



CURRICULUM VITAE
MOHSEN I. AFOUNA-OCT-2008

ADDRESS

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King Abdel-Aziz University
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PROFILE:

Highly motivated scientist (teacher, lab scientific researcher) with expertise in development of topical, ocular and transdermal drug delivery systems. Experienced in development of non-clinical methodologies to assess the topical efficacy of various antiviral agents. Outstanding background in pharmaceutical sciences, development and management of scientific research projects combined with fluency in English and Arabic. Author of several recent articles, review articles and chapter in textbook regarding ocular, topical, transdermal, chirality and biopharmaceutics. Excellent written and oral communication skills with supervisory and teaching experience. Driven young pharmaceutical scientist, love to work in a dynamic teaching and research and development environment.

EDUCATION

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| 1998 | Ph.D. (Pharmaceutical Sciences), Pharmaceutics in a joint supervision program between the University of Al-Azhar (Egypt) and the University of Utah (SLC, UT, USA), Department of Pharmaceutics and Pharmaceutical Sciences. |
| 1995 | M. S. Pharmaceutical Sciences (Pharmaceutics), College of Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt. |
| 1987 | B. S., Pharmacy, College of Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt. |

EXPERIENCES

1. Associate Professor in the Department of Pharmaceutics, King Abdul Aziz University, Jeddah, KSA, 1247-to present
2. Assistant Professor in the Department of Pharmaceutics, King Abdul Aziz University, Jeddah, KSA.1423-1427 H
3. Assistant Professor in the Department of Pharmaceutics and Industrial Pharmacy at Al-Azhar University, Nasr City, Cairo, Egypt. 5/2003- 10/2003.
4. Research Scientist, Department of Pharmaceutical Sciences, UAMS, College of Pharmacy, Little Rock, AR 72205, USA, 2001-2003.
5. Assistant Professor in the Department of Pharmaceutics and Industrial Pharmacy at Al-Azhar University, Nasr City, Cairo, Egypt. 12/1998-March 2002.
6. Ph.D. studies with Distinguished Professor Dr. **William I. Higuchi** and Professor **Abdel H. Ghanem**, Department of Pharmaceutics at the University of Utah, Salt Lack City, UT, USA. 1996-1998.
7. Assistant Lecturer, Department of Pharmaceutics and Industrial Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt. 1995-1996.
8. Teaching Assistant, Department of Pharmaceutics and Industrial Pharmacy, Al-Azhar University, Nasr City, Cairo, Egypt. 1988-1993.
9. Community Pharmacist in the private sector pharmacies, 10/1987 to 4/1988.

