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(54) ORAL PULSED DOSE DRUG DELIVERY SYSTEM

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MD (US)

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Field of Classification Search 424/452, 424/458, 468-472, 514, 649 See application file for complete search history.

(56)References Cited

U.S. PATENT DOCUMENTS

2,099,402 A 11/1937 Keller

(Continued)

FOREIGN PATENT DOCUMENTS

109438

AU

1/1940

(Continued)

OTHER PUBLICATIONS

US 6,034,101, 3/2000, Gupta et al. (withdrawn) Complaint for Declaratory Judgment, Impax Laboratories. Inc. v. Shire International Laboratories, Inc. (Civ. Action No. 05772) and Exhibits attached thereto.

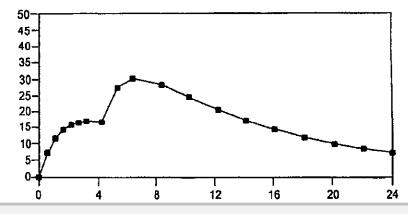
(Continued)

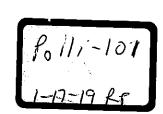
Primary Examiner—Shengjun Wang (74) Attorney, Agent, or Firm-McDermott Will & Emery

ABSTRACT (57)

A multiple pulsed dose drug delivery system for pharmaceutically active amphetamine salts, comprising an immediaterelease component and an enteric delayed-release component wherein (1) the enteric release coating has a defined minimum thickness and/or (2) there is a protective layer between the pharmaceutically active amphetamine salt and the enteric release coating and/or (3) there is a protective layer over the enteric release coating. The product can be composed of either one or a number of beads in a dosage form, including either capsule, tablet, or sachet method for administering the beads.

