####  Curriculum Vitae

Raimar Löbenberg, PhD

President JRC Pharmaceuticals Inc.

Director, Drug Development and Innovation Centre

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Visiting Graduate Students 57

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Other Trainees 58

# Citizenship

German, Canadian

# Education

Nov 1996 Doctor of Philosophy in Pharmaceutical Technology,

 Johann Wolfgang Goethe-University, Frankfurt,

 title of the dissertation: Nanoparticles as carriers for AZT

Apr 1990 University degree in Pharmacy,

 Johannes Gutenberg-University, Mainz

Jun 1986 Abitur, Eleonoren Schule, Darmstadt

# Post Doctoral Fellow Ship

Jan 96 – Jun 97 FDA-Project on dissolution behavior of Case I and II compounds and *in vitro/in vivo* correlations, under Prof. Dr. J.B. Dressman

# Sabbaticals

Jul 07 – Jun 08 International Liaison Officer to the USP:

 Development of Global Drug Performance Standards using Biowaivers.

Jul 97 – Jun 99 Two-year sabbatical performing in vivo studies on drug absorption and BCS classification, at the University of Michigan, Ann Arbor, USA, Prof. Dr. G.L. Amidon.

# Positions held

Jul 2012 – present Professor at the University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences

Nov 2009 – Aug 2013 Division Chair, Pharmaceutical Sciences

Jul 2009 – present Director of the Drug Development and Innovation Centre

Jul 2005 – Jun 2012 Associate Professor at the University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences

Dec 2001 – present President of JRC Pharmaceuticals Inc.

Jan 2000 – Jun 2005 Assistant Professor at the University of Alberta, Faculty of Pharmacy and Pharmaceutical Sciences.

Jul 1997 – Jan 2000 Hochschul Assistant, Department of Pharmaceutical Technology, Frankfurt University

# Teaching

**Undergraduate Lectures:** Compounding and basic principles in pharmaceutics instruction is given to 130 first and second-year undergraduate students, three times/week  - 2 hours lectures.  Topics include for the first year students: Pharmacopeial Compounding Standards USP Chapter 795, Stability Considerations in Dispensing Practice <1191>, Compounding Powders, Capsules, Suppositories, Solutions, Pharmaceutical Waters, Suppository Bases, Herbal Extraction Processes, Container Materials and Closures; for the second year students: Sterile Compounding USP 797, Sterilization Methods, Parenteral Dosage Forms, Granulation Processes, Tablets, Film Coating, Quality Control and Pharmaceutical Performance Tests, Biopharmaceutics, Biowaivers, Controlled Release, New Drugs and the Drug Approval Process, Natural Heath Products, Future Dosage Forms.

Seminars: Three times a week, 1 hour pre-lab seminar.

Laboratory: Three times a week, 3 hours laboratory exercises. In the first year instruction is given in compounding and basic pharmaceutics. There is practical training in non sterile liquid, solid, and semi solid dosage forms and their production, documentation and quality control in public pharmacies; The second year students have labs about low risk manipulations of sterile products, and dissolution testing and compounding of complex formulations.

**Graduate Course in Pharmaceutics**: PHARM 611 Pharmaceutical Formulation Development.  Topics covered: Statistical Design Approaches in Pharmaceutics using Mini Tab, Regulatory Sciences; FDA Industrial Guidance on SUPAC (IR, MR, SS), BCS, IVIVC, Regulatory differences between Medical Devices and Drugs, Industrial Analytical Assay Development, GLP and GMP Requirements, Dissolution Testing, Quality by Design, In vitro modeling of Dosage Form Effects on the Oral Performance of Drugs.

**Health Canada Lectures:** Quality Control and Formulation of Modern Dosage Forms; Topics covered: Buccal and Sublingual Drug Delivery, Controlled Release Dosage Forms, Dose Dumping, Semisolid Dosage Forms, Franz cells as Performance Tests, Nasal Dosage Forms and Dispensers, In Vitro In Vivo Correlations, Nano Sized Delivery Systems, Ophthalmic Dosage Forms, Vaginal Dosage Forms.

# Research

**Inhalable nanoparticles for pulmonary drug delivery of anti-cancer drugs**: This research is performed in collaboration between Engineering, Medicine and Pharmacy. The first publication of this work has received the most cited award of the International Journal of Pharmaceutics in 2004. Since then several review articles and publications were published, national and international invited talks were delivered and workshops and symposia were organized about this topic. One patent was issued and another patent application was filed. The preclinical application and the high potential of this delivery platform was published in 2011; showing that inhalable nanoparticles are much more potent compared to other routes of administration in lung cancer treatment.

**BCS based** **development of in vitro/in vivo Correlations using Biorelevant Dissolution Techniques and Computers Simulations**: This research received the New Investigator Award in 2001 and was/is supported by industry. It generated many publications and was presented at Merck Forsst’s annual research day, FDA-AAPS workshop, AAPS annual conference, Canadian Society for Pharmaceutical Sciences annual conference, SINDUSFARMA (Brazil) Workshop, Pharmaceutical Technology Society of Korea, AAPS outreach workshop South Africa and Argentina.

**Quality by Design and performance testing**: Publications about this topic have been published in various journals including the AAPS Journal. The work was presented at conferences and workshops in Brazil, China, South Korea, Canada and to the USP expert committee on performance testing. This work has also changed the USP specifications of the disintegration test.

**Formulation development and novel processes**: Publications about different processes and formulation work, including process analytical technology, were published by my lab. In one project, sponsored by the USP, we investigated blending sequences between an API and two excipients. The results showed that dissolution properties of certain tablets might change depending on blending sequences before compression

**TCM and Natural Health Products**: The Drug Development and Innovation Centre is involved in translational research to design and develop modern Natural Health Products. Our research is shared at workshops and symposia, and published in several manuscripts. The center has provided several clinical trials with dosage forms and developed prototypes of products which are currently commercialized.

**Medical Marijuana**: our lab has expertise in the assessment of medical marijuana. We have developed analytical assays and extraction methods for major cannabinoids. We work on modern formulations of medical marijuana to develop therapeutic alternatives to smoking.

# Service

* Division Chair, 2009 – 2013
* Senate of the University of Alberta; 2008 - 2013
* Associate Editor: Journal of Biomedical Nanotechnology; 2007-2011
* Editorial Advisory Board: Dissolution Technologies; ongoing
* Editorial Advisory Board: Archives of Pharmacal Research; ongoing
* Editorial Advisory Board: The Open Drug Delivery Journal; ongoing
* Editorial Advisory Board: Current Traditional Medicine; 2014 ongoing
* Graduate Studies committee 2000 – 2004, 2008 - 2010
* AFPC Representative to the USP Convention 2005, 2010, 2015
* Academic Appeals committee 2005 / 2006
* Member of the General Faculty Council, 2001-04, 05-13, 14-15
* Curriculum development: Member of the Dermatology Module
* Faculty representative to the University Library
* University Communications Advisory Committee 2013-ongoing
* University Chemical Safety Committee
* Assessment committee 2010 - 2014
* Curriculum committee 2013 - 2104
* New Pharm D Committee 2009 – ongoing
* Pre-Clinical Trial Committee, Cross Cancer Institute 2014- ongoing
* Communication advisory committee, 2013 ongoing

# Consultancies

* Tyrelest
* GSK
* Expert and Chair of reconsideration panels of Health Canada
* Expert witness in patent disputes
* Vertex Inc. Boston
* Merck Frosst, Krikland
* Portsystems LLC, Ann Arbor
* Kinetana Group, Hong Kong
* Biopack Inc, Edmonton
* AltaChem Pharma, Edmonton
* Health Canada, Medical Marijuana Research Program
* QLT Inc. Vancouver
* Novokin Inc. Edmonton
* Cannasat Therapeutics, Toronto
* Cevena Bioproducts Inc. Edmonton
* Sinoveda Canada Inc.

# National and International Professional Activities

2015- 2017 Vice Chair USP Expert Committee Dietary Supplements None-Botanicals

2016 - 2017 Past President Canadian Society for Pharmaceutical Sciences

2014 - 2015 **President Canadian Society for Pharmaceutical Sciences**

2012 - 2013 President Elect Canadian Society for Pharmaceutical Sciences

2012 - 2018 Health Canada: Scientific Advisory Committee on Pharmaceutical Sciences and Clinical Pharmacology

2011 - 2018 Scientific Advisory Panel on Opioid Analgesic Abuse (SAP-OAA)

2006 - 2016 AAPS Steering Committee for In Vitro Release and Dissolution

2006 - 2018 Vice Chair of the Specialty Committee of Traditional Chinese Medicine in Pharmaceutics;
World Foundation of Chinese Medicine Societies

2014 - 2015 Dietary Supplements Compendium Advisory Committee

2010 - 2015 USP Extended-Release Dietary Supplements Expert Panel

2010 - 2015 Chair USP Committee Performance testing of Dietary Dosage Forms

2010 - 2015 USP Expert Committee Dietary Supplements and Botanical Medicines

2010 - 2015 USP Expert Committee General Chapters; Dosage Forms Subcommittee

2005 - 2010 USP Expert Committee Dietary Supplements, Bioavailability

2005 - 2010 USP Membership Committee

# Qualifications

Jun 2009 Director Drug Development and Innovation Centre – holds a Health Canada site license

Dec 2005 Narcotic license for handling cannabis possession, production, packing, sale , transprotaion

Apr 1994 Qualification to be production and quality control manager in the pharmaceutical industry in Germany (AMG §15)

May 1993 State appointed examiner at the school for Pharmaceutical Technical Assistants

Jul 1991 Approbation als Apotheker

# Association Memberships (past and current)

* International Association for Pharmaceutical Technology, APV
* Controlled Release Society, CRS
* International Pharmaceutical Federation, FIP
* Association de Pharmacie Galénique Industrielle, APGI
* **American Association of Pharmaceutical Scientists, AAPS**
* Michigan Mass Spec Discussion Group
* Deutsche Pharmazeutische Gesellschaft, DPhG
* European Association of Pharma Biotechnology
* **Canadian Society of Pharmaceutical Sciences, CSPS**
* Alberta Lung Association
* NHP Research Society of Canada

# Awards and Recognitions

* 2018 Visiting Scientist University of Michigan
* 2017 Visiting Scientist University of Michigan
* 2016 Visiting Scientist University of Michigan
* 2014 Special Scholar University of Sao Paulo, Neglected Diseases
* 2013 Award of Merit 2013 Faculty of Pharmacy and Pharmaceutical Sciences
* 2012 Guest Professor at the Jiangxi University of TCM, China
* 2012 University of Alberta **President’s Achievement Award** “Connecting Communities”
* 2011 Hugh Kelly Fellowship, Rhodes University, South Africa
* 2010 Premier's **Gold Award of Excellence**
* 2010 **Canada Awards of Excellence**
* 2010 ASTech 2010 Award; Alberta Science and Technology Leadership Foundation
* 2006 Second Best Article, Bundesverband der Pharmazeutischen Industrie in Deutschland
* 2004 **Most Cited Paper Award** International Journal of Pharmaceutics
* 2004 Senate community service recognition
* 2003 Senate community service recognition
* 2002 Senate community service recognition
* 2001 Senate community service recognition
* 2001 ACCP New Investigator Award

# Patent

Effervescent powders for inhalation US Patent Application July 2006 – issued May 2011 PI: Löbenberg

"Nanocristais de Rifampicina, processo de preparação e seus usos” (University of Alberta Tech ID#2017008, "Rifampin Nanocrystals: Toward Improved Antituberculosis Therapy"; Inventors: Nadia Araci Bou Chacra – Universiade Sao Paulo (USP), Katherine Jasmine Curo Melo - USP, Nikoletta Fotaki – University of Bath, and Raimar Löbenberg – University of Alberta)

“Nanopartículas lipídicas contendo Buparvaquona, processo de obtenção e seus uso” (University of Alberta Tech ID #2017008, "Buparvaquone Lipid Nanoparticles, Preparation Process and Uses"; inventors Nadia Araci Bou Chacra – USP, Paulo Cesar Cotrim – USP, Lis Marie Monteiro – USP, Nikoletta Fotaki – Bath, and Raimar Löbenberg – Alberta)

# Patent Applications

Topical system for optimum local delivery, US provisional patent. (PI: Kinetana Inc. July 2004)

An optimized TCM formula for the prevention and treatment of Arthritis, US provisional patent. (PI: Kinetana Inc. June 2004)

Formulation of Powder Containing Nanoparticles for Aerosol Delivery to the Lung, Canadian Patent application July 2003 PI shared: Loebenberg Roa Finlay Patent based on the publication for which I’m the PI

# Disclosure of Invention

* The use of tribolminescent materials for photodynamic therapy
* Apparatus to determine Thermal Conductivity and Efussivity
* Macrophage Targeting in Cancer treatment.
* Medical Foams
* Nanocrystals to treat Tuberculosis
* Naocrystals to treat Leishmanasis
* Foamable microemulsions

# Publications and h-Index

Google Scholar (h-Index) (please see current scores at:)

URL: http://scholar.google.com/citations?user=wP6VNfMAAAAJ

## Peer Reviewed Publications **(bold PI**, trainee**)**

### Book Chapter

6 BOU-CHACRA, N.A.; CURTIVO, C.P.D.; TAVARES, G.D.; LÖBENBERG, R. Fundamentos da Qualidade por Design. In: Terezinha de Jesus Andreoli Pinto; Natalia Bellan. (Org.). Diretrizes no processo de regulamentação sanitária dos medicamentos no Brasil. 1 ed. São Paulo: Manole, 2014, p. 1-34.

