

Shamik Mascharak

- MD Student, expected graduation Spring 2023
- Ph.D. Student in Stem Cell Biology and Regenerative Medicine, admitted Autumn 2019
- MSTP Student

Publications

PUBLICATIONS

- **Multiplexed evaluation of mouse wound tissue using oligonucleotide barcoding with single-cell RNA sequencing.** *STAR protocols*
Januszyk, M., Griffin, M., Mascharak, S., Talbott, H. E., Chen, K., Henn, D., Spielman, A. F., Parker, J. B., Liang, N. E., Cotterell, A., Guardino, N., Foster, D. S., Wagh, et al
2022; 4 (1): 101946
- **Machine Learning-Based Desmoplastic Signatures Predict Patient Outcomes in Pancreatic Ductal Adenocarcinoma**
Guo, J. L., Mascharak, S., Foster, D. S., Guardino, N. J., Griffin, M., Miller, E., Raghavan, S., Longacre, T. A., Norton, J. A., Longaker, M. T.
LIPPINCOTT WILLIAMS & WILKINS.2022: S53-S54
- **Inhibition of Yes-Associated Protein Promotes Skin Wound Regeneration in Large Animals**
Januszyk, M., Talbott, H. E., Griffin, M., Guardino, N., Spielman, A., Guo, J. L., Mascharak, S., Wan, D. C., Longaker, M. T.
LIPPINCOTT WILLIAMS & WILKINS.2022: S196
- **Adipocytes the Forgotten Culprit in Skin Fibrosis: Exploring the Mechanism of Fat Driven Skin Fibrosis**
Griffin, M., Guardino, N., Spielman, A. F., Mascharak, S., Parker, J. L., Guo, J. L., Abbas, D., Wan, D. C., Bauer-Rowe, K. E., Longaker, M. T.
LIPPINCOTT WILLIAMS & WILKINS.2022: S199
- **Engrafted-Positive Fibroblasts: The Primary Cell Type Present in Fibrotic Capsules During Foreign Body Response**
Parker, J. B., Griffin, M., Mascharak, S., Spielman, A., Cotterell, A. C., Abbas, D., Lintel, H., Januszyk, M., Wan, D. C., Longaker, M. T.
LIPPINCOTT WILLIAMS & WILKINS.2022: S68
- **Multimic analysis reveals conservation of cancer-associated fibroblast phenotypes across species and tissue of origin.** *Cancer cell*
Foster, D. S., Januszyk, M., Delitto, D., Yost, K. E., Griffin, M., Guo, J., Guardino, N., Delitto, A. E., Chinta, M., Burcham, A. R., Nguyen, A. T., Bauer-Rowe, K. E., Titan, et al
2022
- **Wound healing, fibroblast heterogeneity, and fibrosis.** *Cell stem cell*
Talbott, H. E., Mascharak, S., Griffin, M., Wan, D. C., Longaker, M. T.
2022; 29 (8): 1161-1180
- **Profibrotic Signaling Pathways and Surface Markers Are Upregulated in Fibroblasts of Human Striae Distensae and in a Mouse Model System.** *Plastic and reconstructive surgery*
Borrelli, M. R., Griffin, M., Chen, K., Diaz, N. M., Adem, S., Mascharak, S., Shen, A. H., Ngaage, L. M., Lewis, N., Longaker, M. T., Gurtner, G., Wan, D. C., Lorenz, et al
2022
- **Multi-omic analysis reveals divergent molecular events in scarring and regenerative wound healing.** *Cell stem cell*
Mascharak, S., Talbott, H. E., Januszyk, M., Griffin, M., Chen, K., Davitt, M. F., Demeter, J., Henn, D., Bonham, C. A., Foster, D. S., Mooney, N., Cheng, R., Jackson, et al
1800
- **Where There Is Fat There Is Fibrosis: Elucidating the Mechanisms of Creeping Fat-Driven Stricture Formation**
Bauer-Rowe, K. E., Griffin, M., Foster, D., desJardins-Park, H. E., Mascharak, S., Norton, J. A., Hyun, J. S., Longaker, M. T.

