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### POSITION AND EMPLOYMENT:

- **Virginia Tech**  
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**2021-**
- **Terasaki Institute for Biomedical Innovation**  
**Terasaki Fellow**  
Los Angeles, CA  
**2020-2021**

### EDUCATION AND TRAINING:

- **University of California, Los Angeles**  
**Postdoctoral Scholar, Advisor: Ali Khademhosseini**  
Department of Bioengineering, California NanoSystems Institute  
Los Angeles, CA  
**2018-2020**
- **University of North Carolina at Chapel Hill | North Carolina State University**  
**Ph.D. Pharmacoengineering, Advisor: Zhen Gu**  
Joint Department of Biomedical Engineering  
Raleigh, NC  
**2013-2017**
- **Nanjing Tech University**  
**M.S. Biochemical Engineering, Advisors: Hanjie Ying | Jingjing Xie**  
Department of Biotechnology and Pharmaceutical Engineering  
Nanjing, China  
**2010-2013**
- **Nanjing Tech University**  
**B.S. Bioengineering, Advisors: Hanjie Ying | Bingfang He**  
Department of Biotechnology and Pharmaceutical Engineering  
Nanjing, China  
**2006-2010**

### HONORS AND AWARDS:

- Outstanding Reviewer for Biomaterials Science, Royal Society of Chemistry, 2018
- Chinese Government Award for Outstanding Ph.D. Students Abroad, Washington, DC, 2017
- National Scholarship for Distinguished Graduate Student, China, 2013
- Student Graduated with Honor, Nanjing Tech University, 2010

### PROFESSIONAL SERVICES:

**Guest editor**, Regenerative Biomaterials “*Drug Delivery for Regeneration*”

**Editorial board member**, Med-X

**Session Chair**, Micro- and Nanotechnologies for Medicine Symposium July 16-20, 2018; July 8-12, 2019; Los Angeles, CA, USA

**Independent reviewer** for more than 40 journals (over 220 times) including ACS Applied Materials & Interfaces, ACS Applied Bio Materials, Acta Biomaterialia, Analytical Chemistry, ACS Nano, Advanced Materials, Advanced Healthcare Materials, Advanced Functional Materials, Advanced Science, Applied Sciences, Bioactive Materials, Biomaterials, Biomaterials Science, Biomedicines, Biomedicine & Pharmacotherapy, Biomolecules, Biosensors and Bioelectronics, BMC Cancer, Cancers, Chemical Engineering Journal, ChemComm, ChemNanoMat, Colloids and Surfaces B: Interfaces, Computational and Structural Biotechnology Journal, Drug Delivery, Drug Delivery and Translational Research, Drug Discovery Today, EBioMedicine, Emergent Materials, Exploration, Frontiers in Pharmacology, International Journal of Molecular Sciences, Journal of Biological Chemistry, Journal of Clinical Medicine, Journal of Controlled Release, Journal

of Extracellular Vesicles, Journal of Molecular Liquids, Journal of Nanobiotechnology, Journal of Pharmaceutical Analysis, Molecules, Molecular Immunology, Macromolecular Bioscience, Materials Advances, Materials Science and Engineering: C, Microfluidics and Nanofluidics, Nanomaterials, Nano Research, Pharmaceutics, Pharmacy, Regenerative Engineering and Translational Medicine, Small, Science Advances, Scientific Reports, Theranostics.

## PATENT APPLICATIONS:

- [9] Gu Z, **Sun W**, Nucleic Acid Nanocages, Compositions, and Uses Thereof, PCT/US2016/046353, 2017 (Licensed to Locus Biosciences)
- [8] Xie J, **Sun W**, Ying H, Guo T, Ji W, Zhu C, Chen X, Chen Y, Wu J. Gene of codon optimized N-acetyl glucosamine isomerase and expression thereof. Chinese patent grant No. CN103276001B, 2014.
- [7] Xie J, Ji W, Ying H, **Sun W**, Guo T, Chen Y, Chen X, Wu J. Use of N-acetylneuraminic acid aldolase in catalytic synthesis of N-acetylneuraminic acid. PCT/CN2013/087987, 2015.
- [6] Ying H, Zhu M, Xie J, **Sun W**, Wang Y, Guo T, Zhu C, Chen Y, Chen X, Wu J. Site-specific mutagenesis modified cytidine triphosphate (CTP) synthetase. Chinese patent publication No. 103540570A, 2014.
- [5] Khademhosseini A, **Sun W**. Biodegradable Microneedles for Transdermal Therapeutic Agent Delivery. PCT/US19/58333.
- [4] Khademhosseini A, **Sun W**, Zhou X. Gelatin Methacryloyl-Based Microneedle Patches For Delivery Of Water-Insoluble Drug. PCT/US21/23753.
- [3] Khademhosseini A, Jabbarzadeh E, **Sun W**, Kim H. Injectable Shear-Thinning Hydrogel Containing Immune-Checkpoints for Enhanced Tumor Therapy. UCLA CASE NO. 2020-765-1.
- [2] Khademhosseini A, **Sun W**. Biodegradable Microneedle Patch For Transdermal Gene Delivery. PCT/US21/043577.
- [1] Khademhosseini A, **Sun W**. Gelatin Methacryloyl Microneedle Patches For Minimally-Invasive Extraction Of Skin Interstitial Fluid. PCT/US21/12550.