20 Claims, 7 Drawing Sheets







	ILS. I	PATENT	DOCUMENTS	OTHER PUBLICATIONS
	Ų.D. 1			
2,738,303		3/1956		Fukumori, Coating of Multiparticulates Using Polymeric
3,048,520			Boswell	Dispersions, Multiparticulate Oral Drug Delivery (Swar-
3,365,365			Butler et al.	brick and Selassie eds. 1994), 79-110.
3,979,349		9/1976		Bodmeier et al., The Influence of Buffer Species and
4,049,79	. А	9/1977		Strength on Dittiazem HCl Release from Beads Coated with
			Pope et al 604/890.1	the Aqueous Cationic Polmer Dispersions, Eudraglt RS, RL
4,728,512	; A. *	2/1022	Mehta et al 424/473	30D, Pharmaceutical Research vol. 13, No. 1, 1996, 52-56.
4,794,00			Mehta et al.	Shire Laboratories Inc.'s Opposition to Barr Laboratories'
4,871,549) A *		Veda et al 424/494	Motion to Amend Its Answers and Counterclaims, Sep. 15,
4,891,230			Geoghegan et al 424/461	2004.
4,894,240			Geoghegan et al 424/497	Chan, Materials Used for Effective Sustained-Release Prod-
4,902,510			Korsatko et al 424/497	ucts, Proceedings of the International Symposium held on
4,917,89		4/1990	Geoghegan et al 424/461	Jan. 29–31, 1987 (The Bombay College of Pharmacy 1988),
5,002,770		3/1991	Geoghegan et al 424/497	69–84.
5,011,692	2 A *		Fujioka et al 424/426	
5,011,69	1 A *		Nuemberg et al 424/464	PDR Drug Information for Ritalin LA Capsules, Apr.
5,051,26	2 A *		Panoz et al 424/468	(2004).
5,093,20) A *		Watanabe et al 428/407	Greenhill et al., A Pharmacokinetic/Pharmacodynamic
5,137,73	3 A		Noda et al.	Study Comparing a Single Morning Dose of Adderall to
5,202,15	ЭΑ .		Chen et al.	Twice-Daily Dosing in Children with ADHD. J. Am. Acad.
5,226,90	2 A *	7/1993	Bae et al 604/892.1	Adolesc. Psychiatry, 42:10, Oct. 2003.
			Amidon et al 424/451	Teva Notice letter: Feb. 21, 2005.
5,260,06		11/1993		Bauer, et al., Cellulose Acetate Phthalate (CAP) and Trimel-
5,260,069		11/1993		litate (CAT), Coated Pharmaceutical Dosage Forms (1998),
5,275,81			Amer et al	102–104.
5,312,38	5 A. *	3/1994	Wong et al 604/892.1	Guidance for Industry: SUPAC-MR: Modified Release
5,364,62			Geoghegan et al 424/497 Morella et al.	
5,378,47			Noda et al 424/490	Solid Oral Dosage Forms (1997).
5,395,62 5,407,68			Patel et al	Treatise on Controlled Drug Delivery, pp. 285–299 (Agis
5,411,74			Oshlack et al.	Kydonieus ed. 1992).
5,422,12			Lehmann et al.	Guidance for Industry: Extended Release Oral Dosage
5,474,78			Kotwal et al 424/472	Forms: Development, Evaluation, and Application of In
5,496,56			Okada et al.	Vitro/In Vivo Correlations (1997).
5,541,17			Rhodes et al.	Wouessidjewe, Aqueous polymethacrylate Dispersions as
5,616,34	5 A *	4/1997	Geoghegan et al 424/497	Coating Materials for Sustained and Enteric Release Sys-
5,618,55			Desai et al.	tems, S.T.P. Pharma Sciences 7(6) 469-475 (1997).
5,733,57	5 A	3/1998	Mehra et al.	Adderall XR Package Inset, Sep. (2004).
5,800,83			Morella et al 424/489	Marcotte et al., Kinetics of Protein Diffusion from a Poly(D,
5,824,34			Seth et al 424/473	L-Lactide) Reservoir System, Journal of Pharmaceutical
5,824,34			Cherukuri et al 424/484	Sciences, vol. 79, No. 5, May 1990.
5,824,34			Ng et al 424/486	Guo Deposition Transcript, Jan. 24, 2005.
5,837,28			Mehta et al 424/459	
5,840,32	9 A ~	11/1998	Bai	Watano, et al., Evaluation of Aqueous Enteric Coated Gran-
5,885,61			Hsiao et al	ules prepared by Moisture Control Method in Tumbling Flu-
5,885,99			Bencherif et al 514/256 Busetti et al 424/490	idized Bed Process, Chem. Pharm. Bull. 42(3) 663-667
5,891,47			Burnside et al.	(1994).
6,322,81 6,605,30			Burnside et al.	Schaffer Deposition Transcript, Aug. 17, 2005.
6,749,86			Robinson et al.	Rambali, et al., Using experimental design to optimize the
6,764,69			Pather et al.	process parameters in fluidized bed granulation on a semi-
2004/005900			Couch et al.	full scale, International Journal of Pharmaceutics 220 (2001)
200 1.0005500		5/2001		149–160.
Li Li	OPRIO	ON DATE	NT DOCUMENTS	Treacy Deposition Transcript, Aug. 31, 2004.
	OICEIC	JIV IALL	ALL DOCOMENTS	Tulioch, et al., SL1381 (Adderall XR), a Two-component,
EP	640	0 337	3/1995	Extended-Release Formulation of Mixed Amphetamine
JР	59-08	32311	5/1984	
JP	03-14	18215	6/1991	Salts: Bioavailability of Three Test formulatons and Com-
JΡ	07-06		3/1995	parison of Fasted, Fed, and Sprinkled Administration,
JP	09-24	19557	9/1997	PHARMACOTHERAPY vol. 22, No. 11. (2002),
JР	09-26		10/1997	1405–1415.
JP		31634	3/1998	Chang Deposition Transcript, Sep. 8, 2004.
	VO87/0		* 1/1987	Edward Stempel, Prolonged Drug Action, HUSA's Pharma-
	VO90/0		* 8/1990	ceutical Dispensing, Sixth Edition, 1966, 464, 481-485.
	/O-97/0		2/1997	McGuiness Deposition Transcript, Aug. 6, 2004.
	/O-98/1		4/1998	Remington's Pharmaceutical Sciences, RPS XIV,
)3471 A	1/1999	1700–1714.
WA V	/1 1=(1(1/5)	95759 A	5/2000	IIVV I/IT



Vasilevska, et al., Preparation and Dissolution Characteristics of Controlled Release Diltiazem Pellets, Drug Development and Industrial Pharmacy, 18(15), 1649–1661 (1992).

Opening Expert Report of Dr. Walter Chambliss and exhibits thereto, Mar. 15, 2005.

