CURRICULUM VITAE

PART I: General Information

Name: Mason Wright Freeman

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Place of Birth: Arlington, Virginia

Spouse: Gale Sherrard Haydock, M.D.

Children: James Harrington (1/13/89), Sarah Wright (2/5/91)

Education:

1973	B.A., Harvard College, Cambridge, MA *cum laude* in History & Literature
1979	M.D., University of California, San Francisco

Postdoctoral Training:

Internship and Residencies:

1979-1980	Intern in Medicine	Massachusetts General Hospital
1980-1981	Junior Assistant Resident in Medicine	Massachusetts General Hospital
1981-1982	Senior Assistant Resident in Medicine	Massachusetts General Hospital
1985	Chief Resident in Medicine	Massachusetts General Hospital

Fellowships:

1982-1984	Clinical and Research Fellow in Medicine (Endocrinology), Massachusetts General Hospital
1986-1990	Research Fellow in Medicine, Harvard Medical School, Boston, MA
1989-1990	Postdoctoral Research Fellow, Department of Biology, Massachusetts Institute of Technology, Cambridge, MA

Licensure and Certification:

1981	Massachusetts Board of Registration
1983	American Board of Internal Medicine
1985	American Board of Internal Medicine, Subspecialty Board in Endocrinology and Metabolism

Academic Appointments:

1985-1990	Instructor in Medicine	Harvard Medical School, Boston, MA
1990-2000	Assistant Professor	Harvard Medical School, Boston, MA
2001-present	Associate Professor	Harvard Medical School, Boston, MA

Hospital Appointments: (all at the Massachusetts General Hospital)

1985-1990	Assistant in Medicine
1990-1994	Assistant Physician
1994-2001	Associate Physician
2001-present	Physician
1990-1992	Director, Cardiovascular Health Center
1992-present	Chief, Lipid Metabolism Unit
1994-	Director, Melvin and Barbara Nessel Gene Therapy Center
2004 -	Assoc. Program Director for Academic Career Development Department of Medicine, Internal Medicine Residency Program

Other Professional Positions and Major Visiting Appointments:

1982-1983 Visiting Scientist
Department of Biology Massachusetts Institute of Technology

Hospital and Health Care Organization Service Responsibilities

1986-present Director, Lipid Clinic Massachusetts General Hospital

1986- Attending Physician,
Bigelow Medical Service Massachusetts General Hospital

1986- Attending Physician,
Endocrine Service Massachusetts General Hospital

1992- Co-Director, Lipid Laboratory Massachusetts General Hospital

1993-2000 Director, Molecular Biology Core Lab
Reproductive Sciences Center Massachusetts General Hospital

1997-2000 Director,
Melvin & Barbara Nessel
Gene Therapy Center Massachusetts General Hospital

1997-2004 Director, Lipid Clinic,
Hawthorn Medical Group, New Bedford, MA (PCHI clinic)

2000-present Director, Molecular Biology Core Lab,
Program in Inflammation Massachusetts General Hospital

2000-2003 Co-Director,
Program in Genomics Applications Massachusetts General Hospital
National Heart Lung Blood Institute Genomics Center

2003-present Director,
Program in Genomics Applications Massachusetts General Hospital
National Heart Lung Blood Institute Genomics Center

Major Administrative Responsibilities

1990-1992 Director,
Cardiovascular Health Center Massachusetts General Hospital

1992-present Chief,
Lipid Metabolism Unit Massachusetts General Hospital

1993-2000 Director, Molecular Biology Core,
Reproductive Sciences Center Massachusetts General Hospital

2000-present Faculty Director,
Microarray Facility Massachusetts General Hospital

2004-present Director, Genetics and Genomics Unit
Clinical Research Program Massachusetts General Hospital

2004-present Associate Program Director for Academic Development
Internal Medicine Residency Program Massachusetts General Hospital

2004-present Clinical Director of Adult Medical Genetics
Partner's Healthcare Massachusetts General Hospital

Major Committee Assignments:

National and Regional:

1986-1988 Voluntary Hospitals of America, Lipid Council, member

1991-1995 American Heart Association, Massachusetts Affiliate, Cholesterol Educational Task Force
Senior council member

