Stanford

Sarah Heilshorn

Rickey/Nielsen Professor in the School of Engineering and Professor, by courtesy, of Bioengineering and of Chemical Engineering

Materials Science and Engineering

NIH Biosketch available Online Curriculum Vitae available Online

CONTACT INFORMATION

- **Administrator**

  Naomi Tudor - Administrative Associate

  Email ntudor@stanford.edu

Bio

BIO

Heilshorn's interests include biomaterials in regenerative medicine, engineered proteins with novel assembly properties, microfluidics and photolithography of proteins, and synthesis of materials to influence stem cell differentiation. Current projects include tissue engineering for spinal cord and blood vessel regeneration, designing injectable materials for use in stem cell therapies, and the design of microfluidic devices to study the directed migration of cells (i.e., chemotaxis).

ACADEMIC APPOINTMENTS

- Professor, Materials Science and Engineering
- Professor (By courtesy), Chemical Engineering
- Professor (By courtesy), Bioengineering
- Member, Bio-X
- Member, Cardiovascular Institute
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Affiliate, Precourt Institute for Energy
- Faculty Fellow, Sarafan ChEM-H
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- New Innovator Award, National Institutes of Health (2009)
- CAREER Award, National Science Foundation (2009)
- New Investigator Award, Petroleum Research Fund, American Chemical Society (2009)

PROFESSIONAL EDUCATION

- PhD, Caltech , Chemical Engineering (2004)

- MS, Caltech , Chemical Engineering (2000)
- BS, Georgia Tech , Chemical Engineering (1998)

LINKS

- Heilshorn Laboratory Site: https://web.stanford.edu/group/heilshorn/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Protein engineering

Tissue engineering

Regenerative medicine

Biomaterials

Teaching

COURSES

2025-26

- Biomaterials in Regenerative Medicine: BIOE 361, MATSCI 381 (Spr)

2024-25

- Bioengineering Materials to Heal the Body: MATSCI 81N (Spr)
- Introduction to Materials Science, Biomaterials Emphasis: ENGR 50M, MATSCI 50M (Aut)

2023-24

- Biomaterials in Regenerative Medicine: BIOE 361, MATSCI 381 (Spr)
- Introduction to Materials Science, Biomaterials Emphasis: ENGR 50M (Aut)

2022-23

- Bioengineering Materials to Heal the Body: MATSCI 81N (Spr)
- Introduction to Materials Science, Biomaterials Emphasis: ENGR 50M (Aut)
- Introductory Science of Materials: OSPBER 50M (Aut)
- Introductory Science of Materials: OSPFLOR 50M (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Lyla Dong, Andrea Flores Perez, Danielle Klinger, Zachary Montgomerie, Rachel SONG, Cindy Shi, Lucy Wang, Brendan Wirtz

Postdoctoral Faculty Sponsor

Fotios Christakopoulos, Carla Huerta Lopez, Dohui Kim, Jordan Moore, Narelli Paiva, Avery Rui Sun

Doctoral Dissertation Advisor (AC)

Wendy Alwala, Naomi Alyafei, Neil Baugh, Jordan Bunch, Betty Cai, Seungheon Lee, Esther Mozipo, Dom Pizzarella, Diya Singhal, Tianming Yang, Daiyao Zhang

Doctoral Dissertation Co-Advisor (AC)

Anthony Han, Centaine Joseph, Becca Lau, Sofia Madrigal Gamboa, Yee Lin Tan

Master's Program Advisor

Chrystalen Stambaugh

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Bioengineering (Phd Program)
- Stem Cell Biology and Regenerative Medicine (Phd Program)

