OMB No. 0925-0001 and 0925-0002 (Rev. 10/2021 Approved Through 01/31/2026)

# BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person.

NAME: Ilona Fridman

eRA COMMONS USER NAME (credential, e.g., agency login): I_Fridman

POSITION TITLE: Assistant Member in Center for Discovery & Innovation at Hackensack Meridian Health, Assistant Professor of Medical Sciences, Hackensack Meridian School of Medicine; Assistant Professor of Oncology, Georgetown University School of Medicine, Georgetown Lombardi Comprehensive Cancer Center

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, including postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE *(if applicable)* | Completion Date MM/YYYY | FIELD OF STUDY |
|---|---|---|---|
| Saint Petersburg State University, Russia | B.A, M.A. | 2003 | Engineering |
| Brooklyn College School of Natural and Behavioral Sciences<br>City University of New York | M.A. | 2010 | Organizational Psychology |
| Columbia Business School<br>New York | Ph.D. | 2017 | Management and decision science |

## A. **Personal Statement**

As a health communication researcher and decision scientist, I am a passionate advocate for health communication that empowers informed decisions and enables high-quality equitable patient care. My career purpose is to provide solutions to public health problems by designing interventions that improve communication between patients and the healthcare system. My engineering education allowed me to acquire quantitative skills for advanced data analysis, while my graduate education in psychology and management equipped me well with theoretical knowledge of decision-making. This expertise applied to oncology care resulted in a strong research portfolio that includes the following contributions: a) Developing and testing a theoretical framework to understand and guide complex conversations between healthcare providers and patients during clinical encounters, b) Implementing an automated text analysis to identify systemic biases in decision-making during clinical consultations, and c) Developing a digital decision-support tool for patients with early-stage breast cancer to reduce overtreatment. I have authored over two dozen of publications, of which two-thirds I served as the first author. My work has been accepted into high-impact journals such as JAMA Oncology, Health Psychology, JMIR Public Health, and Surveillance. The latest project related to health misinformation was selected for a podium presentation at the Academy Health Research conference. I received prior funding from both internal and external agencies: T32 Cancer Care Quality Training Program (NIH), DukeDataPlus Program (2018), and the UNC NC TraCS pilot research award (2022).

Studying healthcare communication for almost 15 years, I have observed that patients' decisions and well-being are strongly associated with the type and quality of health information they receive. In the current era of digital health information, two-thirds of patients receive information not only from their clinicians but also from many different sources of various credibility, according to the National Trends Survey conducted by NCI. In my previous research, I found that respondents who trusted sources with a high prevalence of misinformation had less accurate knowledge and were less likely to adhere to recommended behavior to protect their health. As a health communication researcher, I have the analytical skills and theoretical knowledge to help patients make informed decisions in the current era of publicly available health information of various qualities. In my previous funded project (K22), I proposed a multilevel intervention to address cancer misinformation around complementary and alternative therapy.

**Ongoing and recently completed projects that I would like to highlight include:**

## Current Active

Agency: National Cancer Institute
Identifying Number: 1K22CA288932-01
Title of Project: Cancer Misinformation and Use of Complementary and Alternative Therapy (CAM) among Patients with Cancer
Dates of Project Period: 4/1/2024-3/31/2027
Role on Project: Principal Investigator
Percent Effort:75%

## Completed

Agency: Genentech Corporation
Title: Identifying Opportunities to Pursue Equity When Implementing Virtual Visits in Oncology Care
Dates of Project Period: 01/01/21-12/31/23
Primary Investigator: Jennifer Elston Lafata, Ph.D
Role Project: Postdoctoral researcher
Description: Designing recruitment materials, developing analytical databased merging survey with HER data, data analysis, conceptualizing and manuscript writing
Percent Effort: 5%

Agency: National Cancer Institute
Identifying Number: T32CA116339-16
Title of Project: Cancer Care Quality Training Program
Dates of Project Period:8/1/2021-7/30/2022
Corresponding PI: Ethan Basch, MD
Role: Trainee
Description: This funding allowed me to develop a novel research program that focuses on digital cancer information and misinformation. In two years, I have developed my research program that focuses on the digital health information and misinformation that patients discover beyond clinical settings and use it to make treatment decisions about cancer. I secured internal funding to support my research program and secured the Transitional Career Award K-22 at the National Cancer Institute.