Agyilirah GA and Bauker SB, Polymers for Enteric Coating Applications, Polymers for Controlled Drug Delivery (Peter J. Tarcha ed. 1991) 39–66.

Impax Laboratories, Inc.'s First Amended Answer and Affirmative Defenses.

Moller, Dissolution Testing of Delayed Release Preparations, Proceedings of the International Symposium held on Jan. 29–31, 1987 (The Bombay College of Pharmacy 1988), 85–111.

Impax Laboratories, Inc.'s Reply Memorandum in Support of the Motion to Amend its Answer dated Mar. 18, 2005 and exhibits thereto.

Stevens, et al., Controlled, Multidose, Pharmacokinetic Evaluation of Two Extended-Release Carbamazepine Formulations (Carbatrol and Tegretol-XR), Journal of Pharmaceutical Sciences vol. 87, No. 12, Dec. 1998, 1531–1534.

Deposition transcript of Honorable Gerald J. Mossinghoff and exhibits thereto.

Physicians' Desk Reference: Adderall, 51st Ed. (1997).

Expert Report of Dr. Joseph R. Robinson and exhibits thereto, Feb. 28, 2005.

Sriamornsak, et al., Development of sustained release theophylline pellets coated with calcium pectinate, Journal of Controlled Release 47 (1997) 221–232.

Answering Expert Report of Dr. Alexander Klibanov, Apr. 25, 2005.

Sprowls' American Pharmacy: An Introduction to Pharmaceutical Techniques and Dosage Forms, 7th Ed. (1974), 387–388.

Barr Laboratories' Objections and Responses to Plaintiff Shire Laboratories Inc.'s Fifth Set of Interrogatories (No. 17).

Sheen, et al., Aqueous Film Coating Studies of Sustained Release Nicotinic Acid Pellets: An In-Vitro Evaluation, Drug Development and Industrial Pharmacy, 18(8), 851–860 (1992).

Barr Laboratories' Objections and Responses to Plaintiff Shire Laboratories Inc.s' Fourth Set of Interrogatories (Nos. 15–16).

Barr Laboratories' Inc.'s Objections and Responses to Shire laboratories Inc.'s Second Set of Interrogatories (Nos. 8-11).

Scheiffele, et al., Studies Comparing Kollicoat MAE 30 D with Commercial Cellulose Derivatives for Enteric Coating on Caffeine Cores, Drug Development and Industrial Pharmacy, 24(9), 807–818 (1998), 807–818.

The United States Pharmacopeia 27, National Formulary 22 (2004) pp. 2302–2312.

Expert Report of the Honorable Gerald J. Mossinghoff and exhibits thereto, Mar. 16, 2005.

The United States Pharmacopeia 23, National Formulary 18 (1995) pp. 1791–1799.

Charles S.L. Chiao and Joseph R. Robinson, Sustained-Release Drug Delivery Systems, Remington: The Science and Practice of Pharmacy, Tenth Edition (1995) 1660-1675.

Shargel; Pharmacokinetics of Oral Absorption, Applied Biopharmaceutics & Pharmacokinetics. 5th Ed. (2005), 164-166.

American Chemical Society, Polymer Preprints, pp. 633-634, vol. 34, No. 1, Mar. 1993.

Remington: The Science and Practice of Pharmacy, Elutriation, 20th Ed. (2000), 690.

Harrington Deposition Transcript, Jul. 27, 2005.

Physicians' Desk Reference: Ritalin, 56th Ed. (2002).

Kennerly S. Patrick & John S. Markowitz, Pharmacology of Methylphenidate, Amphetamine Enantiomers and Permoline in Attention-Deficit Hyperactivity Disorder, Human Psychopharmacology, vol. 12, 527–546 (1997).

Physicians' Desk Reference: Adderall, 56th Ed. (2002).

Guidance for Industry: Food-Effect Bioavailability and Fed Bioequivalence Studies (2002).

McGraw-Hill Dictionary of Scientific and Technical Terms, 5th Ed. (1994), 97, 972.

McGough et al., Pharmacokinetics of SL1381 (Adderall XR), an Extended-Release Formulation of Adderall, Journal of the American Academy of Child & Adolescent Psychiatry, vol. 42, No. 6, Jun. 2003.

