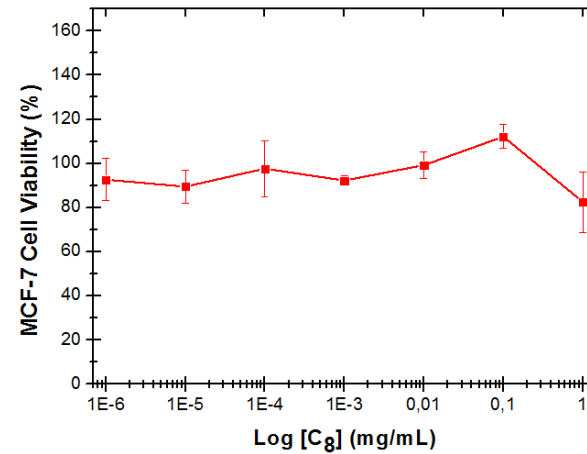
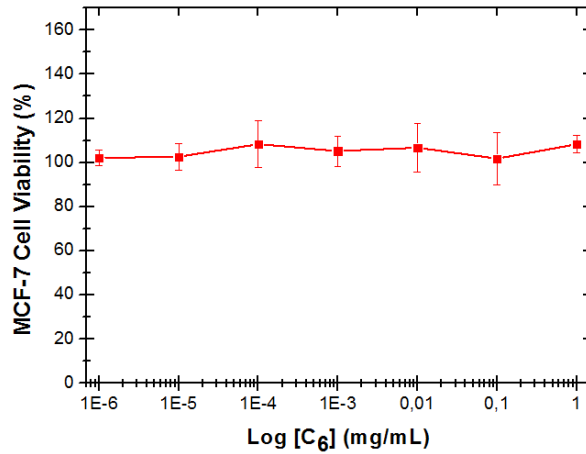
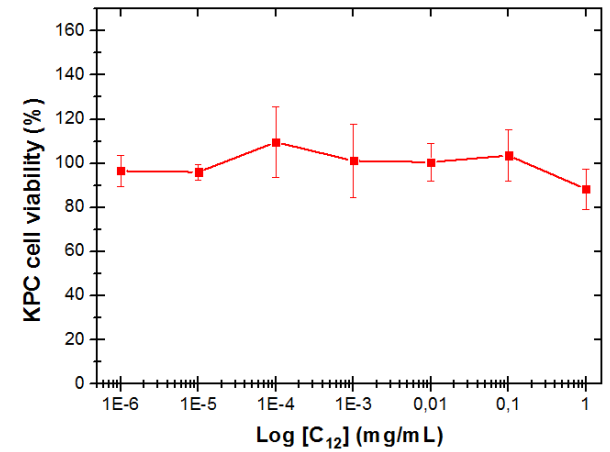
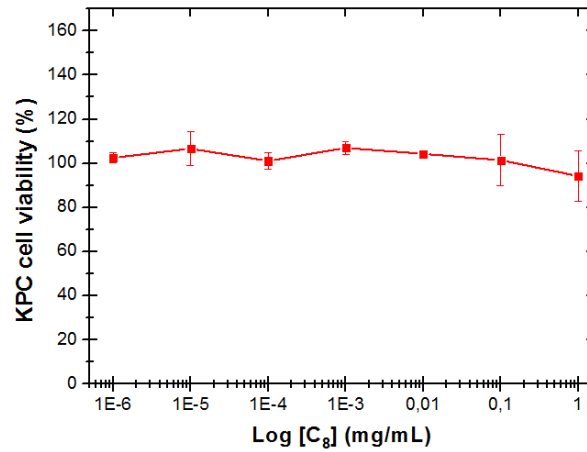
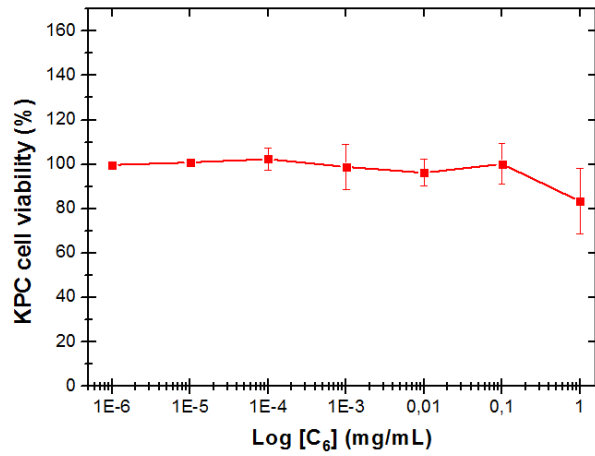
Tests	Measurements
PDI	1.039
DLS	31.6 ± 6 nm
CMC	3±1 μM

PEG-C8 Hybrid



Tests	Measurements
PDI	1.044
DLS	29.9 ± 3.2 nm
CMC	4±1 μM

CELL PROLIFERATION



POLYMERS MTT IN MCF-7

