Personalized Healthcare Technology

Annual Report FY20
July 2019 – June 2020

Creating a future where healthcare works for everyone

Illustration created by Bradley Kwarta (ILLM- '18) for Tom Gaborski, PhD (KGCOE)
Imagine if you could build non traditional networks of exceptional talent to tackle healthcare problems in unconventional ways. Could we tap into differing perspectives and different world views to change how we approach problems? Could we proactively link experts in disparate fields to leverage technology in new ways to create innovative healthcare solutions? This idea, and the answers to these questions, form the nucleus of the Personalized Healthcare Technology initiative.

With over 83 affiliated faculty members, representing 9 colleges, PHT180 is a diverse network increasing collaboration across disciplines into new research directions. A major affiliated grant from the National Institutes of Health includes a co-investigator from the College of Art and Design working together with faculty from the Kate Gleason College of Engineering and the Golisano College of Computing and Information Sciences. Faculty from the Saunders College of Business have formed a new collaboration with Engineering and the College of Health Sciences and Technology to engage in healthcare technology research.

Student talent has always been central to the research enterprise, but at PHT180 we are leveraging students from the College of Art and Design, and from the College of Health Sciences and Technology to assist our researchers in conveying concepts and technical information to both lay and scientific audiences. Students have created over 100 elements of artwork and visualizations for affiliated faculty that are used in proposals, conference presentations, journal publications, and websites. This year our faculty disseminated 103 unique research contributions, including 3 manuscripts that featured RIT student illustrations on the journal cover.

Today we provide a breadth of services to our faculty affiliates including grant development, creative design & development, and grant management resources. This support has helped our active research projects to grow to over $17 million. With new awards in FY20 totaling $5.19 million, and a pipeline of over 54 pending proposals from a growing cadre of faculty, we are poised for explosive growth in healthcare research at RIT. Together, our extraordinary faculty and students are creating a new future where healthcare works for everyone; improved access, reduced cost, and enhanced efficacy.

An engineer, entrepreneur and researcher with expertise in drug delivery and pharmacokinetics, cardiovascular physiology and monitoring, to biosensors and devices. He receives funding from the National Institutes of Health, National Science Foundation, Department of Defense and Industry. Work from his laboratory has resulted in two spin out companies; one focused on wearable technology to aid in triage and treatment of traumatic brain injuries, and the other providing non-invasive cardiovascular assessment in the home.

Advancing Healthcare Research at RIT

Unconventional teams, entrepreneurial spirit, and technology innovations are transforming the landscape of healthcare access, efficacy, and cost.

David Borkholder, PhD
Director, Personalized Healthcare Technology
Bausch + Lomb Professor, Microsystems Engineering

PHT180 Annual Report
ABOUT THE INITIATIVE

Radical collaborations driving healthcare innovation

Personalized Healthcare Technology
DISCOVER opportunities for new partners, sponsors, and grants while being connected with mentors, collaborators, and other talent.

SUPPORT faculty research through all phases, from ideation to proposal development and grant execution.

PROMOTE the individual expertise and success through visual & web assets, media, and news.
National healthcare expenditures are growing at a rate that outpaces that of gross domestic product, and are projected to account for nearly 20% of the US economy by 2028. This unsustainable growth will be further burdened by a doubling of the number of Americans over the age of 65 in the next four decades. The PHT180 initiative is investing in people, programs, places, and partnerships to create a new future in healthcare delivery and individually empowered health to address this national crisis.

Our people come from a wide range of research disciplines, academic programs, and populations. This diversity is central to research that leads to transformative innovations. The PHT180 initiative aims to:

- integrate student talent across programs into the research enterprise at all levels, leveraging RIT’s strengths in technology, art and design.
- invest in our faculty, providing support services that accelerate research success.
- promote networks and collaboration that lead to new and expanding research directions, and a growing extramurally funded research portfolio.