ELSEVIER SCIENCE INC.2021: S65

- **Fibroblast Sub-Populations Dynamically Change Composition to Heal Dorsal Skin Radiation Wounds in Wild-Type Mice**
Abbas, D. B., Griffin, M., Fahy, E. J., Lavin, C., Lee, D., Mascharak, S., King, M., Januszyk, M., Longaker, M. T., Wan, D. C.
ELSEVIER SCIENCE INC.2021: S207-S208
- **Topical Deferoxamine Patch Is Superior to Direct Injection for the Treatment of Radiation-Induced Skin Fibrosis**
Lavin, C. V., Abbas, D. B., Fahy, E. J., Lee, D. K., Griffin, M., Deleon, N., Mascharak, S., Gurtner, G. C., Longaker, M. T., Wan, D. C.
ELSEVIER SCIENCE INC.2021: S202-S203
- **Single-Cell RNA Sequencing Reveals Fibroblast Heterogeneity Across Mouse and Human Embryonic Origins**
Griffin, M., King, M. W., Guardino, N., Tevlin, R., Fahy, E. J., Mascharak, S., Abbas, D., Lavin, C. V., Wan, D., Longaker, M.
ELSEVIER SCIENCE INC.2021: S201-S202
- **Integrated spatial multiomics reveals fibroblast fate during tissue repair.** *Proceedings of the National Academy of Sciences of the United States of America*
Foster, D. S., Januszyk, M., Yost, K. E., Chinta, M. S., Gulati, G. S., Nguyen, A. T., Burcham, A. R., Salhotra, A., Ransom, R. C., Henn, D., Chen, K., Mascharak, S., Tolentino, et al
2021; 118 (41)
- **A comparative analysis of deferoxamine treatment modalities for dermal radiation-induced fibrosis.** *Journal of cellular and molecular medicine*
Lavin, C. V., Abbas, D. B., Fahy, E. J., Lee, D. K., Griffin, M., Diaz Deleon, N. M., Mascharak, S., Chen, K., Momeni, A., Gurtner, G. C., Longaker, M. T., Wan, D. C.
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- **A Novel Xenograft Model Demonstrates Human Fibroblast Behavior During Skin Wound Repair and Fibrosis.** *Advances in wound care*
Borrelli, M., Shen, A. H., Griffin, M., Mascharak, S., Adem, S., Diaz Deleon, N. M., Ngaage, L. M., Longaker, M. T., Wan, D. C., Lorenz, H. P.
2021
- **JUN promotes hypertrophic skin scarring via CD36 in preclinical in vitro and in vivo models.** *Science translational medicine*
Griffin, M. F., Borrelli, M. R., Garcia, J. T., Januszyk, M., King, M., Lerbs, T., Cui, L., Moore, A. L., Shen, A. H., Mascharak, S., Diaz Deleon, N. M., Adem, S., Taylor, et al
2021; 13 (609): eabb3312
- **Modulating cellular responses to mechanical forces to promote wound regeneration.** *Advances in wound care*
Mascharak, S., desJardins-Park, H. E., Davitt, M. F., Guardino, N. J., Gurtner, G. C., Wan, D. C., Longaker, M. T.
