Malar Azhagan Azagarsamy

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EDUCATION

Ph.D. in Chemistry September 2010
University of Massachusetts, Amherst, MA
Thesis title: Design, syntheses and protein responsive assembly/disassembly of amphiphilic dendrimers
Advisor: Professor Sankaran Thayumanavan

M.Sc. in Chemistry April 2000
Madurai Kamaraj University, Madurai, India

B.Sc. in Chemistry March 1997
University of Madras, Chennai, India

RESEARCH/TEACHING EXPERIENCE

Postdoctoral Researcher November 2010-Present

Howard Hughes Medical Institute/University of Colorado
Department of Chemical and Biological Engineering, Boulder, CO
Advisor: Professor Kristi S. Anseth

- Designed and synthesized photodegradable nanogels for protein encapsulation and demonstrated light controlled protein release and activity.
- Designed and synthesized distinctive photocleavable units that can be cleaved using different wavelengths of light.
- Demonstrated optical wavelength controlled sequential release of multiple proteins from a synthetic scaffold and studied its sequential impact on cellular differentiation.

Graduate Research Assistant January 2006-September 2010

University of Massachusetts, Amherst, MA

- Designed and synthesized amphiphilic dendrimers that form solvent-polarity dependent supramolecular assemblies
- Studied self-assembling and guest encapsulation properties of amphiphilic dendrimers in aqueous conditions.
- Demonstrated disassembly of macromolecular (dendrimer) assemblies and subsequent guest release using both enzymatic action and protein-ligand interactions.

Teaching Assistant September 2005-September 2006

University of Massachusetts, Amherst, MA

- Teaching and supervising general chemistry laboratory for undergraduate students.

Research Associate September 2000-July 2005

Dr.Reddy's Laboratories, Hyderabad, India

- Designed and synthesized biologically active small molecules for biological screening.

AWARDS AND FELLOWSHIPS

- Procter & Gamble Outstanding Chemistry Graduate Student Award — August 2009
  University of Massachusetts Amherst
- Graduate School Travel Award — November 2009
  University of Massachusetts Amherst
- Qualified Graduate Aptitude Test in Engineering (GATE-2000) Exam — June 2000
  in the Discipline of Chemistry, India

PUBLICATIONS

1. **Azagarsamy, M. A.**; Anseth, K. S. "Wavelength-controlled photocleavage for orthogonal and sequential release of multiple proteins" *Angew. Chem. Int. Ed.,* **2013,** *ASAP (*DOI: 10.1002/anie.201308174).
2. Gandavarappu, N. R.; **Azagarsamy, M. A.**; Anseth, K. S. "Photo-click living strategy for controlled, reversible exchange of biochemical ligands" *Adv. Mater.*, **2013,** *accepted for publication.*
3. **Azagarsamy, M. A.**; Anseth, K. S. "Bioorthogonal click chemistry: An indispensable tool to create multifaceted cell culture scaffolds" *ACS Macroletters,* **2013***, 2,* 5.
4. Alge, D. L.; **Azagarsamy, M. A.**; Donohue, D. F.; Anseth, K. S. "Synthetically tractable click hydrogels for three-dimensional cell culture formed using tetrazine-norbornene chemistry," *Biomacromolecules,* **2013**, *14*, 949.
5. **Azagarsamy, M. A.**; Alge, D. L; Radhakrishan, S. J.; Tibbit M. W.; Anseth, K. S. "Photocontrolled nanoparticles for on-demand release of proteins" *Biomacromolecules,* **2012***, 13,* 2219.
6. **Azagarsamy, M. A.**; Gandavarappu, N, R.; Anseth, K. S. " Poly(ethylene glycol) (PEG) hydrogels using bioorthogonal, click reactions to create versatile cell culture scaffolds" *Material Matters - Sigma Aldrich*, **2012,** *7*, 35.
7. Torres, D. A; **Azagarsamy, M. A.**; Thayumanavan. S. "Supramolecular displacement-mediated activation of a silent fluorescent probe for label-free ligand screening" *J. Am. Chem. Soc.*, **2012**, *134*, 7235. (Featured in *Chemical and Engineering News,* **2012** as "Simple probe allows drug candidate screening without labels".)
8. Raghupathi, K. R; **Azagarsamy, M. A.**; Thayumanavan. S. "Guest-release control in enzyme-sensitive, amphiphilic-dendrimer-based nanoparticles through photochemical crosslinking" *Chem. Eur. J.*, **2011**, *17,* 11752.
9. Yesilyurt, V.; Ramireddy, R.; **Azagarsamy, M. A.**; Thayumanavan. S. "Accessing lipophilic ligands in dendrimer-based amphiphilic supramolecular assemblies for protein-induced disassembly" *Chem. Eur. J.*, **2012**, *18,* 223.
10. **Azagarsamy, M. A.**; Yesilyurt, V.; Thayumanavan. S. "Disassembly of dendritic micellar nanocontainers due to protein binding" *J. Am. Chem. Soc.*, **2010**, *132*, 4550.
11. **Azagarsamy, M. A.**; Sokkalingam, P.; Thayumanavan. S. "Enzyme-triggered disassembly of dendrimer-based amphiphilic nanocontainers" *J. Am. Chem. Soc.*, **2009**, *131*, 14184.
12. **Azagarsamy, M. A.**; Thayumanavan. S. "Magnetic resonance imaging: Making sense of disassembly" *Nat. Chem.*, **2009**, *1*, 523.
13. **Azagarsamy, M, A.**; Gomez-Escudero, A.; Yesilyurt, V.; Vachet, R, W.; Thayumanavan, S. "Amphiphilic nanoassemblies for the detection of peptides and proteins using fluorescence and mass spectrometry" *Analyst,* **2009**, *134*, 635.
14. **Azagarsamy, M. A.**; Krishnamoorthy, K.; Sivanandan, K.; Thayumanavan, S. "Site-specific installation and study of electroactive units in every layer of dendrons" *J. Org. Chem.*, **2009**, *74*, 9475.

