7. APPENDICES

7.1 APPENDIX A: Size distribution of the nanosuspension formulations measured with LD and PCS techniques during Follow-up stability studies (Mean ± SD, n=3).

7.1.1 FORMULATION A

Buparvaquone……1.0 %

Poloxamer 188…….. 1.0 %

Glycerol 85 %..... 2.5 %

Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.566 ± 0.01	0.696 ± 0.00	0.666 ± 0,00	0.725 ± 0,00
d90% (µm)	1.440 ± 0.00	1.310 ± 0.00	1.356 ± 0.00	1.387 ± 0.00
d95% (µm)	1.330 ± 0.00	1.487 ± 0.00	1.553 ± 0.00	1.584 ± 0.00
d99% (µm)	1.647 ± 0.00	1.798 ± 0.00	1.899 ± 0.00	1.919 ± 0.00
Z Ave (nm)	392.3 ± 22.4	480.3 ± 26.1	480.2 ± 26.2	534.3 ± 16.6
PI	0.32 ± 0,09	0.38 ± 0,05	0.32 ± 0,05	0.26 ± 0,09

7.1.2 FORMULATION B

Buparvaquone……..…1.0 %

Poloxamer 188…….. 0.5 %

Polyvinyl alcohol..... 0.5 %

Glycerol 85 %..... 2.5 %

Water ……..……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.560 ± 0.00	0.571 ± 0.00	0.536 ± 0.00	0.547 ± 0.01
d90% (µm)	1.199 ± 0.01	1.166 ± 0.00	1.192 ± 0.00	1.211 ± 0.00
d95% (µm)	1.386 ± 0.02	1.359 ± 0.00	1.462 ± 0.00	1.407 ± 0.00
d99% (µm)	1.687 ± 0.06	1.674 ± 0.00	1.942 ± 0.00	1.704 ± 0.01
Z Ave (nm)	403.9 ± 13.8	413.4 ± 18.0	415.1 ± 27.7	425.1 ± 10.5
PI	0.24 ± 0,09	0.33 ± 0,10	0.35 ± 0,10	0.25 ± 0,08

7.1.3 FORMULATION C

Buparvaquone……1.0 %
Poloxamer 188…….. 0.5 %
Phospholipon 80..... 0.5 %
Sodium glycocholate…… 0.3 %
Glycerol 85 %..... 2.5 %
Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.561 ± 0.04	0.700 ± 0.00	0.714 ± 0.00	0.725 ± 0.00
d90% (µm)	1.222 ± 0.02	1.269 ± 0.00	1.220 ± 0.00	1.296 ± 0.00
d95% (µm)	1.399 ± 0.02	1.447 ±0.01	1.362 ± 0.00	1.471 ± 0.00
d99% (µm)	1.690 ± 0.06	1.760 ± 0.03	1.620 ± 0.00	1.785 ± 0.00
Z Ave (nm)	420.9 ± 16.8	510.1 ± 11.4	501.5 ± 21.9	535.5 ± 22.0
PI	0.29 ± 0.06	0.28 ± 0.09	0.26 ± 0.07	0.27 ± 0.07

7.1.4 FORMULATION D

Buparvaquone……1.0 %
Tyloxapol…….. 0.3 %
Glycerol 85 %..... 2.5 %
Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.547 ± 0.00	0.583 ± 0.00	0.589 ± 0.03	0.690 ± 0.00
d90% (µm)	1.190 ± 0.00	1.198 ± 0.00	1.244 ± 0.02	1.267 ± 0.00
d95% (µm)	1.386 ± 0.01	1.360 ± 0.00	1.448 ± 0.05	1.408 ± 0.01
d99% (µm)	1.727 ± 0.01	1.635 ± 0.01	1.801 ± 0.10	1.639 ± 0.01
Z Ave (nm)	345.3 ± 9.7	366.8 ± 10.5	359.3 ± 13.9	422.0 ± 19.0
PI	0.33 ± 0.07	0.32 ± 0.07	0.30 ± 0.06	0.23 ± 0.10