2021
- **Decellularized Adipose Matrices can Alleviate Radiation-induced Skin Fibrosis.** *Advances in wound care*
Adem, S., Abbas, D. B., Lavin, C., Fahy, E., Griffin, M., Diaz Deleon, N. M., Borrelli, M. R., Mascharak, S., Shen, A. H., Patel, R. A., Longaker, M. T., Nazerali, R. S., Wan, et al
2021
- **Engineered Matrices Enable the Culture of Human Patient-Derived Intestinal Organoids.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
Hunt, D. R., Klett, K. C., Mascharak, S., Wang, H., Gong, D., Lou, J., Li, X., Cai, P. C., Suhar, R. A., Co, J. Y., LeSavage, B. L., Foster, A. A., Guan, et al
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- **Single Cell RNA Sequencing Reveals Fibroblast Heterogeneity Across Embryonic Origins Of Skin**
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WILEY.2021: A11-A12
- **Novel Genetic Analysis Of MRL Mice Reveals That Complement Inhibition By Factor H Reduces Scarring**
desJardins-Park, H. E., Mack, K. L., Guardino, N., Griffin, M., Davitt, M. F., Mascharak, S., Wan, D. C., Fraser, H. B., Longaker, M. T.
WILEY.2021: A13
- **Adipocytes In Dermal Wounds Undergo Conversion To Pro-fibrotic Fibroblasts That Contribute To Scar Formation**
Guardino, N., desJardins-Park, H. E., Griffin, M., Bauer-Rowe, K. E., King, M. E., King, M. E., Mascharak, S., Longaker, M. T.
WILEY.2021: A31
- **Transgenic Inhibition Of Engrailed-1 Results In Endogenous Postnatal Skin Regeneration**
Mascharak, S., desJardins-Park, H. E., Davitt, M. F., Chen, K., Griffin, M., Guardino, N., Lorenz, H., Wan, D. C., Gurtner, G. C., Longaker, M. T.
WILEY.2021: A14-A15

- **Wnt-active Engrailed-1 Lineage-negative Fibroblasts Mediate Postnatal Skin Regeneration**
Mascharak, S., desJardins-Park, H. E., Januszyk, M., Chen, K., Davitt, M. F., Demeter, J., Henn, D., Griffin, M., Bonham, C. A., Mooney, N., Cheng, R., Jackson, P. K., Wan, et al
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- **Preventing Engrailed-1 activation in fibroblasts yields wound regeneration without scarring.** *Science (New York, N.Y.)*
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- **Engineered Matrices Enable the Culture of Human Patient-Derived Intestinal Organoids** *ADVANCED SCIENCE*
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- **Aged skeletal stem cells generate an inflammatory degenerative niche.** *Nature*
Ambrosi, T. H., Marecic, O., McArdle, A., Sinha, R., Gulati, G. S., Tong, X., Wang, Y., Steininger, H. M., Hoover, M. Y., Koepke, L. S., Murphy, M. P., Sokol, J., Seo, et al
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- **Prrx1 Fibroblasts Represent a Pro-fibrotic Lineage in the Mouse Ventral Dermis.** *Cell reports*
Leavitt, T., Hu, M. S., Borrelli, M. R., Januszyk, M., Garcia, J. T., Ransom, R. C., Mascharak, S., desJardins-Park, H. E., Litzemberger, U. M., Walmsley, G. G., Marshall, C. D., Moore, A. L., Duoto, et al
2020; 33 (6): 108356
- **Peripheral Motor Neuron Activity Influences over Local Sarcoma Progression**
Davitt, M., Foster, D., Mascharak, S., desJardins-Park, H., Norton, J., Longaker, M. T.
ELSEVIER SCIENCE INC.2020: S230–S231
- **Detection, Scoring, and Classification of Solid Organ Fibroses with Machine Learning Analysis**
Mascharak, S., desJardins-Park, H. E., Davitt, M., Foster, D. S., Chinta, M., Wan, D. C., Wernig, G., Longaker, M. T.
ELSEVIER SCIENCE INC.2020: S222
- **Elucidating Molecular Drivers of Wound Regeneration in MRL Mice Via Novel Transcriptomic Analyses**
desJardins-Park, H. E., Mack, K. L., Davitt, M. F., Griffin, M., Mascharak, S., Fraser, H. B., Longaker, M. T.
