

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG BIOEPIS CO. LTD,
Petitioner

v.

REGENERON PHARMACEUTICALS, INC.,
Patent Owner.

Case IPR2023-00442
Patent No. 10,130,681 B2

EXPERT DECLARATION OF RICHARD MANNING. PH.D.

CONFIDENTIAL MATERIAL - SUBJECT TO PROTECTIVE ORDER

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Section A Expert Materials

Attachment A-1 Curriculum Vitae of Richard Manning, Ph.D.

I, Richard Manning, Ph.D., do hereby declare:

1. Introduction

1.1. Qualifications

- (1) I am a Managing Director at Intensity, LLC. I provide data-driven insights to help clients address complex economic questions. Among other things, I have experience conducting economic analyses in matters involving breach of contract, fraud, pricing, economic valuation, intellectual property, antitrust, patent infringement, business strategy, and public policy.
- (2) I earned my B.A. in Economics from Brigham Young University. I received my Ph.D. in Economics from the University of Chicago. After obtaining my Ph.D., I was an economics professor at Brigham Young University and a visiting professor in the Graduate School of Business at the University of Chicago. As an academic, my teaching and research focused on price theory, the economic analysis of law, industrial organization, and the economics of government regulation.
- (3) My career includes 14 years as an executive at multinational pharmaceutical companies. I was Senior Director at Pfizer Inc. and Executive Director at Merck & Co., Inc. I led economic analysis and strategy development to shape practices related to emerging business concerns. Examples of my responsibilities include:

- Leading and undertaking economic analysis and strategy relative to challenges affecting pricing, reimbursement, intellectual property protection, marketing, and other business practices in domestic and global markets.
 - Collaborating with outside academic economists and other experts to analyze critical issues including healthcare benefit design, healthcare system reform proposals, marketing and advertising, intellectual property protection, FDA regulatory reform, including biosimilars approval processes and safety, and new product R&D.
- (4) Previously, I also was a Director in the Advisory Strategy Group at PricewaterhouseCoopers where my responsibilities included working on strategic partnerships, merger and acquisitions activity, economic valuation of early-stage companies, and other economic analyses for biopharmaceutical, medical device, financial, and healthcare clients.
- (5) Prior to joining Intensity, I was a Partner at Bates White, an economics consulting firm offering analysis and expert testimony services to law firms, Fortune 500 companies, and government agencies.
- (6) My areas of expertise include:
- Economic Valuation, Damages, and Commercial Success
 - Breach of Contract, Fraud, and other Commercial Litigation

- Intellectual Property
 - Securities Litigation
 - Tax, Antitrust and Competition
 - Public Policy
- (7) I have provided testimony in U.S. District Court, the Delaware Court of Chancery, the International Chamber of Commerce, and the U.S. Patent and Trademark Office Patent Trials and Appeals Board; served as consulting expert; and prepared reports on various matters in the biopharmaceutical and healthcare industries.

1.2. Scope of work

- (8) Intensity has been retained by Arnold & Porter Kaye Scholer LLP on behalf of Regeneron Pharmaceuticals, Inc. (Regeneron). Intensity is being compensated at my standard hourly rate for my work in this matter. Intensity is being compensated for time spent by others on my team at rates lower than my hourly rate. Intensity's compensation does not depend on the substance of my testimony or the outcome of this matter.
- (9) I was asked to evaluate and, if called upon, to testify concerning commercial success as an objective indicator of non-obviousness in *Inter Partes* review No. IPR2023-00442 regarding U.S. Patent No. 10,130,681 (the '681 Patent).

- (10) In forming the opinions expressed in this declaration, I relied upon my education, experience, and knowledge of the subjects discussed. Additionally, I relied on the declarations of Dr. Diana Do and Dr. David Brown as well as a discussion with Regeneron Pharmaceuticals' Executive Director, Commercial Finance & Business Planning. I also have considered documents and other materials, which are cited herein.

1.3. Framework for commercial success

- (11) I understand that evidence of commercial success is one of the objective indicators that a patent owner may rely upon to support an argument of non-obviousness of a claimed invention.¹ I understand that the Federal Circuit has stated that “[c]ommercial success is relevant because the law presumes an idea would successfully have been brought to market sooner, in response to market forces, had the idea been obvious to persons skilled in the art.”² I understand that, for commercial success to constitute evidence of non-obviousness of a patent, there must be a nexus between the claimed technology and evidence of commercial success. Moreover, the evidence must demonstrate that the

¹ *Demaco Corp. v. F. Von-Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1391–92 (Fed. Cir. 1988).

² *Merck v. Teva*, 395 F.3d 1364, 1376 (Fed. Cir. 2005).

commercial success is due at least in part to the claimed features of the invention and not entirely to factors unrelated to the claimed invention.³

³ United States Patent and Trademark Office, Manual of Patent Examining Procedure, Ninth Edition, Revision: 7/2010, 716.03 I., at 700-2 (“An applicant who is asserting commercial success to support its contention of nonobviousness bears the burden of proof of establishing a nexus between the claimed invention and evidence of commercial success. . . . The term ‘nexus’ designates a factually and legally sufficient connection between the evidence of commercial success and the claimed invention so that the evidence is of probative value in the determination of nonobviousness.”); and 716.03(b) I (“In considering evidence of commercial success, care should be taken to determine that the commercial success alleged is directly derived from the invention claimed, in a marketplace where the consumer is free to choose on the basis of objective principles, and that such success is not the result of heavy promotion or advertising, shift in advertising, consumption by purchasers normally tied to applicant or assignee, or other business events extraneous to the merits of the claimed invention, etc.”)

Demaco Corp. v. F. Von-Langsdorff Licensing Ltd., 851 F.2d 1387, 1391–92 (Fed. Cir. 1988).

Additionally, I understand that the commercial success must not relate exclusively to a feature that was known in the prior art.⁴ I further understand that Federal Circuit case law holds that “if the commercial success is due to an unclaimed feature or device, the commercial success is irrelevant.”⁵

- (12) It is my understanding that the courts commonly accept indicators including significant sales levels, significant sales growth, substitution towards the novel product or method and away from alternative products or methods, persistent price premiums, or the absence of substantial discounting, and other economic indicators as evidence of commercial success of a novel product.⁶ In the context of pharmaceutical products (and by extension biologic products), sales can be measured in terms of revenues, prescriptions, or daily

⁴ *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1364-65 (Fed. Cir. 2023).