PUBLICATIONS

1. **Mohsen I. Afouna**, Ibrahim S. Khattab, Abdel-Azim A. Zaghoul, and Indra K. Reddy "Stereoselective Transport of Timolol Maleate across Hairless Mice Skin upon Using Different Concentrations of Chiral Terpinen-4-ol Enhancer?" (*Submitted to Journal of Pharmacy and Pharmaceutical Sciences*; 2008).
2. **Mohsen I. Afouna**, Ashraf A. Naim, Ala'a Khedr and Adnan El-Marzoqi. "Influence of Various Concentrations of Terpene-4-ol enhancer and Carbopol-934 Mucoadhesive upon the In Vitro Ocular Transport and the In Vivo Intraocular Pressure Lowering Effects of Dorzolamide Ophthalmic Formulations Using Albino Rabbits, (*Submitted to Journal of Pharmaceutical Sciences*; 2008).
3. **Mohsen I. Afouna**, Ala'a Khedr and Adnan El-Marzoqi. "Effects of Various Concentrations of (-)-Carveol and HPMC upon the In Vitro Ocular Transport and the In Vivo Intraocular Pressure Lowering Effects of Dorzolamide Formulations in Normotensive New Zealand Rabbits. *Journal of Ophthalmic Research*, 2008. (*Accepted*).
4. A. Zaghoul, E. Taha, **Mohsen I. Afouna**, I. Khattab1, S. Nazzal. Ex vivo mucoadhesion and in vivo bioavailability assessment and correlation of ketoprofen tablet dosage forms containing bioadhesives. *Pharmazie* 62: 346–350 (2007).
5. Ibrahim S Khattab, Abdel-Azim A Zaghoul, **Mohsen I. Afouna**. Studies on the development of rapidly disintegrating hyoscine butylbromide tablets. *Drug Discov Ther* 2007; 1(1):61-64.
6. **Mohsen I. Afouna**. Enantioselective Transport of Chiral β -Blocker Timolol Maleate through Hairless Mice Skin upon Using Various Concentrations of Chiral Terpene Enhancer (-)- Carveol. *Egyptian Journal of Biomedical Sciences*, 18, 163-179, 2005.
7. **Mohsen I. Afouna**, Ibrahim S. Khattab and Indra K. Reddy. Preparation and Characterization of Demeclocycline Liposomal Formulations and Assessment of their Intra-ocular Pressure Lowering Effects using rabbit model. *Journal of Toxicology-Cutaneous and Ocular Toxicology*, 24 (2), 111-124, (2005).
8. Touitou Elka, Biana Godin, Kommuru R. Thirumala, **Mohsen I. Afouna**, Reddy K. Indra, Skin Transport of Optically Active Stereoisomers, In: Chirality in Drug Design and Development, Reddy K. Reddy, Reza Mehvar (Editors), *Marvel Dekker, Inc., New York, March*, (2004).
9. Hutak CM, Kavanagh ME, **Mohsen I. Afouna**, Khan M. A. and Reddy I. K. Using of SIRC Rabbit Corneal Cell Lines Grown on Polycarbonate- or Polyester-Based Filters for the in Vitro Corneal Transport//Toxicity Screening Using Pilocarpine with and without Benzalkonium Chloride. *Journal of Toxicology-Cutaneous and Ocular Toxicology*, 22 (1,2), 101-114, (2003).
10. **Mohsen I. Afouna**, Fincher T. K., Khan M. A. and Reddy I. K. "Percutaneous Permeation of Optically Active and Racemic Mixtures of Chiral Drugs and Prediction of their Flux Ratios Using Thermal Data: A Pharmaceutical Perspective", *Chirality*, 5, (2003).
11. **Mohsen I. Afouna**, Fincher T. K., Abdel Azim A. Zaghoul, and Reddy I. K. Effect of Azone upon the In vivo Antiviral Efficacy of Cidofovir or Acyclovir Topical Formulations against Cutaneous HSV-1 Infections and Its Correlation with Skin Target Site Free Drug Concentration Using Hairless Mice. *International Journal of Pharmaceutics*, 253 (1-2), 159 – 168, (2003).
12. **Mohsen I. Afouna**, Influence of Various Azone Concentrations upon Skin Target Site Free Drug Concentration (C*) of Bromovinyldeoxyuridine (BVDU) and Acyclovir (ACV) Formulations Using Hairless Mice: A Comparative Study. *Az. J. Pharmaceutical Sciences.*, 28: 26-37, (2001).
13. **Mohsen I. Afouna**, Mehta, S. C., Ghanem, A-H., Higuchi, W. I., Kern, E. R., DeClercq, E., and El-Shattawy, H. Influence of the Treatment Protocol upon the *In-Vivo* Efficacy of Cidofovir (HPMPC) and Acyclovir (ACV) Formulations in Topical Treatment of Cutaneous HSV-1 Infections in Hairless Mice, *Journal of Pharmaceutical Sciences*, 88(5): 530-534 (1999).
14. **Mohsen I. Afouna**, Mehta, S. C., Ghanem, A-H., Higuchi, W. I., Kern, E. R., and DeClercq, E., and El-Shattawy, H. Influence of when Therapy is Initiated upon the in Vivo Efficacy of HPMPC in Treatment of Cutaneous HSV-1 Infections in Hairless Mice. *Journal of Controlled Release, Proceeding*, (5): 593-596 (1998).
15. **Mohsen I. Afouna**, Mehta, S. C., Ghanem, A-H., Higuchi, W. I., Kern, E. R., DeClercq, E., and El-Shattawy, H. Assessment of Correlation between Skin Target Site Free Drug Concentration and the *In-Vivo* Topical Efficacy in Hairless Mice for (E)-5-(2-Bromovinyl)-2-Deoxyuridine and Acyclovir Formulations. *Journal of Pharmaceutical Sciences*, 87(8): 917-921 (1998).
16. Mehta, S. C., **Mohsen I. Afouna**, Ghanem, A-H., Higuchi, W. I. and Kern, E. R. Relationship of Skin Target Site Free Drug Concentration (C*) to the *In-Vivo* Efficacy: An Extensive Evaluation of the

