

Stanford



Artem A. Trotsyuk, Ph.D.

Casual - Other Teaching Staff

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Bio

BIO

Dr. Artem A. Trotsyuk is a fellow with the Stanford Center for Biomedical Ethics. He completed his PhD in Bioengineering and Masters in Computer Science with an AI specialization at Stanford University under the supervision of Dr. Geoffrey Gurtner in the Department of Surgery. He was co-advised by Dr. Zhenan Bao in the Department of Chemical Engineering alongside Dr. Russ Altman and Dr. Michael Snyder. His thesis focused on developing a smart bandage that implements a closed-loop AI processing system for sensing and therapeutic delivery into a wound bed. His current work focuses on evaluating unintended consequences of AI in biomedicine, and developing mitigation frameworks.

ACADEMIC APPOINTMENTS

- Casual - Other Teaching Staff, Continuing Studies and Summer Session

HONORS AND AWARDS

- Forbes 30 Under 30 Scholar, Forbes (09/30/2019)
- 2018 Trainee Award, Wound Healing Society (05/30/2018)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, Stanford University , BIOE-PHD (2022)
- Master of Science, Stanford University , CS-MS (2022)
- Bachelor of Science, University of California, Davis , Biological Sciences (2009)

STANFORD ADVISORS

- Russ Altman, Postdoctoral Faculty Sponsor

LINKS

- Google Scholar: <https://scholar.google.com/citations?user=YOI-9uoAAAAJ&hl=en>

Teaching

COURSES

2023-24

- AI for Beginners: GENE 231 (Win)
- Aging: Science and Technology for Longevity: GENE 223 (Spr)
- Healthcare Venture Capital: GENE 225 (Aut)

2022-23

- AI, Genes and Ethics: GENE 213 (Aut)
- Aging: Science and Technology for Longevity: GENE 223 (Win)
- BioEntrepreneurship Bootcamp: BIOE 396 (Spr)
- Foundations of Bioethics: HUMBIO 174 (Win)
- LONGEVITY VENTURE CAPITAL: GENE 226 (Spr)

Publications

PUBLICATIONS

- **Biomedical Data Science, Artificial Intelligence, and Ethics: Navigating Challenges in the Face of Explosive Growth.** *Annual review of biomedical data science*
Federico, C. A., Trotsyuk, A. A.
2024
- **Unreliable LLM Bioethics Assistants: Ethical and Pedagogical Risks.** *The American journal of bioethics : AJOB*
Goetz, L., Trengove, M., Trotsyuk, A., Federico, C. A.
2023; 23 (10): 89-91
- **Allometrically scaling tissue forces drive pathological foreign-body responses to implants via Rac2-activated myeloid cells.** *Nature biomedical engineering*