15. Gomez-Escudero, A.; **Azagarsamy, M. A.**; Theddu, N.; Vachet, R. W.; Thayumanavan, S. "Selective peptide binding using facially amphiphilic dendrimers" *J. Am. Chem. Soc.*, **2008**, *130*, 11156.
16. Selvakumar, N.; Kumar, G, S.; **Malar Azhagan, A**.; Rajulu, G. G.; Sharma, S.; Kumar, M, S.; Mamidi, N. V. S. R.; Das, J.; Iqbal, J.; Trehan, S. "Synthesis, SAR and antibacterial studies of novel chalcone oxazolidinone hybrids" *Eur. J. Med. Chem.* **2007***, 42,* 538.
17. Selvakumar, N.; Reddy, B, Y.; **Malar Azhagan, A**.; Khera, M. K.; Babu, J. M.; Iqbal, J. "A direct entry into 1-methoxyindole skeleton and into the corresponding indoles by a novel rearrangement: general synthesis of 2-substituted-1-methoxyindoles" *Tetrahedron Lett*. **2003**, *44*, 7065.
18. Selvakumar, N.; Khera, M. K.; Reddy, B, Y.; Kumar, K, M.; Srinivas, D.; **Malar Azhagan, A**.; Iqbal, J. "An efficient total synthesis of 9-methoxy-carbazole-3-carbaldehyde based on a novel methodology for the preparation of methoxy indoles" *Tetrahedron Lett*. **2003**, *44*, 7071.
19. Selvakumar, N.; **Malar Azhagan, A**.; Srinivas, D.; Krishna, G, G. "A direct synthesis of 2-arylpropenoic acid esters having nitro groups in the aromatic ring: a short synthesis of (±)-coerulescine and (±)-horsfiline*" Tetrahedron Lett*. **2002**, *43*, 9175.
20. Selvakumar, N.; Srinivas, D.; **Malar Azhagan, A**. "Observation of O→N type smiles rearrangement in certain alkyl aryl nitro compounds**"** *Synthesis*, **2002**, 2421.

BOOK CHAPTER

1. **Azagarsamy, M. A.**; Krishnamoorthy, K.; Thayumanavan, S. "Molecular recognition using amphiphilic macromolecules" *Molecular Recognition and Polymers: Control of Polymer Structure and Self-Assembly,* ed. Rotello, V. M.; Thayumanavan, S., Wiley: New York, **2008**.
2. Gandavarappu, N, R.; Kubruz, K. A.; **Azagarsamy, M. A.**; Anseth, K. S. "*Biomaterials:* Spatial patterning of biomolecule presentation within biomaterials" *Mimicking the Extracellular Matrix: The Intersection of Matrix Biology and Biomaterials*, ed. Murphy, W. L.; Hudalla, G. A. *Completed writing*, **2013**.

CONFERENCE PRESENTATIONS

1. **Azagarsamy, M. A.**; Mckinnon, D.; Anseth, K. S. "Design and synthesis of UV and visible light degradable hydrogels." Polymer Networks Group, Jackson Hole, August 12-16, 2012.
2. **Azagarsamy, M. A.**; Anseth, K. S. "Design and synthesis of photocontrolled nanoparticles." 238th ACS National Meeting, San Diego, CA, April 16-20, 2012.
3. **Azagarsamy, M. A.**; Sokkalingam, P.; Thayumanavan, S. "Synthesis of bioactive amphiphilic dendrimers." 238th ACS National Meeting, Washington, DC, August 16-20, 2009.
4. **Azagarsamy, M. A.**; Thayumanavan, S. "Biologically triggered supramolecular disassembly of dendrimer based amphiphilic nanoassemblies" 8th National Graduate Research Polymer Conference, UNC at Chapel Hill, June 6 - 9, 2010.
5. **Azagarsamy, M. A.**; Sokkalingam, P.; Thayumanavan, S. "Synthesis of bioactive amphiphilic dendrimers." 238th ACS National Meeting, Washington, DC, August 16-20, 2009.
6. **Azagarsamy, M. A.**; Thayumanavan, S. "Enzyme triggered disassembly of dendrimer based amphiphilic nanoassemblies" Research Fest, UMass Amherst, August 29th, 2009.
7. **Azagarsamy, M. A.**; Gomez-Escudero, A.; Savariar, E. N.; Vachet, R. W.; Thayumanavan, S. "Separation and identification of peptides utilizing supramolecular polymer assemblies" 236th ACS National Meeting, Philadelphia, August 17-21, 2008.