Publications

PUBLICATIONS

- **Biofabrication and biomedical manufacturing research frontiers in the United States** *BIO-DESIGN AND MANUFACTURING*
  Chen, Y., Phillips, K. R., Alsberg, E., Angelini, T. E., Annabi, N., Atala, A., Bandyopadhyay, A., Bellan, L. M., Bertassoni, L. E., Blazeski, A., Boland, T., Bose, S., Burdick, et al
  2026
- **In situ rheological monitoring of diffusion-controlled hydrogel crosslinking for embedded 3D bioprinting.** *Biofabrication*
  Christakopoulos, F., Shih, A., Chung, S. J., Huerta-López, C., Brunel, L. G., De Paiva Narciso, N., Messin-Roizard, C., Tao, J., Myung, D., Heilshorn, S., Fuller, G. G.
  2026
- **Physiological Buffer Selection Alters the Mechanics of Hydrogels with Hydrazone Cross-Links.** *Biomacromolecules*
  Zhang, D., Baugh, N. J., de Paiva Narciso, N., Heilshorn, S. C.
  2026
- **A diffusion-based 3D printing strategy to fabricate self-supporting, perfusable networks.** *BMC methods*
  Ramos Mejia, D., Cai, B., Iranzo, S. C., Perez, A., Tan, Y. L., Lee, S., Heilshorn, S. C.
  2026; 3 (1): 8
- **Expanding the Versatility of Dynamic Covalent Hydrogels with Static Covalent Spot-Welding** *CHEMISTRY OF MATERIALS*
  Huang, M. S., Navarro, R. S., Brunel, L. G., Narciso, N., Rodriguez, G., Baugh, N. J., Roth, J. G., Hull, S. M., Hubka, K. M., Heilshorn, S. C.
  2025
- **Polarized Distribution of Lipid Droplets with Long Acyl Chains and Unsaturation are Hallmarks of Human Intestinal Enteroid Differentiation.** *Analytical chemistry*
  Johansson, P. K., Liu, Y., Klett, K. C., Heilshorn, S. C., Enejder, A.
  2025
- **Guiding Multidirectional Collagen Fiber Alignment Through Extrusion-based 3D Printing for Cell Alignment**
  Singhal, D., Christakopoulos, F., Brunel, L. G., Myung, D., Fuller, G. G., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2025
- **Glioblastoma Cells Respond to Matrix Stress Relaxation Rate in Engineered 3D Viscoelastic Microenvironments**
  Ghorbani, S., Huang, M. S., Zhang, D., Liu, Y., Long, C., Zwetsloot, R. M., Rao, R., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2025
- **Dual-orientation of collagen fibers to guide cell alignment in 3D-printed constructs.** *Acta biomaterialia*
  Singhal, D., Christakopoulos, F., Brunel, L. G., Borkar, S., Doulames, V. M., Mozipo, E. A., Myung, D., Fuller, G. G., Heilshorn, S. C.
  2025
- **Tuning viscoelasticity of dynamic covalent hydrogels for human tissue modeling.** *bioRxiv : the preprint server for biology*
  Narciso, N. d., Christakopoulos, F., Huang, M. S., Baugh, N. J., Huerta-Lopez, C., Matos, E. X., Pashin, K. P., Spakowitz, A., Heilshorn, S. C.
  2025
- **Submucosal Hydrogel for Spring-Mediated Intestinal Lengthening.** *Journal of biomedical materials research. Part A*
  Salimi-Jazi, F., de Paiva Narciso, N., Fell, G., Thomas, A., Navarro, R. S., Rafeeqi, T., Baugh, N. J., Suhar, R. A., Nguyen, J., Lopez, N., Heilshorn, S. C., Dunn, J. C.
  2025; 113 (10): e37986

