



Eric Appel

Associate Professor of Materials Science and Engineering, Senior Fellow at the Woods Institute for the Environment and Associate Professor, by courtesy, of Pediatrics (Endocrinology) and of Bioengineering

Bio

BIO

Eric A. Appel is an Associate Professor of Materials Science & Engineering at Stanford University. He received his BS in Chemistry and MS in Polymer Science from Cal Poly, San Luis Obispo. Eric performed his MS thesis research with Robert D. Miller and James L. Hedrick at the IBM Almaden Research Center in San Jose, CA. He then obtained his PhD in Chemistry working in the lab of Dr. Oren A. Scherman in the Melville Laboratory for Polymer Synthesis at the University of Cambridge. His PhD research focused on the preparation of dynamic and stimuli-responsive supramolecular polymeric materials. For his PhD work, Eric was the recipient of the Jon Weaver PhD prize from the Royal Society of Chemistry and a Graduate Student Award from the Materials Research Society. Upon graduating from Cambridge in 2012, he was awarded a National Research Service Award from the NIH (NIBIB) and pursued a Wellcome Trust Postdoctoral Fellowship at MIT working with Robert S. Langer on the development of supramolecular biomaterials for drug delivery and tissue engineering. Eric's research at Stanford focuses on the development of biomimetic polymeric materials that can be used as tools to better understand fundamental biological processes and to engineer advanced healthcare solutions. His research has led to more than 150 publications, 40 pending or granted patents, and formed the basis for three start-up companies. In 2026, Eric was awarded the Kathryn C. Hach Award for Entrepreneurial Success from the American Chemical Society and has been elected a Fellow of the American Institute for Medical & Biological Engineering and Fellow of the Royal Society of Chemistry.

ACADEMIC APPOINTMENTS

- Associate Professor, Materials Science and Engineering
- Senior Fellow, Stanford Woods Institute for the Environment
- Associate Professor (By courtesy), Bioengineering
- Associate Professor (By courtesy), Pediatrics - Endocrinology
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Faculty Fellow, Sarafan ChEM-H
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Fellow, Royal Society of Chemistry (2026)

- Kathryn C. Hach Award for Entrepreneurial Success, American Chemical Society (2026)
- Fellow, American Institute for Medical & Biological Engineering (2024)
- Biomaterials Science Lectureship Award, Royal Society of Chemistry (2023)
- Young Investigator Award, Society for Biomaterials (2023)
- Hanwha-Total IUPAC Young Polymer Scientist Award, IUPAC (2022)
- Junior Faculty Development Award, American Diabetes Association (2018-2022)
- Hellman Faculty Fellowship, Hellman Fellows Fund (2016-2017)
- PhRMA Research Starter Grant, PhRMA Foundation (2016-2017)
- Margaret A. Cunningham Immune Mechanisms in Cancer Research Award, Proctor Foundation (2016)
- Wellcome Trust Fellowship, Wellcome Trust (2013-2017)
- National Research Service Award, National Institute of Biomedical Imaging and Bioengineering (2013-2016)
- Graduate Student Award, Materials Research Society (2012)
- Jon Weaver PhD Prize, Royal Society of Chemistry of the United Kingdom (2013)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Senator, Stanford Faculty Senate (2025 - present)

PROFESSIONAL EDUCATION

- Postdoc, MIT , Bioengineering
- Ph.D., University of Cambridge , Chemistry (2012)
- M.S., Cal Poly, SLO , Polymer Science (2008)
- B.S., Cal Poly, SLO , Chemistry (2008)