5 Book Title: Rhodiola Rosea

Editors: Alain Cuerrier, Kwesi Ampong-Nyarko

Chapter Title: Commercialization of Rhodiola Rosea

Authors: Nav Sharma and Raimar Loebenberg

4 Book Title: Generic Drug Product Development

Editors: Isadore Kanfer, Leon Shargel

Chapter Title: Experimental Formulation Development

Authors: Isadore Kanfer, Roderick B. Walker, Raimar Löbenberg and Nádia Araci Bou-Chacra

3 Book Title: Therapeutic Delivery Solutions

Editors: Chung Chan; Kwok Chow; Bill McKay; Michelle Fung

ISBN: 978-1-118- 11126-0

Chapter Title: Biorelevant Dissolution Testing

Authors: May Almukainzi, Nadia Bou-Chacra and Raimar Löbenberg

2 Book Title: Therapeutic delivery methods: concise overview of emerging areas

Editors: Beom-Jin Lee

Chapter Title: Mechanism of gastrointestinal drug absorption and application in therapeutic drug delivery

Authors: Raimar Löbenberg, Humberto Ferraz, Nadia A Bou-Chacra, Gordon L Amidon,

1 Book Title: Methods for Assessing Oral Absorption

Editors: J.B. Dressman, H. Lennernäs

Chapter Title: Solubility as a Limiting Factor to Drug Absorption : p. 137-154

Authors: Löbenberg R, Vieira M, and Amidon GL

Marcel Dekker, New York, 2000 ISBN: 0-8247-0272-7

Submitted book chapters or review papers:

Book Title: In Vitro Drug Release Testing of Special Dosage Forms

Editors: Dr. Nikoletta Fotaki,   Prof. Dr. Sandra Klein

Chapter Title: Orally disintegrating dosage forms

Authors: May Almukainzi, Gabriel Aruajo and Raimar Löbenberg

Review Articles

17 Nadia Bou Chacra, Katherine Jasmine Curo Melo, Ivan Andrés Cordova Morales, Erika S Stippler, Filippos Kesisoglou, Mehran Yazdanian, Raimar Löbenberg

Evolution of choice of solubility and dissolution media after two decades of Biopharmaceutical Classification System

AAPS Journal May 2017

16 Development of An algorithm to identify Mass Production Candidate Molecules to Develop Children’s Oral Medicines: A North American perspective Varsha Bhatt-Mehta; Robert B. MacArthur; Raimar Löbenberg; Jeffrey J. Cies; Ibolja Cernak; and Richard H. Parrish II AAPS Open access December 2016

15 Challenges and Future Prospects of Nanoemulsion as a Drug Delivery System

Megumi Nishitani Yukuyamaa, Edna Tomiko Myiake Katoa , Raimar Löbenbergb and Nadia Araci Bou-Chacra

Current Pharmaceutical Design, 2017, 23, 1-14

14 An Algorithm to Identify Compounded Non-Sterile Products that Can Be Formulated on a Commercial Scale or Imported to Promote Safer Medication Use in Children

Varsha Bhatt-Mehta, Robert B. MacArthur, Raimar Löbenberg, Jeffrey J. Cies,
Ibolja Cernak and Richard H. Parrish II

 Pharmacy 3 (4), 284-294

13 Liposomal Drug Delivery: A Versatile Platform for Challenging Clinical Applications

Asadullah Madni, Muhammad Sarfraz, Mubashar Rehman, Mahmood Ahmad, Naveed Akhtar, Saeed Ahmad, Nayab Tahir, Shakeel Ijaz, Raida Al-Kassas, Raimar Löbenberg

Journal of Pharmacy & Pharmaceutical Sciences 2014

12 Overview of the preparation of organic polymeric nanoparticles for
drug delivery based on gelatine, chitosan, poly(D,L-lactide-co-glycolic
acid) and polyalkylcyanoacrylate

Patrick Lai, Weiam Daear, Raimar Loebenberg and **Elmar J Prenner**
Colloids and Surfaces B: Biointerfaces (accepted 2014 March)

11 Dengue Diagnostics: Current Scenario

Advaita Ganguly, Ravindra B Malabadi, Raimar Loebenberg, Mavanur R Suresh and **Hoon H Sunwoo**

Research in Biotechnology, 4(2): 19-25, 2013

10 A Mini-review of Dengue Vaccine Development

Advaita Ganguly, Ravindra B Malabadi, Raimar Loebenberg, Mavanur R Suresh and **Hoon H Sunwoo**

Research in Pharmacy 3(2): 18-25, 2013

9 Al-Hallak, M.K., Sarfraz, M.K., Azarmi, S., Roa, W.H., Finlay, W.H., **Löbenberg, R**., 2011
Pulmonary delivery of inhalable nanoparticles: Dry powder inhalers, Therapeutic Delivery 2012 (10) , pp. 1313-1324

8 **Margareth R. C. Marques**, Raimar Löbenberg, and May Almukainzi
Simulated Biological Fluids with Possible Application in Dissolution Testing

Dissolution Technology, August 2011 p 15- 28

7 Cheng Tong, Ruben Lazano, Yun Mao Tarhseen Mirza, Raimar Loebenberg, Beverly Nickerson, Vivian Gray, **Qingxi Wang**

The Value of Dissolution in the Drug Development Continuum

Pharmaceutical Technology 2009, Volume 33, Issue 4, pp. 52-64

6 Azarmi, S., Roa, W.H., **Löbenberg, R.**

Targeted delivery of nanoparticles for the treatment of lung diseases

(2008) Advanced Drug Delivery Reviews, 60 (8), pp. 863-875.

5 Donauer, N., **Löbenberg, R.**

A mini review of scientific and pharmacopeial requirements for the disintegration test

(2007) International Journal of Pharmaceutics, 345 (1-2), pp. 2-8..

4 Gill, S., Löbenberg, R., Ku, T., Azarmi, S., Roa, W., **Prenner, E.J.**

Nanoparticles: Characteristics, mechanisms of action, and toxicity in pulmonary drug delivery - A review

(2007) Journal of Biomedical Nanotechnology, 3 (2), pp. 107-119.

3 Azarmi, S., Roa, W**., Löbenberg, R**.

Current perspectives in dissolution testing of conventional and novel dosage forms

(2007) International Journal of Pharmaceutics, 328 (1 SPEC. ISS.), pp. 12-21.

 (ranked No 1 downloaded article)

2 Fung, P., Jung, J., Au, D., Huynh, S., Yeung, A.A., **Löbenberg, R**.

West Nile virus in Canada

(2006) Canadian Pharmacists Journal, 139 (3), pp. 50-56.

1 Löbenberg, R., **Amidon, G.L.**

Modern bioavailability, bioequivalence and biopharmaceutics classification system. New scientific approaches to international regulatory standards

(2000) European Journal of Pharmaceutics and Biopharmaceutics, 50 (1), pp. 3-12.

### Research Publications

### Submitted:

IN VITRO AND IN SILICO THERAPEUTIC EQUIVALENCE OF CEPHALEXIN 500 mg TABLETS COMMERCIALIZED IN BRAZIL

Dual Effect of Bile Salts in Nanocarriers: Counteracting Gastrointestinal Lysis and Enhancing Intestinal Permeability of Cefotaxime in Rats

### Published

109 Measuring the Impact of Gastrointestinal Variables on the Systemic Outcome of Two Suspensions of Posaconazole by a PBPK Model

B Hens, A Talattof, P Paixão, M Bermejo, Y Tsume, R Löbenberg, ...

The AAPS Journal 20 (3), 57 2018

108 A New Thermodynamically Favored Flubendazole/Maleic Acid Binary Crystal Form: Structure, Energetics and In Silico PBPK Model-based Investigation

GLB de Araujo, FF Ferreira, CES Bernardes, JAP Sato, OM Gil, ...

Crystal Growth & Design 2018

107 In Vitro Therapeutic Equivalence of Cephalexin 500 mg Tablets Commercialized in Brazil

DDM Ghisleni, IS Kikuchi, AM Saviano, NA Bou-Chacra, R Lobenberg, ...

LATIN AMERICAN JOURNAL OF PHARMACY 37 (1), 7-11 2018

106 Synergistic photoprotective activity of nanocarrier containing oil of Acrocomia aculeata (Jacq.) Lodd. Ex. Martius—Arecaceae

MF Dario, FF Oliveira, DSS Marins, AR Baby, MVR Velasco, R Löbenberg, ...

Industrial Crops and Products 112, 305-312, 2018

105 Pharmaceutical Characterization of MyoNovin, a Novel Skeletal Muscle Regenerator: in silico, in vitro and in vivo Studies

S Alrushaid, NM Davies, JE Anderson, T Le, JA Yáñez, ZH Maayah, ...

Journal of Pharmacy & Pharmaceutical Sciences 21 (1s), 1-18s, 2018

104 Erding Formula in hyperuricaemia treatment: unfolding traditional Chinese herbal compatibility using modern pharmaceutical approaches

J Zuo, H He, Z Zuo, N Bou‐Chacra, R Löbenberg

Journal of Pharmacy and Pharmacology 70 (1), 124-132, 2018

103 Thermodynamic approaches for the prediction of oral drug absorption

Z Fasihi, P Zakeri-Milani, A Nokhodchi, J Akbari, M Barzegar-Jalali, ...

Journal of Thermal Analysis and Calorimetry 130 (3), 1371-1382, 2017

102 Combinational siRNA delivery using hyaluronic acid modified amphiphilic polyplexes against cell cycle and phosphatase proteins to inhibit growth and migration of t...

MB Parmar, DNM Sundaram, RB KC, R Maranchuk, HM Aliabadi, ...

Acta biomaterialia, 2017

101 Dynamic Change in pH by Low Buffer Capacity of Gastrointestinal Fluids Along The Human Gastrointestinal Tract: Implications For In Vivo Dissolution and Absorptio...

B Hens, Y Tsume, M Bermejo, P Paixão, M Koenigsknecht, R Baker, ...

2017 Mol Pharm

100 Intrinsic dissolution simulation of highly and poorly soluble drugs for BCS solubility classification

MD Duque, MG Issa, DA Silva, BA Sakamoto, LNCR Kakuda, ...

DISSOLUTION TECHNOLOGIES 24 (4), 6-11

99 Pharmacokinetic and Toxicodynamic Characterization of a Novel
Doxorubicin Derivative
Authors: Samaa Alrushaid, Casey L. Sayre, Jaime A. Yáñez, M. Laird Forrest,
Sanjeewa N. Senadheera, Frank J. Burczynski, Raimar Löbenberg, Neal M.
Davies

Pharmaceutics 9 (3), 35

98 Mosab Arafat,Cathrin Kirchhoefer, Momir Mikov, Muhammad Sarfraz, Raimar Löbenberg

Nanosized Liposomes Containing Bile Salt: A Vesicular Nanocarrier for

Enhancing Oral Bioavailability of BCS Class III Drug

J PharmPharmSci 20, 305 - 318, Aug 2017

97 B Hens, Y Tsume, M Bermejo, P Paixao, M Koenigsknecht, JR Baker, ...

Low Buffer Capacity and Alternating Motility along the Human Gastrointestinal Tract: Implications for in Vivo Dissolution and Absorption of Ionizable Drugs

Molecular Pharmaceutics Aug 2017

96 LM Monteiro, R Löbenberg, EI Ferreira, PC Cotrim, E Kanashiro, M Rocha, ...

Targeting Leishmania amazonensis amastigotes through macrophage internalisation of a hydroxymethylnitrofurazone nanostructured polymeric system

International Journal of Antimicrobial Agents Jul 2017

95 **Ghada Bachour**, Nadia Araci Bou-Chacra, and Raimar Lőbenberg

Evaluation of the Rupture Test for Stability Studies of Soft-Shell Capsules

Dissolution Technol. 2017 Nov.

94 Nayab KHALID, Nisar U. RAHMAN, Raimar LÖBENBERG,

**Muhammad AKHTAR**, Muhammad K. SARFARAZ, Bra’a M. HAJJAR

Design and Evaluation of SMEDDS to Enhance Solubility and

Dissolution of Anticancer Drug Using Modified Cylinder Method

 Lat. Am. J. Pharm. 36 (4): 647-57 (2017)

93 Roger K. Verbeeck, Isadore Kanfer, **Raimar Löbenberg**\*, Bertil Abrahamsson, Rodrigo Cristofoletti , D.W. Groot, Peter Langguth, James E. Polli, Alan Parr, Vinod P. Shah Mehul Mehta, and **Jennifer B. Dressman**

BIOWAIVER MONOGRAPHS FOR IMMEDIATE RELEASE SOLID ORAL DOSAGE FORMS:
ENALAPRIL"

 Journal of Pharmaceutical Sciences April 2017

92 Braa Hajjar, Kira-Isabel Zier, Nayab Khalid, Shirzad Azarmi, Raimar Löbenberg

Evaluation of a microemulsion-based gel formulation for topical drug delivery of diclofenac sodium

Journal of Pharmaceutical Investigation (2017)

91 May Almukainzi · Ranih Gabr · Ghada Abdelhamid · Raimar Löbenberg

Mechanistic understanding of the effect of renal impairment on metformin oral absorption using computer simulations

Journal of Pharmaceutical Investigation (2017) 47:151–161

90 Lukas Uebbing, Lukas Klumpp, Gregory K. Webster, Raimar Löbenberg

Justification of disintegration testing beyond current FDA criteria using in vitro and in silico models

Drug Design, Development and Therapy, April 2017

89 Lis Monteiro, Raimar Löbenberg, Paulo C. Cotrim, Gabriel Lima Barros de Araújo and **Nádia Bou-Chacra**

Buparvaquone nanostructure lipid carrier: development of an affordable delivery system for the treatment of leishmaniases"

Acepted Jan 2017 BioMed Research International

88 SS Yoo, L Guo, X Sun, AR Shaw, Z Yuan, R Löbenberg, WH Roa

Fabrication and in vitro characterization of gadolinium-based nanoclusters for simultaneous drug delivery and radiation enhancement

Nanotechnology 27 (38), 385104, 2016

87 J Zuo, Q Zheng, H Jian, T Porttin, C Willson, F Misquita, J Capicio, ...

Traditional Chinese Medicine for Managing Inflammatory Pain of Arthritis with Herbal Medicines

Current Traditional Medicine 2 (2), 80-93

86 MB Parmar, BE Arteaga Ballesteros, T Fu, RB KC, H Montazeri Aliabadi, Hugh JC, Löbenberg R, Uludağ H

Multiple siRNA delivery against cell cycle and anti‐apoptosis proteins using lipid‐substituted polyethylenimine in triple‐negative breast cancer and nonmalignant cells

Journal of Biomedical Materials Research Part A July 2016 doi: 10.1002/jbm.a.35846

84 **Moghimipour E,** Sajadi Tabassi S, Ramezani M, Handali S, Löbenberg R

Absorption enhancing effect of total saponins derived from Acanthopyllum squarrusom and Quillaja saponaria on nasal permeation of gentamicin sulfate and carboxyfluorescein

Research Journal of Pharmaceutical, Biological and Chemical Sciences, vol. 7, issue 3 (2016) pp. 285-291

83 **E Moghimipour**, SAS Tabassi, M Ramezani, S Handali, R Löbenberg

Brush border membrane vesicle and Caco-2 cell line: Two experimental models for evaluation of absorption enhancing effects of saponins, bile salts, and some synthetic surfactants

Journal of Advanced Pharmaceutical Technology & Research 7 (3), 75

82 Parvin Zakeri-Milani, Zohreh Fasihi, Jafar Akbari, Ensieh Jannatabadi, Mohammad Barzegar-Jalali , Raimar Loebenberg, Hadi Valizadeh

Crystal-liquid Fugacity Ratio as a Surrogate Parameter for Intestinal Permeability

JPPS 2016 Aug Vol 19 (3)

81 M Sarfraz, W Roa, N Bou-Chacra, **R Löbenberg**

Inflammation caused by Nano-sized delivery Systems: is there a benefit?