Handbook of Pharmaceutical Excipients: Ethylcellulose, Polymethacrylates, (4th ed. (2003), 237-240, 462-468.

Mathir et al., In vitro characterization of a controlled-release chlorpheniramine maleate delivery system prepared by the air-suspension technique, J. Microencapsulaton, vol. 14, No. 6, 743-751 (1997).

R. Bianchini & C. Vecchio, Oral Controlled Release Optimization of Pellets Prepared by Extrusion–Spheronization Processing, IL Farmaco 44(6), 645–654, 1989.

Chang et al., Preparation and Evaluation of Shellac Pseudolatex as an Aqueous Enteric Coating Systems for Pellets, International Journal of Pharmaceuticals, 60 (1990) 171–173, 1990.

Garnett et al., Pharmacokinetic Evaluation of Twice-Daily Extended-Release Carbamazepine (CBZ) and Four-Times-Daily Immediate-Release CBZ in Patients with Epilepsy, Epilepsia 39(3):274-279, 1998.

Liu et al., Comparative Release of Phenylprepanolamine HCl from Long-Acting Appetite Suppressant Product: Acutrim vs. Dexatrim, Drug Development and Industrial Pharmacy, 10(10), 1639–1661 (1984).

Krowczynski & Brozyna, Extended-Release Dosage Forms, pp. 123-131 (1987).

C. Lin et al., Bioavailability of d-pseudoephedrine and Azatadine from a Repeat Action Tablet Formulation, J Int Med Res (1982), 122–125.

Rosen et al., Absorption and Excretion of Radioactively Tagged Dextroamphetamine Sulfate from a Sustained-Release Preparation, Jama, vol. 194, No. 11, Dec. 13, 1965.

C. Lin et al., Compartive Bioavailability of d-pseudoephedrine from a Conventional d-pseudoephedrine Sulfate Tablet and from a Repeat Action Tablet, J Int Med Res (1982) 10, 126–128.

Pelham et al., A Comparison of Morning-Only and Morning/Late Afternoon Adderall to Morning-Only, Twice-Daily, and Three Times-Daily Methylphenidate in Children



Serajuddin, et al., Selection of Solid Dosage Form Composition through Drug-Excipient Compatibility Testing, Journal of Pharmaceutical Sciences vol. 88, No. 7, Jul. 1999, 696-704.

Slattum, et al., Comparison of Methods for the Assessment of Central Nervous System Stimulant Response after Dextroamphetamine Administration to Healthy Male Volunteers, J. Clin Pharmacol 1996; 36: 1039–1050.

Lin & Cheng, In-vitro Dissolution Behaviour of Spansuletype Micropellets Prepared by Pan Coating Method, Pharm. Ind. 51 No. 5 (1989).

Remington's Pharmaceutical Sciences, Fisteenth Edition (1975) 1624–1625.

Ansel et al., Rate Controlled Dosage Forms and Drug Delivery Systems, Pharmaceutical Dosage Forms and Drug Delivery Systems, 6th Ed. (1995), 213–222.

Chan, New Polymers for Controlled Release Products, Controlled Release Dosage Forms Proceedings of the International Symposium held on Jan. 29–31, 1987 (The Bombay College of Pharmacy 1988) 59–111.

Leopold & Eikeler, Eudragit E as Coating Material for the pH-Controlled Drug Release in the Topical Treatment of Inflammatory Bowel Disease (IBD), Journal of Drug Targeting, 1998, vol. 6, No. 2, pp. 85–94.

Jarowski, The Pharmaceutical Pilot Plant, Pharmaceutical Dosage Forms: Tablets, vol. 3, 2nd Ed. (1990), 303-367.

Remington: The Science and Practice of Pharmacy, Basic Pharmacokinetics, 16th Ed. (1980), 693.

Rong-Kun Chang and Joseph R. Robinson, Sustained Drug Release from Tablets and Particles Through Coating, Pharmaceutical Dosage Forms: Tablets (Marcel Dekker, Inc. 1990), 199-302.

Hall HS and Pondell RE, Controlled Release Technologies: Methods, Theory, and Applications, pp. 133–154 (Agis F. Kydonieus ed. 1980).

Porter and Bruno Coating of Pharmaceutical Solid-Dosage Forms, 77-160.