⁵ *Ormco Corporation, et al. v. Align Technology, Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006).

⁶ Ex. 2201 (Guha, Rahul, Jian Li, and Andrea L. Scott (2009), “The Economics of Commercial Success in Pharmaceutical Patent Litigation,” *Landslide* 1(5)).

doses, and sales growth can be measured in terms of sales or share of sales within a product category.⁷

⁷ Ex. 2201 (Guha, Rahul, Jian Li, and Andrea L. Scott (2009), “The Economics of Commercial Success in Pharmaceutical Patent Litigation,” *Landslide* 1(5)).

2. At-Issue Patent

2.1. U.S. Patent No. 10,130,681

(13) U.S. Patent No. 10,130,681, entitled “Use of a VEGF Antagonist to Treat Angiogenic Eye Disorders,” was issued on November 20, 2018.⁸ The ’681 Patent lists George D. Yancopoulos as its inventor and Regeneron Pharmaceuticals, Inc. as its assignee.⁹ The ’681 Patent claims a priority date of January 13, 2011, and the application resulting in the ’681 Patent was filed on March 28, 2017.¹⁰

(14) The abstract of the ’681 Patent reads as follows:¹¹

The present invention provides methods for treating angiogenic eye disorders by sequentially administering multiple doses of a VEGF antagonist to a patient. The methods of the present invention include the administration of multiple doses of a VEGF

⁸ Ex. 1001 (Use of a VEGF Antagonist to Treat Angiogenic Eye Disorders, U.S. Patent No. 10,130,681 (“U.S. Patent No. 10,130,681”), filed 3/28/2017, issued 11/20/2018).

⁹ Ex. 1001 (U.S. Patent No. 10,130,681).

¹⁰ Ex. 1001 (U.S. Patent No. 10,130,681).

¹¹ Ex. 1001 (U.S. Patent No. 10,130,681).

antagonist to a patient at a frequency of once every 8 or more weeks. The methods of the present invention are useful for the treatment of angiogenic eye disorders such as age-related macular degeneration, diabetic retinopathy, diabetic macular edema, central retinal vein occlusion, branch retinal vein occlusion, and corneal neovascularization.

- (15) The '681 Patent has 26 claims.¹² Of these 26 claims, 22 are currently under review in proceeding IPR2023-00442: claims 1, 3–11, 13, 14, 16–24, and 26.¹³ Generally I understand that the '681 Patent describes a dosing regimen directed to treating angiogenic eye disorders in patients who do not have three exclusion criteria by administration of a sequential dosing regimen of the VEGF antagonist. Under the claimed dosing regimen, an “initial” dose of the claimed VEGF antagonist is administered, followed by one or more “secondary” doses administered two to four weeks after the preceding dose, and then one or more “tertiary” doses are administered at least eight weeks following the preceding dose.

¹² Ex. 1001 (U.S. Patent No. 10,130,681).

¹³ Decision Granting Institution of *Inter Partes* Review, 7/19/2023, at 2 and 48.

2.2. Eylea Dosing

- (16) I understand that Eylea is administered according to the claimed dosing regimen.¹⁴ For example, the FDA approved label for Eylea recommends a monthly injection for the first three to five months, depending on the indication, followed by an on-going 8-week or longer maintenance dosing schedule.¹⁵ I will refer to these initial monthly doses as the “loading doses” or loading period, and the extended doses as the “maintenance doses” or maintenance phase.

¹⁴ Ex. 2056 (Declaration of Diana V. Do, M.D., 10/11/2023, at ¶¶ 170-247).

¹⁵ Ex. 2189 (Drugs@FDA, Eylea Label, 3/2021, at 3, available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/125387s069lbl.pdf). (“The recommended dose for EYLEA is 2 mg (0.05 mL) administered by intravitreal injection every 4 weeks (approximately every 28 days, monthly) for the first 3 months, followed by 2 mg (0.05 mL) via intravitreal injection once every 8 weeks (2 months).”)

3. Background and Opinions Regarding Commercial Success

(17) I have submitted declarations as part of three prior U.S. PTAB proceedings, namely IPR2021-00881 regarding U.S. Patent No. 9,254,338;¹⁶ IPR2022-01226, regarding U.S. Patent No. 10,888,601; and IPR2022-01225, regarding U.S. Patent No. 10,130,681 (the same patent at issue in this proceeding). As part of my declaration in IPR2021-00881, I demonstrated substantial commercial success for Eylea, Regeneron's patented biologic treatment, as measured by overall sales and different measures of sales shares among other

¹⁶ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881).

I understand that my declaration submitted originally as Ex. 2052 in IPR2021-00881 has been assigned Exhibit No. 2059 in the current proceeding. I further understand that the exhibits cited in my previous declaration have been assigned the same exhibit numbers in this proceeding, with the exception that Exhibits 2217, 2280, 2281, 2133, and 2137 from the IPR2021-00881 proceeding have been given the following exhibit numbers in these proceedings, respectively: 2025, 2037, 2038, 2039, and 2040.

commonly-used anti-VEGF treatment options.¹⁷ In that declaration I discussed the relative dosing intervals for commonly-used anti-VEGF agents, noting that the FDA-approved labels for each approved agent recommend monthly loading doses prior to maintenance phases with potentially different dosing intervals such that Eylea's 8-week recommended maintenance dosing interval was the differentiating aspect of its dosing.¹⁸ I also presented evidence demonstrating Eylea's 8-week dosing interval in the maintenance dosing

¹⁷ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 8).

¹⁸ The differentiating 8-week dosing regimen in the maintenance phase was shown, through clinical data, to provide the ability to achieve and maintain visual acuity gains as effectively as 4-week maintenance dosing with Lucentis. Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 9.2). *See also*:

Ex. 2055 (Expert Declaration of David M. Brown, M.D., 10/12/2023, at ¶¶ 75–84.)

phase was an important driver of demand for Eylea.¹⁹ Finally, I showed that other potential explanations for Eylea's commercial success are not sufficient to explain Eylea's commercial success to the exclusion of the 8-week recommended dosing interval in the maintenance dosing phase.²⁰

- (18) Regarding the analyses and opinions presented in my prior declaration, I maintain my opinions that (1) Eylea has been a commercially successful biologic therapy for angiogenic eye disorders; (2) Eylea's patented dosing regimen, including the differentiating 8-week recommended dosing interval in the maintenance phase has been an important driver of demand (and hence of commercial success); and (3) potential alternative explanations are not sufficient to explain Eylea's commercial success to the exclusion of the 8-week maintenance dosing interval.
- (19) It is my understanding that Eylea's patented dosing regimen, including the 8-week recommended dosing interval in the maintenance phase, that was

¹⁹ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 9).