7.1.5 FORMULATION E

Buparvaquone……1.0 %

Poloxamer 188…….. 0.5 %

Tyloxapol…… 0.15 %

Glycerol 85 %..... 2.5 %

Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.542 ± 0.00	0.562 ± 0.00	0.598 ± 0.01	0.696 ± 0.01
d90% (µm)	1.208 ± 0.01	1.190 ± 0.00	1.271 ± 0.10	1.294 ± 0.01
d95% (µm)	1.454 ± 0.00	1.410 ± 0.01	1.479 ± 0.41	1.458 ± 0.01
d99% (µm)	1.887 ± 0.00	1.789 ± 0.01	1.818 ± 0.25	1.733 ± 0.04
Z Ave (nm)	350.7± 12.8	352.9 ± 10.4	376.3 ± 38.3	421.2 ± 12.7
PI	0.30 ± 0.04	0.32 ± 0.07	0.29 ± 0.09	0.30 ± 0.09

7.1.6 FORMULATION F

Buparvaquone……2.0 %

Poloxamer 188…….. 0.5 %

Tyloxapol…… 0.15 %

Glycerol 85 %..... 2.5 %

Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.499 ± 0.00	0.590 ± 0.01	0.506 ± 0.00	0.475 ± 0.00
d90% (µm)	1.185 ± 0.01	1.263 ± 0.01	1.347 ± 0.00	1.215 ± 0.02
d95% (µm)	1.466 ± 0.00	1.520 ± 0.00	1.566 ± 0.00	1.433 ± 0.01
d99% (µm)	1.912 ± 0.01	1.985 ± 0.01	1.913 ± 0.01	1.765 ± 0.00
Z Ave (nm)	330.7 ± 8.4	358.2 ± 6.7	358.0 ± 10.3	357.5 ± 10.8
PI	0.24 ± 0.05	0.27 ± 0.06	0.29 ± 0.05	0.33 ± 0.05

7.1.7 FORMULATION G

Buparvaquone……7.0 %

Poloxamer 188…….. 0.5 %

Tyloxapol…… 0.15 %

Glycerol 85 %..... 2.5 %

Water ……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.492 ± 0.00	0.517 ± 0.00	0.492 ± 0.01	0.539 ± 0.00
d90% (µm)	1.193 ± 0.00	1.331 ± 0.00	1.284 ± 0.01	1.410 ± 0.00
d95% (µm)	1.471 ± 0.00	1.599 ± 0.00	1.510 ± 0.01	1.653 ± 0.01
d99% (µm)	1.909 ± 0.00	2.061 ± 0.00	1.869 ± 0.02	2.044 ± 0.03
Z Ave (nm)	342.4 ± 8.5	371.2 ± 15.6	382.8 ± 8.0	417.4 ± 10.3
PI	0.29 ± 0.06	0.27 ± 0.06	0.27 ± 0.09	0.30 ± 0.06

7.1.8 FORMULATION H

Buparvaquone……1.0 %

Phospholipon 90 G…… 1.0 %

Glycerol 85 %..... 2.5 %

Water ……ad…….100 %

7.1.8.1 Room temperature (21 ± 3 °C)

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.511 ± 0.00	0.542 ± 0.00	0.570 ± 0.01	0.708 ± 0.02
d90% (µm)	1.524 ± 0.00	1.722 ± 0.01	1.878 ± 0.00	2.100 ± 0.21
d95% (µm)	1.783 ± 0.01	2.049 ± 0.00	2.135 ± 0.01	2.471 ± 0.05
d99% (µm)	2.183 ± 0.01	2.673 ± 0.02	3.492 ± 0.03	4.085 ± 0.15
Z Ave (nm)	388.7 ± 13.4	425.4 ± 16.4	471.4 ± 20.3	507.8 ± 34.3
PI	0.40 ± 0.05	0.35 ± 0.04	0.34 ± 0.10	0.64 ± 0.19

