BIOGRAPHICAL SKETCH

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NAME: Efthymia Iliana Matthaiou

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

POSITION TITLE: Assistant Professor

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

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Democritus University of Thrace, Alexandroupolis, Evros, Greece	BSc	10/2007	07/2011	Molecular Biology and Genetics
University of Pennsylvania, Philadelphia, PA, USA & Democritus University of Thrace, Alexandroupolis, Evros, Greece	PhD	11/2011	05/2017	Immuno-oncology, Pharmacology and Nanotechnology
Stanford University, Stanford, CA, USA	Postdoctoral Training	09/2017	11/2020	Immunology, Fungal Infections, Lung Transplantation, Bone Marrow Transplantation, Chronic Graft Versus Host Disease, Bronchiolitis Obliterans Syndrome

A. Personal Statement

I am an Assistant Professor in the Department of Immunology and Microbial Diseases at Albany Medical College. My long-term research interests involve the development of a comprehensive understanding of host-fungal interactions in respiratory infections and the development of novel strategies for the treatment of severe and often-lethal fungal infections. My academic training and 17-year research experience have provided me with an excellent background in multiple biological disciplines including molecular and cellular biology, immunology, biochemistry, pharmacology, bioengineering, and nanotechnology. As an undergraduate, I conducted research with Dr. Athanasios Zissimopoulos in clinical biomarkers evaluation. Later I joined the laboratory of “Gene Expression, Molecular Diagnosis and Modern Therapeutics” and worked on several projects under the supervision of Dr. Sandaltzopoulos Raphael. For my undergraduate research thesis, I developed an assay for rapid detection of polymorphisms, in the *egfr* gene, which cause resistance to Tyrosine Kinase Inhibitors (TKIs) in Non-Small Cell Lung Cancer (NSCLC) patients. During my Ph.D., I joined the Ovarian Cancer Research Center (OCRC) of the University of Pennsylvania (UPENN), where I worked under the supervision of Dr. George Coukos, Dr. Andrea Facciabene, Dr. Yadollah Omidi and Dr. Jaleh Barar. My studies were focused on the microenvironment of ovarian cancer. I developed a novel targeted nano-immunotherapy for solid tumors that highly express Tumor Endothelial Marker-1 (TEM1). During my undergraduate and graduate career, I published my research results in peer-reviewed journals and received several academic awards. For my postdoctoral training, I joined Dr. Hsu’s group at Stanford University and

continued building on my previous training in molecular/cellular biology and immunology by investigating the mechanisms that underlie the host-pathogen interactions post lung transplant, with emphasis in Cystic Fibrosis (CF) where the innate immune cells are aberrant. Furthermore, for the last seven years I have been leading clinical research projects. I initiated and managed clinical trials, human studies, and biorepositories and have been managing data collection and bioinformatic analyses. I am particularly interested in fungal infections that affect the human respiratory system. My research has been focused on *Aspergillus fumigatus* (*Af*) related diseases due to the high number of patients affected by aspergillosis and the lack of effective treatment against this opportunistic fungus. This proposal seeks to elucidate the structure and molecular interactions between the human receptor SIRPα and *Af* melanin. An interaction that may define fungal infection and disease progression. I have the motivation, expertise and training necessary to successfully carry out the proposed research project. As result of my 17 years of research experience and project management, I am aware of the importance of conducting a realistic research plan and timeline. These aims will elucidate a new biology, a first-ever described structural mimicry in fungi and how it dictates immune evasion. Understanding the molecular interactions will facilitate the development of targeted treatment of these often-fatal infections.

B. Positions, Scientific Appointments and Honors

Positions

2007-2008	Undergraduate Student Researcher, Pathology Laboratory, School of Medicine, Democritus University of Thrace, Alexandroupolis Greece.
2008 - 2011	Undergraduate Student Researcher, Gene Expression, Molecular Diagnosis and Modern Therapeutics Laboratory, Department of Molecular Biology and Genetics, Democritus University of Thrace, Alexandroupolis, Greece.
2011 - 2017	Graduate Student, Ovarian Cancer Research Center, University of Pennsylvania, Philadelphia, PA, USA and Department of Molecular Biology and Genetics, Democritus University of Thrace, Alexandroupolis, Greece .
2016 - 2017	Teaching Assistant, Department of Molecular Biology and Genetics , Democritus University of Thrace, Alexandroupolis Greece.
2017 - 2020	Postdoctoral Scholar, Department of Pulmonary and Critical Care, School of Medicine, Stanford University, CA, USA
2020 – 2023	Senior Academic Scientist, Department of Pulmonary and Critical Care, School of Medicine, Stanford University, CA, USA
2023 -	Assistant Professor, Department of Immunology and Microbial Disease, Albany Medical College, NY, USA
2023 -	Department Director of Well-Being and Professional Fulfillment, Department of Immunology and Microbial Disease, Albany Medical College, NY, USA