## CONFERENCE PRESENTATIONS:

- [6] **Sun W**, Gu Z, “Cocoon-like Self-Degradable DNA-Nanoclew for Anticancer Drug Delivery” 12<sup>th</sup> International Nanomedicine and Drug Delivery Symposium, Oct 6-8, 2014, Chapel Hill, NC, USA (Poster)
- [5] **Sun W**, Mo R, Gu Z, “Anticancer Drug Delivery with DNA Nano-Ball” 2014 BMES Annual Meeting, Oct. 22-25, 2014, San Antonio, TX, USA. (Poster)
- [4] **Sun W**, Gu Z, “DNA Nano-Cocoon for Bioinspired Delivery of Anticancer Therapeutics” 2015 MRS Spring Meeting, Apr. 6-10, 2015, San Francisco, CA, USA. (Oral Presentation)
- [3] **Sun W**, Gu Z, “DNA Nano-Cocoon for Bioinspired Delivery of Anticancer Therapeutics” 2015 ACS Spring Meeting, Mar. 22-26, 2015, Denver, CO, USA. (Oral Presentation)
- [2] **Sun W**, Mo R, Gu Z, “ATP-Responsive DNA/Graphene Nanoaggregates for Enhanced Control Drug Delivery” 2015 Biomaterials Annual Meeting, Mar. 16-19, 2015, Charlotte, NC, USA. (Oral Presentation)
- [1] **Sun W**, Gu Z, “CRISPR-Cas9 Delivery by DNA Nanoclews for Efficient Genome Editing” 2016 ACS Spring Meeting, Mar. 13-17, San Diego, CA, USA (Poster)

## PUBLICATIONS:

\*Corresponding author; #Equal contribution

## • BOOK CHAPTERS

[3] Zhang S, Lee K, Goudie M, Kim H, **Sun W**, Lee J, Chen Y, Ling H, Li Z, Benyshek C, Hartel M, Dokmeci M, Khademhosseini A. Minimally invasive technologies for biosensing. Chapter in Cao H, Coleman T, Hsiai T, Khademhosseini A, "Interfacing Bioelectronics and Biomedical Sensing". Springer Nature, 2019.

[2] Ye Y, Wang J, **Sun W**, Bomba H, Gu Z. Topical and Transdermal Nanomedicines for Cancer Therapy. Chapter in: Rai P, Morris S, "Nanotheranostics for cancer applications". Springer, 2019.

[1] **Sun W**,\* Gu Z.\* RCA-generated self-degradable DNA nanoclews for pH-responsive delivery of anticancer drugs. Chapter in: Demidov V, "Rolling Circle Amplification". Springer, 2016.

## • PEER-REVIEWED JOURNAL PAPERS

[85] Li S, Zhu Y,\* Haghniaz R, Kawakita S, Guan S, Chen J, Li Z, Mandal K, Bahari J, Shah S, Guo J, Kang H, **Sun W**, Kim H-J, Jucaud V, Dokmeci M, Kollbaum P, Lee C, Khademhosseini A.\* A Microchambers Containing Contact Lens for the Non-Invasive Detection of Tear Exosomes. *Advanced Functional Materials* 2022 [In Press]

[84] Wu Q,# Qu M,# Kim H-J,# Zhou X, Jiang X, Chen Y, Zhu J, Ren L, Wolter T, Kang H, Xu C, Gu Z, **Sun W**,\* Khademhosseini A.\* A Shear-Thinning Biomaterial-Mediated Immune Checkpoint Blockade. *ACS Applied Materials & Interfaces* 2022 [In Press]

[83] Xue Y, Kim H-J, Lee J, Liu Y, Hoffman T, Chen Y, Zhou X, **Sun W**, Zhang S, Cho H-J, Lee J, Kang H, Ryu W, Lee C-M, Ahadian S, Dokmeci M, Lei B, Lee K,\* Khademhosseini A.\* Co-Electrospun Silk Fibroin and Gelatin Methacryloyl Sheet Seeded with Mesenchymal Stem Cells for Tendon Regeneration. *Small* 2022; 18, 2107714.