Molecular Pharmaceutics, August 2016

80 M Sarfraz, W Shi, Y Gao, SD Clas, W Roa, N Bou-Chacra, **R Löbenberg**,

Immune response to antituberculosis drug-loaded gelatin and polyisobutyl-cyanoacrylate nanoparticles in macrophages

Therapeutic Delivery 7 (4), 213-228

79 M Almukainzi, F Jamali, A Aghazadeh-Habashi, **R Löbenberg**

Disease specific modeling: Simulation of the pharmacokinetics of meloxicam and ibuprofen in disease state vs. healthy conditions

European Journal of Pharmaceutics and Biopharmaceutics 100, 77-84

78 S Khiljee, NU Rehman, T Khiljee, R Loebenberg, **RS Ahmad**

Formulation and clinical evaluation of topical dosage forms of Indian Penny Wort, walnut and turmeric in eczema.

Pakistan journal of pharmaceutical sciences 1 (28), 2001-2007

77 Felipe Rebello Lourenço, Fabiane Lacerda Francisco, Márcia Regina Spuri Ferreira, Terezinha de Jesus Andreoli, Raimar Löbenberg, **Nádia Bou-Chacra**

Design Space Approach for Preservative System Optimization of an Anti-Aging Eye Fluid Emulsion

Journal of Pharmacy & Pharmaceutical Sciences 18 (3), 551-561

76 Lis Marie Monteiro, Guilherme Diniz Tavares, Elizabeth Igne Ferreira, Vladi Olga Consiglieri, **Nadia Araci Bou-Chacra**, Raimar Löbenberg

Reverse phase high-performance liquid chromatography for quantification of hydroxymethylnitrofurazone in polymeric nanoparticles

Brazilian Journal of Pharmaceutical Sciences 51 (3), 561-567

75 **Mhammad Naeem, Nisar**, UR Rahman, GUILHERME TAVARES, Savio F Barbosa, Nadia B Chacra, Raimar Loebenberg, Muhammad K Sarfraz

Physicochemical, in vitro and in vivo evaluation of flurbiprofen microemulsion

Anais da Academia Brasileira de Ciências 87 (3), 1823-1831

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### Submitted Publications

### Submitted Abstracts

Dual Effect Of Bile Salts In Nanocarriers: Counteracting Gastrointestinal Lysis And Enhancing The Oral Bioavailability Of BCS Class III Drug

Muhammad Sarfaz, Raimar Loebenberg

2017 AAPS November 12-15, 2017 in San Diego, CA.

Disintegration or Dissolution for Immediate Release Tablets – How to Decide on a Quality Control Method in a QbD Environment

Lukas Uebbing, Leandro Santoro Hernandes, Juliet Obianuju Njoku, Gregory K. Wbster, Raimar Löbenberg

AAPS November 12-15, 2017 in San Diego, CA.

Utilization of Simulation Software in Early Drug Development

Lukas Uebbing, Leandro Santoro Hernandes, Juliet Obianuju Njoku, Gregory K. Wbster, Raimar Löbenberg

AAPS November 12-15, 2017 in San Diego, CA.

Nanostructured Lipid Carrier Containing Hydroxymethylnitrofurazone (NFOH) for the Treatment of Leishmaniasis: A Rational Approach to Select the Proper Liquid Lipid

Aline de Souza, Gabriel Araújo, Raimar Löbenberg, Nadia Bou-Chacra

AAPS November 12-15, 2017 in San Diego, CA

Cationic Ocular Nanoemulsion for the Treatment of Ocular Tuberculosis

Mirla Bazan Henostroza, Nadia Bou-Chacra, Gabriel Araujo, Raimar Lobenberg
AAPS November 12-15, 2017 in San Diego, CA

Olive Oil Nanoemulsion: A Rational Approach Preparation Using High and Low Energy Processes

Megumi Yukuyama, Raimar Löbenberg, Nadia Bou-Chacra
AAPS November 12-15, 2017 in San Diego, CA

Development of Flubendazole Nanocrystals Using High-Pressure Microfluidization: effect of stabilizers and microfluidization time on particle size reduction

Debora Gonçalves, Nadia Bou-Chacra, Raimar Löbenberg, Gabriel de Araujo
AAPS November 12-15, 2017 in San Diego, CA

Hydroxymethylnitrofurazone Nanocrystals (NFOH): A Promising Therapeutic Approach in the Treatment of Leishmaniasis Debora Marins, Gabriel Araújo, Raimar Löbenberg, Nadia Bou-Chacra
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Esculetin Nanocrystal: Toward an Innovative Approach for the Treatment of Hyperuricemia

Jieyu Zuo, Nadia Bou-Chacra, Raimar Lobenberg
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The application of Simulation Software in Early Drug Development

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CSPS annual meeting Montreal

Disintegration or Dissolution as quality control method for immediate release tablets – How to decide in a QbD environment?

Lukas Uebbing, Leandro Santoro Hernandes, Juliet Obianuju Njoku, Gregory K. Wbster, Raimar Löbenberg

CSPS annual meeting Montreal

### Published Abstracts

Pharmacokinetic and Toxicodynamic Characterization of a Novel Doxorubicin Derivative

Samaa Alrushaid, Casey L. Sayre, Jaime A. Yáñez, M. Laird Forrest, Sanjeewa N. Senadheera, Frank J. Burczynski, Raimar

Löbenberg, and Neal M. Davies

CSPS annual meeting Montreal 2017

In-silico Physicochemical and Biopharmaceutical Characterization of MyoNovin, a Novel Skeletal Muscle Regenerating Agent

Samaa Alrushaid, Neal M. Davies, Jaime A. Yáñez, Ousama Rachid, Casey L. Sayre, Raimar Löbenberg, Frank J. Burczynski

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Disintegration or Dissolution as Quality Control Method for Immediate ReleaseTablets – How to Decide in a QbD Environment

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The Application of Simulation Software in Early Drug Development

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How to Justify Disintegration Testing as a Suitable Quality Control Method Using Simulations and Model Fitting

AAPS annual meeting Denver November 2016

170 Jieyu Zuo, **Raimar Loebenberg**
Compatibility Effects of Herb Composition in Reducing Uric Acid Level in Hyperuricemic Mice

AAPS annual meeting Denver November 2016

Muhammad Sarfraz, Wilson Roa, Nadia Bou Chacra, **Raimar Loebenberg**
Inflammation Caused by Nano-Sized Delivery Systems: Is There a Benefit?
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Artemether Nanocrystals: An Innovative Anti-malarial Therapy

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A Gadolinium-Doxorubicin Nanoparticle Complex as a Novel Drug-Delivery System

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Development and Evaluation of SMEDDS of Anticancer Drug Etoposide and Its In Vitro Release by Using a Modified Cylinder Method

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165 Jieyu Zuo, Hui Jian, Zhengyun Zuo, Shilin Yang, **Raimar Löbenberg**

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CSPS annual meeting Vancouver

Jieyu Zuo,Hui Jian, Zhengyun Zuo, Shilin Yang, Raimar Löbenberg

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Evaluation of Carbopol 934P NF Microemulsion-Based Gel Formulations for Topical Drug Delivery of Diclofenac Sodium

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Zhipeng Yuan, Linghong Guo, Shannon Yoo, **Raimar Loebenberg** and Wilson Roa

A Gadolinium-Doxorubicin Nanocomplex as a Novel Targeted Drug-Delivery System

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Is Secondary Toxicity Beneficial for Nano-sized Delivery Systems?

Toxicolgy symposium Edmton May 2016

160 *L. M. Monteiro, R. Loebenberg, P. C. Cotrim, E. Kanashiro, M. Rocha, E.I. Ferreira, N. A. Bou-Cracha*

Burpavaquone Loaded NLCs, Nano-Based Drug Delivery System for Leishmaniases Treatment

May 2-3, 2016, Telus Centre, Edmonton, AB; Infectious Diseases: Scientific Responses to Economic Challenges and Opportunities

Ivan C. Morales 1, Nadia Bou-Chacra 1, Raimar Löbenberg

Artemether Nanocrystals: an innovative antimalarial therapy

May 2-3, 2016, Telus Centre, Edmonton, AB; Infectious Diseases: Scientific Responses to Economic Challenges and Opportunities

Katherine C. Melo, Natalia V. Souza, Humberto G. Ferraz, **Nadia Bou-Chacra**, Raimar Löbenberg

Rifampicin nanocrystal: towards improved antituberculosis therapy

May 2-3, 2016, Telus Centre, Edmonton, AB; Infectious Diseases: Scientific Responses to Economic Challenges and Opportunities

Muhammad Sarfraz, Joyce Macwan, May Almukainzi, Michael B Bolger, **Raimar Loebenberg**
The Importance of Lysosomal Trapping for Setting Clinically Relevant Product Specifications for Dextromethorphan Immediate Release Dosage Forms

AAPS Annual Meeting 2015 Orlando

Lis Monteiro, Raimar Loebenberg, Paulo Cotrim, Nikoleta Fotaki, Nadia Bou-Cracha
A Potential Nanotechnology Based Drug Delivery for the Treatment of Leishmaniases

AAPS Annual Meeting 2015 Orlando

155 Katherine Jasmine Melo, Natalia Souza, Humberto Ferraz, Nikoletta Fotaki, Raimar Lobenberg, Nadia Bou-Chacra
Formulation with Povacoat® to Prevent Aggregation of Rifampin Nanocrystal Using High-Pressure Homogenization

AAPS Annual Meeting 2015 Orlando

May Almukainzi, Raniah Gabr, Ghada Abdelhamid, **Raimar Loebenberg**
Mechanistic Understanding of the Effect of Renal Impairment on the Oral Absorption and Elimination of Metformin Using a PBPK Model

AAPS Annual Meeting 2015 Orlando

Jessica Compri, Veni Felli, Humberto Ferraz, Eduardo Barbosa, Felipe Fernandes, Takayuki Takatsuka, Shunji Uramatsu, Raimar Loebenberg, Nadia Bou-Chacra
Orotic Acid Nanocrystals Stabilized with Povacoat®: Toward an Innovative Treatment of Malaria

AAPS Annual Meeting 2015 Orlando

PBPK Modeling of Dextromethorphan and its Application in Developing Drug Delivery Systems

Muhammad Sarfraz, M. Almukainzi**, R. Löbenberg**

CSPS Annual Meeting May 2015 Toronto

Transdermal Delivery of Bone-Targeting Peptide Hormone Conjugates for Treatment of Tibial Bone Stress Fractures Using Liposomal Cream Base

Ali Aghazadeh-Habashi, Yang Yang, Kathy Tang, Raimar Loebenberg, Michael R. Doschak

CSPS Annual Meeting May 2015 Toronto

150 Reduction-Responsive Micelles Self-assembled from Amphiphilic Hyaluronic Tocopheryl Succinate Conjugates for Targeted Delivery of Curcumin in Therapy against Breast Cancer

Yuan Gao, Xiaoyu Wang, Wilson Roa, Shen Gao, **Raimar Löbenberg**

AAPS Annual meeting, San Diego, November 2014

Inhalable nanoparticle enhances TNF-α and potentiates TH-1 type innate immune response in murine alveolar macrophage model against Tuberculosis

Muhammad K Sarfraz, Yuan Gao, and **R. Löbenberg**

AAPS Annual meeting, San Diego, November 2014

Challenges and Opportunities to Use in Vitro Dissolution Behavior to Compare BCS Class I Generics in China

Jieyu Zuo, Yuan Gao, Nadia Bou-Chacra, **Raimar Löbenberg**

AAPS Annual meeting, San Diego, November 2014

Evaluation of the DDSolver Software Applications

Jieyu Zuo, Yuan Gao, Nadia Bou-Chacra, **Raimar Löbenberg**

AAPS Annual meeting, San Diego, November 2014

Development of Rifampin Nanocrystals Using High Energy Milling: Physical Aspects

K. C. Melo, **N. Bou-Chacra**, G. L. Araujo, T. Takatsuka, R. Loebenberg

AAPS Annual meeting, San Diego, November 2014

145 Orotic Acid Nanocrystals: A Promising Candidate for Novel Anti-malarial Chemotherapy

J. Z. Compri, V. A. Felli, S. F. Barbosa, G. L. Araujo, T. Takatsuka, R. Loebenberg, **N. A. Bou-Chacra**

AAPS Annual meeting, San Diego, November 2014

Challenges and opportunities to use biowaivers to compare generics in China

Jieyu Zuo, Yuan Gao, Nadia Bou-Chacra, **Raimar Löbenberg**

CSPS meeting Montreal June 10-14, 2014

Evaluation of the DDSolver software applications

Jieyu Zuo, Yuan Gao, Nadia Bou-Chacra, **Raimar Löbenberg**

CSPS meeting Montreal June 10-14, 2014

Reduction-responsive micelles self-assembled from amphiphilic hyaluronic tocopheryl succinate conjugates for targeted delivery of curcumin in therapy against breast cancer