1991-1995 American Heart Association, Research Peer Review Committee, reviewer

1997-2000 National Institutes of Health, Metabolism Study section member

2002-present The Endocrine Society, Annual Meeting Steering Committee

2002 Site Visit team, National Institutes of Health,
Program Project in Diabetes, University of Washington, Seattle, WA.

2002-present The Endocrine Society, Cardiovascular Task Force

2003 Co-chair, Programs in Genomics Application symposium organizing committee, NHLBI

2003-present American Heart Association, program/abstract review member

2003-present National Institutes of Health, ZRG1-F06 Study section, Member

Harvard Medical School:

1985-1986 Medicine Curriculum Committee, New Pathway Program, member

1993-1999 Harvard University Committee on Microbiologic Safety, Human Gene Therapy
Subcommittee, member

1999-2004 Harvard University Committee on Microbiologic Safety, Human Gene Therapy
Subcommittee, Chairman

Massachusetts General Hospital/Partner's:

1984-present Intern Selection Committee (periodic sabbaticals), member

1989-1990 Committee on Research, member

1993-1994 Co-Chairman, Committee on Research, Subcommittee on Gene Therapy

1994-1995 Transgenic Animal Planning Committee, member

1994-1996 Committee on Research, Subcommittee on Review of Research Proposals, member

1994-1995 Partner's Subcommittee on Gene Therapy, Co-Chairman

1994-1996 Committee on Research, Subcommittee on Office of Technology Affairs, member

1995-1996 Research Computer Advisory Group, member

1996-1997 Committee on Research, Subcommittee on Genetic Research Guidelines, member

1995-present Clinical Research Council, member

1997-1999 Partner's Council on Atherosclerosis, Co-chairman

2000 Partner's Genetics Advisory Panel, member

2004-present Executive Committee on Research (elected by MGH scientific community)

2004-present Partner's Steering Committee on Genetics and Genomics

Professional Societies

2002-present The Endocrine Society

2000-present Atherosclerosis, Thrombosis, and Vascular Biology Council of the Am Heart Association

Community Service:

1996-2004 Established lipid clinic in outpatient internal medicine practice located in New Bedford, MA to serve the needs of local residents.

Editorial Boards

American Journal of Medicine
UpToDate (Section Editor for Lipid disorders)

Reviewer
Arteriosclerosis, Thrombosis, and Vascular Biology
Atherosclerosis
Blood

Circulation
Circulation Research
Genomics
Journal of Biological Chemistry
Journal of Clinical Endocrinology and Metabolism
Journal of Clinical Investigation
Journal of Experimental Medicine
Journal of Lipid Research
Nature Medicine
New England Journal of Medicine
Proceedings of the National Academy of Sciences
Science

Awards and Honors:

1974-1979	Regents Scholar, University of California, San Francisco
1979	Alpha Omega Alpha
1985-1990	Physician-Scientist Awardee, NIH
1990-1993	American Heart Association, National Grant-in-Aid award

PART II: Research, Teaching and Clinical Contributions

Narrative Report:

My major effort at both MGH and Harvard Medical School focuses on disorders of lipid metabolism and their contribution to atherosclerosis, with an increasing emphasis on designing novel genetic strategies to explore those disorders and treat them. I created the Lipid Clinic at MGH in 1986, ushering in the use of HMG CoA reductase inhibitors to treat cholesterol disorders before their FDA approval in 1987. This was followed by my creation of a basic research laboratory and then a clinical lipid laboratory in 1990-2. The clinic continues to serve as the major site for evaluating and managing patients with lipid disorders at the MGH as well as one of the major teaching venues for lipid disorders at Harvard Medical School. Medical students and residents on the Endocrine service participate with Endocrine fellows in this weekly clinic. An off-site clinic in New Bedford, MA served as a teaching site for fellows and provided a community service to an under-served population in that region of the state from 1996-2004. Other teaching responsibilities include annual service as an attending physician on the Bigelow Medical and Endocrine Services, as well as

the lipid lecturer in the Harvard Medical School human physiology course for second year students and a lecturer in the new Pasteur program at HMS. In the current academic year, I taught in a new Harvard Science and Technology course (HST-146), "Human Biochemistry & Metabolic Diseases" and expect to participate in that annually. In 2004, I became the Associate Program Director for the MGH Internal Medicine Residency program and have co-organized a new curriculum component for the housestaff which focuses on teaching about the tools needed to perform modern clinical investigation.

