L. ANDREW LYON, Ph.D.
Professor of Chemistry & Engineering | Fowler School of Engineering & Schmid College of Science and Technology, Chapman University One University Drive, Orange, CA 92866
lyon@chapman.edu | LinkedIn | www.lyongroup.net

RESEARCH FOCUS & EXPERTISE

- Soft Matter Physics & Regenerative Medicine: Synthesis and characterization of hydrogel microparticles for hemostasis, wound healing, and tissue engineering.
- Translational Engineering: From bench-top discovery to FDA 510(k) clearance and commercial scaling.
- Biomaterials Strategy: Leveraging biophysical cues to direct cellular behavior in synthetic environments.

PROFESSIONAL APPOINTMENTS

Chapman University | Orange, CA

- Member, Center for Targeted Drug Delivery | 2025-Present
- Professor, Fowler School of Engineering | 2023-Present
- Professor, Schmid College of Science and Technology | 2014-Present
- Founding Dean, Fowler School of Engineering | 2019-2023
- Dean, Schmid College of Science and Technology | 2014-2018

Georgia Institute of Technology | Atlanta, GA

- Professor, School of Chemistry & Biochemistry | 1999-2014
- Chair (2013-2014) & Associate Chair (2010-2013)
- Member, Petit Institute for Bioengineering and Bioscience | 2004-2014

California Nanosystems Institute @ UCLA | Los Angeles, CA

- Visiting Professor | January-June 2013

TRANSLATIONAL & ENTREPRENEURIAL LEADERSHIP

Sanguina, Inc. | Co-Founder & Chief Scientific Officer | 2014-Present

- Directed R&D strategy leading to FDA 510(k) clearance for two medical devices in the AnemoCheck family.
- Successfully launched AnemoCheck Mobile (now Ruby Health), an AI-enabled app with >200,000 users and >3M tests performed.

SelSym Biotech, Inc. | Co-Founder & President | 2019-Present (CSO, 2019-2024)

- Leading the development of SymClot, a patented artificial platelet technology for traumatic bleeding.
- Currently executing late-stage planning for an IND submission to the FDA.

SplitRock Therapeutics, Inc. | Co-Founder & Chief Scientific Officer | 2017-2022

- Developed a novel class of protein delivery vehicles triggered by platelet mechanoactivation for targeted modulation of clotting activity.

FUNDING HISTORY

Competitive Research Grants (Federal/Private)

- **Bioresponsive Hydrogel Nanofilaments as Antibacterials** | PI | Arnold and Mabel Beckman Foundation (Young Investigator Award) | 2000 | $200,000
- **CAREER: Bioresponsive Hydrogel Nanoparticles** | PI | National Science Foundation (Division of Chemistry; 9984012) | 3/00-2/04 | $358,000
- **Stimuli-Sensitive Core/Shell Microgels** | PI | National Science Foundation (Division of Materials Research; 0203707) | 6/02-5/06 | $282,000
- **Microgel Coatings to Modulate Inflammatory Responses** | Co-I (with Andres Garcia; PI: R.M. Nerem) | GT/Emory NSF ERC on Tissue Engineering (EEC-9731643) | 9/05-8/06 | $94,000
- **Designed Thin Films from Core/Shell Microgels** | PI | ACS-PRF (AC) | 1/06-8/08 | $80,000
- **Cancer Targeting with Multiresponsive Core/Shell Microgels** | PI (Co-I: Jean Chmielewski, Purdue) | DHHS/NIH (1R21EB006499) | 8/06-7/08 | $399,531
- **Microgel Interfaces for Active Control of Inflammation** | PI (Co-I: Andres Garcia) | Johnson & Johnson/Georgia Tech | 8/06-8/07 | $75,000
- **Graduate training for rationally designed, integrative biomaterials: GTBIOMAT** | Co-I (PI: Ravi Bellamkonda) | DHHS/NIH (T32EB006343) | 7/08-6/13 | $815,766
- **Microsphere mediated differentiation of embryonic stem cells** | Co-I (PI: Todd McDevitt) | DHHS/NIH (R01GM088291) | 8/09-7/14 | $1,684,697
- **Self-healing biomaterials** | PI | NSF (MRSEC seed project) | 9/10-8/14 | $150,000
- **Hydrogel Nano/Microparticles for Surface Modification of Nonwovens for Anti-Fouling and Controlled Release Application** | PI | Kimberly Clark Corporation | 10/10-9/12 | $280,000
- **Anti-Thrombogenic Microgel-Based Coatings** | Co-I (PI: Kevin Maher) | Children's Healthcare of Atlanta (seed grant) | 10/11-9/12 | $50,000
- **Use of nanogels to target delivery of sirna to cancer cells in mice** | Co-PI (PI: John McDonald) | DHHS/NIH (R21CA155479) | 8/11-7/13 | $488,157
- **Fibrinogen-triggered matrix assembly from designed peptide-polymer conjugates** | Co-PI (Co-PI: Thomas Barker) | DHHS/NIH (R21EB013743) | 12/11-11/13 | $376,000
- **Platelets as contractile nanomachines for targeted drug delivery in hemostasis and thrombosis** | Center for Pediatric Nanomedicine (pilot project) | Co-PI (Co-PI Wilbur Lam) | 6/12-6/14 | $60,000