Padmanabhan, J., Chen, K., Sivaraj, D., Henn, D., Kuehlmann, B. A., Kussie, H. C., Zhao, E. T., Kahn, A., Bonham, C. A., Dohi, T., Beck, T. C., Trotsyuk, A. A., Stern-Buchbinder, et al
2023
- **Stronger regulation of AI in biomedicine.** *Science translational medicine*
Trotsyuk, A. A., Federico, C. A., Cho, M. K., Altman, R. B., Magnus, D.
2023; 15 (713): eadi0336
- **Cas9-mediated knockout of Ndr2 enhances the regenerative potential of dendritic cells for wound healing.** *Nature communications*
Henn, D., Zhao, D., Sivaraj, D., Trotsyuk, A., Bonham, C. A., Fischer, K. S., Kehl, T., Fehlmann, T., Greco, A. H., Kussie, H. C., Moortgat Illouz, S. E., Padmanabhan, J., Barrera, et al
2023; 14 (1): 4729
- **Time From Authorization by the US Food and Drug Administration to Medicare Coverage for Novel Technologies.** *JAMA health forum*
Sexton, Z. A., Perl, J. R., Saul, H. R., Trotsyuk, A. A., Pietzsch, J. B., Ruggles, S. W., Nikolov, M. C., Schulman, K. A., Makower, J.
2023; 4 (8): e232260
- **Robotics in Plastic Surgery: It's Here.** *Plastic and reconstructive surgery*
Henn, D., Trotsyuk, A. A., Barrera, J. A., Sivaraj, D., Chen, K., Mittal, S., Mermin-Bunnell, A. M., Chattopadhyay, A., Larson, M. R., Kinney, B. M., Nachbar, J., TerKonda, S. P., Reddy, et al
2023; 152 (1): 239-249
- **Blockchain, Information Security, Control, and Integrity - Who Is in Charge?** *Plastic and reconstructive surgery*
Barrera, J. A., Trotsyuk, A. A., Henn, D., Sivaraj, D., Chen, K., Mittal, S., Mermin-Bunnell, A. M., Larson, M. R., Padmanabhan, J., Kinney, B., Nachbar, J., Sacks, J., Terkonda, et al
2023
- **Nitric oxide-releasing gel accelerates healing in a diabetic murine splinted excisional wound model.** *Frontiers in medicine*
Sivaraj, D., Noishiki, C., Kosaric, N., Kiwanuka, H., Kussie, H. C., Henn, D., Fischer, K. S., Trotsyuk, A. A., Greco, A. H., Kuehlmann, B. A., Quintero, F., Leeolou, M. C., Granoski, et al
2023; 10: 1060758
- **Sensor-enabled Multilayer Artificial Intelligence Analysis for Predictive Wound Healing and Real-Time Patient Monitoring**
Trotsyuk, A. A., Jing, S., Chen, K., Henn, D., Jiang, Y., Niu, S., Sivaraj, D., Nag, R., Snyder, M., bao, Z., Gurtner, G. C.
WILEY.2023: 268-269
- **Interrogation of Wound Healing with Single Cell Analysis using a Wireless Smart Bandage**