As one of the signature interdisciplinary research areas at RIT, the PHT180 initiative integrates with other university programs to provide opportunities for students, and to elevate success of our faculty. We are:

- partnering with undergraduate and graduate degree programs to integrate research opportunities with the academic experience for students.
- developing a sustainable long-term business model that enables support and services to be expanded to all faculty engaged in healthcare research.
- identifying mechanisms to seed investment in new research directions, removing financial barriers to innovation for our faculty.
Places

Facilitating Creativity

Space creates identity, unity, and when properly designed, stimulates creativity, discovery and collaboration. As healthcare technology research at RIT expands, the PHT180 initiative is:

- defining a central space for creative collaboration and partner engagement; a physical presence that creates identity.
- exploring opportunities to centralize human subjects support including a study coordinator, HIPPA compliant data management, and testing.

Partnerships

Extending Our Reach and Serving the World

Partnerships create opportunities for collaborative research, expanded access to clinical study populations, and regional economic development. Expanding partnerships remain a strategic priority for PHT180, specifically to:

- leverage the RRH-RIT Alliance to provide connections and processes that advance RRH as a preferred clinical research partner.
- expand the network at the URMC to connect RIT healthcare researchers with targeted domain expertise.
- coordinate with the Simone Center and Venture Creations to provide healthcare technology expertise to entrepreneurial ventures.
- develop international research partnerships that provide global engagement opportunities for RIT faculty and students.
A Vision of Growth
Accelerating healthcare research at RIT

Double faculty engagement, and achieve $10MM in healthcare research expenditures by 2025

Radical collaborations driving innovation in unconventional ways across campus

Build sustainable healthcare through technology innovations

Expand student engagement at all levels from undergrad to PhD

Emerge as the preeminent institution for applied healthcare research with impact.

Proposal Submissions

Active Awards

New Awards

FY17
FY18
FY19
FY20

$4.76M
$7.14M
$12.53M
$27.39M

$1.82M
$4.15M
$5.19M

$2.52M
$4.76M
$8.92M
$17.31M

$2.52M
$4.76M
$8.92M
$17.31M

$4.76M
$8.92M
$12.53M
$27.39M

$2.52M
$4.76M
$8.92M
$17.31M

$4.76M
$8.92M
$12.53M
$27.39M

$4.76M
$8.92M
$12.53M
$27.39M
ACCELERATING RESEARCH

PHT180 provides individual researchers with pre- and post-award resources to grow and manage their research portfolio

Curated Grant Opportunities List
A searchable, curated grant opportunities list hosted on the PHT180 website https://www.rit.edu/pht180/grant-opportunities, providing faculty with a comprehensive listing of healthcare related funding opportunities.

Grant Review Committee
A committee of established, successful researchers that assists faculty through a pre submission critique with the goal of increasing the quality and scientific rigor of submitted healthcare proposals. https://www.rit.edu/pht180/grant-review-committee

PHT180 Mentors
Experienced researchers offer their time to mentor faculty who are seeking healthcare research grant funding. Mentoring can include grant strategy development, guidance on a particular grant mechanism, refinement of concepts, review of proposals, and best practices in managing an effective research group. https://www.rit.edu/pht180/mentors

Foundations and Development
Members of the PHT180 Leadership Team provide proposal development guidance and creative resources for faculty applying to competitive foundation funding opportunities. They also connect RIT Development resources with the right affiliated faculty for site visits and external presentations in support of RIT’s Capital Campaign.

Grant Development Support
PHT180 has a full-time research development specialist who has a PhD in biomedical engineering and past NIH funding experience. He assists faculty members with personalized funding opportunities, establishing new collaborations within and outside of RIT, and in writing and editing of key grant proposal elements.

Grant Management Support
Grants management support spans pre- and post-award, and is structured to minimize the program management burden on the PI. The broad scope of these services includes serving as an SRS and SPA collaborative liaison, project financial projections, sponsor reporting, and maintenance of the NIH My Bibliography for the investigator.