ELSEVIER SCIENCE INC.2020: S225
- **Transdermal Deferoxamine Treatment Mitigates Fibrosis in Irradiated Skin**
Shen, A. H., Borrelli, M. R., Deleon, N., Adem, S., Mascharak, S., Salhotra, A., Shah, H., Longaker, M. T., Gurtner, G. C., Wan, D. C.
ELSEVIER SCIENCE INC.2020: S235
- **Wounds Heal by Tissue-Resident Fibroblast Progenitors that Proliferate Polyclonally and Mechanoresponsively**
Foster, D. S., Chinta, M., Salhotra, A., Nguyen, A. T., Burcham, A., Mascharak, S., Januszyk, M., Gurtner, G. C., Wernig, G., Longaker, M. T.
ELSEVIER SCIENCE INC.2020: S236–S237
- **Fibroblast Heterogeneity in Wound Healing: Hurdles to Clinical Translation.** *Trends in molecular medicine*
Mascharak, S., desJardins-Park, H. E., Longaker, M. T.
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- **Rewriting the Future: Promises and Limits of Germline Gene Editing in Craniofacial Surgery.** *The Journal of craniofacial surgery*
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- **Doxycycline Reduces Scar Thickness and Improves Collagen Architecture** *ANNALS OF SURGERY*
Moore, A. L., desJardins-Park, H. E., Duoto, B. A., Mascharak, S., Murphy, M. P., Irizarry, D. M., Foster, D. S., Jones, R. E., Barnes, L. A., Marshall, C. D., Ransom, R. C., Wernig, G., Longaker, et al
2020; 272 (1): 183–93
- **Radiation-induced skin fibrosis is reversed by transdermal delivery of deferoxamine**
Borrelli, M. R., Adem, S., Diaz, N., Mascharak, S., Sen, A., Januszyk, M., Nguyen, D., Momeni, A., Gurtner, G. C., Longaker, M. T., Wan, D. C.
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- **Stretch marks are abundant in CD26-positive human dermal fibroblasts and exhibit increased profibrotic mechanosensitive signaling**
Borrelli, M. R., Griffin, M., Ngaage, L. M., Mascharak, S., Lewis, N., Januszyk, M., Wan, D. C., Longaker, M. T., Lorenz, H. P.
WILEY.2020: S32
- **Elucidating the fundamental fibrotic processes driving abdominal adhesion formation.** *Nature communications*
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- **Tuning Macrophage Phenotype to Mitigate Skeletal Muscle Fibrosis.** *Journal of immunology (Baltimore, Md. : 1950)*
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- **Fat Grafting Rescues Radiation-Induced Joint Contracture.** *Stem cells (Dayton, Ohio)*
Borrelli, M. R., Diaz Deleon, N. M., Adem, S., Patel, R. A., Mascharak, S., Shen, A. H., Irizarry, D., Nguyen, D., Momeni, A., Longaker, M. T., Wan, D. C.
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- **Endogenous Breast Cancer Shows Clonal Proliferation of Cancer Associated Fibroblasts at Primary Tumor and Metastatic Sites**
Foster, D. S., Chinta, M., Nguyen, A. T., Salhotra, A., Ransom, R., Jones, R., Titan, A. L., Mascharak, S., Norton, J. A., Longaker, M. T.
ELSEVIER SCIENCE INC.2019: S262
- **JUN Drives Pathologic Scarring by Activating Key Fibroproliferative Pathways in Fibroblast Subpopulations**
Borrelli, M. R., Garcia, J. T., Moore, A. L., Patel, R. A., Mascharak, S., Duoto, B., Cui, L., Wan, D. C., Wernig, G., Longaker, M. T.
ELSEVIER SCIENCE INC.2019: E215–E216
- **Fibroblast Proliferation in Wound Healing Is Clonal and Focal Adhesion Kinase-Dependent**
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ELSEVIER SCIENCE INC.2019: S223
- **Regenerative Skin Healing Through Targeted Modulation of Engrailed1-Negative Fibroblasts**
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ELSEVIER SCIENCE INC.2019: S228
- **Intrinsic Chromatin State and Extrinsic Wound-Related Cues Can Coordinate to Activate Fibroblasts for Scarring**
desJardins-Park, H. E., Moore, A. L., Litzenburger, U., Mascharak, S., Chinta, M., Ransom, R. C., Hu, M. S., Lorenz, H. P., Chang, H. Y., Longaker, M. T.