- **Targeting Cell-Matrix Induced Chemoresistance With Regorafenib in a 3D Model of Osteosarcoma.** *Journal of biomedical materials research. Part A*
  Rao, R. R., Huang, M. S., Zhang, D., Huerta-López, C., Long, C., Rodriguez, G. A., Mozipo, E. A., Sagi, S., Heilshorn, S. C.
  2025; 113 (9): e37985
- **Organoid bioprinting to pattern the matrix microenvironment** *CURRENT OPINION IN BIOMEDICAL ENGINEERING*
  Zhang, D., Huerta-Lopez, C., Heilshorn, S. C.
  2025; 35
- **Organoid bioprinting to pattern the matrix microenvironment.** *Current opinion in biomedical engineering*
  Zhang, D., Huerta-López, C., Heilshorn, S. C.
  2025; 35
- **Scalable production of human cortical organoids using a biocompatible polymer.** *Nature biomedical engineering*
  Narazaki, G., Miura, Y., Pavlov, S. D., Thete, M. V., Roth, J. G., Avar, M., Shin, S., Kim, J. I., Hudacova, Z., Heilshorn, S. C., Pașca, S. P.
  2025
- **Reinforcement of Fibrillar Collagen Hydrogels with Bioorthogonal Covalent Crosslinks.** *Biomacromolecules*
  Brunel, L. G., Long, C. M., Christakopoulos, F., Cai, B., de Paiva Narciso, N., Johansson, P. K., Singhal, D., Baugh, N. J., Zhang, D., Enejder, A., Myung, D., Heilshorn, S. C.
  2025
- **Viscoelastic N#cadherin-like interactions maintain neural progenitor cell stemness within 3D matrices.** *Nature communications*
  Huang, M. S., LeSavage, B. L., Ghorbani, S., Gilchrist, A. E., Roth, J. G., Huerta-López, C., Mozipo, E. A., Navarro, R. S., Heilshorn, S. C.
  2025; 16 (1): 5213
- **In situ UNIversal Orthogonal Network (UNION) bioink deposition for direct delivery of corneal stromal stem cells to corneal wounds.** *Bioactive materials*
  Brunel, L. G., Cai, B., Hull, S. M., Han, U., Wungcharoen, T., Fernandes-Cunha, G. M., Seo, Y. A., Johansson, P. K., Heilshorn, S. C., Myung, D.
  2025; 48: 414-430
- **Multidirectional alignment of collagen fibers to guide cell orientation in 3D-printed tissue.** *bioRxiv : the preprint server for biology*
  Singhal, D., Christakopoulos, F., Brunel, L. G., Borkar, S., Doulames, V. M., Myung, D., Fuller, G. G., Heilshorn, S. C.
  2025
- **Engineered Hydrogels for Organoid Models of Human Nonalcoholic Fatty Liver Disease.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Liu, Y., Gilchrist, A. E., Johansson, P. K., Guan, Y., Deras, J. D., Liu, Y., Ceva, S., Huang, M. S., Navarro, R. S., Enejder, A., Peltz, G., Heilshorn, S. C.
  2025: e17332
- **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
- **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
- **Bio-orthogonal crosslinking and hyaluronan facilitate transparent healing after treatment of deep corneal injuries with in situ-forming hydrogels.** *NPJ Regenerative medicine*
  Chen, F., Han, U., Wungcharoen, T., Seo, Y. A., Le, P., Jiang, L., Kang, N. W., Song, E., Jang, K., Mundy, D., Fernandes-Cunha, G. M., Heilshorn, S., Myung, et al
  2025; 10 (1): 8
- **One-step bioprinting of endothelialized, self-supporting arterial and venous networks.** *Biofabrication*
  Cai, B., Kilian, D., Ghorbani, S., Roth, J., Seymour, A. J., Brunel, L. G., Ramos Mejia, D., Rios, R. J., Szabo, I. M., Iranzo, S. C., Perez, A., Rao, R. R., Shin, et al
  2025