- **Platelets as contractile biophysical "nanomachines" for targeted drug delivery** | GT/IBB (seed grant) | Co-PI (Co-PI Wilbur Lam) | 7/12- 6/13 | $50,000
- **Platelets as contractile nanomachines for targeted drug delivery in hemostasis and thrombosis** | Co-I (PI: Wilbur Lam; Co-I: Thomas Barker) | 9/13-3/15 | DoD (PR121341/11139352) | $174,199
- **Fibrinogen-triggered matrix assembly from designed peptide-polymer conjugates** | Co-PI (Co-PI: Thomas Barker) | DHHS/NIH (R21EB013743) | 12/11-11/13 | $384,148
- **Platelet-like Particles for Augmentation of Hemostasis** | Co-I (Co-PIs: Thomas Barker and Wilbur Lam) | DHHS/NIH (1R01HL130918) | 7/16-6/20 | $2,683,757

Research Infrastructure & Capacity Building

- **>$120M Raised:** Worked with the university team to raise funding for scholarships, equipment, capital, and programs to enhance student recruitment and modernize STEM research infrastructure.
- **Keck Center ($130M project):** Worked with stakeholders on the design for the ~140,000 ft² Keck Center for Science and Engineering, voted a top STEM facility.
- **Swenson Hall of Engineering ($20M project):** Led planning for a ~30,000 ft² facility designed to house the innovative research, teaching, and manufacturing labs for the Fowler School of Engineering.

INSTITUTIONAL LEADERSHIP

Founding Dean, Fowler School of Engineering (2019-2023)

- Founded the school and recruited 20 new tenure-track faculty and 10 staff to build a research-active cohort.
- Recruited 10 scholars from other units across campus and industry as Affiliate Faculty to recognize and further develop engineering's deep connections with other disciplines and industries.
- Established a diverse Dean's Advisory Council to provide oversight and guidance for the Dean's cabinet as the school progressed towards its strategic goals.
- Launched and helped design and develop 3 new degree programs (BS Computer Engineering, BS Electrical Engineering, MS EECS).
- Built an extensive industry partnership program to provide funding for research and academic programs, student internships, and career navigation.

Dean, Schmid College of Science and Technology (2014-2018)

- Launched the *Chapman Grand Challenges Initiative*, a large-scale undergraduate experiential learning and postdoctoral teacher-scholar training program.
- Recruited >25 new faculty while leading initiatives to diversify the teacher-scholar cohort.

- Developed new organizational structure across the college to support its growth and evolution as driver of STEM research and education at an R2-level university
- Established a diverse Dean's Advisory Council to provide oversight and guidance for the Dean's cabinet as the school progressed towards its strategic goals.

