RICHARD F. HECTOR, Ph.D., J.D.

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Professional experience

UCSF Dept. of Epidemiology and Biostatistics Project Director, Valley Fever Vaccine Project

2000-2008; 2009-present

- Coordinated multi-center university-based vaccine R&D project
- Prepared FDA regulatory filings for IND, clinical protocols, IRB submissions, clinical trial reports; initiated/monitored human clinical trials
- Administrative coordination and oversight of committees and funding agencies involved with project
- Coordination of business development activities (CDA's, MTA's, contracts)
- Prepared patent applications & prosecution responses for project IP in coordination with outside counsel leading to six US-issued patents
- Negotiated interinstitutional agreement for commercialization of project IP
- Identification and oversight of contract facilities for manufacturing, formulation & analytical services, contract research studies
- Coordination and monitoring of human clinical trials

Amunix, Inc., Mountain View, CA

2009-present

- Director, IP
 - Prepare and submit patent applications, prepare amendments and responses to office actions in cooperation with outside counsel
 - Perform FTO analyses
 - Prepare, review and revise legal documents (MTAs, NDAs, term sheets, license agreements, corporate documents)

Wilson Sonsini Goodrich & Rosati, Palo Alto, CA

Associate, IP Counseling & Patents Summer Associate

4/2008-1/2009 5/2006-8/2006

- · Prepared patent applications, prosecution submissions and responses to office actions; worked with foreign associates on responses to national stage office actions
 - -Technologies: recombinant therapeutics & diagnostics, biofuels, fermentation microbes & processes, drugs & formulations, microfluidics, DNA sequencing, devices
- Conducted FTO & due diligence analyses in conjunction with VC financings
- Conducted research for litigation matters

Connetics, Inc., Palo Alto, CA

1999

Head, Product Development

- Head of Department with 16 FTE's, reporting to CEO
- Overall responsibility for rhRelaxin development project including clinical, manufacturing, regulatory, and preclinical/toxicology activities
- · Liaison to two international commercial partner pharmaceutical companies

Shaman Pharmaceuticals, So. San Francisco, CA

1992-1999

Sr. Director, Biological Sciences Department

- Head, Biological Sciences Department reporting to VP Research: '92-'99
 - Manager of scientific staff of up to 23 FTE's
- Project Leader for Diabetes Discovery Project: '93-'99
 - Creation, implementation, and management of project plan
 - Coordination and oversight of up to 50 scientists and support staff
 - Creation and control of \$7 million annual budget
 - Responsible for status reports to President's Advisory Committee
 - Scientific Liaison to Ono Pharmaceuticals, Osaka Japan for joint research agreement for diabetes drug discovery: '95-'98
 - Scientific Liaison to Groupe Lipha, Lyon France, for joint research agreement for diabetes drug discovery: '96-'99
- Project Leader for Masoprocol Project (for NIDDM): '97-'99
 - Project management of Phase I project
 - Budgetary control of project
 - Responsible for status reports to President's Advisory Committee
- Project Leader/member of Nikkomycin Z (antifungal) Project: '93-'99
 - Coordination of preclinical activities, including extramural studies
 - Liaison to NIH Mycoses Study Group
 - Led efforts to secure cGMP production facilities
- Project Leader for Antifungal Discovery Project: '92-'94
 - Scientific control and project management for drug discovery project
 - Liaison to Eli Lilly for joint research agreement for antifungal drug discovery
- Business development
 - Responsible for outlicense of nikkomycin Z and masoprocol projects
 - Responsible for outlicense of diabetes discovery library
- · Director of animal facility, Chairman of IACUC: '92-'99
 - Responsible for all aspects of animal facility, review/approval of animal protocols, accreditation of animal facility

Miles Pharmaceuticals (now Bayer)

1982-1992

- *Sr. Staff Scientist*, Cutter Biological Division, Berkeley, CA (1985-1992)
 - Preclinical evaluation of biologics and synthetic anti-infectives
 - Established animal models of infectious diseases for anti-shock and antifungal indications, including rodent, swine & primate models
 - Coordination of extramural preclinical studies for product development and liaison to anti-infectives group from Bayer AG, Germany
 - Responsible for confirmatory screening of new anti-infectives generated by Bayer AG, Germany for patent protection in U.S.

