

Curriculum Vitae George M. Grass IV

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EDUCATION

- August, 1985: Ph.D. Pharmaceutics. University of Wisconsin, Madison, Wisconsin. Thesis title: Mechanisms of Corneal Drug Penetration.
- 1980-1983: MS Pharmaceutics. University of Wisconsin, Madison, Wisconsin. Thesis title: Relationship of Chemical Structure to Corneal Penetration for Small Organic Compounds.
- 1977-1980: Pharm.D. University of Nebraska Medical Center, Omaha, Nebraska. Licensed to practice pharmacy in Nebraska.
- 1975-1977: Pre-Pharmacy, University of Nebraska, Lincoln, Nebraska.

EXPERIENCE

- August 2001 – Present: President G2 Research, industry consultant to drug discovery and biotechnology organizations, and investors. Engaged in corporate strategy, product development, formulation development, pharmacokinetic analysis, CRO management, investor diligence, and expert witness. Development and licensing of iDEA pharmacokinetic simulation software and databases (www.admedata.com, and www.admemodel.com).
- July 2010 - Present: Board member and Acting CEO of Bamboo Bottle Company, a unique consumer products company (www.bamboobottleco.com)
- Aug 2007 - Aug 2010: Sr. Vice President of Research and Development, Sorbent Therapeutics, a company developing novel therapeutics for sodium and fluid removal. Responsibilities including: corporate strategy, planning and execution; identification, evaluation, integration and management of outside technologies and services. Develop novel technology and product formulation strategy. Assist in representing the company to potential partners and investors.
- May 2005 – Mar 2007: Vice President of Product Development and Chief Technology Officer, PDxRx Inc. a subspecialty focused pediatrics company. Responsibilities including: corporate management and strategy; identification and negotiation of new product/technology opportunities. Assist in representing the company to potential partners and investors.
- 1999-August 2001: Chief Technology Officer, Corporate Officer, Trega Biosciences (acquired by Lion bioscience 4/2001) – corporate management and strategy; identification, evaluation and negotiation of outside technologies; technical development of iDEA pharmacokinetic simulation software; presentation of corporate technology and strategy to and negotiation with customers, collaborators, scientific community and current and prospective investors.
- 1997-2008: Founder and Vice President RaptorGraphics, Inc., Seattle WA (acquired by MDE Engineering Inc.). Corporate management and technical / strategic development of computer graphics and simulation business targeted to legal applications.
- 1996-1999: Founder, President, CEO and Chief Business Officer, NaviCyte, Inc. (acquired by Trega Biosciences 11/1999) – Responsible for all corporate/financial/strategic management and establishment of all contracts/licenses. Design of new products, establishment of contract service organization, development of simulation models to predict pharmacokinetics and pharmacodynamics. Establishment of Pharma consortium for development of ADME simulation software.
- 1987 -1996: Founder, President and CEO of Precision Instrument Design, Inc., Tahoe City, CA. Design, manufacture, and marketing of laboratory equipment for conducting basic research in drug

delivery. Responsible for all corporate/financial/strategic management. Development of simulation models to predict pharmacokinetics and pharmacodynamics.

- 1991 - 1996: Pharmaceutical industry consultant on drug delivery subjects including oral delivery, controlled release, peptide and protein delivery, ocular drug delivery and simulation modeling of various drug delivery related issues.
- 1985-1991: Staff Researcher I / II, Pharmaceutical Development, Dosage Design and Development, Institute of Pharmaceutical Sciences, Syntex Research, Palo Alto, California. Development of early stage (pre IND, IND and pre NDA) compounds for oral delivery. Basic research in mechanisms of oral absorption including methods to orally deliver peptides. Computer modeling and pharmacokinetic simulations. Supervision of two BS/MS positions, one Post Doctoral Fellow and various interns.
- 1983-1985: Computer sales and installation, CBM Computer Center, Madison, Wisconsin. Sales and installation of microcomputers. Network installations and troubleshooting.
- 1980-1985: Teaching (Pharmaceutics and Pharmaceutical Dispensing laboratory classes) / Research Assistant, University of Wisconsin, Madison, Wisconsin.
- 1980: Research Technician, Creighton University, Omaha, Nebraska. Fabrication of gels and matrices from various polymers for ocular inserts. Conducted ocular pharmacokinetic determinations using measurements of miosis in rabbits.
- 1977-1979: Research Technician, Product Development, Streck Laboratories, Omaha, Nebraska. Developed methods for fixation, cryoprotection of platelets and red blood cells. Product development of latex calibration standards for various cell counters.

AWARDS, HONORS, AFFILIATIONS

Co-reipient 1989 Ebert Prize
Sigma Xi Scientific Research Society
Rho Chi Pharmacy Honor Society
Member, American Association Pharmaceutical Sciences
Member, Controlled Release Society

PATENTS

G.M. Grass and S.A. Sweetana, An apparatus for the determination of transport across tissues, membranes or cell cultures, US Patent #5,183,760, Feb 2, 1993.