Yuan Gao, Xiaoyu Wang, Wilson Roa, Shen Gao, **Raimar Löbenberg**

CSPS meeting Montreal June 10-14, 2014

Modeling the absorption of Metformin in patients with post gastric bypass surgery

May Almukainzi,Viera Lukacova, and **Raimar Löbenberg**

CSPS meeting Montreal June 10-14, 2014

140 In Silco modelling (Gastroplus™) to overcome pharmacogenomic variation in humans using different Dextromethophan dosage forms

Muhammad Sarfaz, May Almukainzi,and **Raimar Löbenberg**

CSPS meeting Montreal June 10-14, 2014

Modeling the Absorption of Metformin in Patients Post Gastric Bypass Surgery

Almukainzi, May, **Loebenberg, Raimar**

November 13, 2013 AAPS Annual meeting San Antonio

Comparative Dissolution Studies between Innovator and Selected Immediate Release Oral Dosage Forms containing BCS Class I Drugs, Metronidazole, Zidovudine and Amoxicillin Marketed in South Africa and India

**Kanfer, Isadore**, Nallagundla-Reddy, Hemasundar, Patnala, Srinivas, Loebenberg, Raimar

November 13, 2013 AAPS Annual meeting San Antonio

Investigation of a Nanostructured Polymeric Drug Delivery System containing Hidroxymethynitrofurazone:

Preparation, Physicochemical Characterization and In Vitro Evaluation of Potential Leishmanicidal Activity

Monteiro, Lis, Loebenberg, Raimar, Kanashiro, Edite, Rocha, Mussya, Ferreira, Elizabeth, Cotrim, Paulo, **Bou-Chacra, Nadia**

 November 13, 2013 AAPS Annual meeting San Antonio

Nanoencapsulated and Free Passiflora serratodigitata L. Extracts: an Innovative Strategy for Anti-Ulcer Therapy

Strasser,Marc, Noriega, Peky, Netto, Alberto, Funghi, Nathalia, Lobenberg, Raimar, Bou-Chacra, Nadia, **Bacchi, Elfriede**

November 13, 2013 AAPS Annual meeting San Antonio

135 Development of Furosemide Nanocrystals Using High Energy Milling: Physical-Chemical Aspects

Savio F. Barbosa, Bruna R. D. Barbosa, Takayuki Takatsuka, Guilherme. D. Tavares, Gabriel L. B. Araujo, Hui Wang, Reinhard Vehring, Raimar Löbenberg, **Nádia A. B. Chacra**.

November 13, 2013 AAPS Annual meeting San Antonio

 Cationic nanostructured system: towards an innovative ophthalmic drug delivery Platform

T Nathália B Funghi, Juliana D Conte, Raimar Löbenberg and **Nádia A Bou-Chacra**

November 13, 2013 AAPS Annual meeting San Antonio

Cross-linked hyaluronic acid-lipoic acid micelles for enhanced solubility, stability and targeted delivery of curcumin to breast cancer cells.

Y. Gao, M. Sarfraz, W. Roa, S-D. Clas**, R. Loebenberg**

November 13, 2013 AAPS Annual meeting San Antonio

Rifampicin loaded in hyaluronic acid-tocopherol succinate micelles for targeted delivery to macrophages: intracellular uptake, behavior and cytokines activity.

Y. Gao, M. Sarfraz, W. Roa**, R. Loebenberg**

November 13, 2013 AAPS Annual meeting San Antonio

In Silco modelling (Gastroplus™) to overcome pharmacogenomic variation in humans using different Dextromethophan dosage forms

Muhammad K Sarfraz, M. Almukainzi, and **R. Löbenberg**

CSPS annual meeting June 11-14 2013 Vancouver

130 The behaviour of rifampicin loaded hyaluronic acid α-tocopherol succinate micelles in alveolar macrophages

Yuan Gao, Muhammad Khan Sarfraz, Sophie-Dorothee Clas, Wilson Roa, **Raimar Löbenberg**

CSPS annual meeting June 11-14 2013 Vancouver

Synthesis and in vitro characterization of hyaluronic acid α-tocopherol succinate based self- assembling micelles for targeted delivery of Rifampicin to macrophages

Yuan Gao, Muhammad Khan Sarfraz, Sophie-Dorothee Clas, Wilson Roa, **Raimar Löbenberg**

CSPS annual meeting June 11-14 2013 Vancouver

Cross-lined Hyaloranic acid lipoic Acid micelles for enhanced solubility, stability and targeted delivery of curcumin to breast cancer cells

Yuan Gao, Muhammad Khan Sarfraz, Wilson Roa, **Raimar Löbenberg**

CSPS annual meeting June 11-14 2013 Vancouver

Distribution of effervescent inhalable nanoparticles after pulmonary delivery; in vivo study.

A-H. Kamal , M. Sarfraz, S. Azarmi, W. Roa, W. Finlay**, R. Loebenberg**

AAPS annual conference 2012

Hyaluronic acid–tocopheryl succinate micelles containing rifampicin for active targeting to macrophages.

Y. Gao, M. Sarfraz**,** W. Roa, S-D. Clas**, R. Loebenberg**

AAPS annual conference 2012

125 A new dissolution method to assess the in vitro release of nanoparticles.

Y. Gao, Z. Jieyu, N. Bou-Chacra, T. Andreoli Pinto, S-D. Clas, **R. Loebenberg**

AAPS annual conference 2012

Lipid Nanocarriers containing Nystatin Nanocrystal for the Treat the Oral Mucosa

M Barao, R Loebenberg, **NAB Chara**

AAPS annual conference 2012

Development and method validation to evaluate the entrapment efficiency of polymeric nanoparticles containing a new antileishmanicidal drug: Hydroxymethylnitrofural

LM Montei, R Loebenberg, **NAB Chara**

AAPS annual conference 2012

Furosemide nanocrystals: preparation and physical-chemical characterization for the development of an innovative pulmonary dosage form

S Babosa, R Loebenberg, **NAB Chacra**

AAPS annual conference 2012

Modeling different Dextromethophan dosage forms using Gastro Plus
Muhammad Sarfraz, May Alkmkainzi, M.H.D Kamal Al-Hallak, Raimar Loebenberg

CSPS Toronto 2012

120 Nanoparticles loaded with Rifampicin and Moxifloxacin induced variable levels of Activation in Murine Alveolar Macrophages.
Wenjun Shi, Muhammad Sarfraz, Wilson Roa, **Raimar Loebenberg**

CSPS Toronto 2012

Distribution of effervescent inhalable nanoparticles after pulmonary delivery; in vivo study.
A-H. Kamal , M. Sarfraz, S. Azarmi, W. Roa, W. Finlay, **R. Loebenberg**

CSPS Toronto 2012

Hyaluronic acid–tocopheryl succinate micelles containing rifampicin for active targeting to macrophage
Y. Gao, M. Sarfraz, W. Roa, S-D. Clas, **R. Loebenberg**

CSPS Toronto 2012

A new dissolution method to assess the in vitro release of nanoparticles
Y. Gao, Z. Jieyu, N. Bou-Chacra, T. Andreoli Pinto, S-D. Clas, **R. Loebenberg**

CSPS Toronto 2012

115 Simulations of the in vivo release of meloxicam and ibuprofen in pain

May Almukainzi, Fakhreddin Jamali, Raimar Löbenberg

AAPS Annual Meeting Washington DC, 2011

Nanoparticles Loaded with Rifampicin and Moxifloxacin Induce Variable Levels of Activation in Murine Alveolar Macrophages

Wenjun Shi, Muhammad Sarfraz, Wilson Roa, **Raimar Loebenberg**

AAPS Annual Meeting Washington DC, 2011

MHD Kamal AL-Hallak, Shirzad Azarmi, Finlay. H Warren, Claude Rouleau, Wilson. H Roa, Raimar Löbenberg

The efficacy and body distribution of inhalable nanoparticle after pulmonary delivery

AAPS Annual Meeting Washington DC, 2011

Modeling different dextromethophan dosage forms using GastroPlus

Muhammad Sarfraz, May Alkmkainzi, M.H.D Kamal Al-Hallak, Raimar Loebenberg

AAPS Annual Meeting Washington DC, 2011

Simulations of the in vitro dissolution using DDDplus

May Almukainzi, Arthur Okumu, Hai Wei, Raimar Löbenberg

AAPS Annual Meeting Washington DC, 2011

110 Impact of the Harmonized Specifications on the Performance of the Disintegration Test

May Almukainzi, Mahnor Salehi, Nadia Araci Bou Chacra, Raimar Löbenberg

AAPS New Orleans October, 2010

The Rupture Test as a Performance Test for Soft Shell Capsules

May Almukainzi, Mahnor Salehi, Nadia Araci Bou Chacra , Raimar Löbenberg,

AAPS New Orleans October, 2010

In Vitro Similarity: Towards Global Performance Standards for Generics

R. Löbenberg, N. A. Chacra, E. Stippler, V. P. Shah, R. L. Williams

Distribution of inhalable doxorubicin-loaded nanoparticle after pulmonary delivery

AAPS New Orleans October, 2010

Distribution of inhalable doxorubicin-loaded nanoparticle after pulmonary delivery

MHD Kamal Al-Hallak, Shirzad Azarmi, Warren H. Finlay, Wilson H. Roa and Raimar Löbenberg

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 Inhalable nanoparticles, a non-invasive approach to treat lung cancer

Shirzad Azarmi, Kamal Al-Hallak, Warren H. Finlay, Wilson H. Roa, Raimar Löbenberg

AAPS New Orleans October, 2010

105 Pulmonary Toxicity of Polysorbate-80-coated Inhalable NPs; in vitro and in vivo Evaluation

MHD Kamal Al-Hallak, Shirzad Azarmi, Chris Sun, Patrick Lai, Elamr J Prenner, Wilson H Roa and Raimar Löbenberg

10th Annual Symposium CSPS , June 2010 Vancouver

Isothermal Microcalorimetry as a Quality by Design Tool to Determine Optimal Blending Sequences

MHD Kamal Al-Hallak, Shirzad Azarmi, Zhenghe Xu, Yadollah Maham, Raimar Löbenberg

10th Annual Symposium CSPS , June 2010 Vancouver

Microcalorimetric Method to Assess Macrophage-Nanoparticle Interaction; Phagocytosis

MHD Kamal Al-Hallak, Shirzad Azarmi , M.H.Gilzad Kohan, Anwar Anwar-Mohamed, Wilson H. Roa , Raimar Löbenberg.

10th Annual Symposium CSPS , June 2010 Vancouver

Impact of the Harmonized Specifications on the Performance of the Disintegration Test Introduction

May Almukainzi, Mahnor Salehi, Nadia Araci Bou Chacra, Raimar Löbenberg

10th Annual Symposium CSPS, June 2010 Vancouver

 The Rupture Test as a Performance Test for Soft Shell Capsules

May Almukainzi, Mahnor Salehi, Nadia Araci Bou Chacra, Raimar Löbenberg

10th Annual Symposium CSPS , June 2010 Vancouver

100 In vivo evaluation of inhalable effervescent nanoparticles in the treatment of lung cancer

Wilson Roa, Shirzad Azarmi, Kamal Al-Hallak, Tony Magliocco, Warren Finlay, Raimar Loebenberg

Canadian Cancer Society meeting 2010

Garlic against MRSA- The antibacterial effect of Allicin in different formulations

S. Waldmann, R. Soudy, K.Kaur, M.Keelan, K. Alagiakrishnan, C. Sadowski, R. Loebenberg

Pharmacy Research Day Nov 2009

Nanoparticle - macrophage interactions monitored by isothermal microcalorimetry

MHD Kamal AL-HALLAK, Anwar Anwar-Mohamed, Shirzad Azarmi, Wilson Roa, Raimar Loebenberg

Pharmacy Research Day Nov 2009

In vivo evaluation of inhalable effervescent doxorubicin nanoparticles in lung cancer bearing mice

Shirzad Azarmi , Kamal Al-Hallak , Warren H. Finlay , Wilson H. Roa , Raimar Löbenberg

AAPS Nov 2009 Los Angeles

 Isothermal Microcalorimetry as a Quality by Design Tool to Determine Optimal Blending Sequences

MHD Kamal AL-HALLAK, Shirzad Azarmi, Yadollah Maham, Xu, Zhenghe Xu, Raimar Löbenberg

AAPS Nov 2009 Los Angeles

95 Nanoparticle - macrophage interactions monitored by isothermal microcalorimetry

MHD Kamal AL-HALLAK, Anwar Anwar-Mohamed, Shirzad Azarmi, Wilson Roa, Raimar Loebenberg

AAPS Nov 2009 Los Angeles

Pulmonary toxicity of polysorbate-80 coated inhalable NPs; in vitro and in vivo study

M. Al-Hallak, S. Azarmi, C. Sun, P. Lai, E. J. Prenner, W. H. Roa, R. Loebenberg

AAPS Nov 2009 Los Angeles

Investigation to Support new Disintegration Specifications

Nadia Chacra, Mahnor Salehi, Raimar Löbenberg

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Secondary Toxicity of Nanoparticles Mediated by Macrophages; MHD Kamal Al-Hallak, Shirzad Azarmi, Wilson Roa, Raimar Löbenberg, AAPS Atlanta, 2008

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 Secondary Toxicity of Nanoparticles Mediated by Macrophages; MHD Kamal Al-Hallak, Shirzad Azarmi, Wilson Roa, Raimar Löbenberg, AAPS Atlanta, 2008

90 Impact of Pharmacopeial Harmonization on the Performance of the Disintegration Test, Ninan Donauer, Raimar Loebenberg, AAPS Atlanta, 2008

Inhalable nanoparticles: a new non-invasive approach for the treatment of lung cancer

Shirzad Azarmi, Warren H. Finlay, Wilson Roa, Raimar Löbenberg; International Symposium on Nano Drug Delivery Systems, Toronto, Canada, 2008.

