

Dr. Craig Jon Hawker

Date of Birth: January 11, 1964
Toowoomba, Australia

Research Interests: *Synthetic Polymer Chemistry, Nanotechnology--Materials science that integrates fundamental studies with the development of nanostructured materials for advanced properties and functions in microelectronics and biotechnology*

Professional History:

2010-present Ruth and Alan J. Heeger Chair in Interdisciplinary Science
University of California, Santa Barbara

2004-present Director of Materials Research Laboratory
Professor of Materials, Chemistry and Biochemistry
University of California, Santa Barbara

1993-2004 Research Staff Member,
IBM Almaden Research Center

2001-present Honorary Professor of Chemistry
University of Queensland

1990-1993 Queen Elizabeth II Research Fellow,
University of Queensland

Education:

1988-1990 Post-doctoral Research Associate, Cornell University
Supervisor: *Professor J.M.J. Fréchet*

1985-1988 Ph.D. Degree, University of Cambridge, U.K.
Supervisor: *Professor Sir A.R. Battersby*
Thesis title: *Biosynthesis of Vitamin B₁₂ - Model Studies on the Spiro Intermediate*

1981-1984 B.Sc. (1st Class Honors), University of Queensland

Awards:

2011 Arthur C. Cope Scholar, American Chemical Society
2010 Elected Fellow, American Chemical Society
2010 Elected, Fellow of the Royal Society
2010 Polymer Division Fellow, American Chemical Society
2010 Macro Group UK International Medal for Outstanding Achievement
2009 PMSE Fellow, American Chemical Society
2008 DSM – International Performance Materials Award, IUPAC
2007 Mark Scholar Award, American Chemical Society
2006 IBM Research Division Award
2005 Dutch Polymer Award, Dutch Chemical Institute
2005 ACS Award in Applied Polymer Science, American Chemical Society
2004 Industrial Scientist Award, American Chemical Society
2003 Co-operative Research Award, American Chemical Society
2002 IBM Corporate Technical Recognition Award
2001 Carl S. Marvel Award in Creative Polymer Science, American Chemical Society
2000 Young Scientists Award, IUPAC
1999 Patent Invention Award, IBM Corporation
1997 Arthur K. Doolittle Award, American Chemical Society
1997 Patent Invention Award, IBM Corporation
1995 Innovation Award, IBM Corporation
1993 Rennie Memorial Medal, Royal Australian Chemical Institute
1992 Research Award, Australian Research Council
1991 Treloar Prize, Polymer Division, Royal Australian Chemical Institute
1990 Queen Elizabeth II Research Fellowship, Australian Research Council
1985-1988 Ribbands Scholar, Wolfson College, University of Cambridge
1985-1988 1851 Research Scholarship, Royal Commission for the Exhibition of 1851
1985-1988 Overseas Research Scheme Award, S.E.R.C.
1988 Science Fellow, Harkness Fellowships
1985 Commonwealth Scholarship and Fellowship Award, British Council
1985 Masson Memorial Medal, Royal Australian Chemical Institute
1985 University Medal, University of Queensland

- 1984 Poole Award, University of Queensland
1984 CSR Chemicals Prize, University of Queensland
1983 Douglas McNaughton Scholarship, University of Queensland
1983 T.G.H. Jones Scholarship, University of Queensland
1982 Edward Taylor Memorial Prize, University of Queensland
1981 Chemistry Prize, University of Queensland

Named Lecturerships:

- 2010 Bayer Lecturer, University of Southern Mississippi
2010 RSC Chemical Sciences Lecturer
2010 Moses Gomberg Lecturer, University of Michigan
2007 Humphrey Memorial Lecturer, University of Vermont
2006 Proctor & Gamble Lecturer, Wright State University
2006 Dillion Steele Lecturer, University of Queensland
2006 IMS Distinguished Lecturer, University of Connecticut
2005 Murtiashaw Lecturer, University of South Carolina
2005 Discovery Lecturer, DuPont Central Research
2005 Frontiers Lecturer, Department of Chemistry, Texas A&M University.
2004 Victor M. Chambers Memorial Lecturer, Department of Chemistry, University of Rochester
2004 Cherry Emerson Jr. Lecturer, Department of Chemistry, Georgia Institute of Technology
2003 Bayer-Stein Lecturer, Department of Chemistry, University of Massachusetts, Amherst
2002 Whitby Memorial Lecturer, Department of Polymer Science, University of Akron
2002 Inaugural Cornforth Lecturer, Department of Chemistry, University of Sydney
2002 Melville Lecturer, Department of Chemistry, University of Cambridge
1999 Rauscher Lecturer, Rensselaer Polytechnic Institute, NY
1998 Carothers Lecturer, DuPont Central Research

Professional Activities:

- Editor, Journal of Polymer Science
- International Editorial Board, Angewandte Chemie International Edition
- Editorial Board, Chemical Communications
- Editorial Board, ACS Combinatorial Science
- Editorial Board, Polymer Bulletin
- Editorial Board, International Journal of Polymeric Materials
- Editorial Board, Chemistry of Materials
- Editorial Board, Macromolecules
- Editorial Board, Progress in Polymer Science
- Editorial Board, Polymer
- Editorial Board, Nanotechnology, Science and Applications
- Chair, 2003 Polymers (East) Gordon Research Conference
- Advisory Board, The Knowledge Foundation
- Adjunct Professor of Chemistry, University of Queensland
- Royal Australian Chemical Institute, Member
- Member, Polymer Division, Royal Australian Chemical Institute
- U.S.A. Representative, International Relations Committee, RACI
- American Chemical Society, Member
- Member, Division of Polymer Chemistry, ACS
- Member, Division of Polymeric Materials:
Science and Engineering, ACS

Advisory Boards and Consulting:

- Scientific Advisory Board, Relypsa (2007-present)
- Scientific Advisory Board, Amgen (2007)
- Scientific Advisory Board, Ilypsa Therapeutics (2007)
- Scientific Advisory Board, Intezyne Inc. (2005-present)
- Technical Advisory Board, Intermolecular Inc. (2005-present)
- Technical Advisory Board, Mitsubishi Chemical Company (2004-2006)
- Scientific Advisory Board, Warwick Effect Polymers (2003-present)
- Scientific Advisory Board, SYMYX Technologies (1997-2003)
- Scientific Advisory Board, MicroBar Technologies (1998-2001)

- Scientific Advisory Board, Australian Institute for Bioengineering and Nanotechnology (2004-present)
- Scientific Advisory Board, MIT Institute for Soldier Nanotechnologies (2004-present)
- Scientific Advisory Board, NSEC, University of Wisconsin, Madison (2003-present)
- Scientific Advisory Board, Molecular Foundry, Lawrence Berkeley National Laboratory (2005-present)
- Advisory Board, Materials Research Laboratory, University of Illinois (2006-present)

- Consultant to Hitachi Data Systems (2002-2005)
- Consultant to Eastman Kodak (2005-2006)
- Consultant to Mitsubishi Chemical Company (2004-present)
- Consultant to Ciba Specialty Chemicals (2005-2006)
- Consultant to BASF (2006-2008)
- Consultant to Allergan (2006-present)
- Consultant to Promerus (2006)

Publications:

339. Shokeen, M.; Pressly, E.D.; Hagooley, A.; Zheleznyak, A.; Ramos, N.; Fiamengo, A.L.; Welch, M.J.; Hawker, C.J.; Anderson, C.J. "Evaluation of Multivalent, Functional Polymeric Nanoparticles for Imaging Applications", *ACS NANO*, **2011**, *5*, 738-747.
338. Chute, J.A.; Hawker, C.J.; Rasmussen, K.O.; Welch, P.M. "The Janus Character of Heterogeneous Dendritic Nanoparticles", *Macromolecules*, **2011**, *44*, 1046-1052.
337. Binauld, S.; Damiron, D.; Connal, L.A.; Hawker, C.J.; Drockenmuller, E. "Precise Synthesis of Molecularly Defined Oligomers and Polymers by Orthogonal Iterative Divergent/Convergent Approaches", *Macromol. Rapid Comm.* **2011**, *32*, 147-168.
336. Pressly, E.D.; Amir, R.J.; Hawker, C.J. "Rapid Synthesis of Block and Cyclic Copolymers via Click Chemistry in the Presence of Copper Nanoparticles", *J. Polym. Sci., Polym. Chem.*; **2011**, *49*, 814-819.
335. Barner-Kowollik, C.; Du Prez, F.E.; Espeel, P.; Hawker, C.J.; Junkers, T.; Schlaad, H.; Van Camp, W. "'Clicking' Polymers or Just Efficient Linking: What Is the Difference?", *Angew. Chem., Int. Ed.*, **2011**, *50*, 60-62.
334. Spruell, J.M.; Hawker, C.J. "Triggered structural and property changes in polymeric nanomaterials", *Chemical Science*, **2011**, *2*, 18-26.
333. Kim, E.; Choi, S.; Guo, R.; Ryu, D.Y.; Hawker, C.J.; Russell, T.R. "Transition behavior of PS-b-PMMA films on the balanced interfacial interactions", *Polymer*, **2010**, *51*, 6313-6318.
332. van Berkel K.Y.; Hawker, C.J. "Tailored composite polymer-metal nanoparticles by miniemulsion polymerization and thiol-ene functionalization", *J. Polym. Sci., Polym. Chem.*; **2010**, *48*, 1594-1606.
331. Treat, N.D., Campos, L.M., Dimitriou, M.D.; Ma, B.; Chabinyk, M.L.; Hawker, C.J. "Nanostructured Hybrid Solar Cells: Dependence of the Open Circuit Voltage on the Interfacial Composition", *Adv. Mater.*, **2010**, *22*, 4982-4986.
330. Leibfarth, F.A.; Schneider, Y.; Lynd, N.A.; Schultz, A.; Moon, B.; Kramer, E.J.; Bazan, G.C.; Hawker, C.J. "Ketene Functionalized Polyethylene: Control of Cross-Link Density and Material Properties", *J. Am. Chem. Soc.*, **2010**, *132*, 14706-14709.

329. Antoni, P.; Robb, M.J.; Campos, L.; Montanez, M.; Hult, A.; Malmstrom, E.; Malkoch, M.; Hawker, C.J. "Pushing the Limits for Thiol-Ene and CuAAC Reactions: Synthesis of a 6th Generation Dendrimer in a Single Day", *Macromolecules*, **2010**, *43*, 6625-6631.
328. Montanez, M.I.; Campos, L.M.; Antoni, P.; Hed, Y.; Walter, M.V.; Krull, B.T.; Khan, A.; Hult, A.; Hawker, C.J.; Malkoch, M. "Accelerated Growth of Dendrimers via Thiol-Ene and Esterification Reactions", *Macromolecules*, **2010**, *43*, 6004-6013.
327. Nulwala, H.; Burke, D.J.; Khan, A.; Serrano, A.; Hawker, C.J. "N-Vinyltriazoles: A New Functional Monomer Family through Click Chemistry", *Macromolecules*, **2010**, *43*, 5474-5477.
326. Feldman, K.E.; Kade, M.J.; Meijer, E.W.; Hawker, C.J.; Kramer, E.J. "Phase Behavior of Complementary Multiply Hydrogen Bonded End-Functional Polymer Blends", *Macromolecules*, **2010**, *43*, 5121-5127.
325. Poelma, J.E.; Hawker, C.J. "Block Copolymers: With a little help from above", *Nature Nanotech.*, **2010**, *5*, 243-244.
324. Yoo, M.; Kim, S.; Lim, J.; Kramer, E.J.; Hawker, C.J.; Kim, B.J.; Bang, J. "Facile Synthesis of Thermally Stable Core-Shell Gold Nanoparticles via Photo-Cross-Linkable Polymeric Ligands", *Macromolecules*, **2010**, *43*, 3570-3575.
323. Tang, C.B.; Hur, S.M.; Stahl, B.C.; Sivanandan, K.; Dimitriou, M.; Pressly, E.; Fredrickson, G.H.; Kramer, E.J.; Hawker, C.J. "Thin Film Morphology of Block Copolymer Blends with Tunable Supramolecular Interactions for Lithographic Applications", *Macromolecules*, **2010**, *43*, 2880-2889.
322. Kang, T.; Amir, R.J.; Khan, A.; Ohshimizu, K.; Hunt, J.N.; Sivanandan, K.; Montanez, M.I.; Malkoch, M.; Ueda, M.; Hawker, C.J. "Facile access to internally functionalized dendrimers through efficient and orthogonal click reactions", *Chem. Commun.*, **2010**, *46*, 1556-1558.
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319. Tang, C.B.; Sivanandan, K.; Stahl, B.C.; Fredrickson, G.H.; Kramer, E.J.; Hawker, C.J. "Multiple Nanoscale Templates by Orthogonal Degradation of a Supramolecular Block Copolymer Lithographic System", *ACS NANO*, **2010**, *4*, 285-291.
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317. Sivanandan, K.; Chatterjee, T.; Treat, N.; Kramer, E.J.; Hawker, C.J. "High Surface Area Poly(3-hexylthiophenes) Thin Films from Cleavable Graft Copolymers", *Macromolecules*, **2010**, *43*, 233-241.
316. Bang, J.; Jeong, U.; Ryu, D.Y.; Russell, T.P.; Hawker, C.J. "Block Copolymer Nanolithography: Translation of Molecular Level Control to Nanoscale Patterns", *Adv. Mater.*, **2009**, *21*, 4769-4792.