Biomedical Core Infrastructure
PHT180 provided $80,000 in matching funds towards a $110,000 NYS Empire State Development grant to establish a biomedical research core facility providing centralized, new laboratory equipment to enhance capabilities and accelerate growth in healthcare and biomedical research.
AFFILIATE PUBLICATIONS

Faculty researchers affiliated with PHT180 and their students have published 69 journal articles, 9 preprints, 23 conference proceedings & abstracts, 1 book chapter, and had 1 utility patent issued in FY20 in the healthcare research domain.

To view the full list of publications beginning on page 26.
PHT180 Creative Support and Resources

Design and development teams work on projects for research lab websites, publications, conference materials and proposals. These teams include 13 undergraduate and 8 graduate students from New Media Design, 3D Digital Design, Medical Illustration, Computing & Information Technology, Visual Communication Design and Interactive Games and Media programs. Our students help us to support the research mission of PHT180 across the campus while being exposed to a broad range of research areas.

Website Design and Development

PHT180 provides resources to meet the growing need for faculty researchers to have a professional online presence to promote their research. At the close of FY20 PHT180 has created and launched 12 new faculty research lab websites, with another 12 in active development. These websites are actively curated by the student developers, with faculty leveraging the PHT180 resources for content updates, maintenance and technical issues. These websites promote individual faculty and their healthcare technology research.

UX/UI Design & Development and Cloud Support

PHT180 provides design, application development, access to an apple developer account and cloud-based services to streamline and advance application development for affiliated faculty members. Caroline Easton’s avatar application for cognitive behavioral therapy outside the clinic was supported by PHT180 UX/UI resources and provided essential preliminary data which resulted in three proposal submissions totaling over $7.4MM, with one of these awarded at $1.3MM.

Medical Illustration

Medical Illustration students have worked on 20 large illustration projects over the last year which were used in journal articles, websites, promotional materials, videos and three journal covers for faculty Ke Du, and David Borkholder. (see opposite page)

PHT180 initiated a formal relationship with the graduate Medical Illustration program to proactively partner students with PHT180 researchers for development of their thesis portfolio. Five students have partnered with PHT180 in FY20 working on research projects that focus on scoliosis, behavioral drug intervention and therapy, back pain, CRISPR gene editing, and biomechanical imaging of a murine flexor tendon repair model.

Partner Organization

The MAGIC Center, a hub of collaborative spaces and resources at RIT, has provided computer work stations and IT support to the PHT180 student workers and co-ops. The center also provides meeting and event space to PHT180 faculty and staff.
PHT180 NETWORKING EVENTS

Healthcare Research Networking Events in FY2020

PHT180 hosts Research Vitals events that provide an informal environment for scientific exchange and networking. During FY20 PHT180 hosted 9 research vitals talks.

We hosted a major Fall event in collaboration with the VP of Research to introduce new faculty and healthcare researchers to the initiative, and to provide an opportunity to establish new research collaborations.

Fundamental to the mission of the initiative is to facilitate collaborative, interdisciplinary networks that grow the healthcare research enterprise at RIT. PHT180 proactively assists affiliated faculty in finding research collaborators to meet specific needs. This includes hosting networking events to facilitate informal interactions with internal and external researchers.
SEP 17, 2019
Quantitative Audio-Visual Sentiment Understanding for in-the-moment Emotion Modulation
Yu Kong, RIT GCCIS

OCT 1, 2019
Connecting Healthcare Technology Researchers
Ryne Raffelle, RIT OVPR

OCT 22, 2019
The Cerebrovasculature: From Pathophysiology to Modeling
Dr. Nicola Marchi, CNRS France

NOV 5, 2019
PHT180 Research Development Support
Terry Koo, RIT PHT180

NOV 19, 2019
Moving Towards Personalized Therapies for Disc-Related Back Pain
Karin Wuertz-Kozak, RIT KGCOE