Honors/Awards

2009	The Hellenic Thoracic Society – Undergraduate Research Award
2011	The Onassis Foundation Science Lectures Series “The 2011 Lectures in Biology: Basic and Applied Virology” Keynote Speaker: Harald zur Hausen (Nobel Prize in Medicine-2008) - Travel Award
2013	UPenn Science Student Research Symposium (Selected Oral Presentation) - Best Presentation Award
2013	The Onassis Foundation Science Lectures Series “The 2013 Lectures in Physics and Chemistry: Nanoscience and Nanotechnology” Keynote Speaker: Konstantin Novoselov (Nobel Prize in Physics- 2010) - Travel Award
2014	Translational Research Cancer Centers Consortium (TRCCC) meeting (Poster and Selected Oral Presentation) - The TRCCC-AAI Young Investigator Award
2014	NanoDDS (12th International Nanomedicine and Drug Delivery Symposium, Poster and Selected Oral Presentation) - Best Poster Presentation Award
2015	Translational Research Cancer Centers Consortium (TRCCC) meeting (Poster and Selected Oral Presentation) - The TRCCC-AAI Young Investigator Award
2017	Recent developments in Biological Sciences-New therapeutic approaches for Cancer- Greek Cancer Society Symposium, (invited speaker) - Distinction for advocating towards cancer awareness.

2018 Stanford Postdoc Symposium – Best New Postdoctoral Research Award.
2019 ATS Abstract Scholarship Award (Assembly on Allergy Immunology and Inflammation)
2019 Stanford MCHRI Postdoctoral Fellowship Award ($160k)
2019 IXL Consulting Olympics – 2nd Place ($5000)
2020 ATS Abstract Scholarship Award (Assembly on Respiratory Structure and Function)
2022 Advances Against Aspergillosis and Mucormycosis (AAAM 2022) Best Poster Award
2022 – 2023 Women's Leadership Innovation Lab Fellow (Stanford University)
2023 ATS Abstract Scholarship Award (Assembly on Pulmonary Infections and Tuberculosis)

Other Experience and Professional Memberships:
2014- Member, American Association of Immunologists
2017- Member, Association of Women in Science
2018- Member, American Thoracic Society
2020- Member, Greek Scientists Society

Manuscript Reviewer
2017 - Journal of Gynecologic and Obstetric Investigation
2019 - Bioimpacts Journal
2021 - European Journal of Respiratory Medicine
2021 - PLOS ONE
2022 - Journal of Fungi

C. Contributions to Science

Since the beginning of my career, I have sought intellectually challenging and clinically relevant projects. My early publications addressed the need for evaluation of usefulness of clinical biomarkers as early indication of cancer development and metastasis. My role in this project was to collect clinical samples and perform immunohistochemical staining and analysis. Our group publications nominated reliable biomarkers for early diagnosis of bone metastasis. This work has direct clinical impact on the patients of Alexandroupolis' University Hospital.

1. A Zissimopoulos, D Matthaios, **E Matthaiou**, E Mantadakis, I Karaitiano; Association between bone scintigraphy and serum levels of tumor markers in the detection of bone disease in breast cancer patients Journal of B.U.ON.: official journal of the Balkan Union of Oncology 10/2007; 12(4).
2. Zissimopoulos A, Stellos K, Matthaios D, Petrakis G, Parmenopoulou V, Babatsikou F, **Matthaiou E**, Theodosiadou E, Hountis P, Koutis C; Type I collagen biomarkers in the diagnosis of bone metastases in breast cancer, lung cancer, urinary bladder cancer and prostate cancer. Comparison to CEA, CA 15-3, PSA and bone scintigraphy. J BUON. 2009 Jul-Sep; 14(3):463-72.