G.M. Grass, Membrane Holder, US Patent # 5,591,636, Jan 7, 1997.

G.M. Grass, Device and method for circulating fluid over a membrane., US Patent # 5,599,688 Feb 4, 1997.

G.M. Grass and S.A. Sweetana, Polypeptide composition for oral administration US Patent # 6,156,731 December 5, 2000.

G.M. Grass, Packing device for transporting confluent cell monolayers, US Patent # 6,146,883 November 14, 2000.

G.M. Grass, G.D. Leesman, D.A. Norris, P.J. Sinko, J.E. Wehrli, Method for producing and screening compound libraries., US Patent # 6,996,473 Feb 7, 2006.

G.M. Grass, G.D. Leesman, D.A. Norris, P.J. Sinko, J.E. Wehrli, Pharmacokinetic-based drug design tool and method., US Patent #6,542,858 April 1, 2003.

G.M. Grass, G.D. Leesman, D.A. Norris, P.J. Sinko, J.E. Wehrli, Pharmacokinetic-based drug design tool and method., US Patent #6,647,358 Nov 11, 2003.

M. Schwartz and G.M. Grass, Unitary Pharmaceutical Composition , Method, and Kit for the Treatment or Prevention of Metabolic or Endocrine Disorders, PCT/US2007/07/079889.

A. Strickland and G. Grass, Polymeric Compositions with Enhanced Saline Holding Capacity and Their Method of Preparation and Use., PCT/US2008/074847.

A. Strickland and G. Grass, Polymeric Compositions and Their Method of Use in Combination with Active Agents., PCT/US2008/074848.

A. Strickland and G. Grass, Absorbent Polymeric Compositions with Varying Counterion Content and Their Methods of Preparation and Use, PCT/US2008/074861.

PUBLICATIONS

G.M. Grass, J. Cobby, and M.C. Makoid, Ocular delivery of pilocarpine from erodible matrices. J. Pharm. Sci. 73,618-621 (1984).

G.M. Grass, J.R. Robinson, Relationship of chemical structure to corneal penetration and influence of low-viscosity solutions on ocular bioavailability. J. Pharm. Sci. 73,1021-1027 (1984).

G.M. Grass, R.W. Wood, and J.R. Robinson, Effects of calcium chelating agents on ocular tissue permeability. Invest. Ophthalmol. Vis. Sci. 26:110-113(1985).

G.M. Grass and J.R. Robinson, Mechanisms of Corneal Drug Penetration I. In vivo and in vitro kinetics, J. Pharm. Sci. 77:3-14 (1988).

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G.M. Grass and J.R. Robinson, Mechanisms of Corneal Drug Penetration III. Modeling of Molecular Transport, J. Pharm. Sci. 77:24-26 (1988).

G.M. Grass and S.A. Sweetana, In vitro measurement of gastrointestinal tissue permeability using a new diffusion cell., Pharm Res., 5:372 (1988).

G.M. Grass and W.T. Morehead, Evidence for site specific absorption of a novel ACE-inhibitor., Pharm Res 6:759 (1989).

G. M. Grass and S.A. Sweetana, A correlation of permeabilities for passively transported compounds in monkey and rabbit jejunum., Pharm. Res., 6: 857 (1989).

G.M. Grass and J.R. Robinson, Sustained and controlled release drug delivery systems. In: Modern Pharmaceutics, G.S. Banker and C.T. Rhodes, ed., Marcel Dekker, inc., New York, New York. (1990).

G.M. Grass, S.A. Sweetana, and C. Bozarth, The effects of enprostil and RS-86505-007 on in vitro intestinal permeability of rabbit and monkey., J. Pharm. Pharmacol, 42:40-44 (1990).

W. Rubas, N. Jezyk, R. Kos and G. M. Grass, In vitro transport characteristics of Peyer's patches for passively and actively transported compounds, Proceed. Intern. Symp. Control. Rel. Bioact. Mater., (1990).