DEC 3, 2020
Naval Force Health Protection and Other Research Opportunities at the Office of Naval Research
Dr. Timothy Bentley, Office of Naval Research

JAN 21, 2019
Human-Machine Interaction for Mental Health Care
Zhi (Jenny) Zheng, RIT KGCOE

FEB 4, 2020
Mitochondrial Dysfunction in Orthopedic Soft Tissues: New Insights and Opportunities for Intervention
Michelle Delco, Cornell University

FEB 18, 2020
Nonparametric Bayesian Modeling Approach and its Applications
Rui Li, RIT GCCIS

MAR 3, 2020
Ex Vivo Genome Editing as a Therapeutic Approach for Genetic Diseases
Renee Cottle, Clemson University

2020 Event Planning & Support

The Fifth Annual Effective Access Technology Conference
PHT180 helped to organize the 2020 Access Technology Conference originally planned for March 17th with Leadership team member Dan Philips.

Global Health Conference
College of Art and Design
Golden, Mary
Nae, Hye-Jin
Remington, Roger
Smith, Adam
Wood, Tim

College of Engineering Technology
Hochgraf, Clark
Li, Yangming
O’Neil, Jennifer
Rice, Brian

College of Health Sciences and Technology
Berbary, Cassandra
Doolittle, Richard
Easton, Caroline
Oliphant, John
Ornt, Daniel
Ruder, Elizabeth
Sugarman, Laurence
Trabold, Nicole
Lohse, Barbara

College of Liberal Arts
Baschnagel, Joe
Edlund, John
Godleski, Stephanie
Kothari, Ammina
Ovesdotter Alm, Cecilia
Rantanen, Esa
Stack Whitney, Kaitlyn
Worrell, Tracy

College of Science
Cahill, Nathan
Craig, Paul
Das, Moumita
Ferran, Maureen
Gleghorn, Michael
Malik, Nishant
Munoz, Laura
Schmitthenner, Hans
Skuse, Gary

Golisano College of Computing and Information Sciences
Golen, Erik
Homan, Christopher
Hu, Peizaho
Jacobs, Stephen
Kong, Yu
Li, Rui
Mkaouer, Mohamed Wiem
Oh, Tae
Reznik, Leon
Shi, Pengcheng
Wang, Linwei
Yu, Qi

PHT180 Leadership Team members are highlighted in orange
83 Affiliates

Kate Gleason College of Engineering
Abhyankar, Vinay
Borkholder, David
Broderick, Gordon
Carter, Bob
Day, Steven
Du, Ke
Fard, Nasibeh Azadeh
Gaboraski, Tom
Kolodziej, Jason
Kuhl, Michael
Lamkin Kennard, Kathleen
Liberson, Alex
Lyshevski, Sergey
Phillips, Dan
Proano, Ruben
Ptucha, Raymond
Puchades, Ivan
Rashedi, Ehsan
Richards, Michael
Tsouri, Gill
Wuertz-Kozak, Karin
Zheng, Zhi

9 Colleges

National Technical Institute for the Deaf
Behm, Gary
Samar, Vincent

Saunders College of Business
Akdevelioglu, Duygu
Bui, Quang
Hansen, Sean
Hull, Clyde
Liu, Manlu
Moriuchi, Emi
Perotti, Victor J
Tu, Qiang

External
Schwarz, Karl
Dombovy, Mary

Student Engagement

18 PhD Students
9 MS Students
15 Undergrad Students

CAD, CHST, CLA, COS, GCCIS, KGCOE, SCB

PHT180 Annual Report
The following metrics are based on people, projects, and proposals formally affiliated with PHT180 in FY20.

Total Active Projects

31 Projects
$17.3M Total Award Value
$2.37M FY20 Expenditures
New Awards in FY20

Personalized Healthcare Technology affiliated new awards total $5.19 Million.

