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BIOGRAPHICAL SKETCH

NAME: Rodriguez, Gloria Marcela

eRA COMMONS USER NAME

POSITION TITLE: Associate Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	START DATE MM/YYYY	END DATE MM/YYYY	FIELD OF STUDY
Pontificia Universidad Javeriana, Bogota	BS	01/1981	10/1986	Bacteriology
New York University, New York	SCD	09/1994	05/1999	Microbiology
Public Health Research Institute, New York, NY	Postdoctoral Fellow	05/1999	02/2003	Mycobacteriology

Positions and Honors

Positions and Employment

1986 - 1990 Research Assistant , Instituto de Immunologia, Bogota
1990 - 1994 Research Assistant, New York University, NewYork, NY
1994 - 1999 Graduate Student, New York University. , New York, NY
1999 - 2003 Post-doctoral Fellow , Public Health Research Institute, New York, NY
2003 - 2006 Assistant Professor, PHRI, University of Medicine and Dentistry of New Jersey, Newark, NJ
2007 - 2017 Assistant Professor, New Jersey Medical School, Rutgers University, Newark, NJ
2017 - Associate Professor, New Jersey Medical School, Rutgers University, Newark, NJ

Other Experience and Professional Memberships

2006 - Member, American Society of Microbiology
2008 - Member, Latinoamerican Society of tuberculosis and other mycobacteriosis (SLAMTB)
2010 - Member, American Association for Advancement of Science

Honors

1999 - 2001 Postdoctoral Research Fellowship, UNCF-Park Davis Scientific initiatives Partnership
2001 - 2003 Fellowship in Pulmonary Research, Parker B. Francis Foundation
2011 Faculty Award, Hispanic Center for Excellence. University of Medicine and Dentistry of New Jersey.

Contribution to Science

1. My first publications were in the field of immunology and cell biology of antigen processing and presentation in the context of MHC class II molecules. In those studies I characterized the activity of proteases involved in antigen processing and the nature of the cellular compartments where they function. Importantly, the result of that work was one of the first demonstrations that in contrast to MHC class I molecules, MHC class II molecules could bind and present long peptides. This discovery had broad implications for antigenic epitope analysis and design.

a. Rodriguez GM, Diment S. Destructive proteolysis by cysteine proteases in antigen presentation of ovalbumin. Eur J Immunol. 1995 Jul;25(7):1823-7. PubMed PMID: 7621859.

b. Diment S, Eidelman M, Rodriguez GM, Orlow SJ. Lysosomal hydrolases are present in melanosomes and are elevated in melanizing cells. J Biol Chem. 1995 Mar 3;270(9):4213-5. PubMed PMID: 7876179.

c. Rodriguez GM, Diment S. Role of cathepsin D in antigen presentation of ovalbumin. J Immunol. 1992 Nov 1;149(9):2894-8. PubMed PMID: 1328388.

1. In the field of tuberculosis pathogenesis I have made seminal contributions in the area of iron acquisition and regulation. Iron plays an essential role in host-pathogen interactions because it is essential, elusive, and potentially toxic. To proliferate, pathogens must compete for iron in the host and tightly regulate intracellular iron levels to avoid toxic effects of excess iron. I reported for the first time the gene expression response of M. tuberculosis to changes in iron availability and identified IdeR as the central regulator of iron uptake and storage. I also demonstrated the essentiality of IdeR for M. tuberculosis survival in the host. Furthermore, I discovered IrtAB, the main iron transporter in M. tuberculosis and demonstrated its role in virulence. We also reported on the role of iron storage proteins in virulence, protection against iron deficiency, oxidative stress, and antibiotic resistance. Recently we demonstrated that immunization with a ferritin (bfrB) mutant could confer protection against subsequent infection with virulent M. tuberculosis in a mouse model. The protection elicited by immunization with the bfrB mutant is comparable to BCG vaccination with respect to reduction of bacterial burden. However, significant distinctions in disease pathology and host genome-wide lung transcriptome suggest improved containment of Mtb infection in animals vaccinated with the bfrB mutant compared to BCG.

a. Subbian S, Pandey R, Soteropoulos P, Rodriguez GM. Vaccination with an Attenuated Ferritin Mutant Protects Mice against Virulent Mycobacterium tuberculosis. J Immunol Res. 2015;2015:385402. PubMed PMID: 26339659; PubMed Central PMCID: PMC4539171.