My research laboratory's initial work focused on the movement of cholesterol into macrophages and the impact of that event on inflammation. This work began by studying the structure and function of the macrophage scavenger receptors. I cloned the first macrophage scavenger receptor (SR-A) ever identified while a post-doctoral fellow at MIT in Monty Krieger's lab (Nature, 1990). The work has evolved into broader studies of macrophage function in atherosclerosis using both transgenic and gene deletion animal models. My lab established that PPARγ was not required for macrophage differentiation as had been thought and that ligands for that transcription factor did not exacerbate lipid accumulation and foam cell formation, a concern that had been raised in the treatment of diabetics with the thiazolidinedione class of oral hypoglycemics (Nature Medicine, 2001). Our latest work on scavenger receptors (J Clin Invest 2005, in press) actually challenges the major paradigm of lipid-induced foam cell formation in atherosclerosis and is causing a substantial revision in thinking about the importance of oxidation of LDL in atherogenesis.

In addition to studying the lipid uptake processes in macrophages, we have also examined cholesterol movement out of macrophages via efflux pathways involving the ABCA class of ABC transporters. We originally mapped the gene causing Tangier disease to chromosome 9 and were one of several groups to identify mutations in ABCA1 as the cause of the disease (JLR, 2000). My lab subsequently determined the major topological features of ABCA1 in the plasma membrane, a topology which has proven to be the model for the entire A class of ABC transporters (JBC 2001). We continue to work on the cell biology of this transporter, with our major focus concentrating on how the transporter interacts with the apolipoprotein acceptors to which it transfers cholesterol. This work has established that a direct protein-protein contact between the acceptor apoprotein, apo A-I, and ABCA1 is required for cholesterol efflux to occur in cells

(JBC, 2002). We recently identified a novel protein interaction domain in the transporter and have utilized a purification method developed in our lab to isolate binding partners required for cholesterol efflux to occur (JBC 2004). Currently, we are generating mice lacking expression of the other members of the A class of transporters to determine their presumptive role in lipid trafficking, which ABCA7 representing the first in this group of novel knockouts (JBC, 2005).

Our work has also led us to study the inflammatory signaling cascades activated by lipid interactions with macrophages and this work has in turn led us into studies of the macrophage receptor signal transduction pathways engaged by microbial lipids. We are currently examining whether these pathogen pathways can also be activated by endogenous lipids, which would provide one of the critical missing links in our understanding of the pathogenesis of atherosclerosis. Our study (Nature Medicine, 2004) showing that a deletion of MyD88, a central adaptor protein in the toll receptor signaling cascade, profoundly reduces atherosclerosis has opened up an entirely new understanding of inflammatory signaling pathways in atherosclerosis and a several other laboratories have now followed up on our seminal finding by confirming that Toll receptors do contribute to atherogenesis.

Another interest of the laboratory has been the development of expression profiling as a tool for characterizing gene expression in macrophages and atheroma. I direct the microarray facility at MGH that is seeking to generate low-cost, high-density oligonucleotide spotted microarrays as part of my responsibilities as the Director of our NHLBI funded Program in Genomics center. This center is currently providing microarray expression profiling services for a large number of NHLBI funded investigators in Boston and around the country.

B. Research Funding Information:

<u>Past</u>:

1985-1990 Physician Scientist Award, National Institutes of Health

1986-1988 Lovastatin treatment of patients with moderate hypercholesterolemia; a multicenter clinical trial. (Principal Investigator, Massachusetts General Hospital trial center)

1987-1989 Lovastatin effects on the eye; a multicenter clinical trial.
(Principal Investigator, Massachusetts General Hospital trial center)

1991-1994 American Heart Association/National Grant-in-Aid, Principal Investigator
Rabbit macrophage scavenger receptors in atherosclerosis.