7.1.8.2 Refrigeration (5 ± 3 °C)

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.511 ± 0.00	0.475 ± 0.00	0.485 ± 0.02	0.520 ± 0.05
d90% (µm)	1.524 ± 0.00	1.565 ± 0.01	1.569 ± 0.05	1.580 ± 0.02
d95% (µm)	1.783 ± 0.01	1.786 ± 0.01	1.808 ± 0.02	1.850 ± 0.01
d99% (µm)	2.183 ± 0.01	2.127 ± 0.01	2.190 ± 0.00	2.210 ± 0.03
Z Ave (nm)	388.7 ± 13.4	434.2 ± 16.5	417.6 ± 8.3	427.0 ± 7.0
PI	0.40 ± 0.05	0.33 ± 0.07	0.33 ± 0.09	0.33 ± 0.07

7.1.9 FORMULATION I

Buparvaquone……..…1.0 %

Tween 80……. …..…… 0.5 %

Glycerol 85 %..... 2.5 %

Water ……..……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.517 ± 0.00	0.823 ± 0.02	0.853 ± 0.00	0.864 ± 0.00
d90% (µm)	1.201 ± 0.00	1.510 ± 0.01	1.645 ± 0.00	1.948 ± 0.01
d95% (µm)	1.468 ± 0.00	1.705 ± 0.04	1.876 ± 0.00	2.387 ± 0.01
d99% (µm)	1.925 ± 0.01	2.041 ± 0.06	2.269 ± 0.01	5.643 ± 0.14
Z Ave (nm)	364.2 ± 20.6	558.5 ± 70.6	586.8 ± 76.5	678.0 ± 29.0
PI	0.26 ± 0.11	0.40 ± 0.09	0.43 ± 0.06	0.30 ± 0.07

7.1.10 FORMULATION J

Buparvaquone……1.0 %
Tween 80……. …..…… 1.0 %
Glycerol 85 %..... 2.5 %
Water ……..……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.530 ± 0.00	0.807 ± 0.00	0.846 ± 0.00	0.828 ± 0.02
d90% (µm)	1.202 ± 0.00	1.544 ± 0.01	1.602 ± 0.00	2.502 ± 0.03
d95% (µm)	1.472 ± 0.00	1.760 ± 0.01	1.811 ± 0.00	4.030 ± 0.08
d99% (µm)	1.937 ± 0.00	2.129 ± 0.03	2.177 ± 0.01	5.544 ± 0.06
Z Ave (nm)	365.4 ± 20.8	570.9 ± 48.0	549.9 ± 63.2	665.2 ± 18.6
PI	0.31 ± 0.02	0.48 ± 0.05	0.42 ± 0.08	0.31 ± 0.09

7.1.11 FORMULATION K

Buparvaquone……1.0 %
Tween 80……. …..…… 2.0 %
Glycerol 85 %..... 2.5 %
Water ……..……ad…….100 %

Size parameter	Time (days)			
	0	30	90	180
d50% (µm)	0.530 ± 0.00	0.791 ± 0.00	0.794 ± 0.00	0.814 ± 0.01
d90% (µm)	1.199 ± 0.00	1.338 ± 0.02	1.438 ± 0.00	1.453 ± 0.01
d95% (µm)	1.469 ± 0.00	1.480 ± 0.03	1.618 ± 0.00	1.611 ± 0.01
d99% (µm)	1.937 ± 0.01	1.730 ± 0.05	1.933 ± 0.00	1.875 ± 0.07
Z Ave (nm)	355.1 ± 28.7	421.5 ± 64.3	538.1 ± 53.6	594.8 ± 31.8
PI	0.38 ± 0.05	0.78 ± 0.07	0.36 ± 0.08	0.21 ± 0.07

7.2 APPENDIX B: LD diameters of aerosol droplets (mean ± SD; n=5) produced with with jet and ultrasonic nebulization of Formulations A, B and references 1, 2 and 3 (see section 4.1.2.1).

*Measurements D-1, D-2 and D-3 correspond to time 0, 2.5 and 5 min nebulization time.