Barr Laboratores' Memorandum In Support of its Motion to Amend its Pleadings and exhibits thereto.

Answering Expert Report of Robert Langer, Apr. 25, 2005. Hans-Martin Klein & Rolf W. Gunther, Double Contrast Small Bowel Follow-Through with an Acid-Resistant Effervescent Agent, Investigative Radiology vol. 28, Jul. 1993.

Opening Expert Report of Dr. Michael Mayersohn and exhibits thereto, Mar. 12, 2005.

Rudnic Deposition Transcript, Jul. 28, 2004.

Burnside Deposition Transcript, Feb. 2, 2005.

Kao et al., Lag Time Method to Delay Drug Release to Various Sites in the Gastrointestinal Tract, Journal of Controlled Release 44(1997) 263–270.

Freedom of Information Request Results for—Dexadrine (SmithKline Beecham): May 20, 1976 Disclosable Approval Information.

Teva Notice letter: Jun. 1, 2005.

Prescribing Information: Dexedrine, brand of dextroamphetamine sulfate (2001).

Husson et al., Influence of Size Polydispersity on Drug Release from Coated Pellets, International Journal of Pharmaceutics, 86 (1992) 113–121, 1992.

Rono-Kun Chang et al., Formulation Approaches for Oral

Kiriyama et al., The Bioavailability of Oral Dosage Forms of a New HIV-1 Protease Inhibitor, KNI-272, in Beagle Dogs, Biopharmaceutics & Drug Disposition, vol. 17 125-134 (1996).

Klaus Lehmann, Coating of Multiparticulates Using Polymeric Solutions, Multiparticulate Oral Drug Delivery (Swarbrick and Sellassie ed., 1994).

Goodhart et al., An Evaluation of Aqueous Film-forming Dispersions for Controlled Release, Pharmaceutical Technology, Apr. 1984.

Rosen, et al., Absorption and Excretion of Radioactively Tagged Dextroamphetamine Sulfate From a Sustained-Release Preparation, Journal of the American Medical Association, Dec. 13, 1965, vol. 194, No. 11, 1203–1205.

Leon Lachman, Herbert A. Lieberman, Joseph L. Kanig, The Theory and Practice of Industrial Pharmacy, Second Edition (1976) 371–373.

Wesdyk, et al., Factors affecting differences in film thickness of beads coated in fluidized bed units, International Journal of Pharmaceutics, 93 101–109, (1993).

Daynes, Treatment of Noctural Enuresis with Enteric-Coated Amphetamine, The Practitioner, No. 1037, vol. 173, Nov. 1954.

Physicians' Desk Reference: Dexedrine 56th Ed. (2002). The United States Pharmacopeia 26, National Formulary 21 (2003) pp. 2157–2165.

Barr Laboratories' Supplemental Objections and Responses to Plaintiff Shire Laboratories Inc.'s Third Set of Interrogatories (Nos. 12-14 Redacted).

Rong-Kun Chang, A Comparison of Rheological and Enteric Properties among Organic Solutions, Ammonium Salt Aqueous Solutions, and Latex Systems of Some Enteric Polymers, Pharmaceutical Technology, Oct. 1990.

Guo Deposition Transcript, Jul. 26, 2004.

Chang Deposition Transcript, Jan. 20, 2005.

Holt, Bioequivalence Studies of Ketoprofen: Product formulation, Pharmacokinetics, Deconvolution, and In Vitro – In Vivo correlations, Thesis submitted to Oregon State University, Aug. (1997).

Cody et al., Amphetamine Enantiomer Excretion Profile Following Administration of Adderall, Journal of Analytical Toxicology, vol. 2, Oct. 2003, 485–492.

Ishibashi et al., Design and Evaluatin of a New Capsuletype Dosage Form for Colon-Targeted Delivery of Drugs, International Journal of Pharmaceutics 168, (1998) 31–40, 1998.

Harris et al., Aqueous Polymeric Coating for Modified-Release Pellets, Acqueous Polymeric Coating for Pharmaceutical Dosage Forms (McGinity ed., 1989).