1994-1999 NHLBI/RO1HL 53694 Co-investigator
Gene Therapy of Hemophilias A and B

1997-2000 Genome Therapeutics Principal Investigator
Functional studies of the Tangier disease gene.

1997-2002 NHLBI Specialized Center on Research in Molecular Medicine and Atherosclerosis
Critical Transitions in Atherosclerosis; PI, Project II MGH subcontract
Transgenic strategies to explore plaque rupture in atherosclerotic mice

Current:

1990-2006 NHLBI/RO1 HL 45098 Principal Investigator
Scavenger Receptors in Atherosclerosis.

1995-2005 NIHPO1DK 50305 Key Investigator
The Phagoycte Membrane
Project 2: Macrophage lipid receptors in atherosclerosis

2000-2005 NIHPO1DK 50305 Core Director: Molecular and Cell Biology Core
The Phagocyte Membrane

2000-2005 NHLBI UO1 HL66678 Co- Director and Director
Program in Genomics Applications : Genomic Analysis of Stress and Inflammation

2001-2006 NCRR/R24 RR14466 Principal Investigator
Development and Characterization of CD14 deficient mice

2002-2007 NHLBI/RO1 HL 68988 Principal Investigator
Cell biology of ABCA1

2002-2006 NHLBI/RO1 HL072358 Principal Investigator
Shared Microarray Facility

C. Report of Current Research Activities:

Atherosclerosis-transgenic and gene-deletion models aimed at examining macrophage function in the mouse, including the role of pathogen activated inflammatory pathways in the genesis of atheroma

Macrophage lipid receptors structure/function studies and examination of their role in atherosclerosis

Disorders of lipid metabolism- studies of the cell biology of the ABCA class of ABC transporters. Mutations in ABCA1 cause Tangier disease, which is characterized by the near absence of circulating HDL.

D. Report of Teaching:

1. Local contributions

Harvard Medical School

1991-1993 Pharmacology & Clinical Therapeutics (HST 350)
Lecturer/discussion leader
50-75 medical students
2 hours/yr

1992 Enteric Biology Course for Clinical and Research Fellows
Gastrointestinal fellows from Harvard and other teaching hospitals
30 students
Lecturer (2 hours)

1995-present HMS Human Systems-Lipids
Second year HMS students
130 students
Lecture 1-2 hrs/yr

1996-1999 HMS Gene Therapy Course
Graduate students at HMS and undergraduates at Harvard College
20 students
Lecture 2 hrs/yr

1995-2000 Primed course (HMS Primary care postgraduate course)
Practicing internists
1500-2500 physicians
Lecture 1hr/yr

2000-present Pasteur Course
Medical students
20-39 students
Lecture 1hr/yr

2001 HST 0.90s
Cardiovascular Pathophysiology for Engineers and Scientists
20 students

2000- Intellihealth- on-line consultant editor

2002-present Genetics Review course-Partners program in Human genetics
Genetic counseling students

10 students
Lecture 1.5 hr/yr

2004-present HST-146 HST , Human Biochemistry & Metabolic Diseases
30 Medical Students
Lecture 2/hr yr

Massachusetts General Hospital

1985 Chief Resident in Medicine, Massachusetts General Hospital
Conducted residents report and attending rounds daily for year
Taught 20 medical students two times per week
Preparation time was 30 hrs/week for 50 weeks

1986-2002 Attending Physician, Bigelow Medical Service, MGH
2 medical students, 1 resident, three interns
1 month per year (3-5 hrs/day)

1986-present Attending Physician, Endocrine Service, MGH
1-4 medical students, 1-2 residents, and 3-5 Endocrine fellows
1 month/year (2-3 hrs/day)

1986-present Housestaff lecturer for inpatient and ambulatory care rotations
50-75 interns, residents, and medical students
Lecturer, 2-4 times per year; 1 hour lectures

1986-present Attending Physician and Director of Lipid Clinic
1-2 medical students, 1-2 residents, and 3 Endocrine fellows
Usually 1-3 trainees present each week in the clinic; clinic meets 1 day/week for 4 hours