Trotsyuk, A. A., Jiang, Y., Niu, S., Chen, K., Henn, D., Sivaraj, D., Bao, Z., Gurtner, G. C.
WILEY.2023: 270-271

- **Outcomes of Biosynthetic and Synthetic Mesh in Ventral Hernia Repair.** *Plastic and reconstructive surgery. Global open*
Sivaraj, D., Fischer, K. S., Kim, T. S., Chen, K., Tigchelaar, S. S., Trotsyuk, A. A., Gurtner, G. C., Lee, G. K., Henn, D., Nazerali, R. S.
2022; 10 (12): e4707
- **Healing chronic wounds with a wireless smart bandage with integrated sensors and stimulators** *NATURE BIOTECHNOLOGY*
Jiang, Y., Trotsyuk, A. A., Bao, Z.
2022
- **Wireless, closed-loop, smart bandage with integrated sensors and stimulators for advanced wound care and accelerated healing.** *Nature biotechnology*
Jiang, Y., Trotsyuk, A. A., Niu, S., Henn, D., Chen, K., Shih, C. C., Larson, M. R., Mermin-Bunnell, A. M., Mittal, S., Lai, J. C., Saberi, A., Beard, E., Jing, et al
2022
- **Characterization of Mechanoresponsive Inflammatory Cells during Wound Healing**
Chen, K., Griffin, M., Henn, D., Bonham, C. A., Fischer, K., Padmanabhan, J., Trotsyuk, A. A., Sivaraj, D., Leeolou, M., Kussie, H. C., Huskins, S., Steele, S., Perrault, et al
WILEY.2022: A22
- **Disrupting mechanotransduction decreases fibrosis and contracture in split-thickness skin grafting.** *Science translational medicine*
Chen, K., Henn, D., Januszzyk, M., Barrera, J. A., Noishiki, C., Bonham, C. A., Griffin, M., Tevlin, R., Carlomagno, T., Shannon, T., Fehlmann, T., Trotsyuk, A. A., Padmanabhan, et al
2022; 14 (645): eabj9152
- **Pullulan-Collagen Hydrogel Wound Dressing Promotes Dermal Remodeling and Wound Healing Compared to Commercially Available Collagen Dressings.** *Wound repair and regeneration : official publication of the Wound Healing Society [and] the European Tissue Repair Society*
Chen, K., Sivaraj, D., Davitt, M., Leeolou, M. C., Henn, D., Steele, S. R., Huskins, S. L., Trotsyuk, A. A., Kussie, H. C., Greco, A., Padmanabhan, J., Perrault, D. P., Zamaleeva, et al
2022
- **Topological supramolecular network enabled high-conductivity, stretchable organic bioelectronics.** *Science (New York, N.Y.)*
Jiang, Y., Zhang, Z., Wang, Y. X., Li, D., Coen, C. T., Hwaun, E., Chen, G., Wu, H. C., Zhong, D., Niu, S., Wang, W., Saberi, A., Lai, et al
2022; 375 (6587): 1411-1417
- **Enrichment of Nanofiber Hydrogel Composite with Fractionated Fat Promotes Regenerative Macrophage Polarization and Vascularization for Soft-Tissue Engineering.** *Plastic and reconstructive surgery*
Henn, D., Fischer, K. S., Chen, K., Greco, A. H., Martin, R. A., Sivaraj, D., Trotsyuk, A. A., Mao, H., Reddy, S. K., Kneser, U., Gurtner, G. C., Schmidt, V. J., Sacks, et al
2022; 149 (3): 433e-444e
- **Mechanical Signaling Mediated by IQGAP1 Promotes Pathologic Foreign Body Response**
Sivaraj, D., Padmanabhan, J., Chen, K., Henn, D., Kussie, H. C., Leeolou, M. C., Trotsyuk, A. A., Fischer, K., Perrault, D., Gurtner, G. C.
WILEY.2022: A21
- **Application of No Releasing Gel Increases Fibronectin, TGF-beta 1, and Accelerates Wound Healing in Diabetic Mice**
Noishiki, C., Sivaraj, D., Kosaric, N., Leeolou, M. C., Kussie, H. C., Kiwanuka, H., Henn, D., Fischer, K., Trotsyuk, A. A., Padmanabhan, J., Perrault, D., Murad, F., Chen, et al
WILEY.2022: A8
- **Determining How Early Disruption Of Mechanotransduction Affects Acute Wound Healing**
Kussie, H. C., Sivaraj, D., Leeolou, M. C., Huskins, S. L., Steele, S., Henn, D., Trotsyuk, A. A., Gurtner, G. C., Chen, K.
WILEY.2022: A22
- **Interactions Of Fibroblasts Versus Macrophages In An In Vitro Model Of Scar Formation And Wound Healing**
Huskins, S. L., Griffin, M., Steele, S., Thomas, B., Kussie, H. C., Sivaraj, D., Leeolou, M. C., Trotsyuk, A. A., Padmanabhan, J., Longaker, M. T., Gurtner, G. C., Chen, K.
WILEY.2022: A53-A54
- **Pullulan-Collagen Hydrogel Wound Dressing Promotes Dermal Remodeling and Healing in an Excisional Wound Model**