²⁰ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1).

evaluated in my prior declaration is also a relevant feature related to the at-issue patent in the present IPR, the '681 Patent.²¹

- (20) Important among the commonly asserted potential alternative explanations for commercial success in patent litigation is an extraordinary level of marketing and promotion on the part of the patented product. The assertion is that the observed commercial success is due to extraordinary marketing efforts, and/or extraordinarily accelerating marketing spending over time, rather than the patented features of the product. In the case of prescription medicines, one feature of advertising that attracts attention is direct-to-consumer (DTC) promotion, particularly via television advertising.
- (21) In my prior declaration, submitted for IPR2021-00881, I explained that Eylea's commercial success cannot be attributed to Regeneron's marketing expenditures.²² There, I demonstrated that Regeneron's marketing efforts

²¹ Ex. 1001 (U.S. Patent No. 10,130,681).

Ex. 2056 (Declaration of Diana V. Do, M.D., 10/11/2023, at ¶¶ 170-247).

²² Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.)

were typical of industry marketing practices.²³ Regeneron made large initial investments in marketing Eylea around the time of its launch in 2011, but for the years after, its external expenses (which include marketing expenditures for Eylea) never exceeded more than 4.6% of net sales, a low level relative to industry averages.²⁴ In view of Regeneron's relatively low marketing expenditures, I opined that it was highly unlikely that this could have driven Eylea's commercial success.²⁵

- (22) I understand that in the last quarter of 2018, Regeneron spent approximately \$32 million to run a DTC television commercial that advertised Eylea, but that this campaign was terminated because it was deemed unsuccessful.²⁶

²³ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.)

²⁴ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.)

²⁵ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.)

²⁶ Discussion with Executive Director, Commercial Finance & Business Planning, Regeneron, 10/3/2023.

Additionally, I understand that Regeneron ran an unbranded DTC television and online advertisement promoting diabetic eye health from Q4 2021 to Q1 2022, with associated expenditures of approximately \$76 million in 2021 and \$30 million in 2022.²⁷ If these expenditures for the DTC campaigns are removed from the overall expenditures, external marketing expenditures as a percentage of product revenues did not increase substantially from 2018 through 2021. Furthermore, whether or not the expenditures for these DTC television commercials are included as a component of Regeneron's marketing expenditures, those expenditures remain significantly smaller as a share of net sales than the industry average range of 22.5% to 33% for marketing expenditures referenced in my prior declaration.²⁸

- (23) More generally, as discussed in my declaration for IPR2021-00881, Regeneron's marketing expenditures on behalf of Eylea do not explain Eylea's commercial success to the exclusion of the patented dosing regimen,

²⁷ Discussion with Executive Director, Commercial Finance & Business Planning, Regeneron, 10/3/2023.

²⁸ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.)

including the 8-week recommended dosing in the maintenance phase.²⁹

Although marketing expenditures have increased over time, they have remained a small percent of net sales, remaining substantially smaller as a share of net sales than is typical for the industry.

- (24) Moreover, it is expected that as the number of approved indications for a product increases over time, as they have for Eylea, marketing expenditures and net sales would each increase as more patients qualify for treatment, and physicians need to know more about the expanding number of conditions and a wider set of patients being treated. I have been asked whether the increasing dollar amounts of external expenses from 2018 through 2021 suggests that Regeneron's marketing expenditure is the basis for Eylea's commercial success. Observing that marketing dollars increased in isolation, *i.e.*, without comparison to overall sales trends, is not meaningful in evaluating whether marketing expenditures were a driver of commercial success.
- (25) In light of this understanding, the opinions and analyses presented in my prior declaration, for IPR2021-00881, also apply to the claims of the '681 Patent.

²⁹ Ex. 2059 (Expert Declaration of Richard Manning, Ph.D., 2/11/2022, in IPR2021-00881, at § 10.1.).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like are punishable by fine, imprisonment, or both under Section 1001 of Title 18 of the United States Code.

Dated: 10/12/2023



Richard Manning, Ph.D.

Washington, D.C.

Attachment A-1

October 2023

Richard Manning, Ph.D.*Managing Director*

Dr. Richard Manning is a Managing Director at Intensity, LLC. He provides economic and data-driven insights to help clients solve complex problems arising in a variety of disputes and business settings with emphasis on biopharmaceuticals in both prescription and Over the Counter (OTC) products, life sciences, and animal health. His areas of expertise include:

- Economic Valuation and Damages
 - Intellectual Property
 - Breach of Contract, Fraud, and other Commercial Litigation
 - Securities Litigation
- Tax, Antitrust and Competition
- Public Policy

Dr. Manning has testified in U.S. District Court, U.S. Bankruptcy Court, the Delaware Court of Chancery, the United States Patent Trial and Appeals Board, and the International Chamber of Commerce; served as consulting expert and prepared reports and commentary on a wide range of issues in the biopharmaceutical (both innovative and follow-on sectors) and healthcare industries. His career includes 14 years as an executive in multinational pharmaceutical companies where he led economic analysis and strategy development to shape practices related to emerging business concerns.

Examples of Dr. Manning's work include:

- Economic analysis and strategy relative to challenges affecting pricing, reimbursement, marketing, manufacturing, R&D investments, and intellectual property protection, including commercial success, Paragraph IV and reverse settlements.
- Economic valuation of early-stage companies and strategic investments; evaluating profitability; mergers and acquisitions; and other financial analyses.
- Analyzing healthcare benefit design; healthcare system reforms; FDA regulatory reform, including biosimilars review processes and product safety.

Prior to joining Intensity, Dr. Manning was a Partner at Bates White, an economic consulting firm offering analysis and expert testimony services to law firms, Fortune 500 companies, and government agencies. Previously, Dr. Manning was Executive Director at Merck & Co., Inc., and

he was Senior Director at Pfizer, Inc. Dr. Manning was also a Director in the Advisory Strategy Group at PricewaterhouseCoopers.