Agency: North Carolina Translational and Clinical Science Institute
Title of Project: Empowering patients to evaluate online health misinformation related to prostate cancer.
Dates of Project Period: 7/1/2022-6/31/2023
Role on Project: Principal Investigator
Total Direct Costs over all years of award: $2000

Agency: Dule Data Plus Program, Duke University
Title of Project: Complex Decisions, Real Numbers: Medical Decision-Making
Dates of Project Period: 5/31/2018-7/31/2018
Role on Project: Co-Principal Investigator with Dr.Ryser
Total Direct Costs over all years of award: supported salary of 3 full-time computer science students

Agency: National Cancer Institute
Identifying Number: R00CA207872
Title of Project: The Mathematics of Breast Cancer Overtreatment: Improving Treatment Choice through Effective Communication of Personalized Cancer Risk
Dates of Project Period: 2016-2020
Principle Investigator: Marc D. Ryser
Role in the project: Postdoctoral Researcher
Description: Conducted systematic literature reviews; developed the content for the sections of the decisions support tool; conceptualized qualitative study and assisted with analysis and data interpretation. Conceptualized usability testing, developed materials, analyzed the results, developed the manuscript; Participated in conceptualizing and planning randomized control trial.

Percent Effort: 50%

Agency: National Institute of Allergy and Infectious Diseases
Identifying Number: R01AI114617
Title of Project: HIV cure studies: risk, risk perception, and ethics
Dates of Project Period: 2016-2018
Principle Investigator: Nir Eyal
Role in the project: Postdoctoral Researcher
Description: Conceptualized the project, developed the survey, analyzed the data, conceptualized and write the manuscripts.
Effort: 5%

### B. Positions, Scientific Appointments, & Honors

| | |
|---|---|
| 2024 - | Assistant Member Scientist at the Center for Discovery and Innovation (CDI) and in the Cancer Prevention, Precision & Control Institute (CPPCI), Assistant Professor at Georgetown University at Lombardi Comprehensive Cancer Center |
| 2021- 2024 | Postdoctoral Fellow, Cancer Care Quality Training Program (CCQTP), Lineberger Comprehensive Cancer Center, UNC Chapel Hill |
| 2020-2021 | Project Director, Capstone Course Masters Student, Duke University |
| 2017-2021 | Postdoctoral Fellow, Center for Health Policy, Duke University |
| 2013-2016 | Research Volunteer, Memorial Sloan Kettering Cancer Center |
| 2009-2011 | RA, Management Department Columbia Business School |
| 2010-2010 | RA, Psychology Department Columbia University |
| 2009-2010 | RA, OBGYN Department, Maimonides Medical Center, New York |
| 2009-2010 | Intern, AIM-Strategies Consulting, New York |
| 2006-2008 | Director of Business Development, Panoramik (digital solutions), Russia |
| 2003-2005 | PR Manager, KNAUF (Production of construction materials), Russia |

### Honors & Awards

| | |
|---|---|
| 2022 | Travel Award, Lineberger Comprehensive Cancer Center, UNC-CH |
| 2020 | Cope Duke Library grant for open-access publication |
| 2014 | Deming Doctoral Research Fellowship Recipient |
| 2011 | Doctoral Program Fellowship, Columbia Business School |
| 2009 | Marge Magner Internship Honoraria |
| 2009 | SHRM HR Internship Scholarship |
| 2008 | Brooklyn College University Scholarship |

### C. Contributions to Science

1. *Health Communication Theory*: Information Framing to Palliative Care Practice. In my dissertation, I applied principles of information framing theory to address the issue of overtreatment in patients with advanced cancer. These patients often undergo burdensome cancer treatments that result in significant side effects without providing therapeutic benefits. The palliative care team at Memorial Sloan Kettering Cancer Center sought to optimize consultations for patients with advanced cancer. To achieve this, I proposed a revision of the information framing theory and developed a novel approach to conversations that patients might find frightening or unpleasant. Collaborating with a team of physicians and behavioral scientists, I conducted a series of experiments using hypothetical scenarios involving volunteers and patients with cancer to test the effectiveness of the framework. Our work marked an important application of information framing theory to palliative care consultations, aiming to enhance informed decision-making. The research yielded theoretically grounded recommendations for physicians when consulting about discontinuing cancer-directed treatment for patients with advanced cancer. Enhanced consultations in this area are crucial in reducing overtreatment among patients with advanced cancer. These recommendations gained recognition from medical experts and were published in reputable journals, including JAMA Oncology and the Journal of Pain and Symptom Management. Moreover, our work received the esteemed Columbia Deming Cup (student) award for its application of a theory-grounded approach to a practical problem.