Scientist, Miles Pharmaceuticals Division, West Haven, CT (1982-1985)

- · In vitro susceptibility testing of candidate azole antifungal compounds
- · Developed and implemented new assay procedures
- Coordination of extramural preclinical studies for product development and
- · Liaison to anti-infectives group from Bayer AG

ADMISSIONS

State Bar of California, No. 255884	2008
U.S. District Court for the Northern District of California	2008
Patent Agent, USPTO Reg. No. 51,796	2002

EDUCATION AND TRAINING

Golden Gate University School of Law, San Francisco (evening program)

Doctor of Jurisprudence, with Highest Honors

December 2007

Class Rank: 2/202

Honors: Academic Excellence in Intellectual Property Law; 5 Witkin Awards; CALI Award

Tulane School of Medicine, New Orleans, LA

1980-1982

Postdoctoral fellowship in Medical Mycology under Judith Domer, Ph.D.

University of California, Davis, CA Ph.D. in Microbiology

1980

Graduate studies under Demosthenes Pappagianis, M.D., Ph.D.

Thesis: An Ultrastructural Study of the Cell Wall of Coccidioides immitis

Earl C. Anthony Graduate Fellowship

University of California, Davis, CA Bachelor of Arts in Bacteriology 1974

PROFESSIONAL ACTIVITIES

Memberships: American Society for Microbiology, Medical Mycology Society of the Americas, American Bar Association

Invited Reviewer: Antimicrobial Agents and Chemotherapy; Journal of Infectious Diseases;

BioTechniques; Experimental Mycology; Journal of Investigative Dermatology; Diagnostic Microbiology and Infectious Disease; American Journal of Tropical

Medicine and Hygiene:

Canadian Journal of Microbiology; Medical Mycology

Editor: Editorial Board, Infection and Immunity, 1993-2001

Section Editor, Expert Opinion on Therapeutic Patents, 1991-Present

Editorial Board, Investigational Drugs Database, 1994-1996

Chapter Editor for "Recent Trends in the Discovery, Development, and Evaluation of Antifungal Agents" and "Cutaneous Antifungal Agents"

Committees: Advisor, NCCLS Subcommittee on Standardization of Antifungal Susceptibility

Testing; Organizing Committees: 5th International Symposium on

Coccidioidomycosis; 6th International Symposium on Coccidioidomycosis;

Coccidioidomycosis Study Group Meeting; NIH workshop "Molecular,

Immunologic, and Epidemiologic Approaches to Diagnosis of Systemic Mycoses

and Drug Development" June 1994

PATENTS: INVENTOR ON THE FOLLOWING ISSUED PATENTS

- U.S. 4,851,389. Hector, Richard F. Use of nikkomycin compounds to treat infections of dimorphic, highly chitinous fungi.
- U.S. 4,914,087. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Nikkomycin derivatives, antimycotic compositions of nikkomycin derivatives and azole antimycotics.
- U.S. 5,006,513. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,019,560. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,030,619. Hector, R.F. Synergistic fungicidal composition.
- U.S. 5,091,375. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Nikkomycin derivatives, antimycotic compositions of nikkomycin derivatives and azole antimycotics.
- U.S. 5,096,889. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,134,126. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,149,795. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Nikkomycin derivatives.
- U.S. 5,194,427. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,330,976. Hector, R.F., K. Schaller, H.F. Moeschler, and M. Plempel. Antimycotic compositions of nikkomycins and azole antimycotics.
- U.S. 5,556,875. Thien V. Truong, Donald E. Bierer, Jeffrey M. Dener, Richard Hector, Michael S. Tempesta, Bernard Loev, Wu Yang, and Masato Koreeda. 1,2-Dithiin antiinfective agents.
- U.S. 5,616,321. Hector, Richard F. and Michael S. Collins. Method for treating bacterial meningitis with anti-tumor necrosis factor antibody.
- U.S. 5,668,168. Thien V. Truong, Donald E. Bierer, Jeffrey M. Dener, Richard Hector, Michael S. Tempesta, Bernard Loev, Wu Yang, and Masato Koreeda. 1,2-Dithiin antiinfective agents.
- U.S. 5,789,387. Hector, R.F. and Adam Sabouni. Methods and compositions for treating fungal infections in mammals.