New Proposals Submitted in FY20

54 totaling $27.4M

National Institutes of Health (NIH)
National Science Foundation (NSF)
US Department of Health and Human Services (HRSA)
New York State Department of Health (NYSDOH)
American Heart Association (AHA)
National Aeronautics and Space Administration (NASA)
Office of Naval Research
Swiss National Science Foundation
New York State Empire State Development (NYSESD)
Israel Binational Science Foundation
Personalized Healthcare Technology Affiliated Projects

Active affiliated awards in FY20 come from a diverse group of healthcare research areas and sponsors.

**FEATURED RESEARCH PROJECTS**

**REU Site: Computational Sensing**

PI: Cecilia Alm  
Co-PI: Bailey Reynold

Undergraduate researchers will be challenged to make sense of human behaviors and cognitive processes with hardware, software, and complex thinking, exploring the link between computational science, technology, and the human experience.

**Cell and Tissues Technology Laboratory**

PI: Steven Day  
Co-PI: Vinay Abhyankar, Tom Gaborski

A shared lab space for technologies related to the Life Sciences benefiting regional companies and encouraging interaction between academic researchers and the private sector.

**Fabrication of Integrated Nanopore Platform for High-Throughput Sequencing**

PI: Ke Du  
Co-PI: Yangming Li, Yunbo Zhang

Developing a nanopore based biosensor for high-throughput DNA sequencing.
Enabling Microsystem Technologies for Advanced Drug Delivery

PI: David Borkholder
Co-PI: Denis Cormier, Martin K. Anselm

Developing novel micropumps for inner ear drug delivery by determining pump parameters, functional characteristics and testing new micropumps by attenuating noise damage to the cochlea.

Rochester Partnership to Advance Research and Academic Careers in Deaf Scholars

PI: Richard Doolittle
Co-PI: Matthew Dye

RIT and NTID partner with the University of Rochester to train deaf/hard-of-hearing postdoctoral fellows from disciplines in biomedical sciences while promoting their growth as researchers and educators.

Transparent Ultrathin Nanomembranes for Barrier Cell Models and Novel Co-Culture Systems

PI: Tom Gaborski

Upgrades microscope enable researchers to study in realtime with high-resolution cellular transmigration across the endothelial barrier and three-dimensional crawling through the underlying extracellular matrix.
**Training Clinical Psychology Interns to use Evidence Based Care Models and Tele-Behavioral Health Technology to Treat OUD and SUD in Monroe County**

**PI:** Caroline Easton  
**Co-PI:** Cassandra Berbary, Cory Crane

RIT is increasing the number and quality of psychology interns who are trained to provide access to quality substance use services.

**Ultrasound elastography for non-invasive assessment of tendon healing**

**PI:** Michael Richards

Development and validation of ultrasound based elastography method to measure spatially resolved strain fields in mouse tendons.

**High Relaxivity PSMA-Targeted Contrast Agents for MRI of Prostate Cancer**

**PI:** Hans Schmitthenner  
**Co-PI:** Irene Evans, Joseph Hornak

Providing clear and definitive means of imaging prostate cancer (PCa) using magnetic resonance imaging (MRI).
Home-based videoplethysmographic detection of atrial fibrillation

PI: Gill Tsouri

This project, we will evaluate the use of non-contact video recording technology to detect the presence of AF and deliver an estimation of AF burden.

Peri-procedural transmural electrophysiological imaging of scar-related ventricular tachycardia

PI: Linwei Wang

This research will develop a new noninvasive electrical imaging system to provide an effective identification of potential ablation targets with a potential to improve the standard of care and clinical outcomes of VT ablation.