[82] Wang C, Jiang X, Kim H, Zhang S, Zhou X, Chen Y, Ling H, Xue Y, Chen Z, Qu M, Ren L, Zhu J, Libanori A, Zhu Y, Kang H, Ahadian S, Dokmeci M, Servati P, He X, Gu Z, **Sun W**,\* Khademhosseini A.\* Flexible patch with printable and antibacterial conductive hydrogel electrodes for accelerated wound healing. *Biomaterials* 2022; 285, 121479.

[81] Liu J,# Qu M,# Wang C,# Xue Y, Huang H, Chen Q, Sun W, Zhou X\*, Xu G\*, Jiang X.\* A Dual-Crosslinked Hydrogel Patch for Promoting Diabetic Wound Healing. *Small* 2022; 23, e2106172.

[80] Zhu Y,\* Hartel M, Yu N, Garrido P, Kim S, Lee J, Bandaru P, Guan S, Lin H, Emaminejad S, Barros N, Ahadian S, Kim H-J, **Sun W**, Jucaud V, Dokmeci M, Weiss P, Yan R,\* Khademhosseini A.\* Epidermis-inspired Wearable Piezoresistive Pressure Sensors using Reduced Graphene Oxide Self-Wrapped Copper Nanowire Networks. *Small Methods*. 2022; 20, 2100900.

[79] Lee J, Wang Y, Xue C, Chen Y, Qu M, Thakor J, Zhou X, Barros N, Falcone N, Young P, Dolder F, Lee K, Zhu Y, Cho H-J, **Sun W**, Zhao B, Ahadian S, Jucaud V, Dokmeci M, Khademhosseini A\*, Kim H-J,\* pH-responsive Doxorubicin Delivery using Shear-Thinning Biomaterials for Localized Melanoma Treatment. *Nanoscale*. 2022; 14, 350.

[78] Barros N,# Chen Y,# Hosseini V, Wang W, Nasiri R, Mahmoodi M, Yalcintas E, Haghniaz R, Mecwan M, Karamikamkar S, Dai W, Sarabi S, Falcone N, Young P, Zhu Y, **Sun W**, Zhang S, Lee J, Lee K, Ahadian S, Dokmeci M, Khademhosseini A,\* Kim H-J.\* Recent Developments in Mussel-Inspired Materials for Biomedical Applications. *Biomaterials Science*. 2021; 9, 6653.

[77] Luo Z,# Zhou X,# Mandal K,# He N, Wennerberg W, Qu M, Jiang X, **Sun W**,\* Khademhosseini A.\* Reconstructing the Tumor Architecture into Organoids. *Advanced Drug Delivery Reviews*. 2021; 76, 113839.