PATENT REVIEW ARTICLES

Hector, R.F. Antifungal Agents- Recent Patent Activity. Current Opinion in Therapeutic Patents 1991; 1:1-5.

Hector, R.F. Recent developments in antifungal agents. Current Opinion in Therapeutic Patents 1991; 1:457-473.

Hector, R.F. Recent Advances in Antifungal Agents. Current Opinion in Therapeutic Patents 1992; 2:1391-1398.

Hector, R.F. Review of antifungal patents appearing July 1993 to March 1994. Expert Opinion on Therapeutic Patents 1994; 4(8):911-916.

Hector, R.F. Antifungal patent review: March-November 1994. Expert Opinion on Therapeutic Patents 1994; 5(2):157-161.

Hector, R.F. Novel peptides with antimicrobial properties, with emphasis on antifungal action. Expert Opinion on Therapeutic Patents 1997; 7(8):885-890.

Hector, R.F. Amino-lipopeptide antifungal agents. Expert Opinion on Therapeutic Patents 1998; 8(6):725-728.

Hector, R.F. Quaternized nitrogen-containing azole antifungals. Expert Opinion on Therapeutic Patents 1999; 9(3):327-329.

Hector, R.F. Aerothricins; a new class of β -glucan inhibitors. Expert Opinion on Therapeutic Patents 2002; 12(2):1-4.

Hector, R.F. Thiazolidine and benzylidene thiazolidinedione inhibitors of mannosyltransferase as antifungal agents. Expert Opinion on Therapeutic Patents 2002; 12(8):1285-1287.

Hector, R.F. The many lives of itraconazole. Expert Opinion on Therapeutic Patents 2003; 13(2):141-148.

PUBLICATIONS

Pappagianis, D., R. Hector, H.B. Levine, and M.S. Collins. Immunization of mice against coccidioidomycosis with a subcellular vaccine. Infection and Immunity 1979; 25:440-445.

Pappagianis, D., M.S. Collins, R. Hector, and J. Remington. Development of resistance to amphotericin B in *Candida lusitaniae* infecting a human. Antimicrobial Agents and Chemotherapy 1979; 16:123-126.

Hector, R.F., F.L. Lyon, and J.E. Domer. Immunological relatedness among *Candida albicans* and other *Candida* species. Infection and Immunity 1981; 34:844-850.

Hector, R.F. and D. Pappagianis. Enzymatic degradation of the wall of spherules of *Coccidioides immitis*. Experimental Mycology 1982; 6:136-152.

Hector, R.F., and J.E. Domer. Mammary gland contamination as a means of establishing long-term gastrointestinal colonization of infant mice with *Candidaalbicans*. Infection and Immunity 1982; 38:788-790.

Hector, R.F., J.E. Domer, and E. W. Carrow. Immune responses to *Candida albicans* in genetically distinct mice. Infection and Immunity 1982; 38:1020-1028.

Hector, R.F., and D. Pappagianis. Inhibition of chitin synthesis in the cell wall of *Coccidioides immitis* by polyoxin D. Journal of Bacteriology 1983; 154:488-498.

Hector, R.F., and J.E. Domer. Control of systemic spread of *Candida albicans* with ketoconazole in the stomachs of mice treated with cytarabine. Journal of Infectious Diseases 1983; 147:946-950.

Fashing, C.E., C.E. Hughes, R.F. Hector, and L.R. Peterson. High-pressure liquid chromatographic assay of Bay N 7133 in human serum. Antimicrobial Agents and Chemotherapy 1984; 25:596-598.

Carrow, E.W., R.F. Hector, and J.E. Domer. Immunodeficient CBA/N mice respond effectively to *Candida albicans*. Clinical Immunology and Immunopathology 1984; 33:371-380.

