

Hugh David Charles Smyth, Ph.D.
Professor with Tenure
Alcon Centennial Professor
The University of Texas at Austin
Curriculum Vitae

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EDUCATION AND TRAINING

- 2001 – 2003 **University of North Carolina at Chapel Hill**
School of Pharmacy, Division of Drug Delivery and Deposition
Post-Doctoral Fellow
- 1998 – 2000 **University of Otago, Dunedin, New Zealand**
School of Pharmacy, Department of Pharmaceutical Sciences
Doctor of Philosophy
Thesis: *Investigation of Electrically Assisted Drug Delivery in the Percutaneous Delivery of Peptides*
- 1997 **University of Otago, Dunedin, New Zealand**
School of Pharmacy, Department of Pharmaceutical Sciences
Post Graduate Diploma in Pharmaceutics (with Distinction)
- 1992 – 1995 **University of Otago, Dunedin, New Zealand**
School of Pharmacy, Department of Pharmaceutical Sciences
Bachelor of Pharmacy

PROFESSIONAL APPOINTMENTS

PRIMARY APPOINTMENTS

- 2020 – Present **The University of Texas at Austin**, College of Pharmacy
Alcon Centennial Professorship
- 2018 – Present Full Professor
The University of Texas at Austin, College of Pharmacy
- 2016 – 2020 **The University of Texas at Austin**, College of Pharmacy
Alan W Hamm Centennial Fellow in Pharmacy
- 2014 – 2016 **The University of Texas at Austin**, College of Pharmacy
Fellow to the Jaime N Delgado Endowed Professorship
- 2012 – 2014 **The University of Texas at Austin**, College of Pharmacy,
Bergen Brunswig Corporation Centennial Fellow

2011 – Present	Associate Professor with Tenure The University of Texas at Austin College of Pharmacy, Division of Molecular Pharmaceutics and Drug Delivery
2009 – 2011	The University of Texas at Austin College of Pharmacy, Division of Pharmaceutics Assistant Professor
2005 – 2009	University of New Mexico Health Sciences Center, College of Pharmacy Assistant Professor
2004 – 2005	University of North Carolina at Chapel Hill School of Pharmacy, Division of Drug Delivery and Deposition Research Assistant Professor
2000	Knox Pharmacy , Dunedin, New Zealand, Pharmacist
1998 – 1999	GlaxoWellcome , Research Triangle Park, Durham, NC.
1996	Auckland Hospital , Auckland Healthcare, New Zealand, Pharmacist

ADJUNCT AND OTHER APPOINTMENTS

2020 – Present	Co-Founder and Chief Scientific Officer, Cloxero Therapeutics, Austin, TX.
2017 – Present	Co-Founder, Via Therapeutics, Austin, TX (Start-up from technology developed in my lab)
2016 – Present	Consulting Chief Technology Officer, Nob Hill Therapeutics, San Diego, CA (Start-up from technology developed in my lab)
2010 – 2021	Consulting Chief Scientist, Respira Therapeutics, (Start-up from technology developed in my lab, now in clinical development)
2014 – 2022	Editor-in-Chief, Drug Development and Industrial Pharmacy.
2006 – Present	Lovelace Respiratory Research Institute , Albuquerque, NM Adjunct Associate Scientist
2006 – 2009	University of New Mexico Cancer Research and Treatment Center Member

PROFESSIONAL SOCIETIES

2004 – 2016	International Society for Aerosols in Medicines
2005 – 2008	American Chemical Society
2001 – 2005	North Carolina Pharmaceutical Discussion Group

2001 – Present	American Association of Pharmaceutical Scientists Inhalation and Nasal Community (Previously named: Inhalation and Nasal Technology Focus Group)
1998 – Present	American Association of Pharmaceutical Scientists
1997 – Present	Controlled Release Society
1996 – 2004	Member Pharmaceutical Society of New Zealand

PUBLICATIONS

PEER REVIEWED PAPERS (in reverse chronological order)

Professor, at The University of Texas at Austin (September 2018 – Present)