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314. Iha, R.K.; Wooley, K.L.; Nystrom, A.M.; Burke, D.J.; Kade, M.J.; Hawker, C.J. "Applications of Orthogonal "Click" Chemistries in the Synthesis of Functional Soft Materials", *Chem. Rev.*, **2009**, *109*, 5620-5686.
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309. Licea-Claverie, A.; Alvarez-Sanchez, J.; Picos-Corrales, L.A.; Obeso-Vera, C.; Flores, M.C.; Cornejo-Bravo, J.M.; Hawker, C.J.; Frank, C.W. "The Use of the RAFT-Technique for the Preparation of Temperature/pH Sensitive Polymers in Different Architectures", *Macromolecular Symposium*, **2009**, *283-84*, 56-66.
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304. Kim, B.J.; Fredrickson, G.H.; Bang, J.; Hawker, C.J.; Kramer, E.J. "Tailoring Core-Shell Polymer-Coated Nanoparticles as Block Copolymer Surfactants", *Macromolecules*, **2009**, *42*, 6193-6201.
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302. Chang, J.Y.; Shin, C.H.; Park, Y.J.; Kang, S.J.; Jeong, H.J.; Kim, K.J.; Hawker, C.J.; Russell, T.P.; Ryu, D.Y.; Park, C. "Polymeric gate dielectric interlayer of cross-linkable poly(styrene-r-methylmethacrylate) copolymer for ferroelectric PVDF-TrFE field effect transistor memory", *Org. Elect.*, **2009**, *10*, 849-856.