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- [75] Qu M,# Liao X,# Jiang N, **Sun W**, Xiao W, Zhou X, Khademhosseini A, Li B,\* Zhu S.\* Injectable Open-porous PLGA Microspheres as Cell Carriers for Cartilage Regeneration. *Journal of Biomedical Materials Research: Part A*. 2021; 109, 2091.
- [74] Qu M,# Wang C,# Zhou X,# Libanori A, Jiang X, Xu W, Zhu S, Chen Q, **Sun W**,\* Khademhosseini A.\* Multi-dimensional Printing for Bone Tissue Engineering. *Advanced Healthcare Materials*. 2021; 10, 2001986.
- [73] Jiang X,# Ren L,# Tebon P,# Zhou X, Wang C, Qu M, Zhu J, Ashammakhi N, Ahadian S, Dokmeci MR, Gu Z, **Sun W**,\* Khademhosseini A.\* Cancer-on-a-Chip for Modeling Immune Checkpoint Inhibitor and Tumor Interactions. *Small*. 2021; 18, 2004282.
- [72] Ren L,# Zhou X,# Nasiri R,# Fang J, Jiang X, Wang C, Qu M, Ling H, Chen Y, Xue Y, Hartel M, Tebon P, Zhang S, Kim H, Yuan X, Shamloo A, Dokmeci MR, Li S, Khademhosseini A, Ahadian S,\* **Sun W**.\* Combined Effects of Electric Stimulation and Microgrooves in Cardiac Tissue-on-a-Chip for Drug Screening. *Small Methods*. 2020; 4, 2000438.
- [71] Zhou X,# Jiang X,# Qu M,# Aninwene G, Jucaud V, Moon J, Gu Z, **Sun W**,\* Khademhosseini A.\* Engineering Antiviral Vaccines. *ACS Nano*. 2020; 14, 12370.
- [70] Zhu J, Zhou X, Libanori A, **Sun W**.\* Microneedle-based bioassays. *Nanoscale Advances*. 2020; 2, 4295. **(Invited review)**
- [69] Zhu J, Zhou X, Kim H, Qu M, Jiang X, Lee K, Ren L, Wu Q, Wang C, Zhu X, Tebon P, Zhang S, Lee J, Ashammakhi, Ahadian S, Dokmeci MR, Gu Z, **Sun W**,\* Khademhosseini A.\* Gelatin methacryloyl microneedle patches for minimally-invasive extraction of skin interstitial fluid. *Small*. 2020; 16, 1905910 **(Highlighted as Cover)**
- [68] Qu M,# Jiang X,# Zhou X,# Wang C, Wu Q, Ren L, Zhu J, Zhu S, Tebon P, **Sun W**,\* Khademhosseini A.\* Stimuli-Responsive Delivery of Growth Factors for Tissue Engineering. *Advanced Healthcare Materials*. 2020; 9, 1901714.
- [67] Hassanpour S,# Kim H,# Saadati A, Tebon P, Xue C, Dolder F, Thakor J, Baradaran B, Mosafer J, Hashemzaei M, Lee K, Lee J, Zhang S, **Sun W**, Cho H, Ahadian S, Ashammakhi N, Dokmeci M, Mokhtazadeh A,\* Khamdehosseini A.\* Thrombolytic agents: Nanocarriers in controlled release. *Small*. 2020; 16, 2001647.
- [66] Jamaledin R, Makvandi P,\* Yiu C, Agarwal T, Vecchione R,\* **Sun W**, Maiti T, Tay F,\* Netti P. Engineered Microneedle Patches for Controlled Release of Active Compounds: Recent Advances in Release Profile Tuning. *Advanced Therapeutics*. 2020; 3, 2000171.
- [65] Vajhadin F, Ahadian S, Trivas-Sejdic J, Lee J, Mazloum-Ardakani M,\* Salvador J, Aninwene G, Bandaru P, **Sun W**, Khademhosseini A.\* Electrochemical cytosensors for detection of breast cancer cells. *Biosensors and Bioelectronics*. 2020; 151: 111984.
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- [61] Lee K,\*# Xue Y,# Lee J, Kim H, Liu Y, Sarikhani E, **Sun W**, Zhang S, Tebon P, Haghniaz R, Ostrovidov S, Ahadain S, Ashammakhi S, Dokmeci MR, Khademhosseini A.\* A Patch of Detachable Hybrid Microneedle Depot for Localized Delivery of Mesenchymal Stem Cells in Regeneration Therapy. *Advanced Functional Materials*. 2020; 30: 2000086. **(Highlighted as Cover)**
- [60] Zhang S,\*# Ling H,# Chen Y, Cui Q, Ni J, Wang X, Hartel MC, Meng X, Lee K, **Sun W**, Lin H, Emaminejad S, Ahadian S, Ashammakhi N, Dokmeci MR, Khademhosseini A.\* Hydrogel-Enabled Transfer-Printing of Conducting Polymer Films for Soft Organic Bioelectronics. *Advanced Functional Materials* 2020; 30: 1906016. **(Highlighted as cover)**
- [59] Zhou X,# Qu M,# Tebon P,# Jiang X, Wang C, Xue Y, Zhu J, Zhang S, Oklu R, Sengupta S, **Sun W**,\* Khademhosseini A.\* Screening Cancer Immunotherapy: When Engineering Approaches meet Artificial Intelligence. *Advanced Science*. 2020; 7, 2001447.
- [58] Xu C, Xiao L, Cao Y, He Y, Lei C, Xiao Y, **Sun W**, Ahadian S, Zhou X, Khademhosseini A,\* Ye Q.\* Mesoporous silica rods with cone shaped pores modulate inflammation and deliver BMP-2 for bone regeneration. *Nano Research*. 2020; 13, 2323.
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- [55] Li Z, Zhang S,\* Chen Y, Ling H, Zhao L,\* Luo G, Wang X, Hartel M, Liu H, Xue Y, Lee K, **Sun W**, Kim H, Lee J, Zhao Y, Emaminejad S, Ahadian S, Ashammakhi N, Dokmeci M, Jiang Z, Khademhosseini A.\* Gelatin methacryloyl-based pressure sensors for medical wearables. *Advanced Functional Materials*. 2020; 30, 2003601.
- [54] Fang J, Hsueh YY, Soto J, **Sun W**, Wang J, Gu Z, Khademhosseini A, Li S.\* Engineering Biomaterials with Micro/Nano Technologies for Cell Reprogramming. *ACS Nano*. 2020; 14: 1296.
- [53] Xue Y, Lee J, Kim H, Cho H, Zhou X, Liu Y, Tebon P, Hoffman T, Qu M, Ling H, Jiang X, Li Z, Zhang S, **Sun W**, Ahadian S, Dokmeci M, Lee K,\* Khademhosseini A.\* Rhodamine Conjugated Gelatin Methacryloyl Nanoparticles for Stable Cell Imaging. *ACS Applied Bio Materials*. 2020; 3, 6908.
- [52] Zhou X,# Luo Z,# Baidya A, Kim H, Wang C, Jiang X, Qu M, Zhu J, Ren L, Vajhadin F, Tebon P, Zhang N, Xue Y, Feng Y, Xue C, Chen Y, Lee K, Lee J, Zhang S, Xu C, Ashammakhi N, Ahadian S, Dokmeci MR, Gu Z, **Sun W**,\* Khademhosseini A.\* Biodegradable  $\beta$ -cyclodextrin conjugated gelatin methacrylate microneedles for delivery of water-insoluble drug. *Advanced Healthcare Materials*. 2020; 9, 2000527.
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- [50] **Sun W**,\* Wang J, Hu Q, Zhou X, Khademhosseini A, Gu Z.\* CRISPR-Cas12a delivery by DNA-mediated bio-responsive editing for cholesterol regulation. *Science Advances*. 2020; 6: eaba2983.