	Respi-jet Kendall		
	MMD*	Span	% <5μm
Formulation A			
Measurement D-1	4.1 ± 0.0	2.0 ± 0.0	60.0 ± 0.6
Measurement D-2	4.0 ± 0.0	1.9 ± 0.0	63.7 ± 4.5
Measurement D-3	4.4 ± 0.0	1.6 ± 0.0	59.2 ± 0.8
Formulation B			
Measurement D-1	4.5 ± 0.1	1.9 ± 0.0	54.7 ± 0.5
Measurement D-2	4.4 ± 0.1	2.0 ± 0.0	60.7 ± 1.4
Measurement D-3	4.6 ± 0.1	2.0 ± 0.1	55.7 ± 1.1
Reference 1			
Measurement D-1	4.4 ± 0.1	2.0 ± 0.0	60.4 ± 2.3
Measurement D-2	4.3 ± 0.2	0.9 ± 0.6	71.5 ± 6.0
Measurement D-3	4.4 ± 0.2	2.1 ± 0.0	62.3 ± 2.1
Reference 2			
Measurement D-1	4.7 ± 0.0	1.9 ± 0.0	53.4 ± 0.3
Measurement D-2	4.6 ± 0.1	1.9 ± 0.0	53.8 ± 0.9
Measurement D-3	4.2 ± 0.1	2.1 ± 0.0	58.1 ± 0.9
Reference 3			
Measurement D-1	4.6 ± 0.1	1.8 ± 0.0	54.1 ± 0.6
Measurement D-2	4.3 ± 0.2	1.6 ± 0.1	58.4 ± 3.4
Measurement D-3	3.9 ± 0.1	1.7 ± 0.1	63.2 ± 2.6

*Measurements D-1, D-2 and D-3 correspond to time 0, 2.5 and 5 min nebulization time.

	Pari Turbo Boy		
	MMD*	Span	% <5μm
Formulation A			
Measurement D-1	4.3 ± 0.1	2.5 ± 0.1	56.0 ± 1.0
Measurement D-2	4.1 ± 0.2	2.7 ± 0.1	57.9 ± 1.8
Measurement D-3	4.2 ± 0.1	2.6 ± 0.1	57.1 ± 1.1
Formulation B			
Measurement D-1	4.6 ± 1.0	2.4 ± 0.6	50.3 ± 2.6
Measurement D-2	4.3 ± 0.0	2.6 ± 0.0	56.1 ± 0.3
Measurement D-3	4.1 ± 0.1	2.7 ± 0.1	57.7 ± 1.0
Reference 1			
Measurement D-1	4.2 ± 0.5	2.4 ± 0.4	54.0 ± 1.0
Measurement D-2	3.8 ± 0.5	2.6 ± 0.2	58.2 ± 1.4
Measurement D-3	3.4 ± 0.5	2.6 ± 0.2	62.0 ± 1.0
Reference 2			
Measurement D-1	4.6 ± 0.2	2.3 ± 0.1	53.3 ± 1.6
Measurement D-2	4.7 ± 0.2	2.3 ± 0.1	51.9 ± 1.5
Measurement D-3	4.5 ± 0.2	2.3 ± 0.1	53.2 ± 1.1
Reference 3			
Measurement D-1	3.9 ± 0.1	2.7 ± 0.0	60.4 ± 0.7
Measurement D-2	3.8 ± 0.2	2.8 ± 0.1	59.3 ± 1.2
Measurement D-3	3.7 ± 0.1	2.9 ± 0.0	61.8 ± 1.3

*Measurements D-1, D-2 and D-3 correspond to time 0, 2.5 and 5 min nebulization time.