Pappagianis, D., A. Ornelas, and R. Hector. Guanine plus cytosine content of the DNA of *Coccidioides immitis*. Sabouraudia 1985; 23:451-454.

Hector, R.F., and P.C. Braun. Synergistic action of nikkomycins X and Z with papulacandin B on whole cells and regenerating protoplasts of *Candida albicans*. Antimicrobial Agents and Chemotherapy 1986; 29:389-394.

Collins, M.S., G.C. Tsay, R.F. Hector, R.E. Roby, and J.H. Dorsey. Immunoglobulin G potentiation of tobramycin and azlocillin in the therapy of *Pseudomonas aeruginosa* sepsis in neutropenic mice and neutralization of exotoxin A in vivo. Reviews of Infectious Diseases 1986; 8(S4):S420-S425.

Lyon, F.L., R.F. Hector, and J.E. Domer. Innate and acquired immune resistance against *Candida albicans* in congenic B10.D2 mice with deficiency of the C5 component of complement. Journal of Medical and Veterinary Mycology 1986; 24:359-367.

Hector, R.F., and P.C. Braun. Use of a 96-well, epifluorescent reader for rapid assessment of compounds inhibitory to *Candida spp.* Journal of ClinicalMicrobiology 1986; 24:620-624.

- Collins, M.S., G.C. Tsay, R.F. Hector, R.E. Roby, and J.H. Dorsey. Therapy of experimental *Pseudomonas* burn wound sepsis with ciprofloxacin and *Pseudomonas* immunoglobulin. Antibiotics and Chemotherapy 1987; 39:222-232.
- Braun, P.C., R.F. Hector, M. Kamarck, J. Hart, and R. Cihlar. Cerulenin and sodium butyrate inhibit chitin release from the plasma membrane in *Candida albicans*. Canadian Journal of Microbiology 1987; 33:546-550.
- Collins, M.S., R.F. Hector, R.E. Roby, A.A. Edwards, D.K. Ladehoff, and J.H. Dorsey. Prophylaxis of gram-negative and gram-positive infections in rodents with three intravenous immunoglobulins and therapy of experimental polymicrobial burn wound sepsis with *Pseudomonas* immunoglobulin and ciprofloxacin. Infection 1987; 15:S60-S68.
- Domer, J.E. and R.F. Hector. Enhanced immune responses in mice treated with penicillin/tetracycline or bactrim and colonized with *Candida*. Antimicrobial Agents and Chemotherapy 1987; 31:691-697.
- Hector, R.F., and P.C. Braun. The effects of bifonazole on chitin synthesis in *Candida albicans*. *In* Recent trends in the discovery, development, and evaluation of antifungal agents. 1988; pp. 369-382. R. Fromtling (Ed.). J.R. Prous, Barcelona.
- Hector, R.F., B.L. Zimmer, and D. Pappagianis. Microtiter method for MIC testing with spherule-endospore phase *Coccidioides immitis*. Journal of Clinical Microbiology 1988; 26:2667-2668.
- Hector, R.F., M.S. Collins, and J.E. Pennington. Treatment of experimental *Pseudomonas aeruginosa* pneumonia with a human IgM monoclonal antibody. Journal of Infectious Diseases 1989; 160:483-489.
- Hector, R.F., P.C. Braun, J.T. Hart, and M.E. Kamarck. The use of flow cytometry to monitor chitin synthesis and its inhibition in regenerating protoplasts of *Candida albicans*. Journal of Medical and Veterinary Mycology 1990; 28:51-57.
- Hector, R.F. and E. Yee. Evaluation of Bay R 3783 in rodent models of superficial and systemic candidiasis, meningocerebral cryptococcosis, and pulmonary aspergillosis. Antimicrobial Agents and Chemotherapy1990; 34:448-454.
- Hector, R.F., B.L. Zimmer, and D. Pappagianis. Evaluation of nikkomycins X and Z in murine models of coccidioidomycosis, histoplasmosis, and blastomycosis. Antimicrobial Agents and Chemotherapy 1990; 34:587-593.
- Hector, R.F., E. Yee, and M.S. Collins. Use of DBA/2N mice in models of systemic candidiasis and pulmonary and systemic aspergillosis. Infection and Immunity 1990; 58:1476-1478.