Functional role of Toll-like receptor associated microRNAs in intervertebral disc pathophysiology

PI: Karin Wuertz-Kozak

Identifying miRNA candidates that are associated with TLR2 signaling in human nucleus pulposus and annulus fibrosus cells by next generation sequencing, and establishing their functional role in DDD.
NEW RESEARCH PROJECTS

$5.19 MM in new awards for FY2020

**$68K**
Shenzhen Ruhan Gene Tech Co Ltd
PI: Ke Du
Fabrication of Integrated Nanopore Platform for High-Throughput Sequencing

**$6K**
SiPhox
PI: Ke Du
Preparation of Gold-DNA and quantum dot-DNA probes for photonic detection of SARS-CoV-2

**$5K**
UofR
PI: Ke Du
CRISPR-Cas13a Enabled Sensitive Optofluidics Platform for Zika RNA Sensing

**$10K**
Colgate Palmolive
PI: Ke Du
Bio-Fluids Movement in Biomemetic Microchannels

**$2.9M**
NIH
PI: David Borkholder
Inconspicuous Daily Monitoring to Reduce Heart Failure Hospitalizations

**$337K**
NIH/Drexel
PI: Steven Day
Multifunctional VAD Technology for High-Risk Pediatric Patients
Supplement to High Relaxivity PSMA-Targeted Contrast Agents for MRI of Prostate Cancer

A Modular Platform for the Development and Analysis of Barrier Tissue Models

Functional role of Toll-like receptor associated microRNAs in intervertebral disc pathophysiology

Training Clinical Psychology Interns to use Evidence Based Care Models and Tele-Behavioral Health Technology to Treat OUD and SUD in Monroe County
Support That Changes Lives

RIT’s PHT180 initiatives are helping create a world in which everyone can lead healthier lives. Support of PHT180 can help to change the largely unsustainable models of healthcare currently in place and move us more quickly toward better health, supporting new ways for healthcare providers to treat patients, improving outcomes, and creating a higher quality of life.

Harnessing RIT’s Specific Expertise Will Drive Success

Support of RIT’s PHT180 initiatives is the key to addressing the wide-ranging opportunities in health diagnosis and treatment. Investments in this area will make it possible for RIT to harness the unique expertise of our university: design, engineering, data analytics, computing and technology, behavioral health and healthcare systems.

The impact potential of this signature research is immeasurable. Through generous support of PHT180, RIT will be able to:

- Help to dramatically reduce the cost of healthcare
- Discover, invent, and produce life-changing health technologies and systems
- Create new companies that will alter economic and personal health landscapes
- Enable populations across the globe – both economically marginalized and geographically removed – to access healthcare that is currently unavailable to them
ENDOWED PROFESSORSHIPS

Outstanding faculty members are a key element to research quality. For PHT180, they bring much needed research reputations, help to establish RIT’s stature in the field, and attract the graduate degree candidates critical for research success. Demand for outstanding faculty members in technology-driven fields is fierce, and endowed professorships help to recruit top faculty to RIT.

UNDERGRADUATE STUDENT RESEARCH

In addition to driving new knowledge, research at RIT provides experience for undergraduate students pursuing research-intensive careers and graduate school admission. RIT brings undergraduates into advanced research projects as full members of the team so they may grow as scientists and build a published research portfolio. Few universities other than RIT expose undergraduate students to this level of research work.

GRADUATE STUDENT RESEARCH

Graduate students are essential to research teams in PHT180, and the research opportunities afforded them to have a tremendous impact on the overall quality of the initiative. In addition, graduate research helps to drive new knowledge and academic quality into the undergraduate programs that are connected to PHT180. A strong graduate research program, with support for affiliated research projects is critical to attracting highly-qualified master’s and Ph.D. students to RIT.

DIRECT RESEARCH SUPPORT

PHT180 research projects have a wide impact range. Supporters have the opportunity to drive new knowledge and problem solving in areas that matter to them by funding research initiatives in specific areas. Investments in the research programs of specific PHT180 faculty can support that researcher’s achievements, or a supporter may choose to establish a research fund with defined parameters for a specific discipline or industry issue.