PATENTS

- E. Abo-Hamed, O.A. Scherman, E.A. Appel. "United States Patent 10,065,856 Method of storing a gas, in particular hydrogen", The inventors
- E.A. Appel, A.C. Yu. "United States Patent 10,590,257 Biomimetic, Moldable, Self-Assembled Cellulose Silica-based Trimeric Hydrogels and Their Use as Viscosity Modifying Carriers in Industrial Applications", Leland Stanford Junior University
- Y. Dong, W. Wang, E.A. Appel, B.C. Tang, M.J. Webber, O. Veisoh, K. Xue, R. Langer, D.G. Anderson. "United States Patent 10,683,379 Polymers, Hydrogels, and Uses Thereof", Massachusetts Institute of Technology
- E.A. Appel, M.W. Tibbitt, R. Langer. "United States Patent 11,045,429 Shear-thinning Self-healing Networks", Massachusetts Institute of Technology
- M.J. Webber, E.A. Appel, R. Langer, D.G. Anderson. "United States Patent 11,191,841 Supramolecular Modification of Proteins", Massachusetts Institute of Technology
- O.A. Scherman, E.A. Appel, X.J. Loh, F. Biedermann, M. Rowland. "United States Patent 11,491,227 Cucurbituril-Based Hydrogels", Cambridge Enterprises Limited
- E.A. Appel, C.L. Maikawa, J.L. Mann. "United States Patent 11,945,892 Polymer Excipients for Biopharmaceutical Formulations", Leland Stanford Junior University
- E.A. Appel, J.Y. Woo, L.M. Stapleton. "United States Patent 11,969,526 Adhesion Prevention with Shear-thinning Polymeric Hydrogels", Leland Stanford Junior University
- E.A. Appel, J.Y. Woo, L.M. Stapleton. "United States Patent 11,975,123 Adhesion Prevention with Shear-thinning Polymeric Hydrogels", Leland Stanford Junior University
- E.A. Appel, J.L. Mann, J.H. Klich, C.M. Kasse. "United States Patent 12,144,862 Antibody Biopharmaceutical Formulations Including Polymer Excipients", Leland Stanford Junior University
- E.A. Appel, A.A.A. Smith, H. Autzen, Y. Cheng. "United States Patent 12,378,337 Lipid Nanodiscs Solubilized Through Poly(Acrylic Acid-co- Styrene) Copolymers", Leland Stanford Junior University
- E.A. Appel, G. Agmon, M.M. Davis, S. Correa, E.C. Gale. "United States Patent 12,433,959 Injectable hydrogels for controlled release of immunomodulatory compounds", Leland Stanford Junior University

- J.L. Hedrick, E.A. Appel, R.D. Miller, F. Nederberg, R.M. Waymouth. "United States Patent 8,013,065 Methods for Making Multi-Branched Polymers", Leland Stanford Junior University
- O.A. Scherman, E.A. Appel, T.L. Hughes. "United States Patent 8,757,264 Viscous Wellbore Fluids", Schlumberger Technology Corp
- E.A. Appel, J.L. Hedrick, V.Y. Lee, R.D. Miller, J. Sly. "United States Patent 8,765,098 Star Polymers, Methods of Preparation Thereof, and Uses Thereof", IBM
- E.A. Appel, J.L. Hedrick, V.Y. Lee, R.D. Miller, J. Sly. "United States Star Polymers, Methods of Preparation Thereof, and Uses Thereof", IBM

LINKS

- Lab Site: supramolecularbiomaterials.com
- LinkedIn: <https://www.linkedin.com/in/eric-appel-29203111>

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The underlying theme of the Appel Lab at Stanford University integrates concepts and approaches from supramolecular chemistry, natural/synthetic materials, and biology. We aim to develop supramolecular biomaterials that exploit a diverse design toolbox and take advantage of the beautiful synergism between physical properties, aesthetics, and low energy consumption typical of natural systems. Our vision is to use these materials to solve fundamental biological questions and to engineer advanced healthcare solutions.

Teaching

COURSES

2024-25

- Biomaterials for Drug Delivery: BIOE 385, MATSCI 385 (Win)
- Organic and Biological Materials: MATSCI 190, MATSCI 210 (Spr)

2023-24

- Organic and Biological Materials: MATSCI 190, MATSCI 210 (Spr)
- The History and Science of Vaccine Technology: OSPOXFRD 30A (Aut)

2022-23

- Biomaterials for Drug Delivery: BIOE 385, MATSCI 385 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Neil Baugh, Betty Cai, Connor Call, Yi Yi Du, Becca Lau, Marigold Malinao, Ariel Stiber

Postdoctoral Faculty Sponsor

. Alakesh, Xiangyuan Guo, Suzanne Lightsey, Namita Nabar, Hannah O'Toole, Alex Prossnitz

Doctoral Dissertation Advisor (AC)