J. Sjogren, Controlled release oral formulation technology, Rate Control in Drug Therapy, (1985) 38-47.

Burns et al., A Study of Enteric-coated Liquid-filled Hard Gelatin Capsules with Biphasic Release Characteristics, International Journal of Pharmaceutics 110 (1994) 291–296. The Merck Index: Amphetamine, 13th Ed. (2001), 97, 1089. Impax Laboratories, Inc.'s First Supplemental Responses to Shire Laboratorics Inc.'s First Set of Interrogatorics (Nos. 11–12)

Burnside Deposition Transcript, Feb. 3, 2005.

Brown et al., Plasma Levels of d-Amphetamine in Hyperactive Children, Psychopharmacology 62, 133-140, 1979.

Mehta et al.. Evaluation of Fluid-bed Processes for Enteric



Handbook of Pharmaceutical Excipients: Plymethacrylates, (2nd ed. 1994), 361-366.

Impax Laboratories, Inc.'s Memorandum in Support of the Motion to Amend its Answer dated Feb. 25, 2005 and exhibits thereto.

Brauer et al., Acute Tolerance to Subjective but not Cardiovascular Effects of d-Amphetamine in Normal, Healthy Men, Journal of Clinical Psychopharmacology, 1996; 16(1):72–76.

Glatt, The World of the Fluid Bed, Fluid Bed Systemsm, 1-19.

Brown et al., Behavior and Motor Activity Response in Hyperactive Children and Plasma Amphetamine Levels Following a Sustained Release Preparation, Journal of the American Academy of Child Psychiatry, 19:225–239, 1980. Office Action mailed Mar. 2, 2005 in European Patent Aplication No. 99 970594.0–2123.

Angrist et al., Early Pharmacokinetics and Clinical Effects of Oral D-Amphetamine in Normal Subjects, Biol. Psychiatry 1987, 22: 1357–1368.

Court Docket for Shire Laboratories v. Teva Pharmaceutical Industries Ltd., Case No. 2:06-cv-00952-SD, Jan. 8, 2007. Complaint in Shire Laboratories v. Teva Pharmaceutical Industries Ltd., and exhibits thereto, Case No. 2:06-cv-00952-SD, Mar. 2, 2006.

Answer and Counterclaims in Shire Laboratories v. Teva Pharmaceutical Industries Ltd., Case No. 2:06-cv-00952-SD, Jul. 24, 2006.

Reply to Counterclaims in *Shire Laboratories* v *Teva Pharmaceutical Industries Ltd.*, Case No. 2:06-cv-00952-SD, Aug. 16, 2006.

Defendants' Response to Plaintiff Shire's First Set of Interrogatories (1-12) in *Shire Labatories v. Teva Pharmaceutical Industries Ltd.*, Case No. 2:06-cv-00952-SD, Sep. 20, 2006.

Defendants' Responses to Plaintiff's First Set of Request for the Production of Documents and Things (1-70) in *Shire* Laboratories v. *Teva Pharmaceutical Industries Ltd.*, Case No. 2:06-cv-00952-SD, Oct. 4, 2006.

Plaintiff's Response to Defendants' First Set of Interrogatories in *Shire Labatories* v. *Teva Pharmaceutical Industries Ltd.*, Case No. 2:06-cv-00952-SD, Oct. 11, 2006.

Plaintiff's Response to Defendants' First Set of Production Requests in *Shire Laboratories* v. *Teva Pharmaceutical Industries Ltd.*, Case No. 2:06-cv-00952-SD, Oct. 11, 2006.

Defendants' Responses to Plaintiff's Second Set of Requests for the Production of Documents and Things (71-80) in Shire Laboratories v. Teva Pharmaceuticals Industries Ltd., Case No. 2:06-cv-00952-SD, Nov. 8, 2006.

Defendants' Responses to Plaintiff Shire's Second Set of Interrogatories (No. 13) in *Shire Laboratories* v. *Teva Pharmaceuticals Industries Ltd.*, Case No. 2:06-cv-00952-SD, Nov. 8, 2006.

Petition Under Section 8 and exhibits thereto, submitted to the Canadian Patent Office on Dec. 4, 2006.

Exh. 3, Excerpts from the Deposition Transcript of Richard Chang, dated Sep. 8, 2004.

Exh. 4, Excerpts from the Deposition Transcript of Richard A. Couch, dated Sep. 14, 2004.

Exh. 5, Excerpts from the Deposition Transcript of Kimberly Fiske, dated Sep. 17, 2004.

Exh. 7, Excerpts from the Deposition Transcript of Beth Burnside, dated Feb. 2, 2005.