- Leeolou, M. C., Sivaraj, D., Davitt, M., Henn, D., Steele, S., Huskins, S. L., Trotsyuk, A. A., Kussie, H. C., Greco, A., Perrault, D., Padmanabhan, J., Longaker, M. T., Chen, et al
WILEY.2022: A24
- **Characterization of Mechanoresponsive Inflammatory Cells during Wound Healing**
Chen, K., Griffin, M., Henn, D., Bonham, C. A., Fischer, K., Padmanabhan, J., Trotsyuk, A. A., Sivaraj, D., Leeolou, M. C., Kussie, H. C., Huskins, S. L., Steele, S., Perrault, et al
WILEY.2022: A31-A32
 - **Galvanotactic Smart Bandage for Chronic Wound Management and Tissue Regeneration**
Trotsyuk, A. A., Jiang, Y., Niu, S., Henn, D., Chen, K., Larson, M., Beard, E., Saberi, A., Sivaraj, D., Mermin-Bunnell, A., Mittal, S., Jing, S., Kwon, et al
WILEY.2022: A36
 - **Allometric Tissue-Scale Forces Activate Mechanoresponsive Immune Cells To Drive Pathological Foreign Body Response To Biomedical Implants**
Padmanabhan, J., Chen, K., Sivaraj, D., Kuehlmann, B., Bonham, C., Dohi, T., Henn, D., Stern-Buchbinder, Z., Than, P., Hosseini, H., Barrera, J., Kussie, H., Magbual, et al
WILEY.2022: A19-A20
 - **Characterization of Mechanoresponsive Inflammatory Cells during Wound Healing**
Chen, K., Griffin, M., Henn, D., Bonham, C. A., Fischer, K., Padmanabhan, J., Trotsyuk, A. A., Sivaraj, D., Leeolou, M. C., Kussie, H. C., Huskins, S. L., Steele, S., Perrault, et al
WILEY.2022: A5
 - **IQGAP1-mediated mechanical signaling promotes the foreign body response to biomedical implants.** *FASEB journal : official publication of the Federation of American Societies for Experimental Biology*
Sivaraj, D., Padmanabhan, J., Chen, K., Henn, D., Noishiki, C., Trotsyuk, A. A., Kussie, H. C., Leeolou, M. C., Magbual, N. J., Andrikopoulos, S., Perrault, D. P., Barrera, J. A., Januszyk, et al
2022; 36 (2): e22007
 - **Inhibiting Fibroblast Mechanotransduction Modulates Severity of Idiopathic Pulmonary Fibrosis.** *Advances in wound care*
Trotsyuk, A. A., Chen, K., Kwon, S. H., Ma, K. C., Henn, D., Mermin-Bunnell, A. M., Mittal, S., Padmanabhan, J., Larson, M. R., Steele, S. R., Sivaraj, D., Bonham, C. A., Noishiki, et al
2021
 - **Mechanical Strain Drives Myeloid Cell Differentiation Toward Pro-Inflammatory Subpopulations.** *Advances in wound care*
Chen, K., Henn, D., Sivaraj, D., Bonham, C. A., Griffin, M., Choi Kussie, H., Padmanabhan, J., Trotsyuk, A. A., Wan, D. C., Januszyk, M., Longaker, M. T., Gurtner, G. C.
2021
 - **Mechanical Activation Of Inflammation At The Implant-tissue Interface Underlies Pathological Foreign Body Response**
Padmanabhan, J., Chen, K., Bonham, C. A., Kuehlmann, B. A., Dohi, T., Henn, D., Stern-Buchbinder, Z. A., Than, P. A., Hosseini, H. S., Magbual, N. J., Borrelli, M., Sivaraj, D., Trotsyuk, et al
WILEY.2021: A9
 - **CRISPR/Cas9 Editing Of Autologous Dendritic Cells To Enhance Angiogenesis And Wound Healing**
Henn, D., Zhao, D., Bonham, C. A., Chen, K., Greco, A. H., Padmanabhan, J., Sivaraj, D., Trotsyuk, A., Barrera, J. A., Januszyk, M., Qi, L., Gurtner, G. C.
WILEY.2021: A31-A32
 - **Disrupting Mechanotransduction Reduces Scar Formation And Restores Cellular Subpopulations In A Large Animal Model Of Skin Grafting**
Chen, K., Henn, D., Bonham, C. A., Noishiki, C., Barrera, J. A., Carlomagno, T. C., Shannon, T., Mays, C. J., Trotsyuk, A. A., Padmanabhan, J., Longaker, M. T., Januszyk, M., Gurtner, et al
WILEY.2021: A12-A13
 - **Adipose-derived stromal cells seeded in pullulan-collagen hydrogels improve healing in murine burns.** *Tissue engineering. Part A*
Barrera, J., Trotsyuk, A., Maan, Z. N., Bonham, C. A., Larson, M. R., Mittermiller, P. A., Henn, D., Chen, K., Mays, C. J., Mittal, S., Mermin-Bunnell, A. M., Sivaraj, D., Jing, et al
2021
 - **Xenogeneic skin transplantation promotes angiogenesis and tissue regeneration through activated Trem2+ macrophages.** *Science advances*
Henn, D., Chen, K., Fehlmann, T., Trotsyuk, A. A., Sivaraj, D., Maan, Z. N., Bonham, C. A., Barrera, J. A., Mays, C. J., Greco, A. H., Moortgat Illouz, S. E., Lin, J. Q., Steele, et al