ELSEVIER SCIENCE INC.2019: S223–S224
- **Cancer-Associated Fibroblasts Persist but Show Decreased Fibroblast Activation Protein Expression after Neoadjuvant Chemotherapy in Human Pancreatic Ductal Adenocarcinoma**
Foster, D. S., Nguyen, A. T., Chinta, M., Titan, A. L., Salhotra, A., Jones, R., Mascharak, S., Norton, J., Longaker, M. T.
ELSEVIER SCIENCE INC.2019: S257–S258
- **Tumors Co-Opt Fibroblast Wound Healing Capacity**
Foster, D. S., Mascharak, S., Nguyen, A. T., Chinta, M., Salhotra, A., Titan, A. L., Jones, R., da Silva, O., Norton, J. A., Longaker, M. T.
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- **The Spectrum of Scarring in Craniofacial Wound Repair** *FRONTIERS IN PHYSIOLOGY*
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- **The Spectrum of Scarring in Craniofacial Wound Repair.** *Frontiers in physiology*
desJardins-Park, H. E., Mascharak, S., Chinta, M. S., Wan, D. C., Longaker, M. T.
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- **A Clearing Technique to Enhance Endogenous Fluorophores in Skin and Soft Tissue.** *Scientific reports*
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- **Doxycycline Reduces Scar Thickness and Improves Collagen Architecture.** *Annals of surgery*
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2018
- **Automated Quantification of Vessel Structure: A Novel Method for Analysis of Angiogenesis in Wound Healing**
Jardins-Park, H., Mascharak, S., Moore, A. L., Duoto, B. A., Longaker, M. T.
ELSEVIER SCIENCE INC.2018: E196
- **Reduced Scar Thickness Achieved by Topical Doxycycline Is Mediated by Specific Skin Fibroblast Populations and Not Immune Cell Infiltrate**
Moore, A. L., Murphy, M. P., Irizarry, D. M., Des Jardins-Park, H. E., Duoto, B. A., Mascharak, S., Foster, D. S., Jones, R., Wernig, G., Longaker, M. T.
ELSEVIER SCIENCE INC.2018: S210–S211
- **Engrailed1-Positive Fibroblasts May Modulate Transcription of the TGF-beta Pathway in the Transition from Scarless Healing to Scarring Phenotype**
Moore, A. L., Marshall, C. D., Des Jardins-Park, H. E., Duoto, B. A., Mascharak, S., Barnes, A., Ransom, R. C., Hu, M. S., Lorenz, H., Longaker, M. T.
ELSEVIER SCIENCE INC.2018: E221–E222
- **Mouse Model with cJUN Over-Expression Eludes to Deep Dermal Fibroblast Expansion and Immune Cell Recruitment as the Biologic Mechanism of Hypertrophic Scarring**
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ELSEVIER SCIENCE INC.2018: S208
- **Detecting oropharyngeal carcinoma using multispectral, narrow-band imaging and machine learning.** *The Laryngoscope*
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- **Prrx1 Labels the Fibrogenic Fibroblast in the Ventral Dermis**
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WILEY.2018: A4
- **YAP-dependent mechanotransduction is required for proliferation and migration on native-like substrate topography** *BIOMATERIALS*
Mascharak, S., Benitez, P. L., Proctor, A. C., Madl, C. M., Hu, K. H., Dewi, R. E., Butte, M. J., Heilshorn, S. C.
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- **Use of protein-engineered fabrics to identify design rules for integrin ligand clustering in biomaterials** *INTEGRATIVE BIOLOGY*
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