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- [47] Wang J,# Yu J,# Zhang Y, Zhang X, Kahkoska AR, Chen G, Wang Z, Sun W, Cai L, Chen Z, Qian C, Shen Q, Khademhosseini A, Buse JB, Gu Z.\* Charge-switchable polymeric complex for glucose-responsive insulin delivery in mice and pigs. *Science Advances*, 2019; 5: eaaw4357.
- [46] Lasli S, Kim H, Lee K, Suurmonde CE, Goudie M, Bandaru P, Sun W, Zhang S, Zhang N, Ahadian S, Dokmeci MR, Lee J,\* Khademhosseini A.\* A Human Liver-on-a-Chip Platform for Modeling Nonalcoholic Fatty Liver Disease. *Advanced Biosystems* 2019; 3: 1900104. (Highlighted as Cover)
- [45] Yeung C, Chen S, King B, Lin H, King K, Akhtar F, Diaz G, Wang B, Zhu J, Sun W, Khademhosseini A, Emaminejad S.\* A 3D-Printed Microfluidic-Enabled Hollow Microneedle Architecture for Transdermal Drug Delivery. *Biomicrofluidics* 2019; 13: 064125.
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- [43] Sun W, Lee J, Zhang S, Benyshek C, Dokmeci MR, Khademhosseini A. Engineering Precision Medicine. *Advanced Science* 2018, 6: 1801039. (Highlighted as Front Cover)
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- [40] Hu Q, Sun W, Wang J, Ruan H, Zhang X, Ye Y, Shen S, Wang C, Lu W, Cheng K, Dotti G, Zeidner JF, Wang J, Gu Z.\* Conjugation of haematopoietic stem cells and platelets decorated with anti-PD-1 antibodies augments anti-leukaemia efficacy. *Nature Biomedical Engineering*. 2018; 2: 831-40.
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- [33] Wang C, **Sun W**, Ye Y, Bomba HN, and Gu Z.\* Bioengineering of Artificial Antigen Presenting Cells and Lymphoid Organs. *Theranostics* 2017; 7: 3504-3516.
- [32] Wang C, Ye Y, **Sun W**, Yu J, Wang J, Lawrence DS, Buse JB, and Gu Z.\* Red Blood Cells for Glucose-Responsive Insulin Delivery. *Advanced Materials* 2017; 29: 1606617.
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- [30] Yu J, Zhang Y, **Sun W**, Kahkoska AR, Wang J, Buse JB, and Gu Z.\* Insulin-Responsive Glucagon Delivery for Prevention of Hypoglycemia. *Small* 2017; 13: 1603028. **(Highlighted as Cover)**
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- [19] Yu J, Zhang Y, **Sun W**, Wang C, Ranson D, Ye Y, Weng Y,\* Gu Z.\* Internalized compartments encapsulated nanogels for targeted drug delivery. *Nanoscale* 2016; 8: 9178-84.
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