Ibukun Ajifolokun, Alexander Bechtold, Lyla Dong, Noah Eckman, Priya Ganesh, Kyra Gillard, Athena Kolli, Anahitha Kottamasu, Anna Makar-Limanov, Anahita Nejatfard, Saira Reyes, Rachel SONG, Tatum Wilhelm, Christian Williams

Doctoral Dissertation Co-Advisor (AC)

Joyce An, Kim Cheng, Alice Gao, Lucy Zhang

Doctoral (Program)

Lyla Dong, Lucy Wang, Christian Williams

Postdoctoral Research Mentor

Alex Prossnitz

Publications

PUBLICATIONS

- **Preventing peritendinous adhesions using lubricious supramolecular hydrogels.** *Nature communications*
Meany, E. L., Williams, C. M., Song, Y. E., Doulames, V. M., Alakesh, A., Bailey, S. J., Williams, S. C., Jons, C. K., Fox, P. M., Appel, E. A.
2026
- **Ultrahigh-concentration biologic therapeutics enabled by spray drying with a glassy surfactant excipient.** *Science translational medicine*
Jons, C. K., Prossnitz, A. N., Eckman, N., Dong, C., Utz, A., Appel, E. A.
2025; 17 (812): eadv6427
- **Generation of an inflammatory niche in a hydrogel depot through recruitment of key immune cells improves efficacy of mRNA vaccines.** *Science advances*
Meany, E. L., Klich, J. H., Jons, C. K., Mao, T., Chaudhary, N., Utz, A., Baillet, J., Song, Y. E., Saouaf, O. M., Ou, B. S., Williams, S. C., Eckman, N., Irvine, et al
2025; 11 (15): eadr2631
- **Sustained exposure to multivalent antigen-decorated nanoparticles generates broad anti-coronavirus responses.** *Matter*
Baillet, J., Klich, J. H., Ou, B. S., Meany, E. L., Yan, J., Bruun, T. U., Utz, A., Jons, C. K., Lecommandoux, S., Appel, E. A.
2025; 8 (4)
- **Biomaterials to enhance adoptive cell therapy** *NATURE REVIEWS BIOENGINEERING*
Eckman, N., Nejatfard, A., Cavet, R., Grosskopf, A. K., Appel, E. A.
2024; 2 (5): 408-424
- **Delivery of CAR-T cells in a transient injectable stimulatory hydrogel niche improves treatment of solid tumors.** *Science advances*
Grosskopf, A. K., Labanieh, L., Klysz, D. D., Roth, G. A., Xu, P., Adebowale, O., Gale, E. C., Jons, C. K., Klich, J. H., Yan, J., Maikawa, C. L., Correa, S., Ou, et al
2022; 8 (14): eabn8264
- **Hydrogel-Based Slow Release of a Receptor-Binding Domain Subunit Vaccine Elicits Neutralizing Antibody Responses Against SARS-CoV-2.** *Advanced materials (Deerfield Beach, Fla.)*
Gale, E. C., Powell, A. E., Roth, G. A., Meany, E. L., Yan, J., Ou, B. S., Grosskopf, A. K., Adamska, J., Picece, V. C., d'Aquino, A. I., Pulendran, B., Kim, P. S., Appel, et al
2021: e2104362
- **Designing spatial and temporal control of vaccine responses.** *Nature reviews. Materials*
Roth, G. A., Picece, V. C., Ou, B. S., Luo, W., Pulendran, B., Appel, E. A.
2021: 1-22
- **Physical networks from entropy-driven non-covalent interactions.** *Nature communications*
Yu, A. C., Lian, H., Kong, X., Lopez Hernandez, H., Qin, J., Appel, E. A.
2021; 12 (1): 746
- **A Quantitative Description for Designing the Extrudability of Shear-Thinning Physical Hydrogels.** *Macromolecular bioscience*
Lopez Hernandez, H., Souza, J. W., Appel, E. A.
2020: e2000295
- **An ultrafast insulin formulation enabled by high-throughput screening of engineered polymeric excipients.** *Science translational medicine*
Mann, J. L., Maikawa, C. L., Smith, A. A., Grosskopf, A. K., Baker, S. W., Roth, G. A., Meis, C. M., Gale, E. C., Liong, C. S., Correa, S., Chan, D., Stapleton, L. M., Yu, et al
2020; 12 (550)