b. Pandey R, Rodriguez GM. IdeR is required for iron homeostasis and virulence in Mycobacterium tuberculosis. Mol Microbiol. 2014 Jan;91(1):98-109. PubMed PMID: 24205844; PubMed Central PMCID: PMC3902104.

c. Pandey R, Rodriguez GM. A ferritin mutant of Mycobacterium tuberculosis is highly susceptible to killing by antibiotics and is unable to establish a chronic infection in mice. Infect Immun. 2012 Oct;80(10):3650-9. PubMed PMID: 22802345; PubMed Central PMCID: PMC3457556.

d. Rodriguez GM, Smith I. Identification of an ABC transporter required for iron acquisition and virulence in Mycobacterium tuberculosis. J Bacteriol. 2006 Jan;188(2):424-30. PubMed PMID: 16385031; PubMed Central PMCID: PMC1347291.

1. Manganese transport and regulation in M. tuberculosis. Although Fe-restriction is the most prominent and well-understood example of nutritional immunity, Mn sequestration has recently emerged as an important mechanism of host resistance to several bacterial and fungal infections. Our recent studies discovered key Mn homeostatic mechanisms in Mtb, which comprises a Mn dependent transcriptional regulator and two Mn transporters, MntH and MntABCD. We found that Mtb strains deficient for Mn import are highly sensitive to conditions of low Mn availability and fail to proliferate in THP-1 macrophages.

a. Pandey R, Russo R, Ghanny S, Huang X, Helmann J, Rodriguez GM. MntR(Rv2788): a transcriptional regulator that controls manganese homeostasis in Mycobacterium tuberculosis. Mol Microbiol. 2015 Dec;98(6):1168-83. PubMed PMID: 26337157; PubMed Central PMCID: PMC5157835.

1. Iron dependent regulation of vesiculation in Mtb. We discovered that increased production of membrane vesicles is part of the response of Mtb to iron limited conditions as encountered in the host. In addition we uncovered distinct composition of vesicles produced under iron limitation including the presence of a potent siderophore that can function in adaptation to iron limitation. This opens a new chapter in the study of mechanisms used by Mtb to interact with the host.

a. Rodriguez GM, Prados-Rosales R. Functions and importance of mycobacterial extracellular vesicles. Appl Microbiol Biotechnol. 2016 May;100(9):3887-92. PubMed PMID: 27020292; PubMed Central PMCID: PMC4879809.

b. Prados-Rosales R, Weinrick BC, Piqué DG, Jacobs WR Jr, Casadevall A, Rodriguez GM. Role for Mycobacterium tuberculosis membrane vesicles in iron acquisition. J Bacteriol. 2014 Mar;196(6):1250-6. PubMed PMID: 24415729; PubMed Central PMCID: PMC3957709.

2. Persistence of M.tuberculosis under iron-starvation. Although Mtb needs iron for growth, recently, we uncovered the remarkable ability of Mtb to persists for long time in conditions of Fe-starvation, able to tolerate antibiotics and ready to reactivate replication when iron becomes available. In conjunction with

analysis of the iron-environment of human granulomas that showed microenvironments in which Mtb likely experiences drastic Fe-deprivation, this discovery suggest that Fe-deprivation in the lung might trigger a state of persistence in Mtb and promote chronic latent TB infection. Because latent TB is a major problem for TB diagnostics, treatment and control, these findings aid understanding the physiology of persistent Mtb and provide new avenues for therapeutic research.

a. Kurthkoti K, Amin H, Marakalala MJ, Ghanny S, Subbian S, Sakatos A, Livny J, Fortune SM, Berney M, Rodriguez GM. The Capacity of Mycobacterium tuberculosis To Survive Iron Starvation Might Enable It To Persist in Iron-Deprived Microenvironments of Human Granulomas. MBio. 2017 Aug 15;8(4)PubMed PMID: 28811344; PubMed Central PMCID: PMC5559634.

Complete list of Publish work in MyBibliography

https://www.ncbi.nlm.nih.gov/sites/myncbi/14wUPqdykabQ5/bibliography/46010642/public/?sort=date&direction=ascending