POST-DOCTORAL FELLOWS

Post-doc fellowships are the front door to a research career, and an important part of the PHT180 initiative. Postdoctoral work creates domain experts that are able to apply what they’ve learned to identify and solve new problems in healthcare technology and systems. Like faculty members, post-doctoral fellows are in high demand, competitive research support packages are an important part of bringing the best to RIT.
PHT180 is a great platform to elevate the research of the faculty members at RIT. The mentors and grant editor are willing to spend time helping me to polish my research proposals. PHT180 is helping faculty members to design the schematics in manuscripts and grant proposals. With this great support, some of our works at RIT have been selected as cover stories by top international journals such as ACS Sensor, ACS Infectious Diseases, ACS Applied Materials & Interfaces, and Advanced Functional Materials and are widely covered by media such as Yahoo, Science Daily, EurekAlert!, and RIT News.

Ke Du
Assistant Professor, KGCOE

When I began working at RIT in fall 2019, PHT180 not only helped me to create a professional website to display my research internally and externally, it has also supported me in creating outreach material for back pain patients. Furthermore, knowing little about the US funding system upon my arrival, PHT180 has guided me through the application process and has been crucial in being able to submit several grant proposals.

Karin Wuertz-Kozak
Professor, KGCOE

The PHT180 team provides dedicated mentorship for my healthcare-based research. From website design and administrative support to assisting with identifying and writing grants their expertise is invaluable. My affiliation with PHT 180 helps in making interdisciplinary connections on campus and provides access to unique funding opportunities to support my scholarly agendas.

Mary Golden
Assistant Professor, CAD

PHT180 was my first job as a medical illustrator/ graphic designer and was a great platform for me to understand how to work more efficiently and professionally. Many of my artworks were published in research journals and as cover art, which was an exciting and unique experience for me. Getting my works noticed on social media helps me to build a stronger portfolio/ resume. It has been a very cool experience to work with students and professors from different programs at RIT. I was so inspired by an interesting research topic with a professor that I ended up using the topic for my graduate thesis.

Wenrong He
MFA Student, Medical Illustration

PHT180 was my first job as a medical illustrator/ graphic designer and was a great platform for me to understand how to work more efficiently and professionally. Many of my artworks were published in research journals and as cover art, which was an exciting and unique experience for me. Getting my works noticed on social media helps me to build a stronger portfolio/ resume. It has been a very cool experience to work with students and professors from different programs at RIT. I was so inspired by an interesting research topic with a professor that I ended up using the topic for my graduate thesis.
Access Technology

https://doi.org/10.1145/3334480.3375217

https://doi.org/10.1145/3308561.3354627

Artificial Intelligence

https://doi.org/10.3390/s20123600


https://doi.org/10.1016/j.media.2020.101670

https://doi.org/10.1109/ICDM.2019.00127

https://doi.org/10.1007/978-3-030-32226-7_85

https://doi.org/10.1109/TBME.2019.2939138

Behavioral Health

https://doi.org/10.1007/s42844-020-00007-5

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7252070/

https://doi.org/10.1186/s40814-020-00580-7

https://doi.org/10.1037/dev0000793


Biomedical micro/nano technologies


Allahyari, Z., Casillo, S., Perry, S., Peredo, A., & Gaborski, T. “Disrupted Surfaces Reduce Nuclear YAP Localization through Diminished Cell Spreading in ADSCs” Biomedical Engineering Society (BMES) annual meeting, Philadelphia, PA, Oct. 2019


Biophysics


Cardiovascular Health


Healthcare Systems and Bioinformatics


**Mobile Health**

[https://doi.org/10.1093/jamia/ocaa029](https://doi.org/10.1093/jamia/ocaa029)

[https://doi.org/10.3390/mi11070648](https://doi.org/10.3390/mi11070648)

[https://doi.org/10.1101/2020.05.26.116863](https://doi.org/10.1101/2020.05.26.116863)


**Social and Human Computing**

[https://doi.org/10.1186/s12245-020-00286-w](https://doi.org/10.1186/s12245-020-00286-w)


[https://doi.org/10.1145/3351529.3360663](https://doi.org/10.1145/3351529.3360663)
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