- **Interpenetrating networks of fibrillar and amorphous collagen promote cell spreading and hydrogel stability.** *Acta biomaterialia*
  Brunel, L. G., Long, C. M., Christakopoulos, F., Cai, B., Johansson, P. K., Singhal, D., Enejder, A., Myung, D., Heilshorn, S. C.
  2025
- **Cancer Organoids as reliable disease models to drive clinical development of novel therapies.** *Journal of experimental & clinical cancer research : CR*
  Blandino, G., Satchi-Fainaro, R., Tinhofer, I., Tonon, G., Heilshorn, S. C., Kwon, Y. J., Pestana, A., Frascolla, C., Pompili, L., Puce, A., Iachettini, S., Tocci, A., Karkampouna, et al
  2024; 43 (1): 334
- **Organoid bioprinting: from cells to functional tissues** *NATURE REVIEWS BIOENGINEERING*
  Huang, M. S., Christakopoulos, F., Roth, J. G., Heilshorn, S. C.
  2024
- **Live Cell Imaging of Human Liver Fibrosis using Hepatic Micro-Organoids.** *JCI insight*
  Guan, Y., Fang, Z., Hu, A., Roberts, S., Wang, M., Ren, W., Johansson, P. K., Heilshorn, S. C., Enejder, A., Peltz, G.
  2024
- **Cell tumbling enhances stem cell differentiation in hydrogels via nuclear mechanotransduction.** *Nature materials*
  Ayushman, M., Mikos, G., Tong, X., Sinha, S., Lopez-Fuentes, E., Jones, S., Cai, P. C., Lee, H. P., Morrison, A. J., Spakowitz, A., Heilshorn, S. C., Sweet-Cordero, A., Yang, et al
  2024
- **Photoactivated growth factor release from bio-orthogonally crosslinked hydrogels for the regeneration of corneal defects.** *Bioactive materials*
  Kang, N., Seo, Y. A., Jackson, K. J., Jang, K., Song, E., Han, U., Chen, F., Heilshorn, S. C., Myung, D.
  2024; 40: 417-429
- **Porosity dominates over microgel stiffness for promoting chondrogenesis in zwitterionic granular hydrogels.** *Biomaterials science*
  Asadikorayem, M., Brunel, L. G., Weber, P., Heilshorn, S. C., Zenobi-Wong, M.
  2024
- **In Situ UNIversal Orthogonal Network (UNION) Bioink Deposition for Direct Delivery of Corneal Stromal Stem Cells to Corneal Wounds.** *bioRxiv : the preprint server for biology*
  Brunel, L. G., Cai, B., Hull, S. M., Han, U., Wungcharoen, T., Fernandes-Cunha, G. M., Seo, Y. A., Johansson, P. K., Heilshorn, S. C., Myung, D.
  2024
- **Interpenetrating networks of fibrillar and amorphous collagen promote cell spreading and hydrogel stability.** *bioRxiv : the preprint server for biology*
  Brunel, L. G., Long, C. M., Christakopoulos, F., Cai, B., Johansson, P. K., Singhal, D., Enejder, A., Myung, D., Heilshorn, S. C.
  2024
- **Engineered Protein Hydrogels as Biomimetic Cellular Scaffolds.** *Advanced materials (Deerfield Beach, Fla.)*
  Liu, Y., Gilchrist, A. E., Heilshorn, S. C.
  2024: e2407794
- **The lysogenic filamentous Pseudomonas bacteriophage phage Pf slows mucociliary transport.** *PNAS nexus*
  Burgener, E. B., Cai, P. C., Kratochvil, M. J., Rojas-Hernandez, L. S., Joo, N. S., Gupta, A., Secor, P. R., Heilshorn, S. C., Spakowitz, A. J., Wine, J. J., Bollyky, P. L., Milla, C. E.
  2024; 3 (9): pgae390
- **In Situ-Forming, Bioorthogonally Cross-linked, Nanocluster-Reinforced Hydrogel for the Regeneration of Corneal Defects.** *ACS nano*
  Kang, N. W., Jang, K., Song, E., Han, U., Seo, Y. A., Chen, F., Wungcharoen, T., Heilshorn, S. C., Myung, D.
  2024
- **FIBRIN-BASED DELIVERY OF HEDGEHOG PATHWAY MODULATORS DURING NERVE REPAIR IN MOUSE MODELS OF NERVE INJURY**
  He, L., Cai, B., Ghorbani, S., Kilian, D., Bekale, L., Heilshorn, S., Pepper, J.
  WILEY.2024: S144
- **Combinatorial Hipsc-Neuron And Engineered Biomaterial Transplantation Therapy ToTreat Chronic Spinal Cord Injury**
  Doulames, V. M., Hefferon, M. E., Baugh, N. J., Suhar, R. A., Long, C. M., Palmer, T. D., Heilshorn, S. C.