- Predictive Value of the C* Concept Using Acyclovir as a Model Drug. , *Journal of Pharmaceutical Sciences*, 86(7): 797-801 (1997).
17. Samir C. Mehta, **Mohsen I. Afouna**, Abdel-Halim Ghanem, William I. Higuchi, Earl R. Kern and Hamed El-Shattawy. The relationship of basal cell layer drug concentration (C*) to the antiviral efficacy: A rigorous evaluation of the C* concept for predicting the entire range of topical efficacy of acyclovir formulations in the treatment of cutaneous HSV-1 infections in hairless mice, *Antiviral Research*, 34, P-80(1997)
 18. **Mohsen I. Afouna**, Ph.D. Dissertation, Optimization of the Availability of Antiviral Agent Using Topical Application in a joint supervision program between the *University of Al-Azhar (Egypt) and the University of Utah, SLC, UT (USA)*, (1998).
 19. **Mohsen I. Afouna**, Master's Thesis, Pharmaceutical Studies on the Availability of Enalapril Maleate, *Al-Azhar University*, (1995).
- **PUBLISHED CHAPTERS**
 1. Touitou Elka, Biana Godin, Kommuru R. Thirumala, **Mohsen I. Afouna**, Reddy K. Indra. *Skin Transport of Optically Active Stereoisomers*, In: "Chirality in Drug Design and Development". Reddy K. Reddy, Reza Mehvar (Editors), Marcel Dekker, Inc., New York, March, (2004).
 - **SELF-PUBLISHED BOOKS FOR PHARMACY STUDENTS (I am currently searching a prestigious publisher(s) to take care of the latest edition of this series of books)**
 1. **Mohsen I. Afouna**. "Introduction to the Pharmaceutical Dosage Forms".
 2. **Mohsen I. Afouna**. "Basic Pharmacokinetics and Applied Biopharmaceutics".
 3. **Mohsen I. Afouna**. "Sterile Dosage Forms: Preparation and Clinical Applications".
 4. **Mohsen I. Afouna**. "Applications of Physical Pharmacy in Pharmaceutics".
 5. **Mohsen I. Afouna**. "Basic Pharmaceutical and Clinical Calculations".
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- **ABSTRACTS PRESENTED IN NATIONAL OR INTERNATIONAL MEETING AND WORKSHOPS**
 - 1- **Mohsen I. Afouna**, Ibrahim S. Khattab and Indra K. Reddy. Demeclocycline Liposomal Formulations: Preparation, Characterization and Assessment of their Intra-ocular Pressure Lowering Effects using rabbit model, The 9th International Pharmaceutical Sciences Meeting and Exposition, Dec. (2005).
 - 2- **Mohsen I. Afouna**, [Bio]availability of Topical Formulations: From Ambiguous Definition to Lack of Generaliz[able] Approaches for Assessments. The 9th International Pharmaceutical Sciences Meeting and Exposition, Dec. (2005).
 - 3- Training workshop in "Application of Software in the Design of Advanced Learning website (Web CT). Center of Development of Higher Education, King Abdul Aziz University, Jeddah, KSA. (2005).
 - 4- Training workshop in "Effective Teaching Skills". Center of Development of Higher Education, King Abdul Aziz University, Jeddah, KSA, (2005).
 - 5- Training workshop in "Planning and Preparation of Multiple Choice Questions (MCQ) Exams. Center of Development of Higher Education, King Abdul Aziz University, Jeddah, KSA, (2005).
 - 6- **Mohsen I. Afouna**, Ibrahim, E. A., Kassem, Fincher K. I. and Reddy K. I. Stability Characterization of Long-Acting Angiotensin Converting Enzyme Inhibitor; Enalapril Maleate Physical Mixtures with Selected Excipients Using Differential Scanning Calorimetry. *The SRDG, Annual Meeting, Little Rock, AR, USA, May, 2002*.
 - 7- **Mohsen I. Afouna**, Ibrahim, E. A., Kassem, A., Fincher K. I. and Reddy K. I. Influence of Tablet Manufacturing Technique on the Physic-mechanical Characteristics, of Enalapril Maleate Tablets. *The AAPS Annual Meeting, Toronto, Canada, Oct. 2002*
 - 8- Fincher T. K., **Mohsen I. Afouna**, and Reddy I. K. Effect of the physicochemical characteristics upon the permeability of drug using chiral terpene enhancers. *The AAPS Annual Meeting, Montreal, Canada, Oct. 2002*
 - 9- **Mohsen I. Afouna**, Influence of Various Azone Concentrations upon Skin Target Site Free Drug Concentration (C*) of Bromovinyldeoxyuridine (BVDU) and Acyclovir (ACV) Formulations Using Hairless Mice: A Comparative Study. *The AAPS Annual Meeting, Colorado, Denver, USA, Oct. 2001*.
 - 10- **Mohsen I. Afouna**, Ibrahim, E. A., Kassem, A and El-Shattawy, H Stability Characterization of Long-Acting Angiotensin Converting Enzyme Inhibitor; Enalapril Maleate Physical Mixtures with Selected Excipients Using Differential Scanning Calorimetry. *The AAPS Annual Meeting, Colorado, Denver, USA, Oct. 2001*.