- **A co-formulation of supramolecularly stabilized insulin and pramlintide enhances mealtime glucagon suppression in diabetic pigs.** *Nature biomedical engineering*
Maikawa, C. L., Smith, A. A., Zou, L. n., Roth, G. A., Gale, E. C., Stapleton, L. M., Baker, S. W., Mann, J. L., Yu, A. C., Correa, S. n., Grosskopf, A. K., Liong, C. S., Meis, et al
2020
- **Injectable Hydrogels for Sustained Codelivery of Subunit Vaccines Enhance Humoral Immunity.** *ACS central science*
Roth, G. A., Gale, E. C., Alcántara-Hernández, M. n., Luo, W. n., Axpe, E. n., Verma, R. n., Yin, Q. n., Yu, A. C., Lopez Hernandez, H. n., Maikawa, C. L., Smith, A. A., Davis, M. M., Pulendran, et al
2020; 6 (10): 1800–1812
- **Wildfire prevention through prophylactic treatment of high-risk landscapes using viscoelastic retardant fluids.** *Proceedings of the National Academy of Sciences of the United States of America*
Yu, A. C., Lopez Hernandez, H., Kim, A. H., Stapleton, L. M., Brand, R. J., Mellor, E. T., Bauer, C. P., McCurdy, G. D., Wolff, A. J., Chan, D., Criddle, C. S., Acosta, J. D., Appel, et al
2019
- **A Multiscale Model for Solute Diffusion in Hydrogels.** *Macromolecules*
Axpe, E., Chan, D., Offeddu, G. S., Chang, Y., Merida, D., Hernandez, H. L., Appel, E. A.
2019; 52 (18): 6889–97
- **Use of a supramolecular polymeric hydrogel as an effective post-operative pericardial adhesion barrier.** *Nature biomedical engineering*
Stapleton, L. M., Steele, A. N., Wang, H. n., Lopez Hernandez, H. n., Yu, A. C., Paulsen, M. J., Smith, A. A., Roth, G. A., Thakore, A. D., Lucian, H. J., Tothorow, K. P., Baker, S. W., Tada, et al
2019; 3 (8): 611–20
- **A 3D-Printed Scaffolded Hydrogel Microneedle Array Biosensor for Real-Time, Continuous Monitoring.** *Advanced materials (Deerfield Beach, Fla.)*
Kwak, J. W., Trinh, T., White, A. D., Chen, Y., Eckman, N., Jain, I., Xu, Y., Nguyen, N., Gopalan, D., Kim, Y. E., Unni Kamat, N., Tumbleston, J. R., Park, et al
2026: e73325
- **Small-Angle Neutron Scattering Reveals Structural Hierarchy of Polymer- Nanoparticle Hydrogels** *MACROMOLECULES*
Eckman, N., Saouaf, O. M., Jons, C. K., Pingali, S., Prossnitz, A. N., Kasse, C. M., Mai, D. J., Appel, E. A.
2026
- **Evolving Transport Properties of Dynamic Hydrogels Enable Self-Tuning of Short- and Long-Term Cargo Delivery.** *Journal of biomedical materials research. Part A*
Sen, S., Dong, C., Jons, C. K., Reineking, W., Alakesh, A., Eckman, N., Song, Y. E., Prossnitz, A. N., Appel, E. A.
2026; 114 (4): e70074
- **Gradient Multinozzle 3D Printing.** *bioRxiv : the preprint server for biology*
Rosalia, L., Sinha, S., Weiss, J. D., Hsia, S., Solberg, F. S., Sharir, A., Shibata, M., Du, J., Mosle, K., Rutsche, D., Rao, Z. C., Tam, T., Rankin, et al
2026
- **A Translational Surgical Porcine Model for Postoperative Intra-Abdominal Adhesion Formation.** *Journal of visualized experiments : JoVE*
Reveron-Thornton, R. F., Hsu, C. H., Bobst, W., Guo, J. L., Meany, E. L., M Williams, C., Berry, C., Fallah, M., Korah, M., P Agolia, J., Guo, C., Fell, G. L., Hyun, et al
2026
- **Long-Acting Hydrogel-Based Depot Formulations of Tirzepatide and Semaglutide for the Management of Type 2 Diabetes and Weight** *ADVANCED THERAPEUTICS*
d'Aquino, A. I., Dong, C., Nguyen, L. T., Yan, J., Jons, C. K., Saouaf, O. M., Song, Y., Eckman, N., Kapasi, S., Williams, C. M., Doulames, V., Sen, S., Manna, et al
2026; 9 (2)
- **A Developmental Roadmap Toward Abdominal Adhesions Prevention Technologies.** *Annals of surgery open : perspectives of surgical history, education, and clinical approaches*
Christensen, R. R., Wright, K. E., Ives, J. K., Minnick, C. E., Chen, Q., Girgis, M. D., Ko, C., Gibbons, M. M., Russell, T. A., Huy, T. C., Bercz, A., Smith, J. J., Bailey, et al
2025; 6 (4): e637

