BIOGRAPHICAL SKETCH

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NAME: Blaser, Martin J. M.D.

eRA COMMONS USER NAME (credential, e.g., agency login): BLASEM01

POSITION TITLE: Professor, Medicine and Microbiology

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)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Pennsylvania, Philadelphia, PA	BA	05/1969	Economics
New York University, New York, NY	MD	05/1973	Medicine
University of Colorado Health Sciences Center	--	06/1977	Internal Medicine
University of Colorado Health Sciences Center	--	06/1979	Infectious Diseases

A. Personal Statement

My lab has been studying gastrointestinal biology since 1979 (with first CCFA funding in 1982), gastric colonization since 1986, GI tract cancers since 1990, and the human microbiome since 2002. We conducted the initial studies linking *H. pylori* to gastric cancer, and its loss to esophageal adenocarcinoma, which brought us into the microbiome. Early 16S rRNA surveys of the esophagus, stomach, lung, and skin established the baseline present in health that then were used to assess pathologic relationships. Nearly 20 years ago, we began to hypothesize that some of the diseases of modernization, including obesity, diabetes, certain estrogen-driven malignancies and immunologic and neurodevelopmental disorders, were due to changes in the ancestral human microbiome. We have had especial emphasis on the role of the GI tract microbiome in early life development, with consequences for how normal metabolism and immunity develop. Because of widespread antibiotic use, especially in young children, we have explored in animal models their role in perturbing the microbiome, and the downstream effects. Recently, we have been exploring microbiome changes that could be fueling the metabolic and inflammatory disease epidemics of asthma, obesity, diabetes, autism and estrogen-driven diseases, respectively using both mouse models and human samples to understand underlying mechanisms. We have used multi-“omic” approaches to address these questions, including studies of heredity in mouse disease models. Specimens from experimental animals and from human studies permit linked analyses of tissue gene expression with single cell resolution and with GI tract metagenome and metabolic pathways to identify taxa, strains, and molecules that can be used to predict the development of disease and prognosis and to interdict disease onset for problems related to intestinal inflammation and distant tissue injury.

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

Ongoing Projects

R01AI158911-01A1
Blaser, (PI) (MPI: Barrett, Gennaro, Horton)
9/17/21-8/31/24
Cohort and Biomarkers for COVID-19 Severity, Natural History, and Reinfection

U01AI122285
Blaser, (PI)
4/1/16-4/30/23
Microbial, immune, and metabolic perturbations by antibiotics (MIME study)

U01AI122285-05S1
Blaser (PI)
5/1/20-4/30/23
NIAID Extension of Investigator-Initiated Clinical Trials-COVID-19 Supplement

R35GM139655
Fang, (PI), Role: Sub-PI)
2/1/21-1/31/26
High Resolution Characterization of Bacterial Epigenomes and Microbiome

IFF 2020
Blaser, (PI)
6/1/20-3/31/23
Anti-tumor effects of probiotics on breast cancer

Leducq 17CVD01
Bäckhed, (PI), Role: PI for Rutgers
1/1/18-12/31/23
Gut Microbiome as a target for the treatment of cardiometabolic diseases

USDA/ University of Washington UWSC11810
Hartigh, (PI): Role: Consortium Project Lead
4/1/20-3/31/25
Specific Molecular Profiles and Biomarkers of Food and Nutrient Intake, and Dietary Exposure

The State of New Jersey
Blaser, Martin PD/PI
9/1/21-8/31/24
The New Jersey Kids Study

Recently Completed Projects
Danone LLC, 2020
Blaser, (PI)
6/1/20-5/31/22
Is Microbiome Status a Predictor of Clinical Outcome in SARS-19 Infections?

NSF 2027984
Madhav, (PI): Role: Collaborator
6/15/20-5/31/21
RAPID: Collaborative: Transfer Learning Techniques for Better Responses to COVID-19 in the U.S.