- G.M. Grass and V.L. Lee, A STELLA® model to predict aqueous humor and plasma drug concentrations from topical dosing to the eye., *Proceed. Intern. Symp. Control. Rel. Bioact. Mater.*, (1990).
- V. H-L Lee, S. Doddakashi, G.M. Grass, W. Rubas, Oral route of peptide and protein drug delivery., in V. H-L Lee (ed.) *Peptide and Protein Drug Delivery: Fundamentals and Technology*, Marcel Dekker, New York, 1991.
- M.W. Ramsay, G.M. Grass, and J.J. Vallner, Pharmacokinetic simulations using Stella: prediction of in vivo performance of oral dosage forms., *Eur. J. Pharm. and Biopharm.*, 37:192-7 (1991).
- I.H. Hidalgo, K.M. Hilgren, G.M. Grass, and R.T. Borchardt, Characterization of the unstirred water layer in CACO-2 cell monolayers using a novel diffusion apparatus, *Pharm. Res.*, 8:, 222-227 (1991).
- W. Rubas and G.M. Grass, Review: Gastrointestinal lymphatic absorption, *Adv. Drug Del. Rev.*, 7:15-69 (1991).
- S. Ohdo, G.M. Grass, and V. H-L. Lee, Improving the ocular:systemic ratio of topical timolol by varying the dosing time., *Invest. Ophthalmol. and Vis. Sci.* , 32:2790-98 (1991).
- V.H.L. Lee, A.M. Luo, S. Li, S.K. Podder, J. S-C. Chang, S. Ohdo, and G.M. Grass, Pharmacokinetic basis for nonadditivity of intraocular pressure lowering in timolol combinations. *Invest. Ophthalmol. and Vis. Sci.* , 32:2948-2957 (1991).
- I.H. Hidalgo, K.M. Hilgren, G.M. Grass, and R.T. Borchardt, A new side-by-side diffusion cell for studying transport across epithelial cell monolayers *In Vitro.*, *In Vitro Cell Dev. Biol.*, 28A: 578-580 (1992).
- N. Jezyk, W. Rubas and G.M. Grass, Permeability Characteristics of Various Intestinal Regions of Rabbit, Dog, and Monkey, *Pharm. Res.* 9:1580-1586 (1992).
- W. Rubas, N. Jezyk, and G.M. Grass, Linear relationship between the permeability of a human colon adenocarcinoma cell line (Caco-2) and rabbit colon., *Proceed. Intern. Symp. Control. Rel. Bioact. Mater.*, 12:306 (1992).
- W. Rubas, N. Jezyk, and G.M. Grass, Comparison of the Permeability characteristics of a human colonic epithelial (Caco-2) cell line to colon of Rabbit, Monkey, and Dog Intestine, and Human Drug Absorption, *Pharm. Res.* 10:113 (1993).
- G.M. Grass and V.H.L. Lee, A model to Predict Aqueous Humor and Plasma Pharmacokinetics of Ocularly Applied Drugs, *Invest. Ophthalmol. and Vis. Sci.*, 34:2251-2259 (1993).
- K. Ng, H. Lane, G. Grass, and R.T. Borchardt, Characterization of the unstirred water layer in cultured brain microvessel endothelial cells., *In Vitro Cell. Dev. Biol.*, 29A:627-629 (1993).
- G. M.. Grass, C. A.. Bozarth, and J. J. Vallner, Evaluation of the Performance of Controlled Release Dosage Forms of Ticlopidine Using *In Vitro* Intestinal Permeability and Computer Simulations, *J. Drug Targeting*, 2:23-33 (1994).
- W. Rubas, N. Jezyk, and G.M. Grass, Mechanism of Dextran Transport Across Rabbit Intestinal Tissue and a Human Colon Cell-Line (Caco-2), *J. Drug Targeting*, 3:15-21 (1995).
- G. M. Grass, Simulation models to predict oral drug absorption from in vitro data, *Advanced Drug Delivery Reviews*, 23:199-219 (1997).

D.A. Norris, G. D. Leesman, P.J. Sinko, G. M. Grass, Development of predictive pharmacokinetic simulation models for drug discovery, *J. of Controlled Release*, 65: 55-62 (2000).

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Adv Drug Deliv Rev Mar 31;54(3):433-51 (2002).

P.V. Paranjpe, G. M. Grass and P. J. Sinko, In Silico Tools for Drug Absorption Prediction: Experience to Date, *Am J Drug Deliv* 1(2) 133-148 (2003).

ABSTRACTS AND PRESENTED PAPERS (sample)

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G.M. Grass and S.A. Sweetana, Correlation of passive diffusional transport in monkey and rabbit jejunum., International Congress of Pharmaceutical Sciences of F.I.P., Amsterdam, The Netherlands, Sept. 1987.

K. Cahill, S. Sweetana, and G.M. Grass, Evaluation of the comparative oral absorption of a prodrug and its parent compound using an in vitro system., AAPS Regional, Reno Nevada, January 1988.

L. Chee, S.A. Sweetana, and G.M. Grass, Correlation of active transport of glucose and intracellular levels of ATP in monkey and rabbit jejunum., AAPS Regional, Reno Nevada, January 1988.

G.M. Grass, S.A. Sweetana, and C. Bozarth, Effect of enprostil and RS-86505 on in vitro intestinal permeability of actively and passively transported compounds., AAPS Regional, Reno Nevada, January 1988.

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G.M. Grass, S.A. Sweetana, K.M. Cahill, and J.J. Vallner, A method for determination of the relative intestinal permeabilities of a prodrug and its active moiety., Third International Conference on Drug Absorption, Edinburgh, UK (1988).

G.M. Grass and C.A. Bozarth, Evidence for gastrointestinal metabolism and metabolite absorption of ticlopidine. AAPS Western Regional Meeting Reno, Nevada (1989).

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