DATA SCIENCE FELLOWSHIP

Through Our Big Data Scientist Training Enhancement Program

Improving Patient Care Through Data Science

The Big Data Scientist Training Enhancement Program (BD-STEP) is a two-year fellowship opportunity offered through the National Cancer Institute (NCI) and the Veterans Health Administration (VHA) that uses data science to advance cancer research and patient care. Competitively selected postdoctoral fellows are placed in four VA medical centers across the country to work with clinicians and interdisciplinary researchers to address important patient-centered health challenges. Fellows have the unique opportunity to utilize the extensive VA health data infrastructure while gaining valuable exposure to the clinical environment.

BD-STEP is accepting applications for the next cohort of data science fellows

The complexity of oncology makes it a prime field for data-driven research projects with the potential to greatly improve patient care. Collaboration between NCI and VHA has provided an avenue to access rich, diverse cancer data resources, including diagnosis and treatment information from the VA Central Cancer Registry and longitudinal, clinical data from the VA's national healthcare system. The combination of data access, academic mentorship, and clinical guidance allows fellows to formulate and address clinically important questions in cancer research.

IMPROVE CARE FOR OUR VETERANS WHILE YOU ENHANCE YOUR DATA SCIENCE SKILLS

Why Apply?

BD-STEP fellows use data science to improve outcomes for cancer patients. The program offers aspiring healthcare data scientists access to unparalleled longitudinal datasets including diagnosis, treatment, molecular, and clinical information for large and diverse patient populations. BD-STEP fellows utilize these data to pursue important research questions, improving basic understanding of cancer while also improving clinical care. Over the course of their research, fellows receive mentorship from both academic and clinical advisors and leverage their VA and NCI/NIH connections to network with healthcare and data science experts across government, academia, and industry. This equips BD-STEP graduates with the diverse skillsets they need to pursue careers in healthcare data science.

Who is Eligible?

Applicants must meet all 3 criteria:

1. POSTDOCTORAL RESEARCHERS
Applicants must have obtained a PhD in engineering, computer science, physical science, or other related disciplines, including:

- Engineering disciplines
- Computer Science
- Mathematics
- Physics
- Chemistry

2. COMPUTATIONAL SCIENTISTS
In addition to a history of collaboration and teamwork with strong communication skills, applicants must have:

- Experience in bioinformatics, modeling, or management of large data sets
- Strong background in advanced mathematics and statistics
- Proficiency in at least one programming language

3. US CITIZENS
Applicants must be US citizens to be hired within a VA facility. Non-citizens are also encouraged to apply, but are not eligible for VA stipend support.

What is Needed?

- Curriculum Vitae (CV)
- Brief statement of interest (no more than one page) to include proposed research areas/topics
- Letter of support from academic mentor
- Rank order of BD-STEP sites: Boston, MA; Durham, NC; Houston, TX; and Palo Alto, CA

Note:

Enrolled fellows are hired by the VA with locality-adjusted stipends and benefits.

Questions?

FOR MORE INFORMATION ABOUT THE PROGRAM, CONTACT:

Frank Meng, PhD
BD-STEP Program Director, VHA
frank.meng2@va.gov

Michelle Berny-Lang, PhD
Program Director, NCI Center for Strategic Scientific Initiatives
michelle.berny-lang@nih.gov

LEARN MORE ONLINE:

www.va.gov/oaa/specialfellows/programs/sf_bdstep.asp
https://cssi.cancer.gov/bd-step

Now Accepting Applications!

SUBMIT TO:

service.cancer.gov/bd-step

Accepting applications on a rolling basis, with cohorts to launch annually in October.

THE BIG DATA SCIENTIST TRAINING ENHANCEMENT PROGRAM

Developing the Next Generation of Healthcare Data Scientists

MISSION

BD-STEP

The Big Data Scientist Training Enhancement Program (BD-STEP) is a two-year fellowship program that uses data science to advance cancer research and patient care. A Veterans Health Administration (VHA) advanced fellowship launched in 2015 in collaboration with the National Cancer Institute (NCI), the program provides well-rounded training and unparalleled access to VA data resources and NCI cancer research expertise. Competitively selected postdoctoral fellows work with VA clinicians and cancer researchers to gain valuable clinical exposure and oncology domain knowledge. Fellows use comprehensive health data to pursue patient-centered research questions, improving basic understanding of cancer while also improving clinical care for Veterans.

PARTNERSHIP

VHA

The mission of the VHA is to honor America's Veterans by providing exceptional health care that improves their health and well-being. BD-STEP connects talented early career data scientists with VA researchers and clinicians to advance healthcare for our Veterans. Through clinically-oriented operational projects and research that harnesses the VA's big data resources, fellows' research projects can inform healthcare administrators and empower clinicians to translate findings to improve patient care. VHA provides program leadership, VA Medical Center oversight, and fellow salaries and benefits for BD-STEP.