	Multisonic		
	MMD*	Span	% <5μm
Formulation A			
Measurement D-1	4.5 ± 0.1	1.4 ± 0.1	57.7 ± 1.8
Measurement D-2	4.7 ± 0.3	1.3 ± 0.1	54.5 ± 4.4
Measurement D-3	5.0 ± 0.1	1.6 ± 0.1	49.6 ± 1.3
Formulation B			
Measurement D-1	4.6 ± 0.2	1.3 ± 0.1	58.4 ± 5.9
Measurement D-2	5.0 ± 0.3	1.6 ± 0.1	51.2 ± 5.0
Measurement D-3	4.8 ± 0.3	1.4 ± 0.1	53.5 ± 4.6
Reference 1			
Measurement D-1	5.2 ± 0.1	1.4 ± 0.1	47.7 ± 1.2
Measurement D-2	4.6 ± 0.3	1.4 ± 0.1	56.6 ± 4.6
Measurement D-3	4.7 ± 0.1	1.5 ± 0.0	53.8 ± 1.4
Reference 2			
Measurement D-1	5.5 ± 0.3	1.7 ± 0.1	44.2 ± 3.1
Measurement D-2	4.9 ± 0.1	1.5 ± 0.0	51.9 ± 1.6
Measurement D-3	5.0 ± 0.2	1.6 ± 0.2	50.9 ± 3.2
Reference 3			
Measurement D-1	5.5 ± 0.4	1.7 ± 0.2	44.4 ± 4.1
Measurement D-2	4.9 ± 0.2	1.5 ± 0.1	51.0 ± 2.2
Measurement D-3	4.7 ± 0.2	1.4 ± 0.1	55.7 ± 3.5

*Measurements D-1, D-2 and D-3 correspond to time 0, 2.5 and 5 min nebulization time.

	Omron U1		
	MMD	Span	% <5μm
Formulation A			
Measurement D-1	9.5 ± 1.1	1.3 ± 0.0	27.4 ± 5.7
Measurement D-2	9.2 ± 0.2	1.3 ± 0.1	21.8 ± 2.3
Measurement D-3	10.0 ± 0.1	1.3 ± 0.0	17.8 ± 0.6
Formulation B			
Measurement D-1	9.5 ± 0.2	1.3 ± 0.1	20.1 ± 1.1
Measurement D-2	9.6 ± 0.4	1.3 ± 0.0	20.0 ± 1.2
Measurement D-3	9.3 ± 0.5	1.4 ± 0.1	17.7 ± 1.9
Reference 1			
Measurement D-1	8.9 ± 0.1	1.1 ± 0.0	24.1 ± 1.6
Measurement D-2	9.4 ± 0.6	1.1 ± 0.0	21.9 ± 1.3
Measurement D-3	8.9 ± 0.2	1.1 ± 0.0	24.9 ± 1.3
Reference 2			
Measurement D-1	10.9 ± 0.2	1.2 ± 0.0	17.5 ± 0.8
Measurement D-2	10.6 ± 0.2	1.2 ± 0.0	19.3 ± 0.7
Measurement D-3	10.7 ± 0.3	1.2 ± 0.0	18.5 ± 2.3
Reference 3			
Measurement D-1	10.4 ± 0.4	1.2 ± 0.1	21.3 ± 1.9
Measurement D-2	10.6 ± 0.3	1.2 ± 0.0	20.8 ± 2.2
Measurement D-3	10.6 ± 0.4	1.2 ± 0.0	20.7 ± 1.2

AKNOWLEDGEMENTS

The work summarized here is a result of three and a half years of intense collaboration and work developed at the Freie Universität Berlin, Rijksuniversiteit Groningen and Robert Koch Institut Berlin. I would like to express my gratitude to the following people, who enthusiastically shared with me part of their expertise and knowledge:

To Prof. Dr. Rainer Müller, my promotor, for giving me the opportunity and the topic to start a PhD in Berlin and for entering me into the fascinating "Nanoworld". I am grateful for the confidence and opportunity granted to me to move to Berlin in 2003, also for introducing me to Prof. Kayser and Dr. Steckel. I am thankful for his interest on my research area, the publication of my work in journals and international conferences and for the review and evaluation of this manuscript.

My deepest gratitude to Prof. Dr. Oliver Kayser from the Rijksuniversiteit Groningen (The Netherlands). I am thankful for his professional guidance, his support, confidence and advice reading all my manuscripts and for the general interest always shown in this work. His vision and uncanny optimism encouraged me especially in challenging moments. I am grateful for his availability for open discussions, his storming of ideas and for opening the doors to scientific collaborations with Dr. A. Kiderlen and Prof. H. Frijlink. Finally, I want to express my gratitude for the resources given to continue and finalize my research.