- **Enabling global access to potent subunit vaccines with a simple and scalable injectable hydrogel platform.** *Biomaterials science*
Ganesh, P., Prossnitz, A. N., Jons, C. K., Eckman, N., Alakesh, A., Song, Y. E., Sen, S., Appel, E. A.
2025
- **Myeloid-driven axonogenesis bridges neural and immune remodeling in glioblastoma**
Choi, J., Nitta, R., Kim, L., Klich, J., Wu, C., Schonfeld, E., Tran, A., Lee, S., Cho, K., Li, G., Appel, E., Lim, M.
OXFORD UNIV PRESS INC.2025: v449
- **Hydrogel formulations for sustained-release of broadly neutralizing antibodies.** *Journal of controlled release : official journal of the Controlled Release Society*
Jons, C. K., Kasse, C. M., Mayer, B. T., Hyrien, O., Sen, S., Meany, E. L., d'Aquino, A. I., Ganesh, P., Eckman, N., Dong, C., Yan, J., Nguyen, L. T., Doulames, et al
2025: 114349
- **Intranasal Sertraline for the Investigation of Nose-to-Brain Delivery to Mitigate Systemic Exposure.** *ACS pharmacology & translational science*
Williams, S. C., Lantz, T., Doulames, V., Alakesh, A., Ramos Mejia, D., Jons, C. K., Huang, Z. Y., Eckman, N., Appel, E. A.
2025; 8 (10): 3669-3676
- **Advancing Wildfire-Retardant Materials: Engineering Strategies for Direct and Indirect Suppression** *ADVANCED ENGINEERING MATERIALS*
Dong, C., Sen, S., Kolli, A., Wilson, S. G., Appel, E.
2025
- **Intranasal Sertraline for the Investigation of Nose-to-Brain Delivery to Mitigate Systemic Exposure** *ACS PHARMACOLOGY & TRANSLATIONAL SCIENCE*
Williams, S. C., Lantz, T., Doulames, V., Alakesh, A., Ramos Mejia, D., Jons, C. K., Huang, Z., Eckman, N., Appel, E. A.
2025
- **Hydrogel-to-Aerogel Transitions in Polymer-Particle Hydrogels Expand the Wildfire Defense Window.** *ACS applied materials & interfaces*
Dong, C., Sen, S., Ru, Z., Kolli, A., Appel, P. S., Fan, J. A., Appel, E. A.
2025
- **Crosslink Dynamics Control Injection Force and Flow Profiles of Non-Covalent Gels** *MACROMOLECULES*
Eckman, N., Appel, E. A.
2025
- **Spatially Tuned Localization of Interleukins and OX40 Agonists Enhances Synergistic Anti-Tumor Immunity.** *bioRxiv : the preprint server for biology*
Klich, J. H., Nejatfard, A., Meany, E. L., Ou, B. S., Baillet, J., Appel, E. A.
2025
- **Sustained exposure to multivalent antigen-decorated nanoparticles generates broad anti-coronavirus responses** *MATTER*
Baillet, J., Klich, J. H., Ou, B. S., Meany, E. L., Yan, J., Bruun, T. U. J., Utz, A., Jons, C. K., Lecommandoux, S., Appel, E. A.
2025; 8 (4)
- **Polyacrylamide-Based Antimicrobial Copolymers to Replace or Rescue Antibiotics.** *ACS central science*
Williams, S. C., Chosy, M. B., Jons, C. K., Dong, C., Prossnitz, A. N., Liu, X., Hernandez, H. L., Cegelski, L., Appel, E. A.
2025; 11 (3): 486-496
- **Osteopontin attenuates the foreign-body response to silicone implants.** *Nature biomedical engineering*
Griffin, M. F., Parker, J. B., Tevlin, R., Liang, N. E., Valencia, C., Morgan, A., Kuhnert, M., Downer, M., Meany, E. L., Guo, J. L., Henn, D., Navarro, R. S., Shefren, et al
2025
- **Sustained Vaccine Exposure Elicits More Rapid, Consistent, and Broad Humoral Immune Responses to Multivalent Influenza Vaccines.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
Saouaf, O. M., Ou, B. S., Song, Y. E., Carter, J. J., Yan, J., Jons, C. K., Barnes, C. O., Appel, E. A.
2025: e2404498
- **In Vitro Evaluation of Gelatin-Based Hydrogels as Potential Fillers for Corneal Wounds.** *Biomacromolecules*

