BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Staquicini, Fernanda

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

POSITION TITLE: Visiting Associate 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)	END DATE MM/YYYY	FIELD OF STUDY
Federal University of São Paulo, São Paulo, São Paulo	BS	12/2000	Biomedical Sciences
Federal University of São Paulo, São Paulo, São Paulo	PHD	10/2004	Cancer Biology & Immunology
The University of Texas M.D. Anderson Cancer Center, Houston, Texas	Postdoctoral Fellow	07/2011	Cell Biology & Biochemistry

A. Personal Statement

The primary goals of my research program are to discover, develop, and rapidly translate targeted agents into clinical applications. To improve diagnosis, prognosis and treatment of human cancers and other conditions in which functional ligand-receptor systems play a role in disease management. In my vision, these long-term goals are critical to accomplish accelerated drug discovery, development and translation into personalized clinical care. I apply combinatorial libraries displaying peptides or antibody fragments to identify molecules that are specifically or selectively expressed on the vasculature of individual tissues or organ systems under normal or pathological conditions. The direct selection of phage display libraries in patients enables accelerated identification, validation, and prioritization of targeted agents, and reduces costly late-stage clinical trial failures by the shifting of decisions to earlier stages in the drug development process. Another unique and attractive feature of display technologies is the ability to detect receptor targets based on their cell surface expression and access to a binding probe, without preconceived biases or assumptions regarding the nature of the expressed receptors. My expertise in in vivo methodologies of selection has also resulted in the development of new antibody tools for targeted delivery. We conceived of a novel and robust antibody discovery methodology, termed Selection of Phage-Display Accessible Recombinant Targeted Antibodies (SPARTA), a unique approach that overcomes several rate-limiting challenges to generate human antibodies amenable to rapid translation into medical applications. SPARTA combines in vitro screening steps of a naïve human antibody library against known tumor targets, with in vivo selections based on tumor-homing capabilities.

1. D'Angelo S, Staquicini FI, Ferrara F, Staquicini DI, Sharma G, Tarleton CA, Nguyen H, Naranjo LA, Sidman RL, Arap W, Bradbury AR, Pasqualini R. Selection of phage-displayed accessible recombinant targeted antibodies (SPARTA): methodology and applications. JCI Insight. 2018 May 3;3(9)PubMed PMID: 29720567; PubMed Central PMCID: PMC6012512.
2. Cardó-Vila M, Marchiò S, Sato M, Staquicini FI, Smith TL, Bronk JK, Yin G, Zurita AJ, Sun M, Behrens C, Sidman RL, Lee JJ, Hong WK, Wistuba II, Arap W, Pasqualini R. Interleukin-11 Receptor Is a Candidate Target for Ligand-Directed Therapy in Lung Cancer: Analysis of Clinical Samples and BMTP-11 Preclinical Activity. Am J Pathol. 2016 Aug;186(8):2162-2170. PubMed PMID: 27317903; PubMed Central PMCID: PMC4973658.
3. Staquicini FI, Qian MD, Salameh A, Dobroff AS, Edwards JK, Cimino DF, Moeller BJ, Kelly P, Nunez MI, Tang X, Liu DD, Lee JJ, Hong WK, Ferrara F, Bradbury AR, Lobb RR, Edelman MJ, Sidman RL, Wistuba II, Arap W, Pasqualini R. Receptor tyrosine kinase EphA5 is a functional molecular target in human lung cancer. J Biol Chem. 2015 Mar 20;290(12):7345-59. PubMed PMID: 25623065; PubMed Central PMCID: PMC4367244.

4. Staquicini FI, Cardó-Vila M, Kolonin MG, Trepel M, Edwards JK, Nunes DN, Sergeeva A, Efstathiou E, Sun J, Almeida NF, Tu SM, Botz GH, Wallace MJ, O'Connell DJ, Krajewski S, Gershenwald JE, Molldrem JJ, Flamm AL, Koivunen E, Pentz RD, Dias-Neto E, Setubal JC, Cahill DJ, Troncoso P, Do KA, Logothetis CJ, Sidman RL, Pasqualini R, Arap W. Vascular ligand-receptor mapping by direct combinatorial selection in cancer patients. Proc Natl Acad Sci U S A. 2011 Nov 15;108(46):18637-42. PubMed PMID: 22049339; PubMed Central PMCID: PMC3219136.

B. Positions and Honors

Positions and Employment

2001 - 2004	Undergraduate Student, Department of Microbiology, Immunology, & Parasitology, Federal University of São Paulo, São Paulo
2003 - 2004	Visiting Graduate Student, The University of Texas, M. D. Anderson Cancer Center, Houston, TX
2005 - 2011	Postdoctoral Graduate Fellow, The University of Texas, M. D. Anderson Cancer Center, Houston, TX
2011 - 2012	Assistant Professor, The University of Texas, M. D. Anderson Cancer Center, Houston, TX
2013 - 2017	Assistant Professor, University of New Mexico Health Sciences Center, Albuquerque, NM
2018 -	Assistant Professor, Rutgers University, Cancer Institute of New Jersey, Newark, NJ