Dr. Manning was an economics professor at Brigham Young University and a visiting professor in the Graduate School of Business at the University of Chicago. As an academic, his teaching and research focused on price theory, the economic analysis of law, industrial organization, and the economics of government regulation.

Dr. Manning received his Ph.D. in Economics from the University of Chicago. He earned his B.A. in Economics from Brigham Young University.

Education

PhD, Economics, University of Chicago, 1989.

MA, Economics, University of Chicago, 1984.

BA, Economics, Brigham Young University, magna cum laude, 1982.

Professional Experience

Intensity, LLC. Managing Director, 2021 to present.

Bates White Economic Consulting, Washington, DC. Partner, 2012–2021.

Merck & Co., Inc., Whitehouse Station, NJ. Executive Director, 2010–2011.

PricewaterhouseCoopers, LLP, New York, NY. Director, Advisory Strategy, 2008–2010.

Pfizer, Inc., New York, NY. Senior Director, 2003–2008.

Pfizer, Inc., New York, NY. Director, 2000–2003.

Pfizer, Inc., New York, NY. Assistant Director, 1999–2000.

Pfizer, Inc., New York, NY. Manager, 1997–1999.

Department of Economics, Brigham Young University Assistant Professor, 1990–1997.

Graduate School of Business, University of Chicago. Visiting Assistant Professor, 1995–1996.

Expert Testimony and Selected Consulting Experience

(Client is underlined.)

Breach of Contract, Fraud, and other Commercial Litigation

1. Fortis Advisors LLC, solely in its capacity as representative of former stockholders of Auris Health, Inc. v. Johnson & Johnson, et al., Court of Chancery of the State of Delaware, Case No. 2020-0881. Submitted expert report (May 2023); testified in deposition (Sept. 2023). (Retained by Selendy & Gay.)
2. Served as expert witness for respondent in arbitration before the American Arbitration Association regarding damages due to an alleged breach of obligations in a supply agreement for Covid-19 tests. Submitted witness statement (December 2022). (Retained by Hueston Hennigan.)
3. Sorrento Therapeutics, Inc., and Scilex Pharmaceuticals, Inc. v. Anthony Mack and Virpax Pharmaceuticals, Inc. Court of Chancery of the State of Delaware, Case No. 2021-0210-PAF. Submitted expert report (July 2022); testified in deposition and trial (Sept. 2022). (Retained by Ballard Spahr.)
4. Don Cleveland, et al. v. Ludwig Institute for Cancer Research LTD. Et al. United States District Court, Southern District of California, Case No. 3:19-cv-02141. Submitted rebuttal expert report (May 2022) and testified in deposition (May 2022). (Retained by Milbank.)
5. Perrigo v. United States of America. United States District Court, Western District of Michigan, Case No. 1:17-cv-00737. Submitted expert report (January 2019) and testified in deposition (March 2019) and trial (June 2021). (Retained by U.S. Department of Justice.)
6. Served as expert witness for claimant in arbitration before the International Chamber of Commerce regarding damages due to an alleged breach of obligations to market a newly launched prescription medication. Submitted witness statement (April 2019), rebuttal statement, and testified in hearing. (Retained by Reed Smith.)
7. Merix Pharmaceutical Corp. v. Clinical Supplies Management, Inc. (CSM), United States District Court, Northern District of Illinois, Case No. 1:11-cv-03318. Retained as testifying expert on behalf of CSM in connection with alleged fraud and breach of contract claims related to the performance of a clinical trial for an over-the-counter medication. Authored expert report (2013) and provided deposition testimony (July 2013) that assessed damages assertions made by plaintiff's experts. Judge Matthew F. Kennelly, of the US District Court for the Northern District of Illinois Eastern Division, granted summary judgment on a number of Merix's damages claims. A jury ultimately found in CSM's favor at trial. (Retained by Segal McCambridge.)
8. National Union Fire Insurance Company of Pittsburgh, Pennsylvania v. Tyco Integrated Security, LLC. United States District Court, Southern District of Florida, Case No. 9:13-cv-80371. Authored an expert report (January 2015) and testified in deposition (March 2015) regarding damages arising from a theft of prescription drugs from a pharmaceutical company warehouse. In April 2016, a Florida federal jury found in Tyco's favor, finding the security company not liable in the insurer's negligence suit. (Retained by Shook, Hardy and Bacon.)

9. Elorac v. Sanofi-Aventis Canada. United States District Court, Northern District of Illinois, Case No. 1:14-cv-01859. Authored an expert report (2016) and provided deposition testimony (June 2016) assessing damages in a breach of contract federal district court action on behalf of the plaintiff, asserting that the defendant failed to perform its duties to commercialize plaintiff's product under a licensing agreement. (Retained by Barnes and Thornburg.)
10. Fera Pharmaceuticals LLS v. Akorn Inc. United States District Court, Southern District of New York, Case No. 1:12-cv-07694. Retained as the testifying expert on behalf of Fera. Authored expert report (2017) and provided deposition testimony (December 2017) evaluating damages, including diminished asset value, resulting from alleged breach of contract, fraudulent inducement, and misappropriation of trade secrets related to Fera's portfolio of prescription ophthalmic anti-infective ointment products. The matter settled on the eve of trial for an undisclosed amount. (Retained by Napoli Shkolnik.)
11. Served as damages expert for plaintiff on a matter related to losses allegedly suffered by a large academic medical center related to a natural disaster. Work included evaluating the value of destroyed and delayed biomedical research projects funded by a large administrative agency and other third parties, and business interruption associated with the loss. The court accepted a motion for summary judgment before reports were filed. (Retained by Pillsbury.)
12. Served as consulting expert to provide liability and damages analysis for defendant multinational pharmaceutical company in a qui tam case involving potential violations of state law in its marketing practices. (Retained by Hogan Lovells.)
13. Retained as testifying and consulting expert to analyze the economics of a pharmacy services contract evaluation and award process for a leading institutional pharmacy plaintiff in a dispute with a large state's Department of Public Safety and Correctional Services.
14. Retained as consulting expert by a class of state Medicaid claimants to evaluate the state's application of an econometric model for benefit determination decisions. (Retained by Herzfeld and Piotrowski.)