   a. **Fridman I,** Higgins E. Regulatory focus and regulatory fit in health messaging. In: Oxford Research Encyclopedia of Communication [Internet] Online: Oxford Research Encyclopedia; 2017.

b. **Fridman I**, Scherr KA, Glare PA, Higgins ET. Using a Non-Fit Message Helps to De-Intensify Negative Reactions to Tough Advice. Pers Soc Psychol Bull. 2016 Aug;42(8):1025-44. doi: 10.1177/0146167216649931. PMCID: PMC5610136.
c. **Fridman I**, Epstein AS, Higgins ET. Appropriate Use of Psychology in Patient-Physician Communication: Influencing Wisely. JAMA Oncol. 2015 Sep;1(6):725-6. doi: 10.1001/jamaoncol.2015.0980. PMID: 26181519.
d. **Fridman I**, Glare PA, Stabler SM, Epstein AS, Wiesenthal A, Leblanc TW, Higgins ET. Information Framing Reduces Initial Negative Attitudes in Cancer Patients' Decisions About Hospice Care. J Pain Symptom Manage. 2018 Jun;55(6):1540-1545. doi: 10.1016/j.jpainsymman.2018.02.010. PMCID: PMC8725201.

2. *Influence of Framing in Health Communication on Patient Choices.* In my postdoctoral work in Duke University, I continued to focus on health communications and proposed a big data approach to the analysis of clinical transcripts in the context of patient-physician consultations related to treatment decisions for early-stage prostate cancer. This work was built on the innovations developed in my dissertation. To carry out the analysis of the transcribed clinical conversations, I completed data science coursework and successfully secured funds from Duke DataPlus. This award allowed me to collaborate with a team of computer scientists. Using advanced language analysis, we examined whether physicians choose to present outcomes focusing on cancer progression and death (loss outcome) versus cancer cure and survival (gain outcome) and whether their choice may sway the opinion of patients toward treatment or active surveillance for early-stage prostate cancer. We discovered that patient preferences for immediate treatment (versus active surveillance) were associated with physicians' use of language emphasizing loss outcomes, rather than gain outcomes. Based on this work we proposed specific recommendations for physicians on how to enhance consultations for preference-sensitive choices, based on our findings. Overall, this research made notable contributions to the field of health communications and decision-making, shedding light on the impact of gain-loss framing in conversations on patient preferences and providing practical guidance for healthcare professionals. This work was recognized by experts in behavioral science and clinical professionals, as evidenced by its presentation at both the Society of Personality and Social Psychology conference and the Society of Medical Decision Making conference in 2019. Our results were published in interdisciplinary Journals, such as the Journal of Behavioral Medicine and Health Psychology.

a. **Fridman I,** Fagerlin A, Scherr KA, Scherer LD, Huffstetler H, Ubel PA. Gain-loss framing and patients' decisions: a linguistic examination of information framing in physician-patient conversations. J Behav. Med. 2021 Feb;44(1):38-52. doi: 10.1007/s10865-020-00171-0. PMID: 32725580.
b. **Fridman I**, Kumaresan V, Vijendra P, Seshadri P, Garland S, Kim G, Fagerlin A, Ubel PA, Ryser MD. Information Processing and Patient Decision Making: A Big Data Approach to Treatment Choice in Prostate Cancer Patients. In 41st Annual Meeting of the Society for Medical Decision Making 2019 Oct 22. SMDM.

3. *Health Communication and Decision Support Tool*. The overarching goal of this project was to develop a decision support tool that informed patients about the risks and benefits of treatment for early-stage breast cancer - ductal carcinoma in situ (DCIS) - and introduced active monitoring as a novel treatment option for DCIS. At the time of the study, the majority of women with DCIS underwent definitive surgery. However, 70-90% of them would not have experienced DCIS progression in their lifetime without surgery. Physicians and researchers were concerned that patients were overtreated and proposed treating eligible patients with active monitoring instead of immediate surgery. Patients who chose active monitoring did not receive surgical treatments unless regularly scheduled tests showed the progression of DCIS. While scientific evidence from clinical trials was yet to arrive, observational studies showed comparable outcomes for surgery and active monitoring. We hypothesized that women who received comprehensive information about treatment options would be more open to choosing active monitoring and, as a result, would avoid side effects associated with surgical options. My role was to interpret the predictive models based on epidemiological data (developed by Dr. Ryser) and present the risks in a patient-facing decision-support tool. I led and implemented comprehensive literature reviews, developed qualitative content, planned, oversaw, and analyzed usability testing studies. Additionally, we designed and implemented a randomized control trial to test the tool with women attending breast cancer clinics for a mammogram. This decision support tool is the first to provide comprehensive information about active monitoring as an alternative to surgical options for DCIS. This work represents an important step towards reducing overtreatment among women diagnosed with DCIS. It has gained recognition from medical professionals, was

presented at the Society of Medical Decision Making conference in 2020, and has been published in the Breast Cancer Research and Treatment Journal.