EDUCATION AND ACADEMIC TRAINING

1997-1998 Postdoctoral Associate | Penn State University (Mentor: Prof. M.J. Natan)
1996 Ph.D. Physical Chemistry | Northwestern University (Mentor: Prof. J.T. Hupp)
1993 M.S. Physical Chemistry | Northwestern University
1992 B.A. Chemistry | Rutgers University

AWARDS & HONORS

2021 Distinguished Educator Award, Irvine Chamber of Commerce
2020 Senior Member, National Academy of Inventors
2006 Hesburgh Award Teaching Fellow (GT award)
2005 National Fresenius Award of Phi Lambda Upsilon
2003 Blanchard Fellowship (GT award)
2003 Camille Dreyfus Teacher-Scholar
2002 Sloan Research Fellow
2000 Beckman Young Investigator
2000 NSF CAREER Award
1999 Research Corporation Research Innovation Award
1996 Edward G. Weston Fellowship of the Electrochemical Society
1995 Link Foundation Energy Fellowship
1996 Donald E. Smith Award for Excellence in Teaching
1995 Donald E. Smith Award for Excellence in Teaching
1992 American Institute of Chemists Student Award

INTELLECTUAL PROPERTY

1. Lam, Wilbur, A.; Hansen, C.; Sakurai, Y.; Lyon, A. Particles for targeted delivery and uses in managing bleeding or blood clotting. US Patent 11,730,701 B2, **2023**
2. Lam, Wilbur, A.; Hansen, C.; Sakurai, Y.; Lyon, A. Particles for targeted delivery and uses in managing bleeding or blood clotting. US Patent 11,464,748 B2, **2022**
3. Barker; Thomas H.; Brown; Ashley Carson; Lyon; Louis Andrew; Stabenfeldt; Sarah E.; Welsch, Nicole; Nicosia, John Functionalized microgels with fibrin binding elements. US Patent 11,419,948 B2, **2022**.
4. Barker; Thomas H.; Brown; Ashley Carson; Lyon; Louis Andrew; Stabenfeldt; Sarah E.; Welsch; Nicole Functionalized microgels with fibrin binding elements. US Patent 10,195,304 B2, **2019**.

5. Lyon, L. A.; McDonald, J.; Dickerson, E. B.; Blackburn, W. H. Nanogels for cellular delivery of therapeutics. US Patent 8,361,510 B2, **2013**.
6. Dickson, R. M.; Lyon, L. A. Apparatus and method of optical transfer and control in plasmon supporting metal nanostructures, US Patent 6,862,396 B2, **2005**.
7. Dickson, R. M.; Lyon, L. A. Apparatus and method of optical transfer and control in plasmon supporting metal nanostructures, US Patent 6,539,156 B1, **2003**.
8. Natan, M. J.; Goodrich, G.; He, L.; Lyon, L. A.; Musick, M. D.; Keating, C. D. Instruments, methods and reagents for surface plasmon resonance, US Patent 6,579,726 B1, **2003**.
9. Natan, M. J.; Pena, D. J.; Goodrich, G.; He, L.; Lyon, L. A.; Musick, M. D.; Holliway, W. D. Biosensing using surface plasmon resonance, US Patent 6,579,721 B1, **2003**.