Intellectual Property

15. Regeneron Pharmaceuticals, Inc. v. Mylan Pharmaceuticals, Inc. United States District Court Northern District of West Virginia, Clarksburg Division, Case No. 1:22-cv-00061. Patent Nos. 10,888,601, 11,253,572 and 11,084,865. Submitted Expert Report and testified in deposition (April 2023). Submitted Supplemental Expert Report (May 2023) and testified in deposition (May 2023). (Retained by Williams & Connolly and Kellogg Hansen.)
16. Mylan Pharmaceuticals Inc., Celltrion, Inc., and Samsung Bioepis Co. Ltd. v. Regeneron Pharmaceuticals, Inc. United States Patent and Trademark Office, Patent Trial and Appeal Board, Case No. IPR2022-01226, Patent No. 10,888,601. Submitted Expert Declaration (April 2023) and testified in deposition (June 2023). (Retained by Arnold & Porter.)
17. Mylan Pharmaceuticals Inc., Celltrion, Inc., and Celltrion, Inc. v. Regeneron Pharmaceuticals, Inc. United States Patent and Trademark Office, Patent Trial and Appeal Board, Case No. IPR2022-01225, Patent No. 10,130,681. Submitted Expert

Declaration (April 2023) and testified in deposition (June 2023). (Retained by Arnold & Porter.)

18. *Mylan Pharmaceuticals Inc., Celltrion, Inc., and Apotex, Inc. v. Regeneron Pharmaceuticals, Inc.* United States Patent and Trademark Office, Patent Trial and Appeal Board, Case No. IPR2021-00881, Patent No. 9,254,338 B2. Submitted Expert Declaration (February 2022) and testified in deposition (May 2022). (Retained by Arnold & Porter.)
19. *Baxalta Incorporated and Baxalta GmbH v. Genentech, Inc. and Chugai Pharmaceutical Co., Ltd.* United States District Court, District of Delaware, Case No. 17-cv-00509. Submitted rebuttal expert report (June 2021) and testified in deposition (August 2021). The matter concluded with a summary judgment for Genentech. (Retained by Paul Weiss Rifkind Wharton & Garrison.)
20. *Purdue Pharma v. Alvogen Pine Brook.* United States District Court, District of Delaware, Case No. 1:17-cv-00677. Retained as testifying expert to assess the commercial success of a prescription drug in a patent infringement litigation related to certain Abbreviated New Drug Applications (ANDAs) filed by defendant. Submitted expert reports and provided deposition testimony (March 2018). The matter settled on the eve of trial. (Retained by Norton Rose.)
21. *In re Covered Business Method Post-Grant Review of U.S. Patent No. 8,036,916, CoreSource v. Quality Healthcare Intermediary.* United States District Court, Northern District Court of Illinois, Case No. 1:13-cv-05182. Submitted declarations to US Patent Trial and Appeals Board (January 2014) involving methods for optimizing healthcare services management. Patent owner respondent terminated its claims. (Retained by McCarter & English.)
22. Retained as consulting expert on behalf of defendant in a breach of contract matter between biopharmaceutical companies before the International Chamber of Commerce. Plaintiff was seeking damages for alleged lost profits related to a joint marketing agreement. Provided support to testifying expert in preparing a rebuttal report regarding the impact of adoption and pricing of biosimilar products entering the marketplace in certain Asian countries. (Retained by Winston & Strawn.)
23. Served as consultant to plaintiff university assessing damages against a consumer products company by an unauthorized filing of patents on property owned by the university. Submitted a declaration (December 2015) to U.S. District Court of Utah, Central Division, addressing recommended economic principles and methodologies for assessing the university's intellectual property market value. (Retained by Parr Brown Gee & Loveless.)
24. Provided consulting expert supporting leading academic expert for respondent in an arbitration between large mobile telecommunications companies regarding royalties to be paid for standard-essential patents.
25. Served as consulting expert supporting leading academic expert for claimant medical device manufacturer in an International Trade Commission (ITC) matter seeking to enjoin importation of surgical devices on basis of harm to public interest.

Securities Litigation & Bankruptcy

26. *In re: Retrotope, Inc.* United States Bankruptcy Court, District of Delaware, Case No. 22-10228 (JTD). Retained by counsel for dissident Retrotope shareholders. Expert report and testified in deposition and evidentiary hearing (July 2022). (Retained by Buchalter.)
27. *Wells Fargo Bank et al. v. Merrimack Pharmaceuticals, Inc.* Court of Chancery of the State of Delaware. Retained as testifying expert on behalf of plaintiffs. The plaintiffs alleged that the company's asset sale was a sale of "substantially all" of the assets, which was a fundamental change, and Merrimack was required to repurchase the convertible notes. Submitted primary and rebuttal reports (September 2017) that valued Merrimack's pipeline of oncology drugs and opined that the sale of Merrimack's sole commercial product constituted a fundamental change of the company. Following the exchange of reports, the parties settled. (Retained by Friedman Kaplan.)
28. *Neogenix Oncology v. Peter Gordon et al.* United States District Court, Eastern District of New York, Case No. 2:14-cv-04427. Submitted a witness statement (March 2019) regarding the value of an early-stage biopharmaceutical company. The parties settled. (Retained by Friedman Kaplan.)
29. *In re: Purdue Pharma L.P. et al., Debtors.* United States Bankruptcy Court Southern District of New York, Chapter 11 Case No. 19-23649 (RDD). Retained by counsel to provide consulting support to Special Committee assessing the arm's-length nature of asset transfers and royalty agreements between Purdue Pharma and the Sackler Families and the Sackler Entities. (Retained by Davis Polk.)

Antitrust and Competition

30. *Pharmaceutical Solutions, Inc. (VetSource) v. Nevada State Board of Pharmacy et al.* United States District Court, District of Nevada, Case No. 2:16-cv-171-RFB-VCF. Retained as the testifying expert on behalf of VetSource, which sued in federal court in response to a cease and desist action that alleged illegal kickbacks. Authored expert report (September 2017) evaluating the market for pet medications in Nevada and the VetSource business model to assess whether the company competes with other retail pharmacies in this market. The parties settled the federal lawsuit on undisclosed terms. VetSource continues to operate in the state under its previously existing business model, and the complaint from the Nevada Board of Pharmacy was rescinded. (Retained by Kutak Rock.)
31. Conducted detailed economic analysis on behalf of Eli Lilly in connection with its \$5.4 billion acquisition of Novartis Animal Health (2014). Both firms were active in developing and marketing animal health products, including medications used to treat pets and livestock. Team assessed overlaps in several areas, and presented results of its analysis to the FTC. The FTC approved the merger after an eight-month investigation, with divestiture required in one product area, canine parasiticides.