1997-present Attending Physician, New Bedford Lipid Clinic
1 medical student or 1 fellow (both Endocrine and Cardiac fellows)
1 day per month for the entire day (8hrs)

2004-present Director, Tools for Human Investigation
Two-week daily course for internal medicine residents provided four times/yr
4 hours per day
15-20 residents

1988-present Continuing Medical Education lecturer in several Medical and Surgical Service courses including: Cardiology, Endocrinology, Internal Medicine, Reproductive Endocrinology,and Women's Health, Primary Care for Subspecialists, Vascular Surgery. Lectures have been given every year since 1988 in Cardiology, Endocrinology, and Internal Medicine courses with an occasional hiatus due to scheduling conflicts. Topics vary from management of hyperlipidemia to use of molecular biologic techniques in reproductive endocrinology.
Typically 100-300 physicians
Lecture, 1hr/yr for each course and usually an additional hour involving meet the professor sessions.

The lecture given in the internal medicine course has consistently been one of the top-rated talks in the course every year for the past decade

1987 Medical Grand Rounds
New approaches to the treatment of hyperlipidemia

1990 Medical Grand Rounds
The role of modified lipoproteins and scavenger receptors in atherosclerosis

1993 Medical Grand Rounds
A tale of two E's; apo E and Vitamin E in Alzheimer's Disease and Coronary Heart Disease
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1997 Medical Grand Rounds
Gene therapy

2001 Medical Grand Rounds
Trafficking in cholesterol: one Island's export product

2003 Endocrine Grand Rounds
The Ins and Outs of Cholesterol transport

2004 Medical Grand Rounds
Cholesterol: New genes, new insights, new therapies.

Advising Responsibilities

Post-doctoral trainees in my laboratory (1 pre-doctoral)

Duration of Training	Name	Current Position
1990-1992	Perry E. Bickel, M.D.	Assistant Professor, Washington University, St. Louis, MO
1990-1996	Paul Aftring, M.D., Ph.D	Senior Director, Metabolic Research GlaxoSmithKline, Philadelphia, PA
1995-1999	Gretchen Eberhart, M.D.	Instructor in Medicine University of Pittsburgh, Pittsburgh, PA
1996-2001	Kathryn Moore, Ph.D	Assistant Professor Harvard Medical School
1997-2001	Xinzhong Wang, Ph.D.	Research staff scientist Biogen, Cambridge, MA
1997-1998	Rosalind Fabunmi, Ph.D.	Staff Scientist American Heart Association, Dallas, TX
1999-2001	M. Murakawa, MD PhD	Staff physician Kyushu University Hospital Fukuoka, Japan

2000-2001	Yuri Bobryshev, Ph.D.	Senior Research Officer Univ of New South Wales Sydney, Australia
1997-2002	Vidya Kunjathoor, Ph.D.	Senior staff scientist, Atherosclerosis Research Novartis Cambridge, MA
1999-2003	Michael Fitzgerald, Ph.D.	Instructor in Medicine Harvard Medial School
2001-2004	Harry Bjorkbacka, Ph.D	Asst. Professor Experimentell kardiovaskulär forskning Universitetssjukhuset MAS Malmö, Sweden
2001-present	W S Kim, Ph.D	Research Fellow Harvard Medical School
2002-2003	Francois Huet, Ph.D.	Staff scientist, Acambis, Cambridge, MA
2003-present	Keichiro Okuhira, Ph.D.	Research Fellow, Harvard Medical School
2004-present	Marc Laberge	HST 3rd year medical student Harvard-MIT HST program

2. Regional, National, and International Contributions

Invited Presentations (selected and most recent samples)

1989 IXth International Symposium on Drugs Affecting Lipid Metabolism, Houston, Texas
Cloning of the macrophage scavenger receptor

1990 31st International Conference on the Biochemistry of Lipids, Munster, Germany
Macrophage scavenger receptors

1991 Annual Session of the American College of Physicians, New Orleans, LA
Managing Hyperlipidemia

1991 Deuel Lipid Conference, Monterey, CA
Macrophage scavenger receptor: role in foam cell formation

1992 Atherosclerosis Forum, Meribel, France
Macrophage scavenger receptors

1993 Cellular and Molecular Biology of the Cardiovascular System, Oviedo, Spain
Molecular pathogenesis of atherosclerosis