- Romo-Valera, C., Appel, E. A., Etxebarria, J., Arluzea, J., Andollo, N.
2025
- **Polyacrylamide-Based Antimicrobial Copolymers to Replace or Rescue Antibiotics** *ACS CENTRAL SCIENCE*
Williams, S. C., Chosy, M. B., Jons, C. K., Dong, C., Prossnitz, A. N., Liu, X., Hernandez, H., Cegelski, L., Appel, E. A.
2025
 - **Postoperative adhesions are abrogated by a sustained-release anti-JUN therapeutic in preclinical models.** *Science translational medicine*
Foster, D. S., Guo, J. L., Meany, E., Berry, C. E., Fallah, M., Korah, M., Januszzyk, M., Bauer-Rowe, K. E., Lopez, D. M., Williams, C. M., Song, R., Griffin, M., Kim, et al
2025; 17 (789): eadp9957
 - **Preventing peritendinous adhesions using lubricious supramolecular hydrogels.** *bioRxiv : the preprint server for biology*
Meany, E. L., Williams, C. M., Song, Y. E., Doulames, V. M., Bailey, S. J., Williams, S. C., Jons, C. K., Fox, P. M., Appel, E. A.
2025
 - **Proceedings of the American College of Surgeons Surgical Adhesions Improvement Project Summit.** *Journal of the American College of Surgeons*
Andersen, D., Wiseman, D., Foster, D., Appel, E., Cardenas, J., Zindel, J., Maggard-Gibbons, M., Ten Broek, R. P., De Wilde, R. L., Carmichael, S., Bauer, S., Mutsaers, S., Russell, et al
2025
 - **Highly Extensible Physically Crosslinked Hydrogels for High-Speed 3D Bioprinting.** *Advanced healthcare materials*
Song, Y. E., Eckman, N., Sen, S., Jons, C. K., Saouaf, O. M., Appel, E. A.
2025: e2404988
 - **Crosslink strength governs yielding behavior in dynamically crosslinked hydrogels.** *Biomaterials science*
Eckman, N., Grosskopf, A. K., Jiang, G., Kamani, K., Huang, M. S., Schmittlein, B., Heilshorn, S. C., Rogers, S., Appel, E. A.
2025
 - **The Chemistry of Henna: A Module for High School Students** *JOURNAL OF CHEMICAL EDUCATION*
Williams, S. C., Appel, E. A.
2025
 - **A thiol-ene click-based strategy to customize injectable polymer-nanoparticle hydrogel properties for therapeutic delivery.** *Biomaterials science*
Bailey, S. J., Eckman, N., Brunel, E. S., Jons, C. K., Sen, S., Appel, E. A.
2025
 - **Clonally expanded, targetable, natural killer-like NKG7 T cells seed the aged spinal cord to disrupt myeloid-dependent wound healing.** *Neuron*
Kong, G., Song, Y., Yan, Y., Calderazzo, S. M., Saddala, M. S., De Labastida Rivera, F., Cherry, J. D., Eckman, N., Appel, E. A., Velenosi, A., Swarup, V., Kawaguchi, R., Ng, et al
2025
 - **Defining Structure-Function Relationships of Amphiphilic Excipients Enables Rational Design of Ultra-Stable Biopharmaceuticals.** *Advanced science (Weinheim, Baden-Wuerttemberg, Germany)*
Prossnitz, A. N., Nguyen, L. T., Eckman, N., Borkar, S., Tetef, S., Autzen, A. A., Fuller, G. G., Appel, E. A.
2025: e2409604
 - **A cGAMP-Containing Hydrogel for Prolonged SARS-CoV-2 Receptor-Binding Domain Subunit Vaccine Exposure Induces a Broad and Potent Humoral Response** *ADVANCED NANOBIO MED RESEARCH*
Bohnert, V., Gale, E. C., Lahey, L. J., Yan, J., Powell, A. E., Ou, B. S., Carozza, J. A., Li, L., Appel, E. A.
2024
 - **Electrochemically mutable soft metasurfaces.** *Nature materials*
Doshi, S., Ji, A., Mahdi, A. I., Keene, S. T., Selvin, S. P., Lalanne, P., Appel, E. A., Melosh, N. A., Brongersma, M. L.
2024
 - **Viral Vector Eluting Lenses for Single-Step Targeted Expression of Genetically-Encoded Activity Sensors for in Vivo Microendoscopic Calcium Imaging.** *Macromolecular bioscience*