MARY ANN LIEBERT, INC.2024: S119

- **Engineered matrices reveal stiffness-mediated chemoresistance in patient-derived pancreatic cancer organoids.** *Nature materials*
  LeSavage, B. L., Zhang, D., Huerta-López, C., Gilchrist, A. E., Krajina, B. A., Karlsson, K., Smith, A. R., Karagyozova, K., Klett, K. C., Huang, M. S., Long, C., Kaber, G., Madl, et al
  2024

- **Air-liquid intestinal cell culture allows in situ rheological characterization of intestinal mucus.** *APL bioengineering*
  Cai, P. C., Braunreuther, M., Shih, A., Spakowitz, A. J., Fuller, G. G., Heilshorn, S. C.
  2024; 8 (2): 026112

- **Bio-Orthogonal Chemistry and Hyaluronan Enhance Corneal Restoration of Collagen Gel: 2-Month Response in Vivo**
  Chen, F., Han, U., Seo, Y., Heilshorn, S., Myung, D.
  ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2024

- **Pf bacteriophages hinder sputum antibiotic diffusion via electrostatic binding.** *Science advances*
  Chen, Q., Cai, P., Chang, T. H., Burgener, E., Kratochvil, M. J., Gupta, A., Hargill, A., Secor, P. R., Nielsen, J. E., Barron, A. E., Milla, C., Heilshorn, S. C., Spakowitz, et al
  2024; 10 (22): eadl5576

- **Laminin-associated integrins mediate Diffuse Intrinsic Pontine Glioma infiltration and therapy response within a neural assembloid model.** *Acta neuropathologica communications*
  Sinha, S., Huang, M. S., Mikos, G., Bedi, Y., Soto, L., Lensch, S., Ayushman, M., Bintu, L., Bhutani, N., Heilshorn, S. C., Yang, F.
  2024; 12 (1): 71

- **Pf bacteriophages hinder sputum antibiotic diffusion via electrostatic binding.** *bioRxiv : the preprint server for biology*
  Chen, Q., Cai, P., Chang, T. H., Burgener, E., Kratochvil, M. J., Gupta, A., Hargil, A., Secor, P. R., Nielsen, J. E., Barron, A. E., Milla, C., Heilshorn, S. C., Spakowitz, et al
  2024

- **Diffusion-Based 3D Bioprinting Strategies.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Cai, B., Kilian, D., Ramos Mejia, D., Rios, R. J., Ali, A., Heilshorn, S. C.
  2023: e2306470

- **Embedded 3d Bioprinting of Collagen Inks into Microgel Baths to control hydrogel Microstructure and Cell Spreading.** *Advanced healthcare materials*
  Brunel, L. G., Christakopoulos, F., Kilian, D., Cai, B., Hull, S. M., Myung, D., Heilshorn, S. C.
  2023: e2303325

- **Gelation of Uniform Interfacial Diffusant in Embedded 3D Printing.** *Advanced functional materials*
  Shin, S., Brunel, L. G., Cai, B., Kilian, D., Roth, J. G., Seymour, A. J., Heilshorn, S. C.
  2023; 33 (50)

- **Rapid assessment of changes in phage bioactivity using dynamic light scattering.** *PNAS nexus*
  Dharmaraj, T., Kratochvil, M. J., Pourtois, J. D., Chen, Q., Hajfathalian, M., Hargil, A., Lin, Y. H., Evans, Z., Oromí-Bosch, A., Berry, J. D., McBride, R., Haddock, N. L., Holman, et al
  2023; 2 (12): pgad406