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2. Narbay, E., Caine, A., Pandit, S., Montgomery, G., Harper, M., Cárdenas-Vásquez, E. D., Hamilton, H., Hicks, M., Mattar, D., Choy, K., Bisoffi, M. & Lyon, L. A. Dynamic, Reconfigurable, and Hierarchical Biosynthetic Composites via Collagen Self-Assembly within Highly Crowded Microgel Pastes. *Adv. Mater.* **Early View**, e15114 **2025**. https://doi.org/10.1002/adma.202515114.
3. Mannino, R.G.; Sullivan, J.; Frediani, J.K.; George, P.; Whitson, J.; Tumlin, J.; Lyon, L.A.; Tyburski, E.A.; Lam, W.A. Real-world implementation of a noninvasive, AI-augmented, anemia-screening smartphone app and personalization for hemoglobin level self-monitoring, *Proc. Natl. Acad. Sci. U.S.A.* **2025**, *122 (20)*, e2424677122. DOI: 10.1073/pnas.2424677122.
4. Nellenbach, K.; Mihalko, E.; Nandi, S.; Koch, D. W.; Shetty, J.; Moretti, L.; Sollinger, J.; Moiseiwitsch, N.; Sheridan, A.; Pandit, S.; Hoffman, M.; Schnabel, L. V.; Lyon, L. A.; Barker, T. H.; Brown, A. C. Ultrasoft platelet-like particles stop bleeding in rodent and porcine models of trauma. *Sci. Transl. Med.* **2024**, *16* (742), eadi4490. DOI: doi:10.1126/scitranslmed.adi4490.
5. Islam, M. R.; Nguyen, R.; Lyon, L. A. Emergence of Non-Hexagonal Crystal Packing of Deswollen and Deformed Ultra-Soft Microgels under Osmotic Pressure Control. *Macromol. Rapid Commun.* **2021**, *42* (20). DOI: 10.1002/marc.202100372.
6. Zhu, M. N.; Lu, D. D.; Lian, Q.; Wu, S. L.; Wang, W. K.; Lyon, L. A.; Wang, W. G.; Bartolo, P.; Dickinson, M.; Saunders, B. R. Highly swelling pH-responsive microgels for dual mode near infra-red fluorescence reporting and imaging. *Nanoscale Adv.* **2020**, *2* (9), 4261-4271. DOI: 10.1039/d0na00581a.
7. Islam, M. R.; Nguy, C.; Pandit, S.; Lyon, L. A. Design and Synthesis of Core-Shell Microgels with One-Step Clickable Crosslinked Cores and Ultralow

Crosslinked Shells. *Macromol. Chem. Phys.* **2020**, *221* (19). DOI: 10.1002/macp.202000156.
8. Islam, M. R.; Lyon, L. A. Deswelling studies of pH and temperature-sensitive ultra-low cross-linked microgels with cross-linked cores. *Colloid. Polym. Sci.* **2020**, *298* (4-5), 395-405. DOI: 10.1007/s00396-020-04620-9.
9. Zhu, M. N.; Lu, D. D.; Wu, S. L.; Lian, Q.; Wang, W. K.; Lyon, L. A.; Wang, W. G.; Bártolo, P.; Saunders, B. R. Using green emitting pH-responsive nanogels to report environmental changes within hydrogels: a nanoprobe for versatile sensing. *Nanoscale* **2019**, *11* (24), 11484-11495. DOI: 10.1039/c9nr00989b.
10. Karg, M.; Pich, A.; Hellweg, T.; Hoare, T.; Lyon, L. A.; Crassous, J. J.; Suzuki, D.; Gumerov, R. A.; Schneider, S.; Potemkin, II; et al. Nanogels and Microgels: From Model Colloids to Applications, Recent Developments, and Future Trends. *Langmuir* **2019**, *35* (19), 6231-6255. DOI: 10.1021/acs.langmuir.8b04304.
11. Islam, M. R.; Tumbarello, M.; Lyon, L. A. Deswelling induced morphological changes in dual pH- and temperature-responsive ultra-low cross-linked poly(N-isopropyl acrylamide)-co-acrylic acid microgels. *Colloid. Polym. Sci.* **2019**, *297* (5), 667-676. DOI: 10.1007/s00396-019-04492-8.
12. Welsch, N.; Brown, A. C.; Barker, T. H.; Lyon, L. A. Enhancing clot properties through fibrin-specific self-cross-linked PEG side-chain microgels. *Colloids Surf., B* **2018**, *166*, 89-97. DOI: 10.1016/j.colsurfb.2018.03.003.
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14. Zhu, M. N.; Lu, D. D.; Wu, S. L.; Lian, Q.; Wang, W. K.; Milani, A. H.; Cui, Z. X.; Nguyen, N. T.; Chen, M.; Lyon, L. A.; et al. Responsive Nanogel Probe for Ratiometric Fluorescent Sensing of pH and Strain in Hydrogels. *ACS Macro Lett.* **2017**, *6* (11), 1245-1250. DOI: 10.1021/acsmacrolett.7b00709.
15. Welsch, N.; Lyon, L. A. Oligo(ethylene glycol)-sidechain microgels prepared in absence of cross-linking agent: Polymerization, characterization and variation of particle deformability. *PLoS One* **2017**, *12* (7). DOI: 10.1371/journal.pone.0181369.
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24. Scotti, A.; Liu, W.; Hyatt, J. S.; Herman, E. S.; Choi, H. S.; Kim, J. W.; Lyon, L. A.; Gasser, U.; Fernandez-Nieves, A. The CONTIN algorithm and its application to determine the size distribution of microgel suspensions. *J. Chem. Phys.* **2015**, *142* (23). DOI: 10.1063/1.4921686.
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27. Saxena, S.; Lyon, L. A. Influence of binary microgel phase behavior on the assembly of multi-functional raspberry-structured microgel heteroaggregates. *J. Colloid Interface Sci.* **2015**, *455*, 93-100. DOI: 10.1016/j.jcis.2015.05.031.
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BOOKS, EDITED VOLUMES, AND BOOK CHAPTERS