1994 Colorado Diabetes/Endocrine Institute, Snowmass, CO
Oxidized lipids and atherosclerosis

1995 Mid-Atlantic Lipid Research Symposium, Atlantic City, NJ
Scavenger receptors in atherosclerosis

1995 Gordon research conference: atherosclerosis, invited speaker, Meriden, N.H.
Scavenger receptor promoter activity

1996 Ministry of Science, Education, and Culture of Japan; Tokyo, Japan
Macrophages and Atherosclerosis

1998 NIH Specialized Ctrs of Research in Molecular Medicine & Atherosclerosis, Bethesda, MD

Transgenic strategies for exploring plaque rupture

1999 NIH conference on Niemann-Pick C disease, Bethesda, MD
Adenoviral-mediated complementation of genetic mutations

2001 NHLBI Program in Genomics Applications, Milwaukee, WI
Genetic studies in human subjects-what are the rules?

2002 The Endocrine Society Annual Meeting, San Francisco, CA
Speaker and Symposium Chair, Genetics and Endocrinology

2002 The American Heart Association, Chicago Illinois
Speaker and Plenary Chair, Macrophage lipid accumulation and atherosclerosis

2002 NIDDK symposium on Microarrays, Bethesda, MD
The use of spotted oligonucleotide arrays

2003 Harvard School of Public Health, Boston, MA
The Ins and Outs of Cholesterol Trafficking

2003 The Endocrine Society: Meet the Professor. Philadelphia, PA
Statin Therapies: Treating the difficult-to-treat patient

2003 NIH Program in Genomics Applications symposium, Bethesda, MD
The development of spotted oligonucleotide microarrays for gene expression profiling

2003 Clinical Endocrinolgy Update: The Endocrine Society Board Review Course- Miami, FL
Lipid disorders- top-rated lecture in the Board review course for endocrinologists

2003 Boston University Medical Center, Endocrine Grand Rounds,
Cholesterol trafficking and its role in atherosclerosis

2003 University of Kentucky, Gill Heart Center Cardiovascular Symposium
Innate Immunity and Atherosclerosis

2004 5th Annual Conference on Arteriosclerosis, Thrombosis and Vascular Biology, San Francisco, CA
Innate immune signaling and atherosclerosis

2004 Endocrine Society: Meet the Professor. New Orleans, LA
The treatment of hyperlipidemia: beyond statins

2004 International Atherosclerosis Society, HDL Workshop, Heraklion, Crete
ABCA transporters

2004 Wake Forest Medical Center, Visiting Professor and lecturer
Lipid trafficking in macrophages

2004 American Heart Association, New Orleans, LA
Gene Expression Profiling for Complex Diseases

2005 Cell Biology of Atherosclerosis, Keystone Conference
Macrophages in Atherosclerosis

2005 Deuel Lipid Conference, Los Angeles, CA
ABCA transporters

1986-present Medical or Endocrine Grand Rounds or Departmental Seminars on topics in lipid metabolism or atherosclerosis at universities and hospitals including Dartmouth College, Harvard Biological Chemistry Department, Brigham and Women's Hospital, Boston University, Rhode Island Hospital, Beth Israel Hospital, East Carolina University, Maine Medical Center, University of Rochester, University of Vermont, University of Kentucky, University of Colorado, and Univ. of California, San Francisco, and Yale Univ.

E. Report of Clinical Activities:

My clinical activities involve directing the Lipid Clinic at MGH and, from 1996 until early 2004, I also directed a community lipid clinic practice in New Bedford, MA. The MGH clinic is held every week while the New Bedford practice was conducted once per month. The MGH practice sees approximately 20 patients per session, with most patients having complex lipid disorders that have been referred by internists or cardiologists for specialty evaluation. The introduction of HMG-CoA reductase inhibitors to patients at the MGH was first accomplished in my Lipid Clinic during phase 2-3 trials and the clinic was involved in a critical investigation of lovastatin that established the safety of this class of drugs. The Lipid Clinic has served as a major training site for other physicians and nurse trainees, including the current director of the Brigham and Women's lipid clinic, as well as multiple nurse practitioners who have helped establish lipid clinics in the region.