- **A Library of Elastin-like Proteins with Tunable Matrix Ligands for In Vitro 3D Neural Cell Culture.** *Biomacromolecules*
  Suhar, R. A., Huang, M. S., Navarro, R. S., Aviles Rodriguez, G., Heilshorn, S. C.
  2023

- **Custom-engineered hydrogels for delivery of human iPSC-derived neurons into the injured cervical spinal cord.** *Biomaterials*
  Doulames, V. M., Marquardt, L. M., Hefferon, M. E., Baugh, N. J., Suhar, R. A., Wang, A. T., Dubbin, K. R., Weimann, J. M., Palmer, T. D., Plant, G. W., Heilshorn, S. C.
  2023; 305: 122400

- **Cell Microencapsulation Within Engineered Hyaluronan Elastin-Like Protein (HELP) Hydrogels.** *Current protocols*
  Hefferon, M. E., Huang, M. S., Liu, Y., Navarro, R. S., de Paiva Narciso, N., Zhang, D., Aviles-Rodriguez, G., Heilshorn, S. C.
  2023; 3 (11): e917

- **Transient Competitors to Modulate Dynamic Covalent Cross-Linking of Recombinant Hydrogels** *CHEMISTRY OF MATERIALS*
  Gilchrist, A. E., Liu, Y., Klett, K., Liu, Y., Ceva, S., Heilshorn, S. C.
  2023
- **Tunable hydrogel viscoelasticity modulates human neural maturation.** *Science advances*
  Roth, J. G., Huang, M. S., Navarro, R. S., Akram, J. T., LeSavage, B. L., Heilshorn, S. C.
  2023; 9 (42): eadh8313
- **3D printing microporous scaffolds from modular bioinks containing sacrificial, cell-encapsulating microgels.** *Biomaterials science*
  Seymour, A. J., Kilian, D., Navarro, R. S., Hull, S. M., Heilshorn, S. C.
  2023
- **3D printing microporous scaffolds from modular bioinks containing sacrificial, cell-encapsulating microgels** *BIOMATERIALS SCIENCE*
  Seymour, A. J., Kilian, D., Navarro, R. S., Hull, S. M., Heilshorn, S. C.
  2023
- **Gelation of Uniform Interfacial Diffusant in Embedded 3D Printing** *ADVANCED FUNCTIONAL MATERIALS*
  Shin, S., Brunel, L. G., Cai, B., Kilian, D., Roth, J. G., Seymour, A. J., Heilshorn, S. C.
  2023
- **Spatially controlled construction of assembloids using bioprinting.** *Nature communications*
  Roth, J. G., Brunel, L. G., Huang, M. S., Liu, Y., Cai, B., Sinha, S., Yang, F., Pașca, S. P., Shin, S., Heilshorn, S. C.
  2023; 14 (1): 4346
- **Rapid assessment of changes in phage bioactivity using dynamic light scattering.** *bioRxiv : the preprint server for biology*
  Dharmaraj, T., Kratochvil, M. J., Pourtois, J. D., Chen, Q., Hajfathalian, M., Hargil, A., Lin, Y. H., Evans, Z., Oromí-Bosch, A., Berry, J. D., McBride, R., Haddock, N. L., Holman, et al
  2023
- **Design Parameters for Injectable Biopolymeric Hydrogels with Dynamic Covalent Chemistry Crosslinks.** *Advanced healthcare materials*
  Narciso, N. d., Navarro, R. S., Gilchrist, A., Trigo, M. L., Rodriguez, G. A., Heilshorn, S. C.
  2023: e2301265
- **3D Bioprinting Of Corneal-Cell Laden Inks As Bioengineered Corneal Substitutes**
  Brunel, L. G., Hull, S. M., Fernandes-Cunha, G., Johansson, P. K., Myung, D., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2023
- **Collagen Gels Crosslinked by Photoactivation of Riboflavin for the Repair and Regeneration of Corneal Defects.** *ACS applied bio materials*
  Fernandes-Cunha, G. M., Brunel, L. G., Arboleda, A., Manche, A., Seo, Y. A., Logan, C., Chen, F., Heilshorn, S. C., Myung, D.
  2023
- **Cell-matrix Interactions Mediate Chemosensitivity In A Tissue Engineered Model Of Osteosarcoma**
  Rao, R. R., Villa-Martin, B. C., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2023
- **Magnetized 3D Bioprinting To Construct Multi-Organoid Assembloids**
  Cai, B., Roth, J. G., Brunel, L. G., Huang, M. S., Liu, Y., Pasca, S., Shin, S., Heilshorn, S.
  MARY ANN LIEBERT, INC.2023
- **3D Bioprinting Of Corneal-Cell Laden Inks As Bioengineered Corneal Substitutes**
  Brunel, L. G., Hull, S. M., Fernandes-Cunha, G., Johansson, P. K., Myung, D., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2023
- **Human enteroids as a tool to study conventional and ultra-high dose rate radiation.** *Integrative biology : quantitative biosciences from nano to macro*
  Klett, K. C., Martin-Villa, B. C., Villarreal, V. S., Melemenidis, S., Viswanathan, V., Manjappa, R., Ashraf, M. R., Soto, L., Lau, B., Dutt, S., Rankin, E. B., Loo, B. W., Heilshorn, et al
  2023; 15
- **Gelation of Uniform Interfacial Diffusant in Embedded 3D Printing.** *bioRxiv : the preprint server for biology*

