BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
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NAME Elena N. Naumova	POSITION TITLE Professor
eRA COMMONS USER NAME (credential, e.g., agency login) ENAUMOVA	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
State Technical University, Novosibirsk, Russia	MS	1982	Statistics
State Technical University, Novosibirsk, Russia	Ph.D.	1988	Appl. Math /Statistics
Bauman Technical University, Moscow, Russia		1989	Computer Sciences

A. Personal Statement

For the proposed application I will develop, test and implement mathematical and statistical modeling and conduct statistical analysis, I will devise study design, facilitate proper medical record abstraction to design "virtual cohort," and oversee the development and implementation of data quality assessment. I have recently joined the Tufts University School of Engineering to establish the Biostatistical Core to facilitate and spearhead innovative interdisciplinary research projects. I have served as a project leader on a number of large studies, funded by NIAID, NIEHS, CDC and EPA and have a long history of productive collaboration with the investigators of this project that has resulted in numerous publications. As a member of editorial board for Landes Bioscience Journal *Self/NonSelf: Immune Recognition and Signaling* I value the high data quality and the high standards for analytical work produced by Dr. Gorski and his team. My primary area of expertise is in modeling of transient processes with application in immunology, ecology and epidemiology of infectious diseases, and studies of aging. I have developed innovative analytical and computational tools to monitor and assess spatio-temporal processes of flu transmission and the intricate relationships between manifestation of infection at a population level and the development of immune memory at an individual level. I am highly proficient with various specialized mathematical, statistical and mapping software, including MATLAB, SAS, S+, and ArcGIS and have an outstanding record of compiling and utilizing multi-sourced databases such as vital and hospitalization records, including Centers for Medicare and Medicaid Services and U.S. Census databases. As a Director of the NIH-sponsored Tufts Initiative for Forecasting and Modeling of Infectious Diseases (InForMID), I have set up workshops and training programs to support field research and analytical assessment of research data. For this study, InForMID will provide a platform for training the doctoral students. My experience in mentoring graduate students will be important for selecting and guiding students' projects relevant to the study. For over a decade I have served on NIH review panels, editorial boards of scientific journals, including the *Journal of Public Health Policy* (Statistical Editor) and the Tufts Medical Center/Tufts University Institutional Review Board, where I help to shape and implement institutional policies on data sharing and management, data quality assurance and information security. I will devote time to develop the data sharing and monitoring plan for this project. I have over 20 years of productive research in biostatistics and epidemiology and the impact of my work is demonstrated by wide media coverage in the USA and abroad. My expertise in modeling immunosenescence and immune response to infections, coupled with my established relationship with the members of the research team, will ensure successful implementation of the proposed study.

B. Positions, Honors and Experience
Positions and Employment
1982-1991   Senior investigator (1988-1991), Staff investigators (1982-1988, Mathematical Modeling and Statistical Processing Laboratory, Department of Epidemiology and Immunology. Institute of Clinical Immunology. USSR Academy of Medical Sciences. Novosibirsk, RUSSIA

1991-1992   Chief, Department of Information and Analysis, Division of Epidemiology and Statistics, Institute of Pathology of Blood Circulation Ministry of Public Health, Novosibirsk, RUSSIA
1993-1997   Research Associate, Department of Family and Community Medicine, Medical College of Wisconsin, Milwaukee, WI, USA
1997-2010   Professor (2008-2010), Associate Professor (2003-2008), Assistant Professor (1997-2003), Tufts University School of Medicine, Department of Public Health and Community Medicine, Boston, MA, USA
2005-present Adjunct Professor, Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, Tufts University, Boston, MA, USA
2006-present Director of the Tufts Initiative for the Forecasting and Modeling of Infectious Diseases
2007-present Director of the Tufts Institute of the Environment
2009-present Adjunct Professor, Dept. Gastrointestinal Sciences, Christian Medical College. Vellore, India
2009- 2010   Visiting Professor, DIMACS, Rutgers State University of New Jersey, New Brunswick, NJ, USA
2010-present Professor and Director of the Biostatistical Core, Tufts University School of Engineering