Selected Policy and Business Consulting Experience

- Retained by industry trade organization to assess economic profitability of US industries accounting for differing levels of financial investment and cost of capital across industries and to prepare white paper on topic including periodic updates.
- Retained by a multinational pharmaceutical company to develop a tool based on economic theory to help the company optimize its participation in price-related contract negotiations with foreign purchasers of generic drug products and biosimilars. The tool provides the

predicted win probability for a given bid and calculates expected profits based on observed market factors.

- Retained to provide consulting services to a start-up pharmaceutical manufacturing company pursuing opportunities in underserved product spaces in both public and private sector markets.
- Retained by a coalition of health insurance companies to assess the costs of compliance with proposed federal regulation regarding transparency and provision of information to customers.
- Evaluated strategic opportunities for commercializing the academic and clinical research undertaken by faculty at a major academic medical institution involved in research and development of gene-based diagnostics.
- Analyzed the prospective impact of the “Cadillac tax” section of the Affordable Care Act on employer and employee choices regarding insurance options, healthcare spending, and federal revenue. Used the Congressional Budget Office health insurance simulation model and predicted that the tax would lead to a lower offer rate of health benefits by employers and an increase in overall healthcare spending, and that the tax would have disproportionate effects on minority populations.
- Retained as consulting expert for a multinational manufacturer of injectable blood plasma derivatives to evaluate the economics of manufacturing and distribution of plasma-based medications and the potential impact of regulatory restrictions on certain business practices.
- Retained as consulting expert for a global life sciences company to evaluate the economics of biosimilar entry in the United States and key international markets. The focus is on market penetration and pricing of medicines entering under a new regulatory framework for follow-on biologics.
- Retained by a leading healthcare company to prepare a report analyzing the economics of the market for blood plasma products in response to changing demand and cost conditions.
- Retained by a multinational life sciences company to analyze the market for oncology products with respect to the sustainability of current and projected future trends in pricing, utilization, and reimbursement.
- Retained by a multinational life sciences and healthcare company to analyze links between health status and economic well-being across countries and over time.
- Prepared a report for research-based pharmaceutical and biotechnology companies evaluating potential compliance costs resulting from Affordable Care Act price reporting requirements to government agencies.
- Performed an economic impact analysis of research and development activities for a leading non-profit stem cell foundation, working with scientists to evaluate programs and assess impact on future economic activity.

Selected Corporate Experience

- Led teams in the assessment of emerging strategic challenges facing a major biopharmaceutical company in both human and animal health businesses related to industry pricing, marketing and other business practices, managed care and government

payor access restrictions, intellectual property protection, litigation threats, healthcare reform proposals, etc.

- Led teams working on mergers and acquisitions analysis for both human and animal health divisions of biopharmaceutical companies, undertaking commercial due diligence, evaluating target companies and market conditions, and providing economic analysis of divestiture options in response to regulatory concerns.
- Worked with leadership of disease management subsidiary of major biopharmaceutical company overseeing studies of health benefits design on issues including medication adherence, cost, and medical outcomes.
- Participated in an executive-level initiative on individualized medicine focused on identifying and evaluating future opportunities in the business of human genetics as it related to the development of gene-based diagnostics and therapeutics.
- Served as company spokesperson on major economic issues and as the company representative on key industry trade organization teams responsible for conducting research projects that addressed the value of innovation, pricing and reimbursement threats, intellectual property protection, international trade-related pricing challenges, etc.
- Developed and provided training on economics of drug discovery and development for research scientists at a global biopharmaceutical company.

Journal Articles

“Comment on ‘Market Exclusivity for Drugs with Multiple Orphan Approvals (1982–2017) and Associated Budget Impact in the US.’” *PharmacoEconomics*. 38, 1373–1374 (2020).
<https://doi.org/10.1007/s40273-020-00975-7>

“The Clinical and Economic Impact of the Early Detection and Diagnosis of Cancer,” with Peter J. Deckers, Tricia Laursen, Stacey Worthy, and Shruti Kulkarni, *Health Law & Policy Brief* XIV, no. 2 (2020): 1–20.

“Prices and Related Controversies in the Biopharmaceutical Industry,” *International Journal of the Economics of Business* 25, no. 1 (2018): 157–66.

“Vaccination and GDP Growth Rates: Exploring the Links in a Conditional Convergence Framework,” with Neal A. Masia, Jonathan Smerling, Tendayi Kapfudz, and Mark Showalter, *World Development* 103 (2018): 88–99.

“Risk-based Decision Making and Ethical Considerations in Donor Compensation for Plasma-derived Medicinal Products,” with Mark Skinner, Ann Hedlund Hoppe, Henry Grabowski, Raffi Tachdjian, James Crone, and Stuart Youngner, *Transfusion* (2016): 1–6.

“An Economic Analysis of Global Policy Proposals to Prohibit Compensation of Blood Plasma Donors,” with Henry Grabowski, *International Journal of the Economics of Business* 23, no. 2 (2016): 149–66.

“Similar Products at Different Prices: Can Biopharmaceutical Companies Segment Markets?” with Christopher Stomberg, Benjamin Scher, Kathleen Twigg, and Andrew Huson, *International Journal of the Economics of Business* 22, no. 2 (2015): 231–44.

“Pharmaceutical Risk Sharing Agreements,” with Joseph Cook and John Vernon, *Pharmacoeconomics* 26, no. 7 (2008): 551–56.