Other Experience and Professional Memberships

2014 -	Member, AACR

Honors

2000	Pereira Barreto Scholar-in-Training Award, Federal University of São Paulo, Brazil
2005	Mario Mariano Young Scientist Award, University of São Paulo, Brazil
2009	Ben F. Love Fellowship in Innovative Cancer Therapy, The University of Texas, M. D. Anderson Cancer Center
2010	Trainee Excellence Award, The University of Texas, M. D. Anderson Cancer Center
2015	Associate Member of the University of New Mexico Cancer Research and Treatment Center, University of New Mexico Comprehensive Cancer Center

C. Contribution to Science

1. My research has been dedicated to identifying proteins expressed differentially in the tumor-associated vasculature and cancer cells to develop targeted diagnostic, imaging and therapeutic strategies. I use phage display technology - peptide and antibody display - and apply high-throughput screening methodologies both in animal models and patients. These publications have unveiled several relevant cancer targets currently being pursued for drug development. These efforts are also part of a large-scale human vasculature mapping project to produce new, ligand-directed pharmacologies.

    a. D'Angelo S, Staquicini FI, Ferrara F, Staquicini DI, Sharma G, Tarleton CA, Nguyen H, Naranjo LA, Sidman RL, Arap W, Bradbury AR, Pasqualini R. Selection of phage-displayed accessible recombinant targeted antibodies (SPARTA): methodology and applications. JCI Insight. 2018 May 3;3(9)PubMed PMID: 29720567; PubMed Central PMCID: PMC6012512.

    b. Cardó-Vila M, Marchiò S, Sato M, Staquicini FI, Smith TL, Bronk JK, Yin G, Zurita AJ, Sun M, Behrens C, Sidman RL, Lee JJ, Hong WK, Wistuba II, Arap W, Pasqualini R. Interleukin-11 Receptor Is a Candidate Target for Ligand-Directed Therapy in Lung Cancer: Analysis of Clinical Samples and BMTP-11 Preclinical Activity. Am J Pathol. 2016 Aug;186(8):2162-2170. PubMed PMID: 27317903; PubMed Central PMCID: PMC4973658.

    c. Staquicini FI, Qian MD, Salameh A, Dobroff AS, Edwards JK, Cimino DF, Moeller BJ, Kelly P, Nunez MI, Tang X, Liu DD, Lee JJ, Hong WK, Ferrara F, Bradbury AR, Lobb RR, Edelman MJ, Sidman RL, Wistuba II, Arap W, Pasqualini R. Receptor tyrosine kinase EphA5 is a functional molecular target in

human lung cancer. J Biol Chem. 2015 Mar 20;290(12):7345-59. PubMed PMID: 25623065; PubMed Central PMCID: PMC4367244.

d. Staquicini FI, Cardó-Vila M, Kolonin MG, Trepel M, Edwards JK, Nunes DN, Sergeeva A, Efstathiou E, Sun J, Almeida NF, Tu SM, Botz GH, Wallace MJ, O'Connell DJ, Krajewski S, Gershenwald JE, Molldrem JJ, Flamm AL, Koivunen E, Pentz RD, Dias-Neto E, Setubal JC, Cahill DJ, Troncoso P, Do KA, Logothetis CJ, Sidman RL, Pasqualini R, Arap W. Vascular ligand-receptor mapping by direct combinatorial selection in cancer patients. Proc Natl Acad Sci U S A. 2011 Nov 15;108(46):18637-42. PubMed PMID: 22049339; PubMed Central PMCID: PMC3219136.

2. In addition to these contributions, I have used integrated combinatorial approaches to target the central nervous system (neural stem cells and brain tumors). In essence, I hypothesized that receptors present on the surface of neural stem cells can be exploited by ligand-directed systems that enable discovery and functional evaluation of molecular mechanisms that control self-renewal and differentiation. Knowledge of the macromolecular structure and function of the target receptor can be used to design compounds that interact with a receptor in a complementary fashion to modulate its activity. I generated a peptide signature of neural stem cells that resulted in the discovery of a novel protein complex that controls adult neural stem cell proliferation and migration. I also established new technologies for ligand-directed and transcriptional targeted imaging of brain tumors to successfully suppress tumor growth, and serially monitor drug response by peptide-targeted AAVP-based molecular-genetic imaging.

   a. Staquicini FI, Dias-Neto E, Li J, Snyder EY, Sidman RL, Pasqualini R, Arap W. Discovery of a functional protein complex of netrin-4, laminin gamma1 chain, and integrin alpha6beta1 in mouse neural stem cells. Proc Natl Acad Sci U S A. 2009 Feb 24;106(8):2903-8. PubMed PMID: 19193855; PubMed Central PMCID: PMC2635839.

   b. Staquicini FI, Sidman RL, Arap W, Pasqualini R. Phage display technology for stem cell delivery and systemic therapy. Adv Drug Deliv Rev. 2010 Sep 30;62(12):1213-6. PubMed PMID: 20932865.

   c. Staquicini FI, Ozawa MG, Moya CA, Driessen WH, Barbu EM, Nishimori H, Soghomonyan S, Flores LG 2nd, Liang X, Paolillo V, Alauddin MM, Basilion JP, Furnari FB, Bogler O, Lang FF, Aldape KD, Fuller GN, Höök M, Gelovani JG, Sidman RL, Cavenee WK, Pasqualini R, Arap W. Systemic combinatorial peptide selection yields a non-canonical iron-mimicry mechanism for targeting tumors in a mouse model of human glioblastoma. J Clin Invest. 2011 Jan;121(1):161-73. PubMed PMID: 21183793; PubMed Central PMCID: PMC3007161.