- 11- EPS/AAPS/FIP workshop on the Bioequivalence Classification Systems, by the Egyptian Pharmacist Syndicate, Cairo, Egypt, Feb. (2000).
- 12- **Mohsen I. Afouna**, The in vivo Antiviral Efficacy of Cidofovir (HPMPC) and Acyclovir (ACV) Topical Formulations with or without Azone Against Cutaneous HSV-1 Infection in Hairless Mice Employing Different Treatment Protocols. *15th Annual Meeting of American Association of Pharmaceutical Scientists, Indianapolis, Indiana, USA*, Oct. (2000).
- 13- Pharmex Consulting Group Workshop on Percutaneous Drug Absorption; Mechanisms-Methodology-Formulations Delivery-Toxicity, by Dr. Ghanem, A-H, and, Research Prof. of Pharmaceutics at the Department of Pharmaceutics and Pharmaceutical Chemistry, University of Utah, Salt Lack City, Utah, USA, March, (1999).
- 14- **Mohsen I. Afouna**, Mehta, S. C., Ghanem, A-H., Higuchi, W. I., Kern, E. R., DeClercq, E., and El-Shattawy, H. Assessment of Correlation between the Skin Target Site Free Drug Concentration (C*) and the *In-Vivo* Efficacy for Bromovinyldeoxyuridine (BVDU) and Acyclovir Formulations in the Treatment of Cutaneous HSV-1 Infections in Hairless Mice, *the 11th International Conference on Antiviral Research (Oral Session), San Diego, California, USA*, April (1998).
- 15- **Mohsen I. Afouna**, Mehta, S. C., Ghanem, A-H., Higuchi, W. I., Kern, E. R., DeClercq, E., and El-Shattawy, H. Absence of Correlation between C* Predictions and the *In-Vivo* Topical Antiviral Efficacy in Hairless Mice for Bromovinyldeoxyuridine (BVDU) Formulations. *Twelfth Annual Meeting of American Association of Pharmaceutical Scientists, Boston, Massachusetts, USA*, Nov. (1997).
- 16- Mehta, S. C., **Mohsen I. Afouna**, Ghanem, A-H., Higuchi, W. I., and Kern, E. R. The relationship of basal Cell Layer Drug Concentration (C*) to the Antiviral Efficacy: A Rigorous Evaluation of the C* Concept for Prediction of the Entire Range of Topical Efficacy of Acyclovir Formulations in the Treatment of Cutaneous HSV-1 Infections in Hairless Mice, *The 10th International Conference on Antiviral Research, Atlanta, Georgia, USA*, April (1997).
- 17- Mehta, S. C., **Mohsen I. Afouna**, Ghanem, A-H., Higuchi, W. I., Kern, E. R., DeClercq, E., and El-Shattawy, H. Absence of Correlation between C* Predictions and the *In-Vivo* Topical Antiviral Efficacy in Hairless Mice for Bromovinyldeoxyuridine (BVDU) Formulations. *The 11th Annual Meeting of American Association of Pharmaceutical Scientists, Seattle, Washington State, USA*, October (1996).