- “Special Issue on Economics of Pharmaceutical Industry,” co-editor with John Vernon, *Managerial and Decision Economics* 28, no. 4–5 (2007): 229–522.
- “The Benefits of Switching Smoking Cessation Drugs to OTC,” with Teh-wei Hu, Hai-Yen Sung, Theodore E. Keeler, Martin Marciniak, and Alison Keith, *Health Economics* 11, no. 5 (2002): 389–402.
- “Economic Impact of Product Liability in US Prescription Drug Markets,” *International Business Lawyer* 29, no. 3 (2001): 104–09.
- “Have Changing Liability Rules Compensated Workers Twice for Occupational Hazards? Earnings Premiums and Cancer Risk,” with John R. Lott, Jr., *Journal of Legal Studies* 29 (2000): 99–130.
- “The Length of Time Necessary to Break Even after Converting to Digital Mammography,” with Mark D. Hiatt and J. Jeffrey Carr, *Journal of Telemedicine and Telecare* 6, no. 4 (2000): 222–24.
- “Products Liability and Prescription Drug Prices in Canada and the United States,” *Journal of Law and Economics* 40 (1997): 203–44.
- “How Term Limits Enhance the Expression of Democratic Preferences,” with Einer Elhauge and John R. Lott, Jr., *Supreme Court Economic Review* 5 (1997): 59–80.
- “Is the Insurance Aspect of Producer Liability Valued by Consumers? Liability Changes and Childhood Vaccine Consumption,” *Journal of Risk and Uncertainty* 12 (1996): 343–58.
- “Logit Regressions with Continuous Dependent Variables Measured with Error,” *Applied Economics Letters* 3 (1996): 183–84.
- “Changing Rules in Tort Law and the Market for Childhood Vaccines,” *Journal of Law and Economics* 37 (1994): 247–75.

Corporate Publications

Economic Realities in Health Care Policy, monograph series, Editor, Pfizer Inc., 1998–2005.

- “The Competitive Advantage of a Healthy Workforce,” Editor, with Alison Keith, 1998.
- “Pharmaceutical Prices: What’s Missing from the Public Discussion,” with Alison Keith, 2000.
- “Prescription Drug Advertising: Empowering Consumers through Information,” 2002.
- “Pharmaceutical Innovation: Lowering the Price of Good Health,” 2002.
- “Pharmaceutical Prices: What’s Missing from the Public Discussion, Updated,” with Neal Masia, 2002.
- “Pharmaceutical Marketing and Promotion: Creating Access to Innovation,” with Neal Masia, 2003.
- “Who Invents New Medicines?” Editor, with Neal Masia, 2005.

Other Publications

“Economic Profitability of the Biopharmaceutical Industry 2022,” with Anushree Subramaniam, September 22, 2022, *available at* <https://intensity.com/news/economic-profitability-of-the-biopharmaceutical-industry-2022>.

“Public Comment to Multilateral Pharmaceutical Merger Task Force” with Kira Stearns, Kyle Kost, and Richard Brady, June 2021, *available at* <https://www.regulations.gov/comment/FTC-2021-0025-0038>.

“Risks In Moving Too Quickly, Or Slowly, On COVID-19 Vaccine” Law360, December 2020, *available at* <https://www.law360.com/articles/1336937>.

“An Integrated Supply Chain: A White Paper on Addressing Essential Medicine Shortages” with Anthony Flammia, Kristina McKean, and Patricia Watson, August 2020, *available at* https://www.phlow-usa.com/wp-content/uploads/Phlow_SAPIR_Whitepaper_091020.pdf

“Economic Profitability of the Biopharmaceutical Industry: 2020 Update,” with Saurav Karki, Policy Brief, May 2020, *available at* <https://www.bateswhite.com/newsroom-insight-Economic-Profitability-Biopharmaceutical-Industry-2020-update.html>.

“Estimating the Burden of the Proposed Transparency in Coverage Rule,” with Arun Sharma and Zachary Mozenter, Bates White Economic Consulting White Paper, January 2020, *available at* https://www.bateswhite.com/media/publication/183_Estimating%20Burden%20of%20Proposed%20TCR.pdf.

“Policies to Reduce Prices of Prescription Medicines,” Policy Brief, September 2019, *available at* https://www.bateswhite.com/media/publication/181_Policy%20Brief%20on%20price%20control%20measures.2019.09.18.pdf.

“The International Pricing Index for Medicare Part B Drugs,” Policy Brief, February 2019, *available at* https://www.bateswhite.com/media/publication/170_International%20Pricing%20Index%20for%20Medicare%20Part%20B%20Drugs.pdf.

“Continuous Manufacturing in Pharmaceuticals: Economic and Policy Issues,” with Richard Sciacca, October 2018, *available at* https://www.bateswhite.com/media/publication/171_Continuous%20Manufacturing.pdf.

“Economic Profitability of the Biopharmaceutical Industry,” with Saurav Karki, Policy Brief, September 2018, *available at* https://www.bateswhite.com/media/publication/167_Economic%20profitability%20of%20the%20drug%20industry.pdf.

“*Commentary on Biotech vs. Pharma Investments*,” Carlson School of Management, Medical Industry Leadership Institute *Exchange* 19, Summer 2018.

“Key Economic and Value Considerations in the US Market for Plasma Protein Therapies,” with Henry Grabowski, February 2018.

“Biosimilar Coding and Reimbursement under Medicare Part B,” with Christopher Stomberg and Ben Wolfert, November 2017.

“Poorly Executed Analyses of Drug Research and Development Is Useless.” *The Hill*. September 29, 2017, *available at* <http://thehill.com/opinion/healthcare/353072-poorly-executed-analyses-of-pharmaceutical-rd-is-useless?rnd=1506695357>.

“Penalizing Generic Drugs with the CPI Rebate Will Reduce Competition and Increase the Likelihood of Drug Shortages,” with Fred Selck, September 2017, *available at* <https://www.accessiblemeds.org/sites/default/files/2017-09/Bates-White-White-Paper-Report-CPI-Penalty-09-12-2017.pdf>.

“Drug Prices and Medical Innovation: A Response to Yu, Helms, and Bach,” with Henry Grabowski, *Health Affairs* Blog, June 2, 2017, *available at* <http://healthaffairs.org/blog/2017/06/02/drug-prices-and-medical-innovation-a-response-to-yu-helms-and-bach/>.

“Oncology Product Sales and Patent Expiration: A Policy Brief,” with Fred Selck, June 2017, *available at* <http://www.bateswhite.com/insight-173.html>.

“The Role of Value and Cost in Prescription Drug Pricing,” *Law360*, September 27, 2016.

“Tax Inversions: How Do Financial Metrics of Foreign Acquisitions Compare?” with Richard Sciacca and Alan Alford, Apr. 6, 2016.

“Tax Inversions: A Preliminary Review of Company Financial Data,” with Richard Sciacca and Alan Alford, Jan 12, 2016.

“Our Best Shot: Expanding Prevention through Vaccination in Older Adults,” with Fred Selck and Kathleen Chandler, July 29, 2015.