I am very interested in the development of novel technologies and the application of these technologies in medicine. My graduate research was focused on translational studies in the field of immuno-oncology. I was involved in several projects at UPENN's Ovarian Cancer Research Center (OCRC). My main project was to study the synthetic lethality and immunomodulatory activity of chemotherapeutics and potent chemotherapeutic compounds. Select a compound that can overcome drug resistance. Screen patients' samples for biomarkers that are expressed highly by tumor cells and tumor derived endothelium and stroma. Develop antibodies against these biomarkers. Design, engineer, and optimize a nanodelivery platform and drug-antibody conjugates for the targeted delivery of the chemotherapeutic compound. Expand and characterize ovarian cancer tumor models in mice, develop ovarian cancer xerograph models. Study the efficacy of the nano-delivery platforms both *in vitro* and *in vivo* and investigate their effects in the tumor microenvironment. During my graduate studies, I developed several delivery platforms using nanotechnology and antibody-drug conjugation chemistries. The novel platforms that I developed were used for both cancer targeted therapy and imaging by OCRC research group. In addition, I helped the development of cDNA prophylactic and therapeutic vaccines. The results of my graduate research studies were highly relevant and produced new details on how to employ targets of tumor microenvironment to develop immunotherapies. Finally, part of my scientific contributions are the two book-chapters that I co-authored on targeted nanomedicines in theragnosis.

Papers

1. **Efthymia-Iliana Matthaiou**, Yi Guo, Jaleh Barar, Raphael Sandaltzopoulos, Lana E Kandalaft, Chunsheng Li, George Coukos, Yadollah Omidi; TEM1-targeting PEGylated PLGA shikonin nanoformulation for immunomodulation and eradication of ovarian cancer (Bioimpacts 2022;12(1):65-86)
2. Guo Y, Hu J, Wang Y, Peng X, Min J, Wang J, **Matthaiou E**, Cheng Y, Sun K, Tong X, Fan Y, Zhang PJ, Kandalaft LE, Irving M, Coukos G, Li C. Tumour endothelial marker 1/endosialin-mediated targeting of human sarcoma. (Eur J Cancer 2018, Feb;90:111-121)
3. Chunsheng Li, Junying Wang, **Efthymia Iliana Matthaiou**, Yi Guo, Jia Hu, Ann Marie Chacko, Vladimir R Muzykantov, and George Coukos; Immuno-imaging and -therapy in ovarian cancer and sarcoma with de novo single-chain fv-fc fusion protein targeting TEM1/CD248. J Immunother Cancer. 2014.
4. John G Facciponte, Stefano Ugel, Francesco De Sanctis, Chunsheng Li, Liping Wang, Gautham Nair, Sandy Sehgal, **Efthymia Matthaiou**, George Coukos and Andrea Facciabene, Tumor endothelial marker 1-specific DNA vaccination targets tumor vasculature. (J Clin Invest. 2014 Apr 1; 124 (4):1497-511).
5. **Efthymia-Iliana Matthaiou**, Jaleh Barar, Raphael Sandaltzopoulos, Chunsheng Li, George Coukos and Yadollah Omidi, Shikonin-loaded antibody-armed nanoparticles for targeted therapy of ovarian cancer (Int J Nanomedicine. 2014 Apr 15; 9:1855-70).
6. Guo Y, Hu J, Wang Y, Peng X, Min J, Wang J, **Matthaiou E**, Cheng Y, Sun K, Tong X, Fan Y, Zhang PJ, Kandalaft LE, Irving M, Coukos G, Li C. Tumour endothelial marker 1/endosialin-mediated targeting of human sarcoma. (Eur J Cancer. 2018 Feb; 90:111-121).

Book Chapters

1. Barar J., **Matthaiou E.**, Coukos G. and Omidi Y. (2013), Targeting tumor microenvironment: ultimate therapy of cancer, in: Genomics and Proteomics, Studium Press LLC.
2. Omidi Y. Barar J., **Matthaiou E.** and Coukos G. (2013), Multifunctional nanomedicines for cancer therapy, in: Diagnostics and Therapeutics, (ISBN: 1-62699-007-7), Shishir S. and Naveen K. (Eds.), Studium Press LLC USA, pp. 129-171.