1. Ren A, Koleng III JJ, Costello M, Spahn JE, Smyth HD, Zhang F. Twin-screw continuous mixing can produce dry powder inhalation mixtures for pulmonary delivery. *Journal of Pharmaceutical Sciences*. 2022 Oct 11.
2. Brunaugh AD, Walz A, Warnken Z, Pearce C, Munoz Gutierrez J, Koleng JJ, Smyth HD, Gonzalez-Juarrero M. Respirable Clofazimine Particles Produced by Air Jet Milling Technique Are Efficacious in Treatment of BALB/c Mice with Chronic Mycobacterium tuberculosis Infection. *Antimicrobial Agents and Chemotherapy*. 2022 Aug 9:e00186-22.
3. Hefnawy, A., Herpin, M.J., Easton, M., Joshi, S., Jordan, D., Smyth, H.D.C., Tarpy, J., Design Validation of a Smart Inhaler Device with an Integrated Spacer for Enhanced Aerosolization Performance. *J Pharm Innov* (2022). <https://doi.org/10.1007/s12247-022-09673-7>
4. Spahn JE, Hefnawy A, Smyth HD, Zhang F. Development of a novel method for the continuous blending of carrier-based dry powders for inhalation using a co-rotating twin-screw extruder. *International Journal of Pharmaceutics*. 2022 Jun 16:121914.
5. Spahn JE, Zhang F, Smyth HD. Mixing of dry powders for inhalation: A review. *International Journal of Pharmaceutics*. 2022 Apr 8:121736.
6. Trementozzi AN, Zhao C, Smyth H, Cui Z, Stachowiak JC. Gap Junction-Mediated Delivery of Polymeric Macromolecules. *ACS Biomaterials Science & Engineering*. 2022 Mar 10;8(4):1566-72.
7. Brunaugh AD, Ding L, Wu T, Schneider M, Khalaf R, Smyth HD. Identification of stability constraints in the particle engineering of an inhaled monoclonal antibody dried powder. *Journal of Pharmaceutical Sciences*. 2022 Feb 1;111(2):403-16.

8. Zhu Y, Gu Z, Liao Y, Li S, Xue Y, Firempong MA, Xu Y, Yu J, Smyth HD, Xu X. Improved intestinal absorption and oral bioavailability of astaxanthin using poly (ethylene glycol)-graft-chitosan nanoparticles: preparation, in vitro evaluation, and pharmacokinetics in rats. *Journal of the Science of Food and Agriculture*. 2022 Feb;102(3):1002-11.
9. Domínguez-Delgado CL, Akhtar Z, Awuah-Mensah G, Wu B, Smyth HD. Effects of Process and Formulation Parameters on Submicron Polymeric Particles Produced by a Rapid Emulsion-Diffusion Method. *Nanomaterials*. 2022 Jan 11;12(2):229.
10. Ding L, Brunaugh AD, Thakkar R, Lee C, Zhao QJ, Kalafat J, Maniruzzaman M, Smyth HD. Comparison of HPMC Inhalation-Grade Capsules and Their Effect on Aerosol Performance Using Budesonide and Rifampicin DPI Formulations. *AAPS PharmSciTech*. 2022 Jan;23(1):1-3.
11. Ceschan NE, Montoto SS, Sbaraglini ML, Ruiz ME, Smyth HD, Bucalá V, Ramírez-Rigo MV. Nebulization of a polyelectrolyte-drug system for systemic hypertension treatment. *European Journal of Pharmaceutical Sciences*. 2021 Dec 26:106108.
12. Ding L, Cai S, Wang J, Smyth H. 481: PEGylated tobramycin significantly improves anti-biofilm activity in vitro and in vivo. *Journal of Cystic Fibrosis*. 2021 Nov 1;20:S226-8.
13. Arafa KK, Smyth HD, El-Sherbiny IM. Mitotropic triphenylphosphonium doxorubicin-loaded core-shell nanoparticles for cellular and mitochondrial sequential targeting of breast cancer. *International Journal of Pharmaceutics*. 2021 Sep 5;606:120936.
14. Brunaugh AD, Ding L, Wu T, Schneider M, Khalaf R, Smyth HD. Identification of Stability Constraints in the Particle Engineering of an Inhaled Monoclonal Antibody Dried Powder. *Journal of Pharmaceutical Sciences*. 2021 Aug 26.
15. Zhu Y, Gu Z, Liao Y, Li S, Xue Y, Firempong MA, Xu Y, Yu J, Smyth HD, Xu X. Improved intestinal absorption and oral bioavailability of astaxanthin using poly (ethylene glycol)-graft-chitosan nanoparticles: preparation, in vitro evaluation, and pharmacokinetics in rats. *Journal of the Science of Food and Agriculture*. 2021 Aug 13.
16. Zhang H, Zhang Y, Williams III RO, Smyth HD. Development of PEGylated chitosan/CRISPR-Cas9 dry powders for pulmonary delivery via thin-film freeze-drying. *International Journal of Pharmaceutics*. 2021 Aug 10;605:120831.
17. Ding L, Brunaugh AD, Stegemann S, Jermain SV, Herpin MJ, Kalafat J, Smyth HD. A Quality by Design Framework for Capsule-Based Dry Powder Inhalers. *Pharmaceutics*. 2021 Aug;13(8):1213.