RESEARCH INTEREST

○ OPHTHALMIC RESEARCH:

- Study the effects the various physicochemical characteristics of the drug, penetration enhancers, and formulation*-related variables upon:
 - a. The *in vitro* transcorneal permeability of the novel compounds across isolated rabbit corneal membrane.
 - b. The *in vivo* IOP lowering effects for the formulation(s) containing anti-glaucoma agents using New Zealand rabbit as an animal model.

*Formulations such as ophthalmic gel, drops (solutions, suspension, emulsions) and liposomes.

○ SKIN RESEARCH:

- Design, preparation, development and characterizations of the various skin preparations intended for treatment of topical/systemic diseases including, gels, creams, ointments, micro/emulsions, emulgels and transdermal drug delivery systems.
- Study the effects the various physicochemical characteristics of the drug, skin penetration enhancers, and formulation-related variables upon:
 - a. The *in vitro* percutaneous transport of the various drugs particularly antiviral agents through freshly excised skin particularly hairless mice.
 - b. The *in vivo* effects for the drug formulation(s) in questions particularly anti-HSV-I/HSV-II agents
- Design and developing of non clinical methodologies for assessing skin target-site drug concentration from appropriate *in vitro* experiments using hairless mice as animal model and its correlation with the *in vivo* efficacy particularly antiviral agents.
- Mechanistic understanding of factors influencing predictivity of the *in vitro-in vivo* correlation.
- Investigating the formulation factors and dose regimens affecting topical efficacy of antiviral agents.

- **BIOPHARMACEUTICS/PHARMACOKINETICS RESEARCH:**
 - Design and determination of bioavailability, bioequivalence and pharmacokinetic parameters of systemic dosage forms employing compartmental and non-compartmental models.
- **SOLID DOSAGE FORMS:**
 - Characterization of drug-exipients interaction using Differential Scanning Calorimetry (DSC) technique.
 - Study of the influence of tablet manufacturing technique on the physical characteristics, the in-vitro release, accelerated stability and shelf-storage stability of tablets.
- **PREPARATION OF PHARMACEUTICAL DOSAGE FORMS:**
 - **Formulation and characterization of:**
 - Tablets (Un-coated and coated), with different manufacturing techniques such as direct compression and wet granulation.
 - Topical preparations (ointments, gels, TDS, lotions, shampoo, deodorants.etc).
 - Suppositories (Rectal and Vaginal), using different bases including water-soluble bases, bases melt at body temperature, and miscellaneous bases.
 - Effervescent salts and tablets (powders and granules).
 - Microcapsules using mechanical and chemical techniques including, spray drying, spray congealing, co-acervation phase separation, electrostatic disposition and other techniques.
 - Capsules (Softgels and hard gelatin capsules).
 - Ophthalmic products (Solutions, suspension, powder for re-constitution and ocular inserts).
 - Parenteral preparation.
- **CO-INVESTIGATOR AND APPLIED GRANT PROPOSALS**
 1. Grant –in-aid for KAU-IRC, up to SR 1,8 million for developing novel antidiabetic TDDS (pending).
 2. Grant –in-aid for KAU-IRC, SR 110,800 for developing novel Dorzolamide ophthalmic solutions and gels for management glaucoma in KSA.
 3. A grant-in-aid to Thera-tech Inc., \$± 70,000 for “Developing a Non-Clinical Methodology to assess the topical efficacy of various Antiviral agents such as Acyclovir (ACV), Cidofovir (HPMPC) and Bromovinyldeoxyuridine (BVDU).
- **ACADEMIC ACTIVITIES, RESEARCH SKILLS AND ATTRIBUTES**
 - 1- **TEACHING COURSES:**
 1. Applied Biopharmaceutics and Pharmacokinetics.
 2. Clinical Pharmacokinetics (Antibiotics, i.e., Aminoglycosides, Vancomycin, and, Antiepileptic drugs, i.e, Carbamazepine, Phenytoin and Valproic acid).
 3. Physical Pharmacy including, drug stability and reaction kinetics, solubility, drug diffusion, international phenomenon, colloids, and coarse dispersions)
 4. Drug Delivery Systems and Pharmaceutical Dosage Forms including topical & systemic liquid, semisolid, solid, sterile, and pressurized dosage forms.
 - 2- **PERCUTANEOUS DRUG TRANSPORT**
 - Characterization of skin transport using side by side as well as Franz diffusion cells.
 - 3- **ANALYTICAL**
 - Experience with DSC, HPLC, UV and X-ray, Gamma Scintillation Counter.
 - 4- **ANIMAL EXPERIMENTATION**
 - Oral gavage of white albino mice.
 - Topical and parenteral treatment of hairless mice.
 - Ocular delivery using rabbits and SIRC cell line.
 - IOP evaluation using Tono Pen XL®
 - 5- **STATISTICAL**
 - Hands on experience with data analysis using statistical software such SPSS and others.
 - 6- **COMPUTER KNOWLEDGE**