NCI

NCI leads, conducts, and supports cancer research across the nation to advance scientific knowledge and help all people live longer, healthier lives. NCI's charge to support workforce development includes training and mentoring the next generation of cancer researchers. The development of data scientists in oncology is particularly important to harness the massive generation of data across the cancer continuum and answer fundamental questions in cancer research and care. Research guidance and support for BD-STEP fellow travel, training, and curriculum development are provided by the NCI Center for Strategic Scientific Initiatives.

BD-STEP and the Value of the VA Health Data

The Big Data Scientist Training Enhancement Program (BD-STEP) was launched in 2015 to train the next generation of healthcare data scientists capable of interpreting and gaining insights from large clinical datasets.

The Veterans Health Administration (VHA) is America's largest integrated healthcare system, providing care at 1,250 health care facilities and serving 9 million enrolled Veterans each year. The long-term care Veterans receive within this centralized healthcare system provides a rich source of longitudinal patient data—covering patients through periods of health and illness. This is unique to the VHA, as the care patients receive in other US healthcare organizations is often fragmented among different clinical sites, making it difficult to obtain a complete patient profile through the aggregation of medical records.

Within the integrated VA healthcare system, there are many untapped opportunities to gain insights from patient data to advance cancer research and care. BD-STEP provides an avenue to access the rich, diverse data available in the VA Electronic Health Record (EHR), including longitudinal clinical patient data and diagnosis and treatment information from the VA Central Cancer Registry. BD-STEP utilizes the expertise of early-career data scientists to analyze these data and facilitate the execution of large-scale system changes in clinical care.

Fellows are placed in four VA medical centers across the country to work with clinicians and interdisciplinary researchers to address important patient-centered health challenges. The sites are guided by an advisory council with VHA and NCI membership, including the NCI's Center for Strategic Scientific Initiatives, Center for Cancer Training, and Center for Biomedical Informatics and Information Technology.

Over the course of their research, fellows network with healthcare and data science experts across government, industry, and academia. They receive research mentorship from VA healthcare providers and academic researchers and curriculum oversight by VHA and NCI program leadership. This equips BD-STEP graduates with the skills and connections they need to pursue careers in healthcare data science after graduation.

Since the launch of the program, BD-STEP fellows have initiated diverse studies using VA healthcare data resources. These including predicting hepatocellular carcinoma in hepatitis C patients using a cohort of more than 180,000 Veterans, comparing frailty assessment via clinical teams and machine learning to predict mortality in patients with congestive heart failure, and characterizating dynamic biological changes associated with prostate cancer progression in obese patients.

Data from America's largest integrated healthcare system

Fellowship Milestones

● **APPOINTMENT**
Fellows are appointed to selected VA medical centers across the country.

● **TRAINING**
Fellows learn how to access and navigate the VA data and shadow clinicians to understand real-world needs and the clinical environment.

● **COLLABORATIVE RESEARCH**
Fellows work with academic and clinical advisors to develop and address important cancer research questions.

● **CAREER LAUNCH**
Fellows continue in careers at the intersection of big data and health.

● **IMPACT ON RESEARCH & CARE**
Research outcomes are published and projects are continued in NCI-supported academic institutions and VA medical centers, advancing cancer research and improving care.

Profile of a BD-STEP Graduate

Fellows who graduate from the program are more than data scientists; they are interdisciplinary researchers who use data science to make a difference in patient care. Fellows use computer science and mathematics to gain insights from healthcare data and solve real-world clinical cancer problems, launching their careers in healthcare data science. Connections made during BD-STEP last beyond the end of the fellowship, providing a network of support and collaboration for early-career scientists.

HEALTHCARE DATA · COMPUTER SCIENCE · CANCER RESEARCH & CARE · MATHEMATICS & STATISTICS
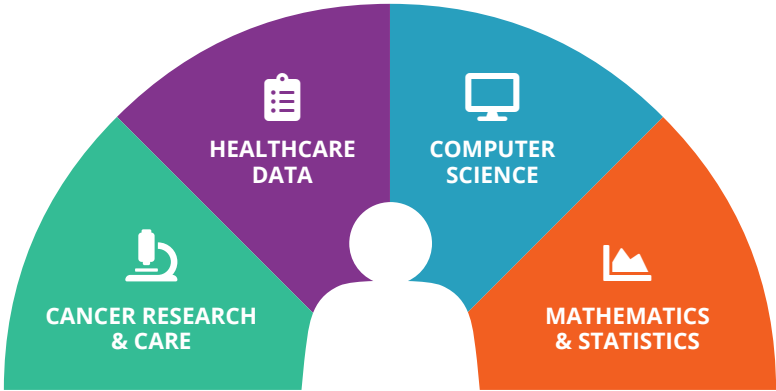
CONTACT INFORMATION:

Frank Meng, PhD
BD-STEP Program Director, VHA
frank.meng2@va.gov

Michelle Berny-Lang, PhD
Program Director, NCI Center for Strategic Scientific Initiatives
michelle.berny-lang@nih.gov

BD-STEP Network: Fiscal Year 2020

Seattle
Boston
Buffalo
Palo Alto
Washington, D.C.
Durham
Houston

33 FELLOWS ACROSS **4** COHORTS

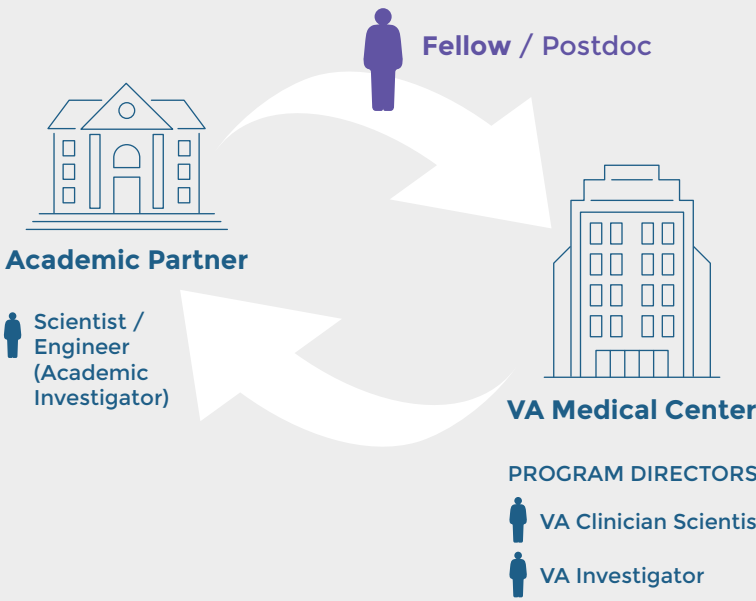● Former BD-STEP sites
● Current BD-STEP sites
● Program administration site

Applicant Backgrounds

Fellows come from diverse academic and research backgrounds in fields including:

● **MATHEMATICS**
● **ENGINEERING**
● **COMPUTER SCIENCE**
● **INFORMATICS**
● **CHEMISTRY**
● **PHYSICS**

Fellow / Postdoc

Academic Partner
Scientist / Engineer (Academic Investigator)

VA Medical Center

PROGRAM DIRECTORS:
VA Clinician Scientist
VA Investigator

HOW OUR FELLOWS HAVE BENEFITED

"BD-STEP allows clinicians and researchers to solve real-world problems with an immediate impact on our nation's Veterans. Using my education to help others is one of the greatest career successes that I could have ever asked for."

JEREMY MASON
Assistant Professor of Research Urology, Keck School of Medicine, University of Southern California / Class of 2016 / Modeling Liver Disease Progression

"I developed skills in machine learning, data analytics, and statistics, and enhanced my healthcare domain knowledge through collaboration with VA physicians. The data is incredibly extensive and there is still so much to learn."

JOANNA SYLMAN
Data Scientist – Analytics, Komodo Health / Class of 2018 / Changes Associated with Prostate Cancer Progression in Obese Patients

"Through BD-STEP, I learned the role of advanced data analysis in the setting of a nationwide healthcare system and accessed the VA's large real-world healthcare datasets."

NATHANAEL FILLMORE
Associate Director for Machine Learning and Predictive Analytics, VA; Instructor in Medicine, Harvard Medical School / Class of 2017 / Clinical and Genomic Factors of Multiple Myeloma Progression

"The experience I gained from BD-STEP allowed me to move into a career with a true impact on the care that Veteran patients receive."

HANNAH GELMAN
Research Health Science Specialist, VA / Class of 2018 / Using MVP data to assess genotype-guided Warfarin dosing algorithms

"I have the privilege to work with the largest electronic health record in the United States to build my future career."

JAVAD RAZJOUYAN
BD-STEP Fellow / Class of 2019 / Assessing Frailty to Predict Mortality in Patients with Congestive Heart Failure

"BD-STEP connected me with leaders in clinical care at the VA, which led to my current VA position. It's fulfilling to use my career to bring cutting-edge treatments to Veterans nationwide."

BRADLEY HINTZE
Data Scientist, National Oncology Program, VA / Class of 2017 / Data infrastructure for precision oncology

FOR MORE INFORMATION VISIT:
cssi.cancer.gov/bd-step and *va.gov/oaa/specialfellows/programs/sf_bdstep.asp*