Exh. 8, Excerpts from the Deposition Transcript of Donald John Treacy, Jr., dated Aug. 31, 2004.

Exh. 9, Excerpts from the Deposition Transcript of Beth Burnside, dated Feb. 3, 2005.

Exh. 10, Excerpts from the Deposition Transcript of Xiaodi Guo, dated Jan. 24, 2005.

Exh. 11, Excerpts from the Deposition Transcript of Xiaodi Guo, dated Jul. 26, 2004.

Exh. 12, Excerpts from the Deposition Transcript of Edward Rudnic, dated Jul. 28, 2004.

Exh. 13, Excerpts from the Deposition Transcript of Richard Rong-Kun Chang, dated Jan. 20, 2005.

Exh. 14, Impax Laboratories Answer And Affirmative Defenses Shire Laboratories, Inc. v. Impax Laboratories, Inc., Civil Action No. 03-CV-01164-GMS.

Exh. 15, Barr Laboratories' Amended Answer, Affirmative Defenses, And Counterclaims, Shire Laboratories, Inc. v. Barr Laboratories, Inc., Civil Action No. 03-CV-6632-PKC.

Exh. 16, Barr Laboratories' Amended Answer, Affirmative Defenses And Counterclaims, *Shire Laboratories, Inc.* v. *Barr Laboratories, Inc.*, Civil Action No. 03-CV-1219-PKC.

Exh. 17, Reply to Barr Laboratories Inc.'s Amended Answer, Affirmative Defenses And Counterclaims, *Shire Laboratories, Inc.* v. *Barr Laboratories, Inc.*, Civil Action No. 03-CV-6632-PKC.

Exh. 18, Civil Docket For Case #: 1:03-cv-01164-GMS, Shire Laboratories, Inc. v. Impax Laboratories, Inc., Civil Action No. 03-CV-01164-GMS.

Exh. 19, Civil Docket For Case #: 1:05-cv-00020-GMS, Shire Laboratories, Inc. v. Impax Laboratories, Inc., Civil Action No. 05-20-GMS.

Exh. 20, Civil Docket For Case #: 1:03-cv-06632-VM-DFE, Shire Laboratories, Inc. v. Barr Laboratories, Inc., Civil Action No. 03-CV-6632-PKC.

Exh. 21, Civil Docket For Case #: 1:03-cv-01219-PKC-DFE, Shire Laboratories, Inc. v. Barr Laboratories, Inc., Civil Action No. 03-CV-1219-PKC.

Exh. 25, Barr Laboratories, Inc.'s '819 Notification Pursuant to § 505(j)(B)(ii) of the Federal Food, Drug and Cosmetic Act (21 U.S.C. § 355(j)(2)(B)(ii) and 21 C.F.R. § 314.95.

Exh. 26, Barr Laboratories, Inc.'s '300 Notification Pursuant to § 505(j)(2)(B)(ii) of the Federal Food, Drug and Cosmetic Act (21 U.S.C. § 355(j)(2)(B)(ii) and 21 C.F.R. § 314.95). Exh. 27, Order Construing The Terms Of U.S. Patent Nos.

6,322,819 and 6,605,300, Shire Laboratories, Inc. v. Impax Laboratories, Inc., Civil Action No. 03-CV-01164-GMS. Gazzaniga, et al., S.T.P. Pharma Sciences, vol. 5, No. 1, gs.

Gazzaniga, et al., S.T.P. Pharma Sciences, vol. 5, No. 1, gs. 83–88 (1995), Time dependent oral delivery for colon targeting.*

Modern Pharmaceutics, Banker, et al., eds., Marcel Dekker, Inc., New York, p. 350 (1996).*

Walia, et al., *Pharm. Dev. Tech.*, vol. 3, No. 1, pp. 103-113 (1998), Preliminary Evaluation of an Aqueous Wax Emulsion for Controlled-Release Coating.*

Wilding et al., *Pharmaceutical Research*, vol. 9, No. 5, pp. 654-657 (1992), Gastrointestinal Transit and Systemic Absorption of Captopil from Pulsed-Release Formulation.* Xu, et al., *Pharmaceutical Research*, vol. 10, No. 8, pp.



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Keep your litigation team up-to-date with **real-time** alerts and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

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With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

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