Isothermal Microcalorimetry and Dissolution Testing to Detect Solid State Reactions in Prednisone Tablets

Kamal Al-Hallak, Raimar Löbenberg, CSPS meeting 2008 Banff

Inhalable nanoparticles: a new non-invasive approach for the treatment of lung cancer

Shirzad Azarmi, Warren H. Finlay, Wilson Roa, Raimar Löbenberg; Banff 2008

 Assessing secondary toxicity of nanoparticles mediated by macrophages on non-small

lung cancer cells using a two compartment co-culture system

MHD Kamal Al-Hallak, Shirzad Azarmi, Wilson Roa, RaimarLöbenberg; CSPS meeting 2008 Banff

80 Development of Inhalable Nanoparticles

Raimar Löbenberg, Warren H Finlay, Wilson H Roa, Elmar J Prenner

AAAR Conference Reno, September 2007

Inhalable nanoparticles a new non-invasive treatment against lung cancer

Raimar Löbenberg, Warren H Finlay, Wilson H Roa, Shirzad Azarmi

AAPS 2007

Katja Schmid, Raimar Löbenberg
Disintegration - A Reliable Performance Test For Natural Health Products?
AAPS 2007

Kendra Schröder, Katja Schmid, Raimar Löbenberg
Influence of Bulk and Tapped Density on the Determination of the Thermal Conductivity of Powders and Blends
AAPS 2007

 Effervescent Powders for Pulmonary Nanoparticle Delivery

Raimar Löbenberg, Warren H Finlay, Wilson H Roa, Shirzad Azarmi

CRS meeting June 2007 Long Beach

75 Shirzad Azarmi, Shusheng Tai, W. H. Finlay, Raimar Löbenberg, Wilson. H.Roa

Formulation and in vivo evaluation of effervescent inhalable carrier particles for pulmonary delivery of nanoparticles

CSPS, Montreal, May 2007

Arthur Okumu, Marie DiMaso, Raimar Löbenberg

Evaluation of a Dissolution Test Method to Forecast *In Vivo* Drug Behavior

CSPS, Montreal, May 2007

Azarmi, S., Tai, S. Finlay, W. H., Löbenberg, R. , Roa, W

Acute in vivo toxicity of dry powder inhalation aerosols with active release of nanoparticles via effervescence

ISAM meeting Banff 2007

Katja Schmid, Raimar Löbenberg
Disintegration - A Reliable Performance Test For Natural Health Products?
12th World Congress on Clinical Nutrition, Edmoton, AB, June 2007

 Kendra Schröder, Katja Schmid, Raimar Löbenberg
A New Quality Control Tool for NHPs: Thermal Conductivity of Powders and Blends
12th World Congress on Clinical Nutrition, Edmoton, AB, June 2007

70 A. Elzainy and R Löbenberg

9 Tetrahydrocannobiolic Acid (THC-Acid) release from Various Topical Formulations

AAPS 2006

H Wei, C Dalton, M DiMaso, I Kanfer, R Löbenberg

Comparison of physicochemical data vs. dissolution data to establish in vitro/in vivo correlations

AAPS 2006

L Ely, WH Finlay, WH Roa, R Löbenberg

Effervescent inhalbe particles containing Ciprofloxacin

AAPS 2006

K Schöder and R Löbenberg

Thermal Conductivity of Powders and Blends

AAPS 2006

 F Ghaffari, Z Xu, R Löbenberg

Isothermal microcalorimetry as fast compatibility screening tool for excipients and active ingredients

AAPS 2006

65 Lyle G. Sweeney, Zhaolin L. Wang, Warren H. Finlay, M. Peppler, Hua Chen, Raimar Löbenberg, Wilson Roa

Rapid Spray-Freeze-Drying, High Efficiency Inhalation Delivery for Powders Containing Anti-Cancer Drug-Loaded Nanoparticles

AAAA meeting 2006

Elmar Prenner, Leticia Ely, Shirzad Azarmi, Raimar Löbenberg

Biophysical characterization of nanoparticle based drug delivery systems to artificial lung surfactant monofilms.

Nanotechnology Forum June 2006 Edmonton

Leticia Ely, Raimar Löbenberg, Warren H. Finlay, Wilson H.-Y. Roa

Inhalable nanoparticles with active release mechanism

Nanotechnology Forum June 2006 Edmonton

Shirzad Azarmi, Hua Chen, Wilson Roa, Warren H. Finlay, Raimar Löbenberg

Synthesis of gelatin nanoparticles and cell uptake studies in 143B osteosarcoma cancer cells

Nanotechnology Forum June 2006 Edmonton

 Shirzad Azarmi, Hua Chen, Shusheng Tai, Tianshan Wang, Warren. H. Finlay, Raimar Löbenberg, Wilson. H. Roa

In vitro and in vivo assessment of the anticancer effect of inhalable doxorubicin nanoparticles

Nanotechnology Forum June 2006 Edmonton

60 Leticia Ely, Raimar Löbenberg, Warren H. Finlay Wilson H.-Y. Roa

Ciprofloxacin inhalable particles

CSPS Ottawa May 2006

Hai Wei, Izzy Kanfer, Marie Di Maso, and Raimar Löbenberg

COMPARISON OF PHYSICOCHEMICAL DATA VS DISSOLUTION DATA TO ESTABLISH IN VITRO/IN VIVO CORRELATIONS

CSPS Ottawa May 2006

Leticia Ely, WH Finlay, WH Roa, R Löbenberg

Optimizing inhalable nanoparticles.

AAPS Meeting Nashville 2005

Raimar Löbenberg and Hai Wei

Dynamic Dissolution Testing: Establishment of an IVIVC for Two Glyburide Formulations

CRS meeting Miami 2005

Leticia Ely, WH Finlay, WH Roa, R Löbenberg

Optimizing inhalable nanoparticles.

ICMENS 2005 Banff July 2005

55 Hai Wei, Raimar Löbenberg

Comparison of solubility and dissolution data to establish in vitro in vivo correlations for glyburide

CSPS meeting 2005 Toronto

Leticia Ely*, Raimar Loebenberg*, Warren Finlay, Wilson Roa

Nanoparticles for pulmonary drug delivery

CSPS meeting 2005 Toronto

Sweeney, L. G., Wang, Z. L., Löbenberg, R., Wong, J. P., Finlay, W. H.,  "Liposomal Ciprofloxacin in a Spray-freeze Dried Powder Form", prediction of aerosol deposition in an idealized mouth using large eddy simulation", abstract and poster presentation, International Society for Aerosols in Medicine 15th Biannual Congress, March 14-19, 2005, Perth, Australia

Finlay, W. H., Wang, Z., Ely, L., Löbenberg, R., Roa, W., Sham, J. O.-H., Zhang, Y., "Development of "cluster bombs for nanoparticle lung delivery", abstract and poster, 23rd Annual American Association for Aerosol Research Conference, Oct. 4-8, 2004, Atlanta, Georgia.

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Cell toxicity of biorelevant dissolution media in caco 2 cells. Annual American Pharmaceutical Scientists Meeting, Baltimore USA, November 9-12, 2004.

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Cytotoxicity of doxorubicin-loaded nanoparticles carried by aerosol “cluster bombs” in lung cancer. Annual American Pharmaceutical Scientists Meeting, Baltimore USA, November 9-12, 2004.

Atawit Somsiri, Raimar Löbenberg, Jarupa Viyoch, Tasana Pitaksuteepong and Neti Waranuch

Anti-androgenic effect of topical applied artocarpin on hamster flank glands. Annual American Pharmaceutical Scientists Meeting, Baltimore USA, November 9-12, 2004.

Leticia Ely, Zhaolin Wang, Jeffrey O.-H. Sham, Yu Zhang, Warren H. Finlay, Wilson H.-Y. Roa, Raimar Löbenberg

Nanoparticle Cluster Bombs for Pulmonary Drug Delivery

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Development of “cluster bombs” for nanoparticle lung delivery

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Development of Inhalable Nanoparticles

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Development of Inhalable Nanoparticles

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Jeffrey O.-H. Sham, Yu Zhang, Warren H. Finlay, Wilson H.-Y. Roa, Raimar Löbenberg

Development of Nanoparticle-Cluster-Bombs for Pulmonary Drug Delivery

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Cell Toxicity Studies of Biorelevant Dissolution Medium using Caco-2 Cells

CSPS conference June 2004 Vancouver

Atawit Somsiri, Raimar Löbenberg, Jarupa Viyoch and Tasana Pitaksuteepong, Neti Waranuch

Growth suppression of hamster flank organs by topical application of artocarpin.

CSPS conference June 2004 Vancouver

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Evidence For In Vitro Cellular Uptake Of a Derivatized β-Cyclodextrin Drug Carrier And Its Potential Metabolite

CSPS conference June 2004 Vancouver

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*In vitro* and *in silico* tools to predict the oral performance of Natural Health Products.

NHPD Conference Montréal February 2004

Hai Wei, Hadi Valizadeh, Raimar Löbenberg

Estimation the oral absorption of two brand glibenclamide tablets: development of strong IVIVC using *in vitro* and *in silico* tools AAPS Meeting Salt Lake City 2003

Hadi Valizadeh, Nahid Qarakhani, Parvin Zakeri-Milani, Shirzad Azarmi, Raimar Löbenberg

Physicochemical characterization of Solid dispersions of indomethacin with PEG 6000, Myrj 52, Lactose, Sorbitol, Dextrin and Eudragit® E100

AAPS Meeting Salt Lake City 2003

 R. Löbenberg, L. Ely, and H. Valizadeh

In vitro and in silico methods to evaluate the bioequivalence of ginkgo biloba products

AAPS Meeting Salt Lake City 2003

35 S. Azarmi, F. Ghaffari, H. Valizadeh, and R. Löbenberg

Mechanistic evaluation of the effect of thermal-treatment on the drug release from formulations containing acrylic polymers

AAPS Meeting Salt Lake City 2003

Yuan Huang, Shirzad Azarmi, Raimar Löbenberg

Synthesis and cellular uptake of protein based nanoparticles

AAPS Meeting Salt Lake City 2003

Yuan Huang, Raimar Löbenberg

Developing a nanoparticle based vector for gene delivery

NSERC: Nano Innovation Workshop, University of Alberta, November 2003

Hai Wei, Raimar Löbenberg

Cell toxicity study of biorelevant dissolution media using caco-2 cells

Faculty of Pharmacy, University of Alberta, Research day October 2003

Yuan Huang, Raimar Löbenberg

Developing a nanoparticle based vector for gene delivery

Faculty of Pharmacy, University of Alberta, Research day October 2003

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Predicting the oral absorption of a class II drug, glibenclamide: development of strong in vitro/in vivo correlations using in vitro and in silico tools.

The Association of Faculties of Pharmacy of Canada (AFPC) Conference 2003 Montréal, Québec 2003

Hai Wei, Hadi Valizadeh, Raimar Löbenberg

Estimation of Oral Absorption of Glibenclamide: The use of In vitro and In

silico Tools to Develop Strong In vitro/In vivo Correlations

Canadian Society for Pharmaceutical Sciences 6th Annual Symposium , Montréal, Québec 2003

Yuan Huang, Shirzad Azarmi, Raimar Löbenberg

Developing a nanoparticle-based vector for drug targeting

Canadian Society for Pharmaceutical Sciences 6th Annual Symposium , Montréal, Québec 2003

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Protein based nanoparticles: synthesis and cellular uptake

23rd Annual Conference Canadian Biomaterials Society, Montréal, Québec 2003

H. Valizadeh, R. Löbenberg

Predicting the oral performance of Ginkgo Biloba

AAPS meeting 2002 Toronto

25 H. Valizadeh, J. M. Hilfinger, J.S.Kim, J.Walton,G.L.Amidon, R. Löbenberg

Estimation of oral drug absorption by means of in vitro studies – Simulation of Oral performance of Glyburide using individual pharmacokinetic data

AAPS meeting 2002 Toronto

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Nanoparticles as colloidal gene targeting vectors

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Ramezani, E. Moghimipour, S.A. Sajadi, R. Löbenberg.

Enhanced permeability of animal skin models using total saponins of Acanthophyllum squarrosum. 50th Annual Congress of the Society for Medicinal Plant Research. Barcelona, Spain, Sept. 8-12, 2002.

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A. Takahashi, S. Suzuki, N. Kawasaki, W. Kubo, S. Miyazaki, R. Löbenberg, J. Bachynsky,

D. Attwood

Percutaneous absorption of non-steroidal anti-inflammatory drugs from in situ gelling xyloglucan formulations in rats

CRS meeting Seoul July 2002

20 Hai Wei and Raimar Löbenberg

Dissolution Behavior of a Carbamazepine and a Glibenclamide Formulation in Biorelevant Dissolution Media.