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300. Ryu, D.Y.; Ham, S.; Kim, E.; Jeong, U.; Hawker, C.J.; Russell, T.P. "Cylindrical Microdomain Orientation of PS-b-PMMA on the Balanced Interfacial Interactions: Composition Effect of Block Copolymers", *Macromolecules*, **2009**, *42*, 4902-4906.
299. Sohn, K. E.; Dimitriou, M. D.; Genzer, J.; Fischer, D. A.; Hawker, C. J.; Kramer, E. J. "Determination of the Electron Escape Depth for NEXAFS Spectroscopy", *Langmuir*, **2009**, *25*, 6341-6348.
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297. Breed, D.R.; Thibault, R.; Xie, F.; Wang, Q.; Hawker, C.J.; Pine, D.J. "Functionalization of Polymer Microspheres Using Click Chemistry", *Langmuir*, **2009**, *25*, 4370-4376.
296. Lee, S.; Lee, B.; Kim, B.J.; Park, J.; Yoo, M.; Bae, W.K.; Char, K.; Hawker, C.J.; Bang, J.; Cho, J.H. "Free-Standing Nanocomposite Multilayers with Various Length Scales, Adjustable Internal Structures, and Functionalities", *J. Am. Chem. Soc.*, **2009**, *131*, 2579-2587.
295. van Berkel, K.Y.; Piekarski, A.M.; Kierstead, P.H.; Pressly, E.D.; Ray, P.C.; Hawker, C.J. "A Simple Route to Multimodal Composite Nanoparticles", *Macromolecules*, **2009**, *42*, 1425-1427.
294. Vestberg, R.; Piekarski, A.M.; Pressly, E.D.; Van Berkel, K.Y.; Malkoch, M.; Gerbac, J.; Ueno, N.; Hawker, C.J., "A General Strategy for Highly Efficient Nanoparticle Dispersing Agents Based on Hybrid Dendritic Linear Block Copolymers", *J. Polym. Sci., Polym. Chem.*; **2009**, *47*, 1237-1258.
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291. Khan, A.; Daugaard, A.E.; Bayles, A.; Koga, S.; Miki, Y.; Sato, K.; Enda, J.; Hvilsted, S.; Stucky, G.D.; Hawker, C.J. "Dendronized macromonomers for three-dimensional data storage", *Chem. Commun.*, **2009**, 425-427.
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288. Lee, Y.; Fukukawa, K.I.; Bang, J.; Hawker, C.J.; Kim, J.K. "A High Purity Approach to Poly(3-hexylthiophene) Diblock Copolymers", *J. Polym. Sci., Polym. Chem.*; **2008**, *46*, 8200-8205.
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285. Khan, A.; Stucky, G.D.; Hawker, C.J. "High-Performance, Nondiffusive Crosslinked Polymers for Holographic Data Storage" *Adv. Mater.*, **2008**, *20*, 3937-3942.
284. Connal, L.A.; Vestberg, R.; Hawker, C.J.; Qiao, G.G. "Fabrication of Reversibly Crosslinkable, 3-Dimensionally Conformal Polymeric Microstructures", *Adv. Funct. Mater.*, **2008**, *18*, 3315-3322.
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280. Khan, A.; Malkoch, M.; Montague, M.F.; Hawker, C.J. "Synthesis and characterization of hyperbranched polymers with increased chemical versatility for imprint lithographic resists", *J. Polym. Sci., Polym. Chem.*; **2008**, *46*, 6238-6254.
279. Takizawa, K.; Nulwala, H.; Hu, J.; Hawker, C.J. "Molecularly defined (L)-lactic acid oligomers and polymers: Synthesis and characterization", *J. Polym. Sci., Polym. Chem.*; **2008**, *46*, 5977-5990.
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277. Ham, S.; Shin, C.; Kim, E.; Ryu, D.Y.; Jeong, U.; Russell, T.P.; Hawker, C.J. "Microdomain orientation of PS-b-PMMA by controlled interfacial interactions", *Macromolecules*, **2008**, *41*, 6431-6437.
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269. Killops, K.L.; Campos, L.M.; Hawker, C.J. "Robust, efficient, and orthogonal synthesis of dendrimers via thiol-ene "Click" chemistry", *J. Am. Chem. Soc.*, **2008**, *130*, 5062-5064.
268. Fukukawa, K.I.; Rossin, R.; Hagooly, A.; Pressly, E.D.; Hunt, J.N.; Messmore, B.W.; Wooley, K.L.; Welch, M.J.; Hawker, C.J. "Synthesis and characterization of core-shell star copolymers for in vivo PET imaging applications", *Biomacromolecules*, **2008**, *9*, 1329-1339.
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Research Associates Mentored:

(i) Thesis Advisor and Postgraduate-Scholar Sponsor (over past five years):

(A) Graduate Students Advised/Co-advised (total 20).

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