Recent Presentations and Panels

- GCR Live: Antitrust in Pharmaceuticals, Looking to the future of antitrust in the pharmaceutical sector, “Pricing reforms – what to expect?” Panel discussion, New York, NY, December 1, 2022.
- “15th Meeting of the American College of Business Court Judges, “Pharmaceutical Regulation: Lessons and Enduring Impacts of Deregulatory Incentives Embraced During a Pandemic,” Panel discussion, George Mason University Antonin Scalia Law School Law and Economics Center, Savannah, GA, October 30, 2020.
- Global Plasma Summit 2020, “The Plasma Industry and Possible Effects of the COVID Pandemic,” Presenter, virtual conference, October 30, 2020
- Promoting Innovation in the Life Science Sector and Supporting Pro-Competitive Collaborations: The Role of Intellectual Property, “Academics’ and Economists’ Views on Collaboration and Competition,” Joint DOJ/USPTO Antitrust Webinar panelist, September 24, 2020
- Meeting of the Association of Blood Service of Ukraine and the Ukrainian Society of Immunology, Allergology and Immunorehabilitation, “Assessing Value for Plasma Protein Therapies,” Presentation, Kiev, Ukraine, September 19, 2019
- 8th Annual American Society of Health Economics meeting, “Setting Drug Prices in Medicare: Toward a Competitive Market?” Policy Roundtable moderator, Washington, DC, June 24, 2019.
- 2019 Plasma Protein Therapeutics Association, Plasma Forum, “Assessing Value for Plasma Protein Therapies,” Panel discussion, Reston, VA, June 18, 2019.
- Symposium on the Legal, Economic, and Regulatory Environment of the Pharmaceutical Industry, “Who Really Pays for Drugs and How Much? Marketing, Pricing, and Transparency,” Panel discussion, George Mason University Antonin Scalia Law School, Arlington, VA, April 15, 2019.

- 15th Annual Symposium of the Journal of Law, Economics, and Policy: Health Care Cost, Quality, and Transparency, “Why Do Drugs Cost so Much? What (If Anything) Should We Do About It?” Panel discussion, George Mason University Antonin Scalia Law School, Arlington, VA, November 16, 2018.
- Pneumococcal Vaccination Pharmacoeconomic Summit, “Childhood Vaccination and Economic Growth,” Presentation, Dubai UAE, February 24, 2018.
- George Mason University Center for the Protection of Intellectual Property Summer Institute, “The Challenges of Encouraging Long-Term Innovation,” Panel discussion, Beaver Creek, CO, July 12, 2017.
- International Health Economics Association, Boston 2017 Congress, “Global Spending Patterns for Oncology Medications,” Presentation, Boston, July 9, 2017.
- George Mason University Center for the Protection of Intellectual Property Fourth Annual Fall Conference, “Assessing the Economic Case for Patents,” Panel discussion, Arlington, VA, October 7, 2016.
- AcademyHealth Annual Research Meeting, “Building a Successful HSR Career Outside the ‘Ivory Tower,’” Panel discussion, Boston, MA, June 27, 2016.
- Sidley Austin’s Global Drug Pricing Conference, “Options for Responding to Price Scrutiny, including Value Based Contracting,” Washington, DC, April 20, 2016.
- Bates White Life Sciences Symposium, “Anti-Kickback Statute,” Panel moderator, Washington, DC, June 8, 2015.
- George Mason University Center for the Protection of Intellectual Property Roundtable, “Patented Innovation in the Pharmaceutical and Biotech Industries,” Hilton Head, SC, May 28–29, 2015.
- George Mason University Attorneys General Education Program, “Pharmaceutical Marketing: Economic and Legal Issues,” Arlington, VA, March 26, 2015.
- Bates White Life Sciences Symposium, “Oncology Case Study,” Washington, DC, June 13, 2014.
- Bates White Life Sciences Symposium, “Litigation Landscape since Last Year’s Supreme Court Decision in *FTC v. Actavis*,” Panelist, Washington, DC, June 12, 2014.
- Bates White Healthcare & Life Sciences Symposium, “Co-pay Coupons Case Study,” Washington, DC, June 10, 2013.
- Indian Institute of Management Bangalore Roundtable, “Ethical Issues in the Health Care Sector in India,” March 2013.
- ACI’s West Coast Edition Paragraph IV Disputes Conference, “Damages Analysis,” San Francisco, CA, December 5, 2012.
- McGuireWoods’ 4th Annual Medical Device and Life Sciences Conference, “Key Economic and Legal Issues in Prescription Drug Marketing,” Chicago, IL, November 8, 2012.
- George Mason University Attorneys General Education Program, “Marketing and Advertising of Prescription Drugs: An Economic Perspective,” Arlington, VA, May 3, 2012.
- Medical Industry Leadership Institute, Carlson School of Management, University of Minnesota, Panel discussion, May 2011.

- PhRMA Asia Pacific Meeting, Panel discussion chair, Singapore, January 2011.
- Incisive Media 7th Annual Healthcare M&A and Business Development Conference, Presentation, Atlanta, GA, September 2009.
- The Deal Healthcare Dealmaking Symposium, Presentation, New York, NY, March 2009.
- Drug Industry Association Annual Meeting, Presentation, 2008.

Professional Activities and Service

- National Advisory Council member, College of Family, Home and Social Sciences, Brigham Young University, Provo, UT
- Advisory Board, Medical Industry Leadership Institute, Carlson School of Management, University of Minnesota
- Business Research Advisory Committee Member and Price Index Committee Chair, US Bureau of Labor Statistics
- Advisory Board, Rutgers Business School, Lerner Center for Pharmaceutical Management
- Founding Member and Advisory Board, Center for Value Based Insurance Design, University of Michigan
- Corporate Council Member, Brookings Institution
- Editorial Board, *Managerial and Decision Economics*
- Ad hoc referee for *International Journal of the Economics of Business*, *Journal of Political Economy*, *Journal of Law and Economics*, *Journal of Legal Studies*, *Journal of Industrial Economics*, *Health Affairs*, *Forum for Health Economics and Policy*, *The Social Science Journal*

PROFESSIONAL ASSOCIATIONS AND RECOGNITIONS

- IAM Patent 1000, Recognized Economic Expert, 2023
- American Economic Association
- International Society for Pharmacoeconomics and Outcomes Research
- Economic Club of New York
- American Society of Health Economists
- National Association of Business Economists
- American Law and Economics Association