Current Professional Memberships/Positions
1993-present   American Statistical Association
1994-present   American Public Health Association
1995-present   CAUCUS for Women in Statistics
1998-present   The International Environmetrics Society
1998-present   The International Society for Environmental Epidemiology
2006-present   Statistical Editor for the Journal of Public Health Policy
2009-present   Member of the Editorial Board of the Journal: *Self/NonSelf: Immune Recognition and Signaling*
2011-present   Member of the Editorial Board of the Journal: *Environmental Health Perspectives*

C. Selected peer-reviewed publications (from total of 125)

Most relevant to the current application
1. Lofgren E, Fefferman NH, Naumov YN, Gorski J, **Naumova EN**. Influenza seasonality: underlying causes and modeling theories review. *Journal of Virology*. 2007 Jun; 81(11):5429-36.
2. **Naumova EN**, Naumov YN, Gorski J. Simulation studies for a multistage dynamic process of immune memory response to influenza: experiment *in silico. Annales Zoologici Fennici*. 2008; 45: 369-84.
3. Wenger JB, **Naumova EN**. Seasonal synchronization of influenza in the United States older adult population. *PLoS ONE*. 2010 Apr 15;5(4):e10187.
4. **Naumova EN**. Visual Analytics for Immunologists: Data Compression and Fractal Distributions. *Self/Non-Self - Immune Recognition and Signaling*. 2010. June 30, (on-line)
5. Naumov YN, **Naumova EN**, Yassai MB, Gorski J. Selective T Cell Expansion during Aging of CD8 Memory Repertoires to Influenza Revealed by Modeling. *J Immunol*. 2011 Apr 22. [Epub ahead of print]

Additional recent publications of importance to the field (in chronological order)
6. Naumov YN, **Naumova EN**, Yassai MB, Kota K, Welsh RM, Selin LK. Multiple glycines in TCR β-chains determine clonally diverse nature of human T cell memory to influenza. *Journal of Immunology*. 2008; 181(10):7407-19.
7. Yassai M, Naumov YN, **Naumova EN**, Gorski J. A Clonotype Nomenclature for T cell Receptors. *Immunogenetics*. 2009; 61(7):493-502.
8. **Naumova EN**, Gorski J, Naumov YN. Two compensatory pathways maintain long term stability and diversity in CD8 T cell memory repertoires. *Journal of Immunology*. 2009; 183(4):2851-8.
9. **Naumova EN**, Parisi SM, Pandita M, Castronovo D, Minihan P. Pneumonia and influenza hospitalizations in elderly people with dementia. *J Am. Geriatr. Soc.* 2009; 57(12): 2192-9.
10. Lofgren ET, Wenger JB, Fefferman NH, Bina D, Gradis S, Bhattacharyya S, Naumov YN, Gorski J, **Naumova EN**. Disproportional effects in populations of concern for pandemic influenza: insights from seasonal epidemics in Wisconsin, 1967-2004. *Influenza and Other Respiratory Viruses*. 2010; 4(4): 205-12.
11. Fefferman NH, **Naumova EN**. Innovation in Observation: A Vision for Early Outbreak Detection. *Emerging Health Threats*. July 6, 2010 (3:e6doi:10.3134/ehtj.10.006; on-line)

12. Mor SM, Aminawung J, DeMaria A, **Naumova EN**. Pneumonia and influenza hospitalizations in American seniors: The impact of HIV. *Epidemiology and Infection.* 2010; Nov 26:1-9. [Epub ahead of print]
13. Cohen SA, Chui KHH, **Naumova EN**. Influenza vaccination in young children reduces influenza-associated hospitalizations in older adults, 2002-2006. *J Am. Geriatr. Soc.* 2011;59(2):327-32.
14. Cohen S, Chui KHH, **Naumova EN**. Measuring disease burden in the older population using the slope-intercept method for population log-linear estimation (SIMPLE). *Statistics in Medicine.* 2011;30(5):480-8.
15. Petrova GV, **Naumova EN**, Gorski J. The Polyclonal CD8 T Cell Response to Influenza M158-66 Generates a Fully Connected Network of Cross-Reactive Clonotypes to Structurally Related Peptides: A Paradigm for Memory Repertoire Coverage of Novel Epitopes or Escape Mutants. *J Immunol.* 2011 Apr 25. [Epub ahead of print]