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I have also served on numerous NIH, NSF, and Foundation proposal review and advisory boards.

MEETINGS AND SYMPOSIA

*I have given **>100** invited oral presentations at domestic and international universities, scientific conferences, and symposia, and have organized or co-organized **18** domestic and international scientific conferences and symposia.*

REVIEWER:

Selected Journals*: Nature*, *Science, J. Am. Chem. Soc., Chemistry and Biology, J. Phys. Chem. B., Langmuir, Macromolecules, Soft Matter, Biomacromolecules, Bioconjugate Chemistry, Chemistry of Materials, Applied Phys. Lett., PNAS, Anal. Chem., Nano Letters, Angewandte Chemie, ChemPhysChem, Advanced Materials, J. Chem. Phys., J. of Electroanal. Chem., J. Poly. Sci., Macromolecular Rapid Comm., J. Poly. Sci. A., Advanced Functional Materials, Colloid and Polymer Science, Journal of Colloid and Interface Science, Polymer, Biomaterials, Advances in Polymer Science, Scientific Reports.*

Selected Funding Agencies*: Link Foundation, NSF, NIH, DoE, DoD, Beckman Foundation, ACS-PRF, Research Corporation, German Government, Irish Government, Singapore Government.*

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

1990 – present	American Chemical Society
2009 – present	International Polymer Colloids Group
2002 – 2004	Optical Society of America
1997 – 2004	American Association for the Advancement of Science
2000 – 2002	American Physical Society
1995 – 2014	Society of Electroanalytical Chemists

PH.D. MENTORSHIP

Justin Debord (Ph.D., 2004)
Current Position: Sr. Production Chemist, BP, Inc.

Clint Jones (Ph.D., 2003)
Current Positions: Dean of the School of Natural Sciences and Associate Professor of Chemistry, Mercyhurst College

Mike Serpe (Ph.D., 2004)
Current Positions: Professor of Chemistry and Associate Dean of International Relations, University of Alberta

Satish Nayak (Ph.D., 2005)
Current Position: Executive Director of Business Development (Renewable Energy Group), Chevron, Inc.

Christine Nolan (Ph.D., 2005)
Current Position: Senior Compliance Specialist, Catalent, Inc.