I also serve as the attending physician on the Endocrine Division service for approximately one month a year and continue to attend on the general medical service (Bigelow) of the MGH Dept of Medicine for 2-4 weeks a year.

PART III: Bibliography

Original reports

1. **Freeman MW**, Spring-Mills E, and AL Jones. The effect of oxandrolone on low and high density lipoprotein profiles in retired breeder rats. *J Gerontol*. 1980;35:31-38.

2. Vasicek TJ, MeDevitt BE, **Freeman MW**, Hendy GN, Potts JT Jr, Rich A, and HM Kronenberg. Nucleotide Sequence of the human parathyroid hormone gene. *Proc Natl Acad Sci USA*. 1983;80:2127-2131.

3. Kronenberg HM, Igarashi T, **Freeman MW**, Okazaki T, Brand SJ, Wiren KM, and JT Potts Jr. Structure and expression of the human parathyroid hormone gene. *Rec Prog Horm Res*. 1986;42:641-663.

4. Born W, **Freeman MW**, Bornstein W, Rapoport A, Klein RD, Hendy GN, Khorana HG, Rich A, Potts JT Jr, and HM Kronenberg. Signal sequence of human preproparathyroid hormone is inactive in yeast. *J Bone Min Res*. 1987;2:353-361.

5. Born W, **Freeman MW**, Hendy GN, Rapoport A, Rich A, Potts JT Jr, and HM Kronenberg. Human preproparathyroid hormone synthesized in *E. coli* is transported to the surface of the bacterial inner membrane but not processed to the mature hormone. *Mol Endocrinology* 1987;1:5-14.

6. **Freeman MW**, Wiren KM, Rapoport A, Lazar M, Potts JT Jr, and HM Kronenberg. Consequences of amino-terminal deletions of preproparathyroid hormone signal sequence. *Mol Endocrinology* 1987;9:628-638.

7. Wiren KM, Ivashkiv L, Ma P, **Freeman MW**, Potts JT Jr, and HM Kronenberg. Mutations in signal sequence cleavage domain of preproparathyroid hormone alter protein translocation, signal sequence cleavage, and membrane-binding properties. *Mol Endocrinology* 1989;3:240-250

8. Abou-Samra AB, **Freeman MW**, Jueppner H, Uneno S, and GV Segre . Characterization of fully active biotinylated parathyroid hormone analogs: application to fluorescence activate cell sorting of parathyroid hormone receptor bearing cell. *J Biol Chem*. 1990;265:58-62.

9. Kodama T, **Freeman M**, Rohrer L, Zabrezky J, Matsudaira P, and M Krieger. Type I macrophage scavenger receptor contains alpha-helical and collagen-like coiled coils. *Nature* 1990;343:531-535.

10. Rohrer L, **Freeman M**, Kodama T, Penman M, and M Krieger. Coiled coil fibrous domains mediate ligand binding by macrophage scavenger receptor type II. *Nature* 1990;343:570-572.

11. Atkinson MJ, **Freeman MW**, and HMKronenberg. Thymosin ß4 is expressed in ROS 17/2.8 osteosarcoma cells in a regulated manner. *Mol Endocrinology* 1990;4:69-74.

12. **Freeman M**, Ashkenas J, Rees DJ, Kingsley DM, Copeland NG, Jenkins NA, and M Krieger. An ancient, highly conserved family of cysteine-rich protein domains revealed by cloning the type I and II murine macrophage scavenger receptors. *Proc Natl Acad Sci USA*. 1990;87:8810-8814.

13. **Freeman M**, Ekkel L, Rohrer L, Penman M, Freedman NJ, Chisholm GM, and M Krieger . Expression of type I and type II bovine scavenger receptors in Chinese hamster ovary cells: Lipid

droplet accumulation and nonreciprocal cross competition by acetylated and oxidized low density lipoprotein. *Proc Natl Acad Sci USA*. 1991;88:4931-4935.