AAPS annual meeting Denver, November 2001

R. Löbenberg

Impact of biorelevant dissolution media for Class I and class II drugs

CAPS meeting Ottawa June 2001

R Löbenberg

Biorelevant Dissolution Media: The Dissolution behavior of Carbamazepine

AAPS annual Meeting 2000

Raimar Löbenberg

Dissolution testing as predictive tool: Predicting oral absorption

Research Day 2000, Faculty of Pharmacy and Pharmaceutical Sciences, Edmonton

Raimar Löbenberg

Bioimaging: Visualizing drug targeting using Nanoparticles

Research Day 2000, Faculty of Pharmacy and Pharmaceutical Sciences, Edmonton

15 A. El-Aneed, Raimar Löbenberg

Advances in Dissolution Testing: The New Physiologically Orientated Media

Research Day 2000, Faculty of Pharmacy and Pharmaceutical Sciences, Edmonton

R Löbenberg, J.S. Kim, J. Crison, G.L. Amidon

Controlled Release of Metoprolol: Influence of Motility and Food

CRS, annual meeting 2000 Paris

R Löbenberg and J Kreuter

Imaging Drug Targeting Using Nanoparticles

CAPS 2000 Vancouver

R Löbenberg and JB Dressman

Predicting Oral Absorption: The Impact of Biorelevant Dissolution Media

CAPS 2000 Vancouver, June 8th 2000

 AE Aneed and R Löbenberg

Biopharmaceutics: The Impact of Biorelevant Dissolution media

Health promotion day University of Alberta, June 10th 2000

10 R Löbenberg, JS Kim, J Crison, and GL. Amidon

Effect of Food on the Pulsatile Delivery of Metoprolol

Pharm Sci AAPS Supplement 1999

R Löbenberg, JS Kim, GL Amidon

Effect of Motility and Food on the Delivery of Metoprolol

DPhG-annual meeting 8th Oct. 1999, Frankfurt, Germany

Archiv der Pharmazie, Vol 3322 (suppl. 2) pp 27

R Löbenberg, DM Oh, S Choe, J Crison, JS Kim, GL Amidon

The Influence of Motility on Drug Absorption Rate from IR and MR Dosage Forms

CRS annual meeting 1999

R Löbenberg, DM Oh, John C, JS Kim, GL Amidon

*In Vitro/In Vivo* Correlation of a To Pulse Dosage Form in Dogs

PharmSci, Vol 1 (1) 491 1998

R Löbenberg, V Shah, and JB Dressman

*In Vitro/In Vivo* Correlation of Two Glibenclamide Formulations

Proceed. 2nd Word Meeting APGI/APV 1998 Paris

5 R Löbenberg, V Shah, J Krämer, JB Dressman

Dissolution Testing as a Prognostic Tool for Oral Drug absorption, Dissolution Behaviour of

Glibenclamide a Case II Compound

Pharm. Res. 1997 Vol 14 (11) 523

R Löbenberg, J Maas and J Kreuter

Macrophage Targeting of 14C-AZT Bound to Nanoparticles Visualized by Radioluminography

Society for Whole Body Autoradiography 21-23. 7.1997 Ann Arbor, MI, USA

R Löbenberg, J Maas and J Kreuter

AZT Bound to Nanoparticles Visualized by Radioluminography in Rats

Proceed. Inter. Symp. Control. Rel. Bioact. Mater. 23 (1996)

R Löbenberg, E Rodgers, A Li wan Po and J Kreuter

Influence of Nanoparticles on the Body Bistribution of AZT

Proceed. Inter. Symp. Control. Rel. Bioact. Mater. 22 (1995)

1 R Löbenberg, L Araujo and J Kreuter

Influence of Nanoparticles on the Body Distribution of AZT

Proceed. 1st Word Meeting APGI/APV, Budapest (1995)

### Other Publications

Guidance Document: Biopharmaceutics Classification System Based Biowaiver

Health Canada, May 30th 2014

Draft Guidance Document: Biopharmaceutics Classification System Based Biowaiver

Health Canada, August 21, 2012, File number: 12-113709-926

Comment: I organized the workshop in 2011 which was used to develop the guidance document and consulted Health Canada on the development and content of the guidance, the guidance is based on my research over the past 15 years.

Pharmaceutical Science Group

Quarterly News Letter Sep 2011

What do we have to consider about In vitro / In vivo correlations for solid oral dosage forms

Interview Toronto Sun: “Generic drugs” 2012

Scientific opinion to the request of Alberta Health Services to evaluate PLO gel based prescriptions

PharmaQbD interview

Viewing Dissolution Testing Through a QbD Lens

Link: <http://www.pharmaqbd.com/node/344>

SciTopic

Dissolution Testing and Quality by Design (QbD)

<http://www.scitopics.com/Dissolution_Testing_and_Quality_by_Design_QbD.html>

Comments to the Alberta College of Pharmacists: Professional Standards

Comments to the Alberta College of Pharmacists: Beyond Use Dates for Compounding Practice

Comments to Alberta Blue Cross on the equivalence of semisolid formulations.

Comments on the proposed regulations for Natural Health Products

Canada Gazette Part I, December 22, 2001) to the

Natural Health Products Directorate posted January 3, 2002.

Comments on the proposed regulations for Natural Health Products

Proposed Standards of Evidence March 2002

# Symposia, Workshops and CE Events

Canadian Society for Pharmaceutical Sciences, Workshop: Bioequivalence and Biowaivers for

Immediate and Modified Release Dosage Forms

November 19th 2015, Ottawa

Canadian Society for Pharmaceutical Sciences, Annual meeting

May 2015, Toronto

Subsequent Entry Biologics (SEBs) in Canada: Current State of the Science

December 10th 2014 Ottawa

CSPS Workshop: "Managing Quality in the Product Lifecycle: Pre-and Post-approval Changes”

March 2014 – Toronto

Sindusfarma Workshop

Practical Aspects of QbD Implementation in the Pharmaceutical Industry

March 24-25th 2014 Sao Paulo, Brazil

AAPS Outreach Workshop

March 7-8th 2013 Argentina member of the organizing committee

Statistical Methods in Quality by Design

Workshop USP Sao Paulo, Brazil member of the organizing committee

March 5th 2013

Quality By Design

CSPS Workshop

June 2012 Toronto (chair of the organizing committee)

The new Canadian BCS workshop

June 2012 Toronto (co-chair of the organizing committee)

Biopharmaceutics Classification System

CSPS and Health Canada Workshop

June 2011 Ottawa (member of the organizing committee)

Graduate Course: Introduction to nanotechnology-base drug delivery systems and drug targeting

(Co-moderator and presenter)

USP April 2011 Sao Paulo

The BCS and Dissolution testing

USP / SINDUSFARMA Brazil workshop (member of the organizing committee

April 2011 Sao Paulo

The BCS and Quality by Design

USP / SINDUSFARMA Brazil workshop

April 2011 Sao Paulo (member of the organizing committee)

Performance Standards for Essential Drugs

Co-organizer, Moderator and Presenter

AAPS Meeting New Orleans 2010

Alcohol Dose Dumping

Co-organizer; Round Table

AAPS Meeting, 2009 Los Angeles

Current performance testing for pharmaceuticals and TCM dosage forms

Hands on workshop (co-organizer and presenter)

Shanghai University for Traditional Chinese Medicine October 2008

12th World Congress of Clinical Nutrition

Co-Chair of the organizing committee for Natural Health Products

Edmonton 2007

First Summer School in Nanotechnology

NIPER, India (presenter and evaluator)

May 2007

AAPS Steering Committee for In Vitro Release and Dissolution

Co-moderator for Phase II IVIVC and Dissolution Development

Durham, NC April 2007

Dissolution testing in pharmaceutical and nutraceutical industry

CSPS Workshop organizer

June 2005 Toronto

ICMENS special session: Pharmaceutical NanoEngineering Conference

W. H. Finlay and R Löbenberg (co organizer)

International Conference on MEMS, NANO and Smart Systems (ICMENS) July 2005 Banff

ICMENS special session: Medical and Pharmaceutical NanoEngineering Conference 2004

R Löbenberg, W. H. Finlay and W. Roa (organizers)

Banff 2004

Co organizer of the Canada-Japan Nanopharmaeutical Symposium both are part of the:

International Conference on MEMS, NANO and Smart Systems (ICMENS)

Banff August 2004

Open House October 2003

2 hours sterile compounding techniques lecture

3 hours sterile compounding techniques lab exercises

Open house October 2002 Faculty of Pharmacy University of Alberta

2 hour seminar on contemporary compounding practice

3 hour lab exercises on modern compounding techniques.

Organizer of the symposium:

Nutraceuticals: the importance of herbal medicine.

December 14th 2001, Faculty of Pharmacy, University of Alberta.

Open house October 2001 Faculty of Pharmacy University of Alberta

2 hours seminar and plenary discussion on modern compounding practices

# Presentations

### Invited Presentations

123 The dosage form – GI interface: Mechanistic Key for Bioavailability and Interchangeability,

 World federation of TCM,

 China August 2017

122 Biowiavers a Global overview

 PQRI – FDA conference

 Rocklville March 2017

121 Scientific and regulatory issues for Traditional Medicines

 World Congress of Clinical Nutrition

 Plenary talk, Bangkok, Thailand, December 2016

120 Quality by Design for the Pharmaceutcal Industry - From the Biopharmaceutcs Drug

Classificatons System to Physiological Based Pharmacokinetc Models

Gilead, Edmonton Alberta October 2016

119 Biowaivers – A global overview

 Jiangxi University of TCM

Nanchang China, September 28th 2016

118 Biowaivers – A Global overview

Guangxi University of Chinese Medicine

 Guangxi China Sep 27 2016

117 Scientific and regulatory Issues with Traditional Medicines

 World Federation of TCM, annual conference

 Guilin China September 26

116 Inhalable Nanoparticles – the impact of the route of administration

 College of Pharmacy

The University of Michigan, Ann Arbor, Aug 26th

115 How to answer reviewer’s comments

 December 3rd

University of Sao Paulo

114 Biowaivers, A Global overview

CPS Workshop

Nov 2015, Ottawa

113 IVIVC in a QbD environment

Eatern Analytical Symposium

Sumerset NJ Nov 2015

112 Clinical relevant product specifications

BMS – scientific seminar

New Brunswick NJ

November 2015

111 Computer Simulations in Pharmaceutical Research and Development: an Industrial Perspective

18th Pharmaceutical Congress of São Paulo

 October 11th 2015 Sao Paulo

110 *The Next Generation of the Modern and Innovative Drug Development: The Use of Pharmaceutical Software*

18th Pharmaceutical Congress of São Paulo

 October 11th 2015 Sao Paulo

109 Dissolution Testing in Quality Control in Nanostructured System Development

 18th Pharmaceutical Congress of São Paulo

 October 11th 2015

108 Pulmonary Delivery systems applied to TB drugs

 Simpósio "Nanotecnologia Aplicada a Fármacos para Doenças Negligenciadas"

Oct 8th Sao Paulo

107 How to Establish Therapeutic Equivalence in vitro?

 Federal University of Ceará, Brazil

 June 24th 2015

106 How to Develop Clinically Relevant Dissolution Methods

 CSPS Annual meeting May 2015

105 The BCS and Biowaivers

 Pharmaceutical Science Group

 May 12th 2015 Toronto

104 In vitro / in vivo Correlations in a QbD environment

LabCQ - Laboratório de Controle de Qualidade de Fármacos e Medicamentos

Departamento de Medicamentos - Universidade Federal do Rio de Janeiro

April 2015

103 Performance Testing of Conventional and Novel Dosage Forms

 Workshop for Nonelected Diseases

USP December 2nd 2014, Sao Paulo, Brazil

102 Research Methodologies 2 – Think outside the box

Hunan University of Traditional Chinese Medicine

November 13th, Changsha, China

101 Research Methodologies 1 – How to prepare research publication?

Hunan University of Traditional Chinese Medicine

November 12th, Changsha, China

100 Inhalable Nanoparticles a None-Invasive Route of Administration to Treat Lung Cancer

 World Federation of TCM, annual meeting

 November, 7th Guangzhou, China

99 Performance Testing of Conventional and Novel Dosage Forms

 Research Week

University Sao Paulo, October 22nd 2014, Sao Paulo, Brazil

98 Bioavailability Profile as Predicted by Simulation and Modeling Approaches

Bioequivalence summit

September 15-16th 2014 Boston

97 Pharmacopeial Performance testing

In vivo Predictive Dissoltuion Conference

The University of Michigan, Ann Abor

August 2014

96 QbD in an ICH environment

Sindusfarma, Workshop Sao Paulo, Brazil

March 24-25, 2014

95 Establishing IVIVC in a QbD environment

Sindusfarma, Workshop Sao Paulo, Brazil

March 24-25, 2014

94 DDSolver, introduction into the software application in drug development

Sindusfarma, Workshop Sao Paulo, Brazil

March 24-25, 2014

93 Inhalable Nanoparticles

 Alberta Nanotechnology Symposium

Feb 7th 2014, Edmonton

92 Inhalable Nanoparticles

 PHARMA TRANSPIRE 2014 International conference on Advances in Biopolymer Drug Delivery Systems