To Dr. Albrecht Kiderlen from the Robert Koch Institute Berlin, for his invaluable help creating the concept to test the nanosuspensions for pulmonary delivery. I am grateful for the warm welcome to his research group, for the facilities and resources directed to my project and for his valuable and critical revision of the manuscript yielded from our collaboration. To his team Petra Matzk and Ulrike Laube I am deeply grateful for their teachings, patience and active engagement to my work. To Elke Radam, Gudi Klim, Carsten Thäle, Dominic Kram and Dr. Tata who made my stay pleasant and harmonious.

To Prof. Dr. Erik Frijlink, from the Pharmaceutical Technology Department at the Rijksuniversiteit Groningen (The Netherlands) and to his team Dr. Anne de Boer and Dr. Wouter Hinrichs, for their interest, brain storming and coordination of resources. Also to Paul Hagedoorn, Marinela Visser and Anko Eissens, who friendly trained and supported me to make from my short research stay, a very productive and effective time.

To Dr. Hartwig Steckel and Dr. Fadi Eskandar from the Christian Albrecht Universität Kiel, for their kind introduction and training related to the characterisation of aerosols. I appreciate his availability to discussions, the suggestions and resources friendly shared.

To my colleague Mario Fichera from the Federal Institute for Materials Research and Testing (BAM) for his support in the characterisation of buparvaquone solid dispersions. To his supervisor Prof. C. Jäger for the coordination and resources required to conduct these analyses and to Klaus J. Wenzel for the X-Ray diffraction measurements. I am deeply grateful for their friendly art and selfless help.

To Dr. Wolfgang Mehnert for his unconditional help on the statistical analysis of the animal tests data.

To Inge Volz and Corinna Schmidt, the hands and head that always helped everybody in the research group of Prof. Müller. Thanks for their kind support sorting out the HPLC, LD, DSC and PCS problems.

To Gabriela Karsubke for being always helpful in the administrative issues, answering all questions that an overseas student may have on the burocracy of the German educational system. I am thankful for her friendship, enthusiasm and good advices to overcome all difficulties along the way.

To all my friends and colleagues who shared my time everyday at the Kelchstraße, thanks for the warm atmosphere, brain storming, support and the important moments of relaxation. To Dr. Vivian Voigt, Dr. Ildiko Terebesi, Dr. Eliana Souto, Dr. Anne Saupe, Dr. Aslihan Akkar, Nadiem Bushrab, Aiman Hommoss, Rachmat Mauludin, Jana Pardeike, Vee Teeranachaideekul, Dr. Conny Keck, Dr. Ilona Butle, Dr. Boris Petri, Dr. Torsten Göppert, Dr. Jan Möschwizer, Jens Uwe Jughanns and Andreas Lemke. To Marc Muchow and Felix Tröster, for the additional friendly IT-help.

To my dearest friends in Mexico, in Germany and in England. I have no words to thank all their love, their moral support and friendship during all these years.

To my parents, Saúl Hernández and Delia Trejo, to whom I owe my values and education. They taught me with plenty of love that the discipline, dedication and passion for our work are the keys of our success. Also to my sisters Lorena and Cirenia. Thank you for always believing in me.

To Dr. Holger Kirstein, my loved husband, for understanding me and motivating me with his love, patience and optimism to continue forward and straight until reaching my goals. I am grateful for his immeasurable care and constant support.

To my family in Germany, Michaela and Dieter Pomierski, Heiko, Tania and Nadine Kirstein, Robert and Rina Pomierski who opened their hearts to make me feel home and family in Berlin. Thank you for all the support and care granted to me.

Last but not least, to **CONACyT** (National Council for Science and Technology of the Federal Government of Mexico), for offering the opportunity to young Mexicans to open the doors to new horizons that foster the hope to construct an even better Mexico.