R01CA204113
Chen, (PI): Role: Co-I
4/1/16-3/31/21
The Foregut Microbiome and Risk of Gastric Intestinal Metaplasia, and Gastric Cancer Risk

Citations:

1. Cho I, Yamanishi S, Cox L, Methe BA, Zavadil J, Li K, Gao Z, Mahana D, Raju K, Teitler I, LiH, Alekseyenko AV, **Blaser MJ.** Antibiotics in early life alter the murine colonic microbiome and adiposity. *Nature* 2012; 488:621-626. PMCID: PMC3553221.
2. Cox LM, Yamanishi S, Sohn J, Alekseyenko AV, Leung JM, Cho I, Kim S, Li H, Gao Z, Mahana D, Zarate Rodriguez JG, Rogers AB, Robine N, Loke P, **Blaser MJ**. Altering the intestinal microbiota during a critical developmental window has lasting metabolic consequences. *Cell* 2014; 158:705-721. PMCID: PMC4134513.
3. Bokulich NA, Chung J, Battaglia T, Henderson N, Jay M, Li H, Lieber A, Wu F, Perez-Perez GI, Chen Y, Schweizer W, Zheng X, Contreras M, Dominguez-Bello MG, **Blaser MJ**. Antibiotics, birth mode, and diet shape microbiome maturation during early life. *Science Translational Medicine* 2016; 8(343):343ra82. PMID: 27306664.

4. Zhang X-S, Yin YS, J Wang, Battaglia T, Krautkramer K, Li WV, Li J, Brown M, Zhang M, Badri M,Armstrong A, Strauch CM, Wang Z, Nemet I, Altomare N, Devlin JC, He L, Morton JT, Chalk JA, Needles K, Liao V, Mount J, Li H, Ruggles KV, Bonneau RA, Dominguez-Bello MG, Bäckhed F, Hazen SL, **Blaser MJ**. Maternal cecal microbiota transfer rescues early-life antibiotic-induced enhancement of type 1 diabetes in mice. *Cell Host & Microbe* 2021; 29:1249-1265.e9 doi:10.1016/j.chom.2021.06.014. PMCID: PMC8370265.

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointment

2019-present	Henry Rutgers Professor of the Human Microbiome, Professor of Medicine and Pathology & Laboratory Medicine; Director, Center for Advanced Biotechnology and Medicine, Rutgers University, New Brunswick NJ
2012-2019	Muriel and George Singer Professor of Medicine; Professor of Microbiology; Director, Human Microbiome Program, NYUGSOM, New York NY
2000-2012	Frederick H. King Professor of Internal Medicine, Chair, Department of Medicine, Professor of Microbiology, New York University School of Medicine (NYUGSOM), New York NY
1991,92,94,96	Professeur Invité, Institut Pasteur, Paris, France
1989-2000	Addison B. Scoville Professor of Medicine, Director, Division of Infectious Diseases, and Prof of Microbiology and Immunology, Vanderbilt Univ School of Medicine, Nashville, TN
1987-1988	Guest Investigator, Laboratory for Bacteriology, Rockefeller Univ., New York NY.
1981-2017	Staff Physician, Department of Veterans Affairs Medical Centers (Denver, Nashville, NY)
1981-1989	Assistant and Associate Professor of Medicine, Div of Infect Diseases, Univ Colorado School of Medicine; Chief, Infect Disease Section, VA Medical Center, Denver CO
1979-1981	Epidemic Intelligence Service Officer, Enteric Diseases Branch, Bacterial Diseases Division, Center for Infectious Diseases, CDC, Atlanta GA.
1972-1973	New York University Student Travel Fellowship (to Ethiopia)

Other Experience and Professional Memberships

2014-2017	Associate Editor, *Gut*
2013-present	Associate Editor, *mBio*
2012-present	Editorial Board, *Microbiome*
2008-2014	Senior Editor, *Cancer Prevention Research*
2006-2012	Associate Editor, *Microbes and Infection*
2006-present	Editorial Board, *Cell Host and Microbe*
2006-2014	Doris Duke Medical Foundation Scientific Advisory Committee
2005-2017	Editorial Board, *FASEBJ.*
2001-2005	Ellison Medical Foundation Advisory Committee
1998-present	Editorial Board, *Emerging Infectious Diseases*
1998-2005	Burroughs Wellcome Fund Advisory Committee
1996-2008	Editorial Board; *Journal of Clinical investigation*
1996-2002	American Board of Internal Medicine; Member, ID Subspecialty Board
1994-2002	Editorial Board, *Journal of Infectious Diseases*
1993-1996	Council, Infectious Diseases Society of America
1990-1999	Editorial Board, *Clinical Infectious Diseases*
1990-2001	Editorial Board, *Infection and Immunity*
1990-1994	Bacteriology and Mycology I Study Section, NIH; Chair1994
1986-1989	Clinical Investigator Career Development Award, from VA
1986-1990	Council, American Federation for Clinical Research
1985-1995	Associate Editor, *American Journal of Epidemiology*
1984	Fellow, Infectious Disease Society of America
1984	Fellow, American Academy of Microbiology
1983-1985	Editorial Board, *Applied and Environmental Microbiology*
1982-1993	Editorial Board, *Journal of Clinical Microbiology*