3. I have co-authored articles describing a nanoengineered system referred to as “phage hydrogel”, which has been applied for targeted delivery of nanocarriers and imaging agents. This spontaneous, biologically active molecular network consists of targeted bacteriophage directly assembled with gold nanoparticles. This nanosystem has been used for enhanced fluorescence and dark field microscopy, surface-enhanced Raman scattering detection, or near infrared photon-to-heat conversion for ligand-directed delivery of doxorubicin loaded liposomes to xenograft tumors in preclinical studies.

   a. Ferrara F, Staquicini DI, Driessen WHP, D'Angelo S, Dobroff AS, Barry M, Lomo LC, Staquicini FI, Cardó-Vila M, Soghomonyan S, Alauddin MM, Flores LG 2nd, Arap MA, Lauer RC, Mathew P, Efstathiou E, Aparicio AM, Troncoso P, Navone NM, Logothetis CJ, Marchiò S, Gelovani JG, Sidman RL, Pasqualini R, Arap W. Targeted molecular-genetic imaging and ligand-directed therapy in aggressive variant prostate cancer. Proc Natl Acad Sci U S A. 2016 Nov 8;113(45):12786-12791. PubMed PMID: 27791181; PubMed Central PMCID: PMC5111687.

   b. Hosoya H, Dobroff AS, Driessen WH, Cristini V, Brinker LM, Staquicini FI, Cardó-Vila M, D'Angelo S, Ferrara F, Proneth B, Lin YS, Dunphy DR, Dogra P, Melancon MP, Stafford RJ, Miyazono K, Gelovani JG, Kataoka K, Brinker CJ, Sidman RL, Arap W, Pasqualini R. Integrated nanotechnology platform for tumor-targeted multimodal imaging and therapeutic cargo release. Proc Natl Acad Sci U S A. 2016 Feb 16;113(7):1877-82. PubMed PMID: 26839407; PubMed Central PMCID: PMC4763738.

   c. Souza GR, Staquicini FI, Christianson DR, Ozawa MG, Miller JH, Pasqualini R, Arap W. Combinatorial targeting and nanotechnology applications. Biomed Microdevices. 2010 Aug;12(4):597-606. PubMed PMID: 19669890.

d. Souza GR, Christianson DR, Staquicini FI, Ozawa MG, Snyder EY, Sidman RL, Miller JH, Arap W, Pasqualini R. Networks of gold nanoparticles and bacteriophage as biological sensors and cell-targeting agents. Proc Natl Acad Sci U S A. 2006 Jan 31;103(5):1215-20. PubMed PMID: 16434473; PubMed Central PMCID: PMC1346765.

Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/fernanda.staquicini.1/bibliography/47993627/public/

D. Additional Information: Research Support and/or Scholastic Performance

Completed Research Support

CT Research Program Pilot Grant Award — Staquicini (PI) — 04/01/2015 – 04/01/2016
University of New Mexico Cancer Center Support Grant
Ferumoxytol-enhanced MRI for breast cancer detection
In this project we characterized ferumoxytol-induced signal changes on MRI within 8 days of ferumoxytol administration in pre-clinical models of breast cancer. We also investigated whether signal intensity of ferumoxytol-contrast MRI provides an effective means to monitor tumor treatment response to standard of care chemotherapeutics.
Role: PI

CT Research Program Pilot Grant Award Program — Ferrara (PI) — 04/01/2015 – 04/01/2016
University of New Mexico Cancer Center Support Grant
Molecular dissection of the antibody response in breast cancer patients
In this project we characterized the humoral immune response of patients with breast cancer and compare tumor-specific antibody populations. The antibody repertoires obtained from the peripheral blood, metastatic or drained lymph nodes surrounding the tumor, and produced by tumor infiltrating B cells, were displayed as recombinant molecules libraries on phage particles. The libraries were investigated to identify tumor-specific antibodies that will be further analyzed for their potential role in tumor recognition.
Role: Co-PI

Internal Research Grant — Staquicini (PI) — 04/01/2015 – 04/01/2016
American Cancer Society
Molecular determinants of lung cancer resistance to radiotherapy
In this project, we studied functions of EphA5 in lung cancer resistance to radiotherapy. Our goals were to characterize the participation of EphA5 in DNA damage response and cell cycle regulation.
Role: PI

R01CA218853 — Staquicini (PI) — 06/04/2018 - 05/31/2023
Functional Targeting of the Tyrosine Kinase EphA5 in Radiation-resistant Lung Cancer
The goals of this project are to: 1) Develop and optimize human monoclonal antibodies against the tyrosine kinase EphA5 and to 2) validate their therapeutic activity in combination with ionizing radiation.