18. Hall MD, Anderson JM, Anderson A, Baker D, Bradner J, Brimacombe KR, Campbell EA, Corbett KS, Carter K, Cherry S, Chiang L, omas Cihlar, Emmie de Wit, Mark Denison, Matthew Disney, Courtney V Fletcher, Stephanie L Ford-Scheimer, Matthias Götte, Abigail C Grossman, Frederick G Hayden, Daria J Hazuda, Charlotte A Lanteri, Hilary Marston, Andrew D Mesecar, Stephanie Moore, Jennifer O Nwankwo, Jules O'Rear, George Painter, Kumar Singh Saikatendu, Celia A Schiffer, Timothy P Sheahan, Pei-Yong Shi, Hugh D Smyth, Michael J Sofia, Marla Weetall, Sandra K Weller, Richard Whitley, Anthony S Fauci, Christopher P Austin, Francis S Collins, Anthony J Conley, Mindy I Davis. Report of the National Institutes of Health SARS-CoV-2 Antiviral Therapeutics Summit. The Journal of Infectious Diseases. 2021 Jun 10.

19. Hewavitharana, Amitha K., Shaw, P. Nicholas, Smyth, H. D.C., Samaranayake, L. P., and Bandara, H. M.H.N. (2021). The importance of complete overlapping of analyte and internal standard peaks in eliminating matrix effects with liquid chromatography–mass spectrometry (Lc–ms). LC-GC North America 39 (7) 335-338..

20. Ding L, Wang J, Cai S, Smyth H, Cui Z. Pulmonary Biofilm-Based Chronic Infections and Inhaled Treatment Strategies. International Journal of Pharmaceutics. 2021 Jun 3;604:120768.

21. Wang JL, Hanafy MS, Xu H, Leal J, Zhai Y, Ghosh D, Williams Iii RO, Smyth HD, Cui Z. Aerosolizable siRNA-encapsulated solid lipid nanoparticles prepared by thin-film freeze-drying for potential pulmonary delivery. International Journal of Pharmaceutics. 2021 Mar 1;596:120215.

22. Brunaugh AD, Sharma S, Smyth H. Inhaled fixed-dose combination powders for the treatment of respiratory infections. Expert Opinion on Drug Delivery. 2021 Feb 27:1-5.

23. Brunaugh AD, Seo H, Warnken Z, Ding L, Seo SH, Smyth HD. Development and evaluation of inhalable composite niclosamide-lysozyme particles: A broad-spectrum, patient-adaptable treatment for coronavirus infections and sequelae. PloS one. 2021 Feb 11;16(2):e0246803.

24. Shah SM, Shah SM, Khan S, Ullah F, Shah SW, Ghias M, Shahid M, Smyth HD, Hussain Z, Sohail M, Elhissi A. Efficient design to fabricate smart Lumefantrine nanocrystals using DENA® particle engineering technology: Characterisation, in vitro and in vivo antimalarial evaluation and assessment of acute and sub-acute toxicity. Journal of Drug Delivery Science and Technology. 2021 Feb 1;61:102228.