- Pappagianis, D., B.L. Zimmer, G. Theodoropoulos, M. Plempel, and R.F. Hector. Therapeutic effect of the triazole Bay R 3783 in mouse models of coccidioidomycosis, blastomycosis, and histoplasmosis. Antimicrobial Agents and Chemotherapy 1990; 34:1132-1138.
- Hector, R.F. Inhibitors of cell wall synthesis-nikkomycins. *In* Recent Progress in Antifungal Chemotherapy 1992; pp. 341-354. Yamaguchi et al. (eds) Marcel Dekker, Inc.
- Perfect, J.R., K. Wright, and R.F. Hector. Synergistic interaction of nikkomycin and cilofungin against diverse fungi. <u>In Recent Progress in Antifungal Chemotherapy</u> 1992; pp. 369-379. Yamaguchi et al.(eds) Marcel Dekker, Inc.
- Hector, R.F. and K. Schaller. Positive interaction of nikkomycins and azoles against *Candida albicans* in vitro and in vivo. Antimicrobial Agents and Chemotherapy 1992; 36:1284-1289.
- Hector, R.F. Compounds active against the cell wall of medically important fungi. Clinical Microbiol. Reviews 1993; 6:1-21 (invited review).
- Deresinski, S. and R. Hector. The history of coccidioidomycosis I. The early history of the disease in North America. II. Biographies of four coccidioidomycologists. In Coccidioidomycosis. Proceedings of the 5th International Conference 1996; pp. 48-76. Einstein and Catanzaro (eds). National Foundation for Infectious Diseases.
- Hector, R.F. New antifungal drugs in preclinical development. In Coccidioidomycosis. Proceedings of the 5th International Conference 1996; pp. 265-274. Einstein and Catanzaro (eds). National Foundation for Infectious Diseases.
- Bierer, D.E., D.M. Fort, C.D. Mendez, J. Luo, P. Peterli-Roth, L.G. Dubenko, R.E. Gerber, J. Litvak, Q. Lu, P. Zhang, M.J. Reed, N. Waldeck, R.C. Bruening, B.K. Noamesi, R.F. Hector, T.J. Carlson, S.R. King. Ethnobotanical-directed discovery of the antihyperglycemic properties of cryptolepine: its isolation from *Cryptolepis sanguinolenta*, synthesis and *in vitro* and *in vivo* activities. J. Med. Chem. 1998; 41:894-901.
- Luo, J., T. Chuang, J. Cheung, J. Quan, J. Tsai, C. Sullivan, R.F. Hector, M.J. Reed, K. Meszaros, S.R. King, T.J. Carlson, and G.M. Reaven. Masoprocol (nordihydroguaiaretic acid): a new antihyperglycemic agent isolated from the cresote bush (Larrea tridentata). Eur. J. Pharmacol. 1998; 346:77-79.
- Luo, J., J. Quan, J. Tsai, C. Hobensack, C. Sullivan, R. Hector, G.M. Reaven. Nongenetic mouse models of non-insulin-dependent diabetes mellitus. Metab. 1998; 47(6):663-668.
- Mathews, K.G., A.P. Davidson, P.D. Kobilik, E.F. Richardson, J. Komtebedde, D. Pappagianis, R.F. Hector, and P.H. Kass. Comparison of topical administration of clotrimazole through surgically placed versus nonsurgically placed catheters for treatment of

nasal aspergillosis in dogs: 60 cases (1990-1996). J. Amer. Vet. Med. Assoc. 1998; 213(4):501-506.

Graybill, J.F., L.K. Najvar, R. Bocanegra, R.F. Hector, and M.F. Luther. Efficacy of nikkomycin Z in the treatment of murine histoplasmosis. Antimicrobial Agents Chemother. 1998; 42(9):2371-2374.