14. Juppner H, Abou-Samra AB, **Freeman M**, Kong XF, Schipani E, Richards J, Kolakowski LF, Kronenberg HM, GV Segre. A G-protein linked receptor for parathyroid hormone and parathyroid hormone related peptide. *Science* 1991;254:1024-1025.

15. Segre GV, Abou-Samra AB, Juppner H, Schipani E, Force T, Urena P, **Freeman M**, Kong XF, Kolawshi LF Jr, Hock J, Bonventre J, Potts JT Jr, HM Kronenberg. Characterization of cloned PTH/PTHrP receptors. *Journal of Endocrinological Investigation* 1992;15:11-17.

16. Abou-Samra AB, Juppner H, Force T, **Freeman M**, Kong XF, Schipani E, Urena P, Richards J, Bonventre JV, Potts JT Jr, Kronenberg HM, and GVSegre. Expression cloning of a PTH/PTHrP receptor from rat osteoblasts-like cells: a single receptor stimulates intracellular accumulation of both cAMP and inositol triphosphatesand increases intracellular free calcium. *Proc Natl Acad Sci USA*. 1992;89:2732-2736.

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18. Retsky KL, **Freeman MW**, and B. Frei. Ascorbic acid and dehydro ascorbic acid prevent oxidative modification of human low density lipoproteins. *J Biol Chem*. 1993;268:1304-1309.

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20. Ashkenas J, Penman M, Vasile E, Acton S, **Freeman M**, and M Krieger. Structures and high and low affinity ligand binding properties of murine type I and type II macrophage scavenger receptors. *J Lipid Res*. 1993;34:983-1000.

21. Zoeller RA, Liu Y, Millham F, **Freeman MW**, and DT Golenbock . Surface expression of human CD 14 in Chinese Hamster Ovary fibroblasts transfers responsiveness to bacterial endotoxin. *J Biol Chem*. 1993:268:22055

22. Li H, **Freeman MW**, and P. Libby. Regulation of smooth muscle cell scavenger receptor expression *in vivo* by atherogenic diets and *in vitro* by cytokines. *J Clin Invest*. 1995;95:122-133.

23. Aftring RP and **MW Freeman**. Structure of the murine macrophage scavenger receptor gene and evaluation of sequences which regulate expression in the macrophage cell line, P388D1. *J. Lipid Res*. 1995:36;1305-1314.

24. Christie R, **Freeman M**, and BT Hyman . Expression of the macrophage scavenger receptor, a multifunctional lipoprotein receptor, in microglia associated with senile plaques in Alzheimer disease. *Am.J.Pathol*. 1996:148;399-403.

25. Eberhart, G.P., Mendez, A.J., and **MW Freeman**. Decreased cholesterol efflux from fibroblasts of a patient without Tangier Disease, but with markedly reduced high density lipoprotein cholesterol levels.*J. Clin. Endo. Metabolism* 1998:83;836-846.

26. Andersson LA and **MW Freeman**. Functional changes in scavenger receptor binding conformation are induced by charge mutants spanning the entire collagen domain. *J. Biol. Chem.* 1998:273;19592-19601.

27. Moore KJ, Fabunmi RP, Andersson LP and **MW Freeman**. In vitro differentiated embryonic stem cell macrophages: a model system for studying atherosclerosis-associated macrophage functions.*Arterioscler Thromb Vasc Biol* 1998;18:1647-1654.

28. Chiang N, Gronert K, Clish, CB, O'Brien JA, **Freeman MW** and C.S. Serhan. Leukotriene B4 receptor transgenic mice reveal novel protective roles for lipoxins and aspirin-triggered lipoxins in reperfusion *J Clin Invest* 1999; 309-316.

29. Fabunmi RP, Moore KJ, Libby P, and **MW Freeman**. Stromelysin-1 (MMP-3) expression driven by a macrophage-specific promoter results in reduced viability in transgenic mice. *Atherosclerosis* 1999; 148:375-386.

30. Fitzgerald M, Moore KJ, **MW Freeman**, GL Reed. Lipopolysaccharide induces scavenger receptor-A expression in murine macrophages via a non-transcriptional mechanism. *J Immunol*. 2000; 164:2692-2700.

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