25. Armijo LM, Wawrzyniec SJ, Kopciuch M, Brandt YI, Rivera AC, Withers NJ, Cook NC, Huber DL, Monson TC, Smyth HD, Osiński M. Antibacterial activity of iron oxide, iron nitride, and tobramycin conjugated nanoparticles against Pseudomonas aeruginosa biofilms. Journal of nanobiotechnology. 2020 Dec;18(1):1-27.

26. Anzueto A, Smyth HD. Letter to the Editor in response to the article:“Nebulization: A potential source of SARS-CoV-2 transmission”. Respiratory Medicine and Research. 2020 Nov 17.

27. Zhang H, Leal J, Soto MR, Smyth HD, Ghosh D. Aerosolizable Lipid Nanoparticles for Pulmonary Delivery of mRNA through Design of Experiments. *Pharmaceutics*. 2020 Nov;12(11):1042.
28. Brunaugh AD, Seo H, Warnken Z, Ding L, Seo SH, Smyth HD. Broad-spectrum, patient-adaptable inhaled niclosamide-lysozyme particles are efficacious against coronaviruses in lethal murine infection models. *bioRxiv*. 2020 September.
29. Andrea N. Trementozzi, Stephanie Hufnagel, Haiyue Xu, Mahmoud S. Hanafy, Felipe Rosero Castro, Hugh D.C. Smyth, Zhengrong Cui, and Jeanne C. Stachowiak, Gap Junction Liposomes for Efficient Delivery of Chemotherapeutics to Solid Tumors *ACS Biomaterials Science & Engineering* 2020 6 (9), 4851-4857, DOI: 10.1021/acsbiomaterials.0c01047
30. Xu H, Alzhrani RF, Warnken ZN, Thakkar SG, Zeng M, Smyth HD, Williams III RO, Cui Z. Immunogenicity of Antigen Adjuvanted with AS04 and Its Deposition in the Upper Respiratory Tract after Intranasal Administration. *Molecular Pharmaceutics*. 2020 Aug 10;17(9):3259-69.
31. Armijo LM, Wawrzyniec SJ, Kopciuch M, Brandt YI, Rivera AC, Withers NJ, Cook NC, Huber DL, Monson TC, Smyth HD, Osiński M. Antibacterial activity of iron oxide, iron nitride, and tobramycin conjugated nanoparticles against *Pseudomonas aeruginosa* biofilms. *Journal of Nanobiotechnology*. 2020 Dec;18(1):1-27.
32. Davis DA, Martins PP, Zamloot MS, Kucera SA, WilliamsIII RO, Smyth HD, Warnken ZN. Complex Drug Delivery Systems: Controlling Transdermal Permeation Rates with Multiple Active Pharmaceutical Ingredients. *AAPS PharmSciTech*. 2020 Jun 4;21:165.
33. Tewes F, Bahamondez-Canas TF, Moraga-Espinoza D, Smyth HD, Watts AB. In vivo Efficacy of a Dry Powder Formulation of Ciprofloxacin-Copper Complex in a Chronic Lung Infection Model of Bioluminescent *Pseudomonas aeruginosa*. *European Journal of Pharmaceutics and Biopharmaceutics*. 2020 May 20.
34. Sahakijpijarn S, Smyth HD, Miller DP, Weers JG. Post-inhalation cough with therapeutic aerosols: Formulation considerations. *Advanced Drug Delivery Reviews*. 2020 May 14.
35. Leal J, Peng X, Liu X, Arasappan D, Wylie DC, Schwartz SH, Fullmer JJ, McWilliams BC, Smyth HD, Ghosh D. Peptides as surface coatings of nanoparticles that penetrate human cystic fibrosis sputum and uniformly distribute in vivo following pulmonary delivery. *Journal of Controlled Release*. 2020 Mar 31.
36. Bandara HM, Hewavitharana AK, Shaw PN, Smyth HD, Samaranayake LP. A novel, quorum sensor-infused liposomal drug delivery system suppresses *Candida albicans* biofilms. *International Journal of Pharmaceutics*. 2020 Mar 30;578:119096.