   a. **Fridman I,** Chan L, Thomas J, Fish LJ, Falkovic M, Brioux J, Hunter N, Ryser DH, Hwang ES, Pollak KI, Weinfurt KP, Ryser MD. A web-based personalized decision support tool for patients diagnosed with ductal carcinoma in situ: development, content evaluation, and usability testing. Breast Cancer Res Treat. 2022 Apr;192(3):517-527. doi: 10.1007/s10549-022-06512-8. PMID: 35107714.

4. *Cancer Misinformation.* The surge in publicly shared health information presents new opportunities and challenges for patients. The abundance of both accurate and inaccurate information complicates patients' ability to make informed choices, with inaccurate health information (or misinformation) representing a significant barrier. Studies indicate up to 30% of social media posts about cancer provide inaccurate or false medical information, with rates even higher for common cancers like prostate (70%) and breast (51%). To aid patients in navigating digital health information, I secured a competitive pilot grant from the North Carolina Translational and Clinical Science to explore cancer misinformation in depth. I assembled a team of computer scientists, physicians, and Ph.D. students to conduct a systematic literature review, extracted Twitter data, and performed natural language processing analysis. The results summarized the types, prevalence, and characteristics of cancer misinformation. We also identified observable characteristics of misinformation that will inform the content of educational materials for patients, helping them identify misinformation and navigate publicly available health information. The results received an enthusiastic reception at the Academy Health podium presentation in 2023. The misinformation framework was published in JMIR Medical Education in 2023 (a), with a manuscript currently under review. This work lays a foundation for future interventions aiming to support patients in the digital era of health information and misinformation.

   a. **Fridman I,** Johnson S, Elston Lafata J. Health Information and Misinformation: A Framework to Guide Research and Practice. JMIR Med Educ. 2023 Jun 7;9:e38687. doi: 10.2196/38687. PMID: 37285192; PMCID: PMC10285617.
   b. **Fridman I,** Boyles D, Chheda R, Wang Z, Baldwin-SoRelle C, Smith A, Elston Lafata J. Identifying User-Friendly Linguistic Characteristics for Detecting Cancer Misinformation on Social Media. (Under Review in JMIR Infodemic)

5. *Patient-physician communication about cancer misinformation.* To translate theoretical work on cancer misinformation into practical interventions, I explored patients' opportunities to validate the information they find outside of clinics. Specifically, we examined patients' experiences when they discuss information from non-clinical sources with their healthcare providers. We recruited individuals living with cancer from online forums. Our survey showed that around 37% of participants had negative experiences, including instances where their providers dismissed them or judged them negatively. Additionally, we conducted an experiment involving the same cohort of patients and presented them with three hypothetical scenarios where a provider disagreed with information from non-clinical sources. Participants' evaluations of the provider's trustworthiness did not differ between the scenarios, in which a provider dismissed the information and the scenario in which a provider shared scientific information. Patients evaluated a provider as significantly more trustworthy if the provider incorporated relationship-building elements alongside scientific explanations. The relationship-building elements included acknowledging the information and assuring the patient of their ongoing support regardless of the patient's decision. This study represents the first experimental evidence outlining patients' positive perspectives regarding provider communication strategies when providers needed to disagree with patient-identified information. Currently, this research is under consideration for publication in JCO Oncology Practice.

   a. **Fridman,** I., Smith, C., Barrett, A., Johnson, S., Bhowmick, A., Hayes, S., & Lafata, J. E. Navigating Disagreements on Health Information: How Cancer Patients Perceive Healthcare Providers' Approaches to Discussing Information from Non-Clinical Sources (Under Review in JCO Oncology Practice)

**Complete List of Published Work in MyBibliography:**
https://www.ncbi.nlm.nih.gov/myncbi/ilona.fridman.1/bibliography/public/