D. Research Support

ACTIVE:

1 R01 AI07545-01 (Kang)   03/15/08 - 02/28/12
NIH/NIAID
Role: Consultant
Transmission dynamics of cryptosporidial infections in India
The goal of this collaborative study is to investigate the transmission dynamics of cryptosporidial infections in children in southern India.

1R01 AI072222-01A2 (Ward)   07/01/08 - 06/30/13
NIH/NIAID
Immune Response to Cryptosporidiosis in a Birth Cohort of Children in South India
The goals are to investigate humoral and cell-mediated immune responses to Cryptosporidium over a 3-year period in a birth cohort of children in South India.
Role: Co-Investigator

CDC/Indian Council of Medical Research   09/01/09 - 08/30/11
Environmental Predictors of Water Safety and Enteric Infections in Vulnerable Populations
This proposal assumes there are multiple channels of exposure from multiple sources for enteric infections and that geographic, environmental and possibly cultural factors interact to maintain unsafe water and continued transmission of endemic enteric infections.
Role: Principal Investigator

NIH/SBIR (Fedson)   09/01/07 - 08/30/11
Outbreak Detection with Combinatorial Methods (Phase II)
This project aims to develop analytical tools and software to detect aberrations in surveillance systems tailored for rare and emerging infections when the count is expected to be low.
Role: Consultant

USAID (Alder)   10/01/09 - 09/31/15
NIH
RESPOND: Avian and Pandemic Influenza and Zoonotic Disease Program
The goal of this project is to strengthen the human capacity of countries to investigate and respond to outbreaks of newly emergent diseases of animal origin in a timely and sustainable manner.
Role: Co-Investigator

Completed

N01 AI-50032-03 (Gorski)   09/30/08 - 03/31/11
NIH/NIAID Tufts (Subcontract)
Generation and Decay of Memory T Cells in Young, Old and Immunocompromised Populations

Develop mathematical modeling tools for assessing influenza exposure and immune memory development in different subpopulations.
Role: Co-Investigator

U19 AI062627-02 (Gorski)   09/1/04 – 08/31/10
NIH/NIAID
Robust T-cell Immunity to Influenza in Human Population
The goal of the project is to model the nature of the responding memory T cell repertoires and generate a molecular description of the epidemiology of influenza.
Role: Project 4 Leader "Portrayal T cell memory: robustness and complexity"; Co-PI for the Technical Development Component

R01 ES13171-01 (Naumova)   07/15/05 – 06/30/09
NIEHS/NIA
Gastroenteritis and Extreme Weather Events in the US Elderly
The goal of the project is to assess the impact of extreme weather events (floods, droughts, heat waves, cold spells, etc.) on the incidence of infections in the US elderly.
Role: Principal Investigator

R21TW006537-02(Griffiths)   07/01/03 - 06/30/06
Fogarty International Center
The Quito Integrated Environment and Policy Study
Implement a feasibility study and capacity building for evaluation of the impact of adverse environmental conditions on heath of residents of Quito, Ecuador.
Role: Co-Investigator/Statistician

EPA Subcontract (Naumova)   07/01/04 - 06/30/05
Waterborne Emerging Diarrheal Diseases in MA
Develop mathematical models for seasonality in waterborne infections using the State surveillance system
Role: Principal Investigator

NIH/SBIR (Fedson)   09/01/06 - 08/30/07
Outbreak Detection with Combinatorial Methods (Phase I)
This project aims to develop the blueprints for analytical tools and software to detect aberrations in surveillance systems tailored for rare and emerging infections when the count is expected to be low.
Role: Consultant