37. Gu J, Clegg JR, Heersema LA, Peppas NA, Smyth HD. Optimization of Cationic Nanogel PEGylation to Achieve Mammalian Cytocompatibility with Limited Loss of Gram-Negative Bactericidal Activity. *Biomacromolecules*. 2020 Mar 24;21(4):1528-38.
38. Zhang X, Yue X, Cui Y, Zhao Z, Huang Y, Cai S, Wang G, Wang W, Hugh S, Pan X, Wu C. A Systematic Safety Evaluation of Nano-porous Mannitol Material as a Dry Powder Inhalation Carrier System. *Journal of Pharmaceutical Sciences*. 2020 Jan 24.
39. Jasmim Leal, Tony Dong, Feng Gao, Melissa Soto, Hugh D.C. Smyth, Debadyuti Ghosh, M13 phage display to identify a permeating peptide against hyperconcentrated mucin, *bioRxiv* 659573; doi: <https://doi.org/10.1101/659573> (Pre-print)
40. **Smyth HD**, Koleng J, Brunaugh AD. Inhaled Delivery of Clofazimine – A High Efficiency, Flow Independent, Cellular-Targeted System for Mycobacterial Infections Respiratory Drug Delivery 2020. Volume 1, 2020: 35-46
41. Jasmim Leal, Xinquan Liu, Xiujuan Peng, Rashmi P. Mohanty, Dhivya Arasappan, Dennis Wylie, Sarah H. Schwartz, Jason J. Fullmer, Bennie C. McWilliams, Hugh D. C. Smyth, Debadyuti Ghosh, A combinatorial biomolecular strategy to identify peptides for improved transport across the sputum of cystic fibrosis patients and the underlying epithelia, *bioRxiv* 659540; doi: <https://doi.org/10.1101/659540> (Pre-print)
42. AD Brunaugh, T Wu, SR Kanapuram, HDC Smyth, Effect of Particle Formation Process on Characteristics and Aerosol Performance of Respirable Protein Powders, *Molecular Pharmaceutics* (2019) 16(10) p 4165-4180
43. Patricia P. Martins, Hugh D.C. Smyth, Zhengrong Cui, Strategies to facilitate or block nose-to-brain drug delivery, *International Journal of Pharmaceutics*, Volume 570, 2019, 118635, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2019.118635>.
44. Kuehl, P.J., Smyth, H.D., Stein, S.W. et al. *In Memoriam: Dr. Paul B. Myrdal*
AAPS PharmSciTech (2019) 20: 211. <https://doi.org/10.1208/s12249-019-1430-z>
45. Tewes, F., Bahamondez-Canas, T.F. & Smyth, H.D.C. Efficacy of Ciprofloxacin and Its Copper Complex against *Pseudomonas aeruginosa* Biofilms, *AAPS PharmSciTech* (2019) 20: 205. <https://doi.org/10.1208/s12249-019-1417-9>
46. Patricia P. Martins, Arnold D. Estrada, Hugh D.C. Smyth, A human skin high-throughput formulation screening method using a model hydrophilic drug, *International Journal of Pharmaceutics*, Volume 565, 2019, Pages 557-568, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2019.05.044>.