As part of my postdoctoral training and my senior researcher role, I was investigating *Af* infection post lung transplantation. I was particularly interested in the role of the innate immune system in *Af* virulence post transplantation. My studies were focused on the macrophage's response/function after transplantation. My goal was to identify the factors that contribute to macrophages dysfunction post transplantation and to develop novel therapeutic strategies based on my findings. Furthermore, I wanted to understand the pathophysiology of the different strains of *Aspergillus spp*. and what are the unique features within the species that drive pathogenesis and virulence. The other part of my training and research role included clinical research and data collection, management, and bioinformatics analyses. I assisted the initiation and managed several studies for bronchiolitis obliterans syndrome (BOS) after hematopoietic cell transplantation. My goal was to collect data that would help the early and accurate detection of BOS, the discovery of novel drugs to treat BOS and the identification of biomarkers for BOS development, progression, and drug response.

Papers

1. Tokamani M, Figgou E, Papamichail L, Sakka E, Toros A, Bouchorikou A, Giannakakis A, **Matthaiou EI**, Sandaltzopoulos R. A Multiplex PCR Melting-Curve-Analysis-Based Detection Method for the Discrimination of Five Aspergillus Species. (J Fungi 2023 Aug 11;9(8):842. doi: 10.3390/jof9080842. PMID: 37623613; PMCID: PMC10455196.)
2. **Efthymia-Iliana Matthaiou**, Wayland Chiu, Carol Conrad, Joe Hsu, Macrophage lysosomal alkalinization drives invasive aspergillosis in a mouse cystic fibrosis model of airway transplantation (J. Fungi 2022, 8(7) 751. https://doi.org/10.3390/jof8070751)
3. **Efthymia Iliana Matthaiou**, Husham Sharifi, Christian O'Donnell, Wayland Chiu, Clark Owyang, Paulami Chatterjee, Ihsan Turk, Laura Johnston, Theresa Brondstetter, Karen Morris, Guang-Shing Cheng, Joe L Hsu; The safety and tolerability of pirfenidone for bronchiolitis obliterans syndrome after hematopoietic cell transplant (STOP-BOS) trial; (Bone Marrow Transplant. 2022 May 31. doi: 10.1038/s41409-022-01716-4)
4. **Efthymia I. Matthaiou**, Gabriele Sass, David A. Stevens, Joe L. Hsu; Iron: an essential nutrient for Aspergillus fumigatus and a fulcrum for pathogenesis (invited review article at Current Opinion in Infectious Diseases 2018)

Conference Papers

1. **E.I. Matthaiou**, W. Chiu, C. Conrad, J. Hsu; Allograft Iron Overload Leads to Macrophage Lysosomal Leakage and Loss Increasing Aspergillus Invasion in a Cystic Fibrosis Mouse Model of Airway Transplantation (American Journal of Respiratory and Critical Care Volume: 203, 2022)
2. **E.I. Matthaiou**, C. O'Donnell, H. Sharifi 3, C.G. Owyang, T. Brondstetter, J.L. Hsu, Safety and Tolerability of Pirfenidone for Bronchiolitis Obliterans Syndrome After Hematopoietic Cell Transplant (STOP-BOS) - An Interim Analysis, (American Journal of Respiratory and Critical Care Volume: 201, 2020)
3. **E.I. Matthaiou**, O.M. Manouvakhova, M. Sinha, A.B. Tu, K.V. Clemons, D.A. Stevens, M.R. Nicolls, J.L. Hsu, The Role of Iron-Induced Macrophage Dysregulation in Aspergillus Fumigatus Invasion in Airway Transplantation (American Journal of Respiratory and Critical Care Volume: 199, 2019)
4. M. Hoppenfeld, **E.I. Matthaiou**, A. Rogers, J. Hsu, Hyperacute Lung Rejection in Setting of Acceptable HLA-Crossmatching (American Journal of Respiratory and Critical Care Volume: 199, 2019)

Patents

1. “Blocking pathogen mimics of CD47 therapeutically with CV1-G4” (Patent application No. 62/862,492)

D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
2015	Certification by Quintiles on International Conference of Harmonization of Good Clinical Practice (ICH GCP)	Certified
2017 - 2024	International Conference of Harmonization of Good Clinical Practice (ICH GCP), CITI	Certified
2018 - 2024	Clinical Operations Certification (Stanford University)	Certified
2019	GIMI Level 1 Certificate, Global Innovation Management Institute	Certified
2019	STEM Teaching Certificate, Stanford University	Certified
2021	Certified Associate in Project Management (CAPM), Project Management Institute	Certified