CURRICULUM VITAE

Febr. 14th, 1972	:	Born in Xalapa, Veracruz, Mexico
1977 - 1983	:	Elementary School “Luis J. Jiménez”, Mexico
1983 - 1986	:	Secondary School “Instituto Científico Motolinía”, Mexico
1986 - 1989	:	High School “C.B.T.i.s. No. 13” Mexico
1989 – 1995	:	Bachelor Science degree in Pharmaceutical Biological Chemistry. Faculty of Chemistry, Universidad Veracruzana, Mexico
1995 - 1997	:	Research work to achieve the Bachelor Science degree. Research Area: Phytochemistry Basic Sciences Research Institute. Universidad Veracruzana. Thesis: “Phytochemical study of Licaria velutina Wan der Werff” Degree awarded on 13th June 1997.
1997 – 2001	:	Work at PROQUINA, S. A. de C. V. (branch of Schering AG, Mexico). Functions occupied during that time: ➢ Analyst in the Department of Analytical Methods Development and Validation. ➢ Responsible for the Stability Studies of new products ➢ Responsible for the Qualification and Maintenance of the Analytical Instruments at the Quality Control Laboratory ➢ Manager of the Quality Control Laboratory
2001 - 2003	:	Mphil (Master Phylosophy) in Pharmacy Research Area: Drug Design – Pharmaceutical and Biomedical Analysis School of Pharmacy of the University of Bradford (BSP). Bradford, United Kingdom. Thesis: “In-vitro aerodynamic characterization of the dose emitted during jet nebulisation of high strength tobramycin solutions”. Degree awarded on July 14th, 2004.
2003 – 2006		PhD Studies Department of Pharmaceutical Technology, Biotechnology & Quality Management. Free University of Berlin. Scholarship 2001- 2005 from the National Council for Science and Technology of Mexico.

PUBLICATIONS LIST

The information content in the present thesis was partially published in the following manuscripts:

Abstracts

Hernández-Trejo N., W. L. J. Hinrichs, M. R. Visser, R. H. Müller, O. Kayser, E. Frijlink, 2005. Enhancement of the *in vitro* dissolution rate of the lipophilic drug buparvaquone by incorporation into solid dispersions. *PharmSci Fair, 2005*, Niece France.

Proceedings

Hernández-Trejo N., A. H. de Boer, P. Hagedoorn, O. Kayser, H. W. Frijlink, and R. H. Müller. 2005. Buparvaquone nanosuspension for inhalation: Formulation strategies and behavior during jet nebulisation*. Proceedings of the 32nd Annual Meeting & Exposition of the Controlled Release Society*, Miami Beach, Florida.

Hernández-Trejo N., O. Kayser, R. H. Müller, and H. Steckel. 2004. Physical stability of buparvaquone nanosuspensions following nebulization with jet and ultrasonic nebulizers. *Proceedings of the International Meeting on Pharmaceutics, Biopharmaceutics and Pharmaceutical Technology*. Nuremberg, Germany.

Publications in journals

Hernández-Trejo N., O. Kayser, H. Steckel, and R. H. Müller. 2005. Characterization of nebulized buparvaquone nanosuspensions - effect of nebulization technology. J*ournal of Drug Targeting.* 13:499-507.

Kayser O., A. Lemke and N. Hernández-Trejo. 2005. The Impact of nanobiotechnology on the development of new drug delivery systems. *Current Pharmaceutical Biotechnology*. 6:3-5.

Hernández-Trejo N., A. Hampe, and R. H. Müller. 2004. A thin layer chromatography method to identify oxaliplatin in aqueous solution. *Die Pharmazeutische Industry*. 66:1545-1550.

Hernández-Trejo N., W.L.J. Hinrichs, O. Kayser, R.H. Müller, M.R. Visser, A. C. Eissens, K. J. Wenzel, M. A. Fichera, C. Jäger, H.W. Frijlink. Dissolution performance and physical characterization of the drug buparvaquone following incorporation into solid dispersions. *International Journal of Pharmaceutics*. *In preparation*.

Hernández-Trejo N., O. Kayser, U. Laube, P. Matzk, R.H. Müller, A. Kiderlen. Inhalation of buparvaquone nanocrystals for therapy of *Pneumocystis* pneumonia in immunodeficient mice. *Antimicrobial Agents and Chemotherapy*. *Sub*mitted.