Shin, S., Brunel, L. G., Cai, B., Kilian, D., Roth, J. G., Seymour, A. J., Heilshorn, S. C.
2023

- **3D bioprinting of dynamic hydrogel bioinks enabled by small molecule modulators.** *Science advances*
  Hull, S. M., Lou, J., Lindsay, C. D., Navarro, R. S., Cai, B., Brunel, L. G., Westerfield, A. D., Xia, Y., Heilshorn, S. C.
  2023; 9 (13): eade7880

- **Elastin-like protein hydrogels with controllable stress relaxation rate and stiffness modulate endothelial cell function.** *Journal of biomedical materials research. Part A*
  Shayan, M., Huang, M. S., Navarro, R., Chiang, G., Hu, C., Oropeza, B. P., Johansson, P. K., Suhar, R. A., Foster, A. A., LeSavage, B. L., Zamani, M., Enejder, A., Roth, et al
  2023

- **Mobility mediates maturation: Synthetic substrates to enhance neural differentiation.** *Cell stem cell*
  Roth, J. G., Huang, M. S., Heilshorn, S. C.
  2023; 30 (2): 115-117

- **Tuning pro-survival effects of human induced pluripotent stem cell-derived exosomes using elastin-like polypeptides.** *Biomaterials*
  Lee, C., Hunt, D., Roth, J. G., Chiu, C., Suhar, R. A., LeSavage, B. L., Seymour, A. J., Lindsay, C., Krajina, B. A., Chen, Y., Chang, K., Hsieh, I., Chu, et al
  2022; 291: 121864

- **Rheological Characterization and Theoretical Modeling Establish Molecular Design Rules for Tailored Dynamically Associating Polymers.** *ACS central science*
  Cai, P. C., Su, B., Zou, L., Webber, M. J., Heilshorn, S. C., Spakowitz, A. J.
  2022; 8 (9): 1318-1327

- **Rheological Characterization and Theoretical Modeling Establish Molecular Design Rules for Tailored Dynamically Associating Polymers** *ACS CENTRAL SCIENCE*
  Cai, P. C., Su, B., Zou, L., Webber, M. J., Heilshorn, S. C., Spakowitz, A. J.
  2022

- **Engineering A Matrix To Improve Reproducibility Of Intestinal Organoids**
  Martin-Villa, B. C., Klett, K. C., Heilshorn, S. C.
  MARY ANN LIEBERT, INC.2022: 39-40

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