Luo, J., J. Cheung, E.M. Yevich, J.P. Clark, J. Tsai, P. Lapresca, R.P. Ubillas, D.M. Fort, T.J. Carlson, R.F. Hector, S.R. King, C.D. Mendez, S.D. Jolad, and G.M. Reaven. Novel terpenoid-type quinones isolate from *Pycnanthus angolensis* of potential utility in the treatment of Type 2 diabetes. J. Pharm. Exp. Therapeutics 1999; 288:529-534.

Goldberg, J, P. Connolly, C. Schnizlein-Bick, M. Durkin, S. Kohler, M. Smedema, E. Brizendine, R. Hector, J. Wheat. Comparison of nikkomycin Z with amphotericin B and itraconazole for treatment of histoplasmosis in a murine model. Antimicrobial Agents and Chemotherapy 2000; 44(6):1624-1629.

Chiou CC, N. Mavrogiorgos, E. Tillem, R. Hector, and T.J. Walsh. Synergy, pharmacodynamics, and time-sequenced ultrastructural changes of the interaction between nikkomycin Z and the echinocandin FK463 against Aspergillus fumigatus. Antimicrobial Agents Chemother. 2001; 45(12):3310-3321.

Hector RF, Laniado-Laborin R. Coccidioidomycosis—A Fungal Disease of the Americas. PLoS Med 2005; 2(1): e2.

Hector RF, Davidson AP, Johnson SM. Comparison of susceptibility of fungal isolates to lufenuron and nikkomycin Z alone or in combination with itraconazole. Am J Vet Research 2005; 66:1090-1093.

Hector RF. An overview of antifungal drugs and their use for treatment of deep and superficial mycoses in animals. Clin Techniques Small Animal Practice 2005; 20(4):240-249.

Ampel NG, Hector RF, Lindan CP, Rutherford G. An archived lot of coccidioidin induces specific coccidioidal delayed-type hypersensitivity and correlates with in vitro assays of coccidioidal cellular immune response. Mycopathologia 2005; 161(2):67-72.

Hector, RF, Rutherford, GW. The public health need and present status of a vaccine for the prevention of coccidioidomycosis. In Coccidioidomycosis, Sixth International Symposium, Annals NY Acad. Sciences 2007; 1111: 259-268.

Johnson, SM, Lerche, NW, Pappagianis, D, Yee, JL, Galgiani, JN, Hector, RF. Safety, antigenicity, and efficacy of a recombinant coccidioidomycosis vaccine in cynomolgus macaques. In Coccidioidomycosis, Sixth International Symposium, Annals NY Acad. Sciences 2007; 1111: 290-300.

Flaherman VJ, RF Hector, GW Rutherford. Estimating severe coccidioidomycosis in California. Emerging Infect. Dis. 2007; 13(7):1087-1090.

Nix DE, Swezey RR, Hector R, Galgiani JN. Pharmacokinetics of nikkomycin Z after single rising oral doses. Antimicrob Agents Chemother. 2009; 53(6):2517-2521

Hector, RF, GW Rutherford, CA Tsang, LM Erhart, O. McCotter, SM Anderson, K. Komatsu, F. Tabnak, DJ Vugia, Y. Yang, JN Galgiani. The public health impact of coccidioidomycosis in Arizona and California. Int. J. Environ. Res. Public Health 2011; 8:1150-1173.

RECENT ABSTRACTS

Rutherford GW, Flaherman V, Hector R. Measuring the burden of coccidioidomycosis in California. American Society of Microbiology Conference on Dimorphic Fungal Pathogens, Denver, Colorado, March 17, 2006.

Lerche NW, Pappagianis D, Johnson SM, Yee JL, Galgiani JN, Hector RF. Antigenicity, safety, and efficacy of a recombinant coccidioidomycosis vaccine in cynomolgus macaques (*Macaca fascicularis*). Sixth International Symposium on Coccidioidomycosis, August 25, 2006

Wheeler G, Faravardeh A, Daily K, Rutherford G, Hector R. A Phase II Study to Evaluate the Reactivity and Tolerability of Intradermally Administered Doses of Coccidioidin in Human Subjects in a Target Population. Presented at the American College of Physicians, Army Chapter, National Meeting. Arlington, VA, Nov. 15-18, 2006.