Honors

2022	Docteur, *honoris causa.* University of Bourdeaux
2021	Prize Medal, Microbiology Society (UK)
2019	Robert Koch Gold Medal
2018	Dupont Nutrition & Health Microbiome Science Award
2017	Deutsche Gesellschaft fur Hygiene und Mikrobiologie (DGHM) Award
2016	Thermo-Fisher New Frontiers in Science and Technology Award
2015-2018	Advisory Council, National Ctr. Complementary and Integrated Health, NIH
2015-present	Chair, Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria
2015	The ASM Lecture
2015	*Cura Personalis* Award, Georgetown University
2014	Distinguished Clinical Scholar and Educator in Residence, NIH
2014	The Anatomy Lesson, University of Amsterdam
2014	Alexander Fleming Award, Infectious Diseases Society of America
2013	American Academy of Arts and Sciences
2012-2018	Board of Governors, American Academy of Microbiology
2011	National Academy of Medicine
2009-2013	Advisory Board for Clinical Research, NIH; Chair 2012-2013
2005-2010	Board of Scientific Counselors, National Cancer Institute; Chair 2009-2010
2005-2006	President, Infectious Diseases Society of America
2004	Master, American College of Physicians
2003	AACR-ACS Award for Research Excellence in Cancer Epidemiology
2001	Wade Hampton Frost Award, American Public Health Association
1996	Alpha Omega Alpha, New York University School of Medicine
1995	Association of American Physicians
1992	Oswald Avery Award, Infectious Disease Society of America
1989	Western Society for Clinical Investigation Young Investigator Award
1988	American Society for Clinical Investigation

C. Contributions to Science

1. Studies of the microbiome in relation to intestinal inflammation and immunity. We have continued our microbiome studies to include both 16S and metagenomic analyses, which have allowed us to observe the flux in immunological development after therapeutic antibiotic pulses in mouse models. We have also assessed how antibiotic pre-treatment affects the microbiome before pathogen administration. These studies prepare us to examine microbial inheritance and inflammatory outcomes.

a. Livanos AE, Greiner TU, Vangay P, Pathmasiri W, Stewart D, McRitchie S, Li H, Chung J, Sohn J, Kim S, Gao Z, Barber C, Kim J, Ng S, Rogers AB, Sumner S, Zhang X-S, Cadwell K, Knights D, Alekseyenko A, Backhed F, **Blaser MJ**. Antibiotic-mediated gut microbiome perturbation accelerates development of type 1 diabetes in mice. *Nature Microbiology* 2016; 1:16140. PMCID: PMC5808443

b. Schulfer A, Battaglia T, Alvarez Y, Bijnens L, Ruiz VE, Ho M, Ward W, Cox LM, Rogers AB, Knights D, Sartor RB, **Blaser MJ**. Intergenerational transfer of antibiotic-perturbed microbiota enhances colitis in susceptible mice. *Nature Microbiology* 2018; 3:234–242. PMCID; PMC5780248.

c. Zhang X-S, Li J, Krautkramer KA, Badri M, Battaglia T, Borbet TC, Koh H, Ng S, Sibley RA, Li Y, Pathmasiri W, Jindal S, Shields-Cutler RR, Hillmann B, Al-Ghalih GA, Ruiz VE, Livanos A, Wout A Nagalingam N, Rogers AB, Sumner SJ, Knights D, Denu JM, Li H, Ruggles KV, Bonneau R, Williamson AR, Rauch M, **Blaser MJ**. Antibiotic-induced acceleration of type 1 diabetes alters maturation of innate intestinal immunity. *eLife* 2018; doi.org/10.7554/eLife.37816

d. Borbet TC, Pawline M, Zhang X, Wipperman MF, Reuter S, Maher T, Li J, Iizumi T, Gao Z, Daniele M, Taube C, Koralov SB, Müller A, **Blaser MJ**. Influence of the early-life gut microbiota on the immune responses to an inhaled allergen. Mucosal Immunology 2022. doi: 10.1038/s41385-022-00544-5