Stella Debord (Ph.D., 2005)

Jonathan McGrath (Ph.D., 2007)
Current Position: Technical Advisor, U.S. Customs and Border Protection

Jongseong Kim (Ph.D., 2007)
Current Position: CEO, OncoLAB, Inc.

Neetu Singh (Ph.D., 2008)
Current Positions: Professor and Head, Center for Biomedical Engineering, Indian Institute of Technology-Delhi

Ashlee St.John Iyer (Ph.D., 2008)
Current Position: Instructor, Kehillah Jewish High School

William Blackburn (Ph.D., 2008)
Current Position: Product Development Manager, MiMedx, Inc.

Courtney (Sorrell) Richman (Ph.D., 2008)
Current Position: Sr. Materials and Process Engineer, Relativity Space, Inc.

Zhiyong Meng (Ph.D., 2009)
Current Position: Lead Polymer Scientist, Nuvvon, Inc.

Toni South (Ph.D., 2010)
Current Position: Lecturer, Department of Chemistry and Biochemistry, Kennesaw State University

Mike Smith (Ph.D., 2012)
Current Position: Director, Moderna, Inc.
Jeff Gaulding (Ph.D., 2013)
Current Position: Senior Manager Product Development, Biolab, Inc.
Grant Hendrickson (Ph.D., 2013)
Current Position: Six Sigma Black Belt Staff, IDEXX, Inc.
Emily Herman (Ph.D., 2014)
Current Position: Senior Research Support Specialist, UL Research Institutes' Chemical Insights
Mark Spears (Ph.D., 2014)
Current Position: Senior Scientist, Virscidian, Inc.
Kim Clarke (Ph.D., 2015)
Current Position: Senior Scientist, American Cancer Society
Shalini Saxena (Ph.D., 2015)
Purva Kodlekere (Ph.D., 2015)
Current Position: Technology Manager, Unilever, Inc.
Caroline Hansen (Ph.D., 2017)
Current Position: Senior Scientist II, IDEXX, Inc.

VISITING SCHOLARS:

Ricarda Schroeder	(visiting Ph.D. student, RWTH Aachen, Fall 2013)
Nurettin Sahiner	(visiting professor, Çanakkale Onsekiz Mart Üniversitesi, 2011-2012)
Claudia Verdes	(visiting undergraduate student, U. of Navarra, 2011, 2012)
Chan Woo Park	(visiting Ph.D. student, KAIST, 2010)
Xiaobo Hu	(visiting Ph.D. student, South China University of Technology, 2009-2010)
Daisuke Suzuki	(visiting Ph.D. student, Keio University, 2006)
Paul Thornton	(visiting Ph.D. student, U. of Manchester, 2007)

UNDERGRADUATE STUDENTS

I have supervised and mentored >100 undergraduate students in independent research in my labs.

POSTDOCTORAL SCHOLARS

Dr. Daniel Cárdenas-Vásquez	(8/23-present; GCI postdoc)
Dr. Molla Islam	(4/17-7/21)
	Current Position: Assistant Professor, Chapman University
Dr. Nicole Welsch	(2/13-6/15)
	Current Position: Project Manager, Covestro, Inc.
Dr. Ashley Brown	(8/11-9/15)
	Current Positions: Professor, Lampe Joint Department of Biomedical Engineering and Director, Comparative Medicine Institute, NCSU/UNC
Dr. Hiroaki Yoshida	(4/11-8/13)
	Current Position: Professor, Okayama University
Dr. Ling Zhang	(6/11-10/12)

Dr. Xing Jin	(3/05-8/05)
Dr. Daoji Gan	(8/00-1/03)

PH.D. COMMITTEES

I have served on the Ph.D. examination committees of >70 students within my home department/school.

EXTERNAL STUDENT COMMITTEES:

I have served as the external Ph.D. dissertation reader/committee member for >35 students outside of my home department or institution, including students performing research in Biology, Physics, and Biomedical, Mechanical, Chemical & Biomolecular, Materials, Civil & Environmental, and Electrical & Computer Engineering. Details available upon request.