- Operational ability in all major software on all windows such as: Microsoft office (Microsoft word, Excel, Power Point, one note, ..etc), COREL Office (Word perfect, Quatro-Pro, Corel Presentation), Adobe Illustrator, WinNonLin, graph bad, graph prism and many others.

- **COMMUNICATION/LEADERSHIP/TEAM WORK**

1. Primary author/co-author of several publications in peer-reviewed journals (see list above).
2. Active participant in several research projects requiring collaboration with other laboratories/researchers during M.S, Ph.D. and Post-doctoral work.
3. Member of the “*Libraries Committee*”, College of Pharmacy, King Abdul Aziz University, Jeddah, KSA.
4. Coordinator of the “*Unit of Quality Assurance and Academic Accreditation (UQAAA)*” “College of Pharmacy, King Abdul Aziz University, Jeddah, KSA.
5. Coordinator of the “*Course Portfolio Committee*”, College of Pharmacy, King Abdul Aziz University, Jeddah, KSA.
6. Member of the “*Continuing Pharmacy Education Committee (CPE)*”. College of Pharmacy, King Abdul Aziz University, Jeddah, KSA.
7. Member of the “*The Department of Pharmaceutics Council*” College of Pharmacy, King Abdul Aziz University, Jeddah, KSA.
8. Teaching of different courses of pharmaceutical Sciences in the Department of Pharmaceutics, King Abdul Aziz University, Al-Azhar University, and Ein Shams University.
9. Member in the oral exam committee for many of the Colleges of Pharmacy in Egypt.

- **HONORS AND ACHIEVEMENTS**

1. Ranked first in overall academic rating at the College of Pharmacy at Al-Azhar University during many years of the undergraduate pharmacy study.
2. Two-years scholarship for Ph.D. study at the University of Utah, College of Pharmacy.
3. Post-doctorate Fellowship (Research Scientist) from the School of Pharmacy at UAMS, LR, AR,USA.
4. Chair Professor for "Design, Development and Consultancy for Novel Drug Delivery Systems", SR 10 Million-KAU, KSA.
5. R & D Consultant for various Egyptian and Saudi Pharmaceutical Co.

- **MEMBERSHIP**

1. The Egyptian General Syndicate of Pharmacists
2. American Association of Pharmaceutical Scientist.
3. Southern Region Discussion Group (SRDG).
4. Controlled Release Society, Inc.
5. The International Society of Antiviral Research.
6. Saudi Council for Continuing Health Education "Approved Trainer".