2021; 7 (49): eabi4528

- **Hydrogel Scaffolds to Deliver Cell Therapies for Wound Healing.** *Frontiers in bioengineering and biotechnology*
Sivaraj, D., Chen, K., Chattopadhyay, A., Henn, D., Wu, W., Noishiki, C., Magbual, N. J., Mittal, S., Mermin-Bunnell, A. M., Bonham, C. A., Trotsyuk, A. A., Barrera, J. A., Padmanabhan, et al
2021; 9: 660145
- **Disrupting biological sensors of force promotes tissue regeneration in large organisms.** *Nature communications*
Chen, K., Kwon, S. H., Henn, D., Kuehlmann, B. A., Tevlin, R., Bonham, C. A., Griffin, M., Trotsyuk, A. A., Borrelli, M. R., Noishiki, C., Padmanabhan, J., Barrera, J. A., Maan, et al
2021; 12 (1): 5256
- **First reported case of *Wohlfahrtiimonas chitiniclastica* infection in California JAAD Case Reports** *Journal of the American Academy of Dermatology Case Reports*
Leelou, M. C., Perrault, D. P., Siravaj, D., Chang, A. S., Chen, K., Trotsyuk, A., Padmanabhan, J., Gurtner, G. C.
2021
- **Flexible smart bandage for wireless wound healing**
Trotsyuk, A. A., Jiang, Y., Niu, S., Larson, M., Beard, E., Saberi, A., Henn, D., Kwon, S., Bonham, C., Chen, K., Januszyk, M., Maan, Z., Barrera, et al
WILEY.2020: S24
- **Cryopreserved human skin allografts promote angiogenesis and dermal regeneration in a murine model.** *International wound journal*
Henn, D. n., Chen, K. n., Maan, Z. N., Greco, A. H., Moortgat Illouz, S. E., Bonham, C. A., Barrera, J. A., Trotsyuk, A. A., Padmanabhan, J. n., Momeni, A. n., Wan, D. C., Nguyen, D. n., Januszyk, et al
2020
- **BIOMIMETIC ADIPOSE STEM CELL DRESSING FOR SKIN REGENERATION**
Trotsyuk, A., Bonham, C. A., Rodrigues, M., Mittermiller, P., Rajadas, J., Inayathullah, M., Gurtner, G.
WILEY.2019: A4
- **ACCELERATION OF WOUND HEALING WITH PHD2-AND MIR210-TARGETING OLIGONUCLEOTIDES**
Dallas, A., Trotsyuk, A., Ilves, H., Rodrigues, M., White, A., Gurtner, G., Johnston, B. H.
WILEY.2019: A36
- **TOPICAL FOCAL ADHESION KINASE INHIBITOR PROMOTES SKIN REGENERATION AND SCAR PREVENTION IN A PRECLINICAL PORCINE MODEL**
Kwon, S., Kuehlmann, B., Dohi, T., Trotsyuk, A. A., Hu, M. S., Inayathullah, M., Rajadas, J., Longaker, M. T., Gurtner, G. C.
WILEY.2019: A11–A12
- **Optimization of transdermal deferoxamine leads to enhanced efficacy in healing skin wounds.** *Journal of controlled release : official journal of the Controlled Release Society*
Duscher, D. n., Trotsyuk, A. A., Maan, Z. N., Kwon, S. H., Rodrigues, M. n., Engel, K. n., Stern-Buchbinder, Z. A., Bonham, C. A., Whittam, A. J., Barrera, J. n., Hu, M. S., Inayathullah, M. n., Rajadas, et al
2019
- **Controlled Delivery of a Focal Adhesion Kinase Inhibitor Results in Accelerated Wound Closure with Decreased Scar Formation** *JOURNAL OF INVESTIGATIVE DERMATOLOGY*
Ma, K., Kwon, S., Padmanabhan, J., Duscher, D., Trotsyuk, A. A., Dong, Y., Inayathullah, M., Rajadas, J., Gurtner, G. C.
2018; 138 (11): 2452–60
- **Deferoxamine Can Prevent Pressure Ulcers and Accelerate Healing in Aged Mice.** *Wound repair and regeneration : official publication of the Wound Healing Society [and] the European Tissue Repair Society*
Bonham, C. A., Rodrigues, M., Galvez, M., Trotsyuk, A., Stern-Buchbinder, Z., Inayathullah, M., Rajadas, J., Gurtner, G. C.
2018
- **RNA-Based Combination Therapy for Diabetic Wound Healing**
Johnston, B. H., Ilves, H., Trotsyuk, A., Rodrigues, M., White, A., Mandell, K., Hammond, P. T., Gurtner, G. C., Dallas, A.
CELL PRESS.2018: 38–39
- **Deferoxamine can prevent pressure ulcers and accelerate healing in aged mice** *WOUND REPAIR AND REGENERATION*
Bonham, C. A., Rodrigues, M., Galvez, M., Trotsyuk, A., Stern-Buchbinder, Z., Inayathullah, M., Rajadas, J., Gurtner, G. C.