Jan 31st 2014, Kurnool-518218 A.P, India

91 Predicting Food-Effects using Dissolution Testing

 AAPS / CSPS Outreach Workshop

 December 2/3 201 Grahams Town South Africa 3

90 Inhalable Nanoparticles: Does the route of Administration matter?

 Central South Hunan University

 31 October, Changsha, China 2013

89 Inhalable Nanoparticles to treat Lung cancer

 Hunan University of TCM

 October 28, Changsha, China 2013

88 What should the Pharmaceutical Scientist know about USP Performance testing?

 World Federation of TCM, annual meeting

 October 26th, Chengdu, China 2013

87 Inhalable Nanoparticles: Does the route of administration matter?

 Beijing University of Chemical Technology

 October 24 2013

86 Bioavailability Profile as Predicted by Simulation and Modeling Approaches

ACCP annual meeting

Bethesda, MD

September 2013

85 Recent Advances in Therapy of Lung Diseases using Nanoparticles

Raimar Löbenberg

International Society for Aerosol Medicine, Nanotoxicology work shop

Chapel Hill, NC, April 6, 2013

84 Bioequivalence in the Americas using the WHO guidelines; an overview.

Raimar Löbenberg

AAPS Workshop, La Plata, Argentina, March 7-8 2013

83 Computer simulations to predict oral drug performance to establish IVIVC

Raimar Löbenberg

AAPS Workshop, La Plata, Argentina, March 7-8 2013

82 USP Performance testing for Natural Health Products

AFDP Functional Ingredients Workshop –

Edmonton, Alberta, February 22, 2013

81 Integrative Approach to Pharmaceuticals and Natural Medicines

Global Heath community lecture series on TCM

February 13th 2013 Roots on White

80 Celebrate Chinese New Year “Scientific Methods to understand TCM”

Scott Library University of Alberta February 11th 2013

79 Inhalable Nanoparticles

Raimar Loebenberg

Ajou Unversity, Korea, Nov 2012

78 The Use of Biowaivers: an overview of generic drugs in the Americas

 Raimar Loebenberg

 Korean Society of Pharmaceutical Sciences and Technology, Nov 2012

77 Performance testing of Traditional Medicines

Raimar Loebenberg

Hunan University of Traditional Chinese Medicine

76 Scientific methods to modernize TCM

Raimar Loebenberg

World Federation of TCM, Nov 2012, Nanchang, China

75 USP Performance testing for Dietary Supplements

Raimar Loebenberg

AAPS annual meeting Chicago, Oct 2012

74 The BCS an Introduction

Raimar Loebenberg

 USP Conference, Sao Paulo, August Brazil 2012

73 BCS and Permeability

Raimar Loebenberg

 USP Conference, Buenos Ares, August Argentina 2012

72 BCS and Solubility

Raimar Loebenberg

 USP Conference, Buenos Ares, August Argentina 2012

71 The BCS an Introduction

Raimar Loebenberg

 USP Conference, Buenos Ares, August Argentina 2012

70 Pulmonary Toxicity of Ploysorbate-80 Coated Inhalable Nanoparticles: In Vitro and In Vivo Study

Raimar Loebenberg, Elmar Prenner

CSC annual meeting Calgary May 2012

69 The Role of Biowaivers in Drug Development

Raimar Loebenberg

CSPS Workshop June 2012 Toronto

68 Bioavailability Profile as Predicted by Simulation Approaches

Raimar Loebenberg

CSPS Workshop June 2012 Toronto

67 Principles of the Biopharmaceutical Drug Classification System in Quality by Design
Raimar Loebenberg

CSPS Workshop June 2012 Toronto

66 Dissolution testing for bio-prediction, waivers of BA/BE and special applications
Speaker : Dr. Raimar Löbenberg,

Grahams Town South Africa 2011

65 Development of in vitro performance testing methods for herbal drugs and nutritional supplements
Dr. Raimar Löbenberg,

Grahams Town South Africa 2011

64 Theory of  Dissolution Testing with regard to the Bio-performance of Drugs
Dr. Raimar Löbenberg,

Grahams Town South Africa 2011

63 Inhalable Nanoparticles

Student’s Union University of Alberta

November 2011

62 The BCS and Biowaivers an Overview

 CSPS/Health Canada workshop

June 2011 Ottawa

61 The Value of Dissolution Testing

Pharmaceutical Science Group annual meeting 2011

May 2011 Toronto

60 Inhalable Effervescent Nanoparticles a new Dosage Form

Introduction to nanotechnology-base drug delivery systems and drug targeting

USP May 2011 Sao Paulo

59 The Biopharmaceutical Drug Classification System and Quality by Design

USP / SINDUSFARMA Brazil workshop

April 2011 Sao Paulo

58 Dissolution testing an industrial perspective

USP / SINDUSFARMA Brazil workshop

April 2011 Sao Paulo

57 In vitro / In Vivo Correlations: Current Knowledge

USP / SINDUSFARMA Brazil workshop

April 2011 Sao Paulo

56 The BCS and Biowaivers

USP / SINDUSFARMA Brazil workshop

April 2011 Sao Paulo

55 Biowaivers

CSPS Webinar

March 2011

54 The Value of Dissolution Testing

Symposium: Performance Standards for Essential Drugs

AAPS Meeting 2010 New Orleans

53 Dissolution Testing and Isothermal Microcalorimetry in QbD

Fudan University

October 2010 Shanghai

52 Applying the Biopharmaceutics Drug Classification System to
Traditional Medicines

Specialty Committee for Pharmaceutical Quality of Traditional Chinese Medicines

WFCMS, Suzhou, China, October 2010

51 New non-invasive treatment options of lung cancer

Luye Pharmaceuticals

Yantai, China, October 2010

50 Performance standards for Generics

Luye Pharmaceuticals

Yantai, China, October 2010

49 Scientific and regulatory aspects of nano-medicines

10th Annual Symposium, CSPS

Vancouver 2010

48 Inhalable nanoparticles to treat lung cancer

8th International Conference and Workshop on Biological Barriers - in vitro Tools, Nanotoxicology, and Nanomedicine Saarbrucken, Germany, March 2010

47 In Vitro Similarity as Surrogate for Therapeutic Equivalence
An investigation on the South American Markets
AAPS Outreach Workshop Grahamstown, South Africa Dec 2009

46 Alcohol Dose Dumping

Symposium

AAPS Meeting Los Angeles 2009

45 Importance of Dissolution testing for Herbal Formulations

Symposium

AAPS Meeting Los Angeles 2009

44 Quality By Design and Traditional Medicines

Shanghai University of Traditional Chinese Medicine

October 2009

43 Inhalable Nanoparticles

Yabao Pharmaceuticals, Xian China

Oct 2009

42 Modern Biopharmaceutics

Yabao Pharmaceuticals, Xian China

Oct 2009

41 Dissolution Testing and Microcalorimetry in Quality by Design

International Conference of the Korean Pharmaceutical Society.

Seoul Oct 2009

40 Nano-Sized Drug Delivery Systems

SINDUSFARMA Brazil (Brazilian Pharmaceutical Association)

Sao Paulo, Brazil, July 2009

39 In vitro and in vivo testing of inhalable nanoparticles

SINDUSFARMA Brazil (Brazilian Pharmaceutical Association)

Sao Paulo, Brazil, July 2009

38 Dynamic dissolution testing

SOTAX user meeting

June 2009 Horsham, PA

37 In vitro/in vivo Correlations for TCM

Shanghai University for Traditional Chinese Medicine

Shanghai, China, October 2008

36 Applying the BCS to Traditional Medicines

World Foundation for Traditional Chinese Medicine

Shanghai, China 2008

35 Dynamic Dissolution Testing

AAPS Short course

Atlanta, November 2008

34 Developing IVIVC using Dynamic Dissolution and Computer Simulations with Gastro Plus™

SAPS/FDA Dissolution workshop

Arlington, April 2008

33 The Biopharmaceutics Drug Classification System and Quality by Design

Raimar Löbenberg, CSPS meeting,

Banff, 2008

32 Nanotechnology Approaches in Drug Delivery

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

Merck Frosst Research Day November 2007

31 The Value of Dissolution Testing in Pharmaceutical Development

Raimar Löbenberg

Merck Frosst November 2007

30 Regulatory Aspects of Herbal Medicines in Europe and North America

Raimar Löbenberg

World Federation for TCM, Second annual Meeting, Nanjing China, October 2007

29 Challenges for Chinese Manufacturers on the North America Market

Raimar Löbenberg

Hunan Greenland Plant Resource Development Co Ltd

Changsha, China, October 2007

28 Development of Inhalable Nanoparticles

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

AAAR Conference, Reno NV September 2007

27 Nanoparticles in Pulmonary Drug Delivery

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

CIMA Labs, Minneapolis, MN, September 2007

26 Inhalable Nanoparticles as drug delivery system

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

Merck Frosst, (Webinar) August 2007

25 In vitro/in vivo correlations based on the Biopharmaceutics Drug Classification System

Raimar Löbenberg

Vertex Inc. (Webinar), August, 2007

24 In vitro / In vivo Correlations

Raimar Löbenberg

CRS Conference June 2007

Long Beach, CA

23 Nanotechnology Approaches in Drug Delivery

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

First Summer School, NIPER, India, May 2007

22 Nanotechnology Approaches in Drug Delivery

Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

Annual conference of the Korean Society of Pharmaceutical Sciences and Technology

November 30th 2006 Korea

21 Inhalable Nanoparticles – What do we need to know?

Raimar Löbenberg

Chosun University Korea, November 28th 2006

20 The Biopharmaceutics Drug Classification System: How can it be used to establish in vitro in vivo correlations?
Raimar Löbenberg, Chosun University Korea, November 28th 2006

19 Canada’s *Natural Health Products Regulations*

Raimar Löbenberg

USP Annual Scientific Meeting, September 2006, Denver, CO

18 Scientific Approaches for the Quality Control of Dietary Supplements

Raimar Löbenberg

USP Annual Scientific Meeting, September 2006, Denver, CO

17 Nanoparticles as Drug Delivery Platform

Raimar Löbenberg

Shanghai Institute for Pharmaceutical Technology, 2006

16 Modern Standardization Methods for Traditional Medicines

Raimar Löbenberg

Shanghai Institute for Pharmaceutical Technology, 2006

15 Modern Standardization Methods for Traditional Medicines

Raimar Löbenberg

World Federation of Traditional Medicines: Founding Conference for The Specialty Committee of Traditional Chinese Medicine on Pharmaceutical Products of Traditional Chinese Herbal Drugs

Nanjing, China August 27th 20006

14 Computer Aided Formulation Design What is available and what has to be developed

Raimar Löbenberg

May 25th Merck Frosst Kirkland, QC, 2006

13 Effusivity and isothermal microcalorimetry in product development

Raimar Löbenberg

Patheon Inc. Mississauga Seminar series February 21st 2006

12 Nanoparticles as Drug Delivery Platform

Raimar Löbenberg

Patheon Inc. Mississauga, Seminar series February 21st 2006

11 Dissolution Testing and Computer simulations to Predict Oral Absorption

Raimar Löbenberg

Patheon Inc. Mississauga Seminar series February 21st 2006

10 Inhalable Nanoparticles as drug delivery platform

Raimar Löbenberg

Department of Biochemistry, University of Calgary, July 2005

9 The Biopharmaceutics Drug Classification System applied to Natural Health Products

Raimar Löbenberg

CSPS Workshop on Dissolution technologies, June 2005

8 Formulation development and performance tests for Natural Heath Products, what can we learn form the pharmaceutical industry?

Raimar Löbenberg

NHP Conference, February 2005 Vancouver

7 Medical Marijuana Formulations and the FDA Drug Approval Process

Raimar Löbenberg

Cannasat Inc, Toronto December 2004

6 Assessing Bioequivalence using the BCS

Raimar Löbenberg

Global IQ, Edmonton December 2004

5 Modern Pharmaceutics: *Drug delivery strategies in vitro models and formulation aspects*

Raimar Löbenberg

Atachem Pharma, November 2004

4 Modern Biopharmaceutics: *In vitro* and *in silico* tools to establish *in vitro/in vivo* correlations

Raimar Löbenberg

Merck Frosst Canada April 2004

3 Smart Materials: Applications of Nanotechnology in Drug Delivery and Drug Targeting

Raimar Löbenberg

MEMS, NANO and Smart Systems (ICMENS 2003) in July 2003 in Banff

2 Biopharmaceutical Classification of Herbal Extracts

Raimar Löbenberg

University of Florida, Department of Pharmaceutical Sciences,August 2002

1 Biopharmaceutics Drug Classification System –Model for Nutraceuticals?

Raimar Löbenberg

Symposium: Nutraceuticals: the importance of herbal medicine.

December 14th 2001, Faculty of Pharmacy, University of Alberta.

### Oral Presentations

Inhalable Nanopaticles the roule of macrophages

USP Faculty of Chemistry

Oct 2017

The dosage form – GI interface: Mechanistic Key for Bioavailability and Interchangeability

UAlberta, April 2017

Pharmacy in the 21st Century

Jiangxi University of TCM

Nanchang China Sep 28th 2016

How to write a scientific publication?

University of Sao Paulo

August 2nd 2016

Inhalable Nanoparticles

University of Sao Paulo

August 3rd 2016

How to answer Reviewer’s Questions

University of Sao Paulo

December 2nd 2015

How to write a Scientific Paper

University of Sao Paulo

June 19th 2015

Pharmacy in the 21st Century

Hunan University of Traditional Chinese Medicine

November 11th Changsha, China

Modernizing Traditional Chinese Medicine

Northern Alberta Health Libraries Association

May 2nd 2014, Northern Alberta Library Association

25 Why Research?

Undergraduate Research Initiative, University of Alberta

Jan 2014

Johannes Kraemer and Raimar Löbenberg

Interchangeability of Multisource Products - How to use In vitro - Methodology

AAPS Workshop, La Plata, Argentina, March 7-8 2013

Raimar Löbenberg

Nanotechnology in drug delivery
Canadian University Woman Association

April 2012

Raimar Löbenberg

Nano-sized drug delivery systems
CCI-Research Group Seminar December 2009

Raimar Löbenberg

The Future of Biowaivers
Faculty Seminar May 2009

20 Raimar Löbenberg, Wilson H Roa, Warren H Finlay and Elmar J Prenner

Blowing-up Lung Cancer

Nano-Alberta meeting November 2008

R. Löbenberg

Issues with the Quality of Dietary Supplements

CARE Network June 20th 2006 University of Alberta

Raimar Löbenberg

Nanoparticles as Drug Delivery Platform

NINT, US Army workshop, March 2006

R. Löbenberg

The Biopharmaceutical Drug Classification System:
Evaluation of the Pharmaceutical Quality of Natural Health Products

Faculty seminar Oct. 2003 University of Alberta

R. Löbenberg

Faculty seminar: Teaching Pharmaceutics

Faculty seminar Apr. 2002 University of Alberta

15 R. Löbenberg, J.S. Kim, J. Crison, G.L. Amidon

Controlled Release of Metoprolol: Influence of Motility and Food

CRS, annual meeting 2000 Paris

Gastrointestinal Drug Absorption

9 September 1999

University of Alberta, Edmonton Canada

*In vitro* and *in vivo* testing of class I and II drugs

17 May 1999 University of Kiel, Germany

*In vitro*/*in vivo* correlations of class I and II drugs

6 May 1999 St. Johns University, NY

Drug delivery and drug targeting

20 April 1999, College of Pharmacy, University of Utah

10 Colloidal drug carriers

6 March 1999, Health Science Center, Kuwait University

Oral drug absorption

5 October 1998, Midwestern University, Chicago IL

Set-up and conditions for permeability and motility studies

14 June 1998 ULAM, The University of Michigan, MI

Nanoparticles as carriers for AZT

5 June 1998 Rutgers University, NJ

Visualizing of AZT-nanoparticles using radioluminography

Makrotage 23.4.1997, Leica Instruments, Bensheim

5 Macrophage targeting of AZT using nanoparticles in vivo

4th meeting of the Frankfurt AIDS Research Association 20.11.1996

Colloidal drug carriers

Open house October 2003 Faculty of Pharmacy University of Alberta

5 hour sterile working exercises with technique validation

Open house October 2002 Faculty of Pharmacy University of Alberta

3 hour hands on laboratory exercise on contemporary compounding of different dosage forms