2. Mathematical modeling and computational development. In addition to the contributions described above, beginning in the early 1990's, we commenced studies modeling well-adapted organisms, such as *H. pylori*, to begin to provide an understanding of their persistence in a host for decades or for life. This has allowed us to explore the mechanisms for persistence at a molecular level, and to build models with greater complexity, providing for general models of persistence, touching such processes as inflammatory diseases, neoplasia, and aging. These models provide for a deepening exploration of the biology of commensalism and symbiosis. From this work, we moved to studies with systems biologists and biostatisticians to develop quantitative metrics for testing hypotheses related to the microbiome.

a. Webb GF, **Blaser MJ**. Dynamics of bacterial phenotype selection in a colonized host. *PNAS 2001;* 99:3135-40. PMCID: PMC122485.
b. **Blaser MJ**, Kirschner D. The equilibria that permit bacterial persistence in human hosts. *Nature 2007;* 449:843-849. PMID: 17943121.
c. Kurtz ZD, Mueller CL, Miraldi ER, Littman DR, **Blaser MJ**, Bonneau R. Sparse and compositionally robust inference of microbial ecological networks. *PLoS Computational Biology* 2015;11(5):e1004226. PMCID: PMC4423992
d. Koh H, **Blaser MJ**, Li H. A powerful microbiome-based association test and a microbial taxadiscovery framework for comprehensive association mapping. *Microbiome* 2017;5(1):45. PMCID: PMC5402681

3. *Helicobacter pylori*, relationships to disease, evolution. Beginning in the mid-1980's, we studied the newly recognized gastric organism, which ultimately was called *Helicobacter pylori.* We first tied the presence of the organism to gastritis, and in several studies provided the first linkages with atrophic gastritis, and then gastric cancer, with evidence of strain-specific differences in disease risk. Continued investigations provided evidence for its ancient (pre-historic) origins in humans, and suggested that the biological relationship may be more commensal than originally believed. In recent years, we have found evidence that *H. pylori* may have benefit to humans, including activities protecting against asthma, esophageal reflux, and downstream neoplastic diseases of the esophagus.

a. Dooley CP, Fitzgibbons PL, Cohen H, Appleman MD, PérezPérez GI, **Blaser MJ**. Prevalence of *Helicobacter pylori* infection and histologic gastritis in asymptomatic persons. *New Engl J Med* 1989; 321:1562-1566. PMID: 2586553.
b. Nomura A, Stemmerman GN, Chyou P-H, Kato I, Pérez-Pérez GI, **Blaser MJ**. *Helicobacter pylori* infection and gastric carcinoma in a population of Japanese-Americans in Hawaii. *New Engl J Med* 1991; 325:1132-1136. PMID: 1891021.
c. **Blaser MJ**, Pérez-Pérez GI, Kleanthous H, Cover TL, Peek RM, Chyou PH, Stemmermann GN, Nomura A. Infection with *Helicobacter pylori* strains possessing *cagA* associated with an increased risk of developing adenocarcinoma of the stomach. *Cancer Res* 1995; 55:2111-2115. PMID:7743510.
d. Ghose C, Perez-Perez GI, Dominguez-Bello MG, Pride DT, Bravi CM, **Blaser MJ**. East Asian genotypes of *Helicobacter pylori*: strains in Amerindians provide evidence for its ancient human carriage. *PNAS* 2002; 99: 15107-15111. PMCID:PMC137551.

4. Microbiome Studies. In addition to our studies on metabolism listed above, we have been working for nearly 20 years on understanding the composition of the human microbiome in general, and now the relationships with cancer oncogenesis, pathology and prognosis.

a. Pei Z, Bini EJ, Yang L, Zhou M, Francois F, **Blaser MJ**. Bacterial biota in the human distal esophagus. *PNAS* 2004; 101:4250-4255. PMCID: PMC384727.
b. Gao Z, Pei Z, Tseng C-H, **Blaser MJ**. Molecular analysis of human forearm superficial skin bacterial biota. *PNAS* 2007; 104:2927-32. PMCID:PMC1815283.
c. **Blaser MJ**. Antibiotic use and its consequences for the normal microbiome. *Science* 2016;352:544-545. PMCID: PMC4939477
d. Ghaddar B, Biswas A, Harris C, Omary MB, Carpizo DR, **Blaser MJ***, De S* (*Corresponding). Tumor microbiome links cellular programs and immunity in pancreatic cancer. *Cancer Cell* 2022: 40:1240-53.

Complete List of Published Work in My Bibliograohy:
http://www.ncbi.nlm.nih.gov/pubmed/?term=blaser+mj