2018; 26 (3): 300–305

- **Controlled Delivery of a Focal Adhesion Kinase Inhibitor Results in Accelerated Wound Closure with Decreased Scar Formation.** *The Journal of investigative dermatology*
Ma, K. n., Kwon, S. H., Padmanabhan, J. n., Duscher, D. n., Trotsyuk, A. A., Dong, Y. n., Inayathullah, M. n., Rajadas, J. n., Gurtner, G. C.
2018
- **Acceleration of Diabetic Wound Healing with PHD2- and miR-210-targeting Oligonucleotides.** *Tissue engineering. Part A*
Dallas, A. n., Trotsyuk, A. n., Ilves, H. n., Bonham, C. A., Rodrigues, M. n., Engel, K. n., Barrera, J. A., Kosaric, N. n., Stern-Buchbinder, Z. A., White, A. n., Mandell, K. J., Hammond, P. n., Mansbridge, et al
2018
- **Allogeneic Cd26/Cd55 Cell Therapy for Treating Burn Wounds**
Trotsyuk, A., Rodrigues, M., Bonham, C., Mittermiller, P., Gurtner, G.
WILEY.2018: A9
- **Transdermal Deferoxamine Enhances Wound Healing in Aged Mice**
Bonham, C. A., Rodrigues, M., Trotsyuk, A., Stern-Buchbinder, Z., Inayathullah, M., Rajadas, J., Gurtner, G. C.
WILEY.2018: A10
- **Identification of cancer stem cell subpopulations of CD34(+) PLC/PRF/5 that result in three types of human liver carcinomas.** *Stem cells and development*
Park, S. C., Nguyen, N. T., Eun, J. R., Zhang, Y., Jung, Y. J., Tschudy-Seney, B., Trotsyuk, A., Lam, A., Ramsamooj, R., Zhang, Y., Theise, N. D., Zern, M. A., Duan, et al
2015; 24 (8): 1008-1021
- **Human liver carcinomas originated from CD34+ hematopoietic precursors** *Hepatology*
Park, S., Nguyen, N. X., Zeng, C., Tschudy-Seney, B., Eun, J., Trotsyuk, A., Lam, A., Ramsamooj, R., Zern, M., Duan, Y.
2012: 56():807A–808A