Autoradiography and Radioluminography

2nd Meeting of the CRS/Local Chapter Germany 25 April 1997, Frankfurt

1 ZL Work Shop on Dissolution testing

1997 Bad Soden a. T.

# Funding

### Contracts and other support

**R Löbenberg**

Analytical development for Medical Marijuana

258,000, 2017, Alberta Biophtonics

**R Löbenberg**

Clinical Trial material packaging

28,000, 2015

**R Löbenberg**

Placebo tablet production

5,000, 2015

**R Löbenberg**

Clinical Trial material packaging

$8,220 2012-2014

**R Löbenberg**

Development of IGY materials

$15,000, 2013/14

**R Löbenberg**

Development of an assay for aUY11

$17,000, 2013

**R Löbenberg**

SmileSonica - Oral Ultrasound Gel

$10,000, 2012-13 (Centre contact)

**R Löbenberg**

Sinoveda Prototype development – Red Rice Yeast

$78,000, 2012-13 (Centre contact)

**R Löbenberg**

Sinoveda Prototype development – Redclover

$50,000, 2012-13 (Centre contact)

**R Löbenberg**

Sinoveda Clinical Trial material development – Efectical

$48,000, 2011-13 (Centre contact)

**R Löbenberg**

Sinoveda Prototype development – Solid Oral dosage form for Efectical

$18,900, 2011 (Centre contact)

**R Löbenberg**

United States Pharmacopeia

Development and testing of a Reference Standard tablet for the Performance Verification Test

$13,000, 2010-11 (Centre contact)

**R Löbenberg**

Azithromycin – Development of Clinical Trial Material

$12,000 2010 (Centre contact)

**Vohar S**

Rhodiola Rosea Clinical trial

$35,000 CFI salary support towards DDIC personell

**R Löbenberg**

Afexa Life sciences

Development of a fast disintegrating tablet

$30,000 ((Centre contact)

**R Löbenberg**

Prototype Clinical Trial materials

Blizmi Inc

$2,250 Year 2008

**R Löbenberg**

Zanagen Inc

Development of a Topical Cream

$78,000 Year: 2008-9

**R Löbenberg**

Alberta Agriculture Department

Development of a QA system

$8,000 Year 2008

**R Löbenberg**

Extraction of Rhodiola

Blizmi Inc

$2,500 Year 2008

**R Löbenberg**

Tablet formulation

Sinoveda Inc

$2,000 Year: 2008

**R Löbenberg**

12 World Congress of Clinical Nutrition

Edmonton, June 2007

University Conference Fund

$3,000

**R Löbenberg**

12 World Congress of Clinical Nutrition

Edmonton, June 2007

AHFMR

$2,500

**Löbenberg R**

Testing of semisolid formulations

Cannasat Therapeutics, 2007

$85,000

**Löbenberg R**

Extraction and formulation of medical marijuana

Cannasat Therapeutics, 2006

$30,000

**Löbenberg R**

ICMENS Medical and Pharmaceutical Nanoengineering Symposium

Alberta Heritage Foundation, 2005

$2,000

**Löbenberg R**

Extraction and formulation of medical marijuana

Cannasat Therapeutics, 2005

$85,000

**Löbenberg R**

ICMENS Medical and Pharmaceutical Nanoengineering Symposium

Alberta Heritage Foundation, 2004

$2,000

**Finlay WH**, Löbenberg R, Roa WH, Lange C

ICMENS Medical and Pharmaceutical Nanoengineering Symposium

University of Alberta, 2004

$3,000

**Löbenberg R**
Establishment of in vitro/in vivo correlation using INTELIPHARM software

Intellipharm in kind software contribution 2001

Commercial value about $1,600

**Löbenberg R**

Nutraceuticals: the importance of herbal medicine

Alberta Heritage Foundation 2001

Conference fund $2,000

**Löbenberg R**

Nutraceuticals: the importance of herbal medicine

University of Alberta 2001

Conference fund $1,500

**Löbenberg R**

Establishment of in vitro in vivo correlations using biorelevant dissolution methods and

Computer simulations.

In kind contribution software license for GastroPlus and ADME-predictor; SimulationsPlus 2000-2011

Commercial value about $100,000 per year

### Grants

Pending:

CIHR Canada Israel

Stick it to Cancer-Novel Multi-Functional Magnetic-Nanoparticles for the Diagnosis and Treatment of Colon Cancer using Magnetic Imaging and Fields

$669.598

Awarded:

Targeting lung-derived proteins as a therapeutic strategy against breast cancer metastasis

$877,282.00 USD, US Army; Breast Cancer Breakthrough

Alison Allen (PI); 30% UofA; Jan 2018- Dec 2020

Predictive Performance testing –
how can in silico models assist in defining critical product attributes?

Abbvie industry grant 80,000 USD/yr for two years. (PI)

Radiation sensitive nanoparticles for breast cancer therapy

Canadian\ Breast Cancer Foundation 2014

$367,530 (PI Roa)

NSERC&Merck Forsst Canada

**R Löbenberg,** Collaborative Grant: In vitro Methods to Optimize Drug-loaded Nanoparticles

$135,040 (Current) 2009- 2012

Canadian Association of Radiation Oncology (co-applicant)

Pharmacokinetic-based Evaluation of Nanoparticle Radiosensitizer

**Wilson Roa**, Raimar Loebenberg, Dr. Eric Bedard Dr. John Amanie Dr. Don Robinson

$25,537 July 1st 2010 June 30th 2011

NSERC&Merck Forsst Canada

**R Löbenberg**, Collaborative Grant: Optimizing Inhalable Nanoparticles

$135,040 Year: 2008 (due to reorganization of Merck the grant had to be resubmitted with a different topic)

**Suresh M**, Sunwoo H, Thomson A, Lutz S, Löbenberg R (Co-applicant)

Oral Passive Antibody Therapy for the Amelioration of Celiac Disease

Alberta Agriculture and Food

$835,544 ($1,449,460 including in kind contributions) Year 2007-2010

**R Löbenberg**, W H Roa, W H Finlay

Inhalable Nanoparticles: A new non-invasive way to treat lung cancer

Alberta Cancer Board, 2006-2009

$290,000

Integration of Dissolution and Permeability Technology into a Computer Aided Test Regime to Predict Oral Absorption”

**Löbenberg R** NSERC collaborative grants/ Merck Frosst, 2005

$65,740

**Löbenberg R**

Dissolution testing to predict oral absorption

Merck Frosst 2003

$12,000

**Finlay W**, Löbenberg R, Roa W (Co-Applicant)

Aerosol Nanoparticle Carriers in Lung Cancer Therapeutics

NSERC Strategic Grant 2003-2006

$409,000

**Löbenberg R**, Somsiri A

Development of a delivery system for Artocarpin

Royal Thai Government 2003

$31,000

**Abrams D,** Löbenberg R and McQuarrie S (Co-applicant)

Synthesis and in vitro evaluation of 99mTc and 18F radiolabelled nanoparticles for sentinel node

scintigraphy

Project grant CSNM/NYCOMED AMERSHAM RADIANT PROGRAM 2002

$3,000

**Löbenberg R**

Predicting oral absorption

American Association of Colleges of Pharmacy

New Investigator award 2001-2002

$15,000 ($10,000 USD)

**Löbenberg R**

Transdermal drug delivery: Utilization of thermo sensitive gels

Taiho Foundation 2001

$25,000

**Löbenberg R**

Startup Fund

University of Alberta 2000-2004

$50,000

# Research trainees

### Visiting Professor

**Prof. Lihua Chen, PhD**

Herbal extraction methods

**Prof. Hadi Valizadeh 3 months**

Peptide transporter interactions

**Prof. Parvin Zakeri 3 months**

 Peptide transporter interactions

**Prof. Qin Zheng**, 12 months visiting Professor, China

Synergisms between TCM plants

**Prof. Xiang Daxiong,** 12 months visiting Professor, China

Applying the BCS to TCM

**Prof. Nadia Chacra,** 6 month visiting Professor, Sao Paulo, Brazil

Biopharmaceutical quality of Generics on the South American markets.

**Prof. Dr. Jiangfang Feng,** 6 month visiting Professor, Shanghai, China

Applying the BCS to TCM

### Post Doctoral Fellows

**Leandro Santos,** PDF

Medical marijuana formulations

**Yuan Gao,** PDF

Macrophage nanoparticle interactions

**Wenjung Shi,** PDF

Nanoparticles to treat TB

**Dejuan Young,** PDF co supervised

Magnetic nanoparticles

**Shirzad Azarmi,** PDF co supervised

Use of nanotechnology for Lung delivery

**Abeer Elzanai,** PDF

Development of cannabis based dosage forms

**Ying Zhang,** PDF co supervised

New materials for drug targeting

**Xia Tao,** PDF co supervised

Novel lung delivery capsules

**Conrad Coester,** PDF co-supervised

Development of a nanoparticular carrier system for pulmonary cytokine delivery into mice

### Graduate Students

**Daniela Armaral Silva**

Inhalabel nanoparticles

**Marcelo Dutra Duque (co-Supervisor with Dr. Humberto Gomes Ferraz)**

Determination of absorption curves dissolution profiles and establishment of IVIVC by sin silico methods using GastroPlus and DDDPlus

**Saqer Alarifi**

 Modelling intestinal dissolution

**Lis Monteiro**

 Dual degree student USP- in vitro release from nanocrystalls

**Juliet Njoku**

DDDPlus simulations

**Areej Alshikhey**

Veterinarian compounding

**Zhipeng Yuan**

Nanoparticles as cancer treatment vehicles

**Braa Hajjar, graduate student MS current**

Herbal medicines

**Jieyu Zuo, graduate student PhD current**

Performance Testing of Oral Dosage forms

**May Almukainzi, PhD student current**

Disease specific drug delivery

**Muhammad Safraz, graduate student PhD current**

Secondary toxicity of nanoparticles

**Advaita Ganguly**

Ultrasensitive Point-of-Care Dengue Diagnostics and Vaccine Applications

**May Almukainzi, graduate student MS**

Evaluation of performance testing and computer simulations for Quality by Design approaches of oral dosage forms

 **Kamal Al-Hallak, graduate student PhD**

Inhalable nanoparticles in lung cancer treatment; efficacy, safety, distribution and nanoparticle-macrophage interactions

**Arthur Okumu, graduate student MS**

 Integration of dissolution technology with computer simulations to predict oral drug absorption

**Letica, Ely, graduate student MS**

Effervescent Dry Powder for Respiratory Drug Delivery

**Sebastian Gittens, graduate student PhD co supervised**

 The foundation of bone targeting to promote the regeneration of bone

**Hai Wei, graduate student PhD**

Development of in Vitro/in Vivo Correlations Based on the Biopharmaceutics Drug Classification System

**Yuan Huang, graduate student MS**

Development of protein based nanoparticles

### Visiting Graduate Students

**Muhammad Mahmodian**

 Macrophage targeting in cancer

**Pranporn Kuropakornpong**

 Tradtional Thai medicine

**Churanya Onlom**

Immuno purification of actives from traditional Thai herbals

**Nayab Khalid (6 month visiting graduate Student, Pakistan)**

Development of SEEDS

**Sonia Khiljee (6 month visiting graduate Student, Pakistan)**

Traditional topical preparations

**Amira Hagazi (12 month visiting graduate Student, Egypt)**

Investigation of compatibility of drugs in the GI tract

**Atawit Somsiri (12 month visiting graduate student, Thailand)**

Development of a delivery system for artocarpin

**Shirzad Azarmi** **(12 month visiting graduate student, Iran)**

Nanoparticle based delivery systems

**Hadi Valizadeh, (12 month visiting graduate student, Iran)**

Development of computer models to predict oral absorption

**Eskandar Moghimipour, (12 month visiting graduate student, Iran)**

 Development of in vitro methods to determine oral absorption

**Akie Takehashi (12 month visiting graduate student, Japan)**

Transdermal drug delivery: Utilization of Thermo Sensitive Gels

### Pharmacy interns 6 months research rotations

**Daniela Armaral Silva**

Incompatibilities of excipient and drugs

**Lukas Uebbig**

Development of a disintegration test framework

**Lukas Klump**

Evaluation of DDDPlus software

**Kira Zier**

Evaluation of topical Diclofenac preparations

**Alexandra Trivonova**

 Assay development for medical marijuana

**Meike Kuhlencord**

 Assay development and Preformulation of aUY11

**Michel Leonhardt**

Lung surfactant nanoparticle interactions

**Anja, Kruessel**

Quality assessment of a TCM cream

**Sarah Waldman**

Micro emulsions for Allicin

**Mahnor Salehi (**

Evaluation of the disintegration test after ICH harmonization

**Nina Donauer**

Development of topical formulations using TCMs

**Katja Schmid (6 month intern from Germany)**

USP Disintegration tester

**Magdalena Scheyer** **(6 month intern from Germany)**

Protein based nanoparticles

### Other Trainees

**Daniela Armaral Silva**

Incompatibilities of excipient and drugs (

**Fatemeh Ghaffari, pharmacy intern**

Microcalorimetry to investigate incompatibilities and instabilities.

**Kendra Schöder (2 month intern from Germany)**

Development and Assessment of a new Effusivity Test Apparatus based on the USP Tap Density Tester.

**Stacy Yuan, Engineering intern**

 Tribulencent materialsfor photo dynamic therapy

**Wes Burwash, Engineering intern**

Aerosol preparations