- Jons, C. K., Cheng, D., Dong, C., Meany, E. L., Nassi, J. J., Appel, E. A.
2024: e2400359
- **Water-Enhancing Gels Exhibiting Heat-Activated Formation of Silica Aerogels for Protection of Critical Infrastructure During Catastrophic Wildfire.** *Advanced materials (Deerfield Beach, Fla.)*
Dong, C., d'Aquino, A. I., Sen, S., Hall, I. A., Yu, A. C., Crane, G. B., Acosta, J. D., Appel, E. A.
2024: e2407375
 - **Saponin nanoparticle adjuvants incorporating Toll-like receptor agonists drive distinct immune signatures and potent vaccine responses.** *Science advances*
Ou, B. S., Baillet, J., Filsinger Interrante, M. V., Adamska, J. Z., Zhou, X., Saouaf, O. M., Yan, J., Klich, J. H., Jons, C. K., Meany, E. L., Valdez, A. S., Carter, L., Pulendran, et al
2024; 10 (32): eadn7187
 - **Biomimetic Non-ergodic Aging by Dynamic-to-covalent Transitions in Physical Hydrogels.** *ACS applied materials & interfaces*
Sen, S., Dong, C., D'Aquino, A. I., Yu, A. C., Appel, E. A.
2024
 - **RGD-Modified Hydrogel Maintains Cell Growth in Mechanically-Induced Limbal Stem Cell Deficient Mouse Model**
Esmaeilkhanian, H., Swarup, A., Eckman, N., Dhowre, H., Ercal, O., Shadmani, A., Appel, E., Wu, A. Y.
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2024
 - **Label-Free Composition Analysis of Supramolecular Polymer-Nanoparticle Hydrogels by Reversed-Phase Liquid Chromatography Coupled with a Charged Aerosol Detector.** *Analytical chemistry*
Tang, S., Pederson, Z., Meany, E. L., Yen, C., Swansiger, A. K., Prell, J. S., Chen, B., Grosskopf, A. K., Eckman, N., Jiang, G., Baillet, J., Pellett, J. D., Appel, et al
2024
 - **Composite gels designed to stick to biological tissue** *NATURE*
Bailey, S. J., Appel, E. A.
2024; 625 (7995): 455-457
 - **Nanoparticle-Conjugated Toll-Like Receptor 9 Agonists Improve the Potency, Durability, and Breadth of COVID-19 Vaccines.** *ACS nano*
Ou, B. S., Baillet, J., Picece, V. C., Gale, E. C., Powell, A. E., Saouaf, O. M., Yan, J., Nejatfard, A., Lopez Hernandez, H., Appel, E. A.
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 - **Use of a biomimetic hydrogel depot technology for sustained delivery of GLP-1 receptor agonists reduces burden of diabetes management.** *Cell reports. Medicine*
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