47. Bahamondez-Canas, T.F.; Heersema, L.A.; Smyth, H.D.C. Current Status of In Vitro Models and Assays for Susceptibility Testing for Wound Biofilm Infections. *Biomedicines* **2019**, *7*, 34.
48. Heersema, L.A.; Smyth, H.D.C. A Multispecies Biofilm In Vitro Screening Model of Dental Caries for High-Throughput Susceptibility Testing. *High-Throughput* **2019**, *8*, 14.
49. Mohadeseh Hashemi, Javad Mohammadi, Meisam Omid, Hugh D.C. Smyth, Bharadwaj Muralidharan, Thomas E. Milner, Amir Yadegari, Davoud Ahmadvand, Mohammad Shalbaf, Lobat Tayebi, Self-assembling of graphene oxide on carbon quantum dot loaded liposomes, *Materials Science and Engineering: C*, Volume 103, 2019, 109860, ISSN 0928-4931, <https://doi.org/10.1016/j.msec.2019.109860>.
50. Moon C, Smyth HDC, Watts AB, Williams RO 3rd. Delivery Technologies for Orally Inhaled Products: an Update. *AAPS PharmSciTech*. 2019 Feb 19;20(3):117. Doi:10.1208/s12249-019-1314-2. PubMed PMID: 30783904.
51. Brunaugh A, Smyth HDC. Process optimization and particle engineering of micronized drug powders via milling. *Drug Deliv Transl Res*. 2018 Dec;8(6):1740-1750. Doi: 10.1007/s13346-017-0444-x. Review. PubMed PMID: 29134556.
52. Nazareth Eliana Ceschan, Verónica Bucalá, Melina Valeria Mateos, Hugh David Charles Smyth, María Verónica Ramírez-Rigo, Carrier free indomethacin microparticles for dry powder inhalation, *International Journal of Pharmaceutics*, Volume 549, Issues 1–2, 2018, Pages 169-178, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2018.07.065>.
53. Silvia Ferrati, Tian Wu, Sekhar R. Kanapuram, Hugh D.C. Smyth, Dosing considerations for inhaled biologics, *International Journal of Pharmaceutics*, Volume 549, Issues 1–2, 2018, Pages 58-66, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2018.07.054>.
54. Jasmim Leal, Tony Dong, Amber Taylor, Emily Siegrist, Feng Gao, Hugh D.C. Smyth, Debadyuti Ghosh, Mucus-penetrating phage-displayed peptides for improved transport across a mucus-like model, *International Journal of Pharmaceutics*, Volume 553, Issues 1–2, 2018, Pages 57-64, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2018.09.055>.
55. Hairui Zhang, Tania F. Bahamondez-Canas, Yajie Zhang, Jasmim Leal, and Hugh D.C. Smyth PEGylated Chitosan for Nonviral Aerosol and Mucosal Delivery of the CRISPR/Cas9 System in Vitro, *Molecular Pharmaceutics Article ASAP*, DOI: 10.1021/acs.molpharmaceut.8b00434
56. Moraga-Espinoza, D.F., Eshaghian, E., Shaver, A, Hugh D. C. Smyth, Effect of Inhalation Flow Rate on Mass-Based Plume Geometry of Commercially Available Suspension pMDIs *AAPS J* (2018) 20: 84. <https://doi.org/10.1208/s12248-018-0241-6>

57. Mohadeseh Hashemi; Bharadwaj Muralidharan; Meisam Omid; Javad Mohammadi; Yahya Sefidbakht; Eun Song Kim; Hugh D. C. Smyth; Mohammad Shalbaf; Thomas E. Milner, Effect of size and chemical composition of graphene oxide nanoparticles on optical absorption cross-section, *J. of Biomedical Optics*, 23(8), 085007 (2018).
<https://doi.org/10.1117/1.JBO.23.8.085007>

58. Brunaugh AD, Smyth HDC. Formulation techniques for high dose dry powders. *Int J Pharm.* 2018, 17;547(1-2):489-498. Doi: 10.1016/j.ijpharm.2018.05.036.

***Associate Professor with Tenure at The University of Texas at Austin
(2011 – Aug 2018)***

59. Herpin MJ, Ebi D, Clemens NT, Smyth HDC. Production and characterization of drug-loaded toroidal vortices from a novel ocular drug delivery device. *Drug Deliv Transl Res.* 2018 Jul 2. Doi: 10.1007/s13346-018-0553-1.
60. Moraga-Espinoza D, Warnken Z, Moore A, Williams RO 3rd, D C Smyth H. An Modified USP Induction Port To Characterize Nasal Spray Plume Geometry And Predict Turbinate Deposition Under Flow. *Int J Pharm.* 2018 Jun 27. Pii:nS0378-5173(18)30458-7. Doi: 10.1016/j.ijpharm.2018.06.058.
61. Takabe H, Warnken ZN, Zhang Y, Davis DA, Smyth HDC, Kuhn JG, Weitman S, Williams Iii RO. A Repurposed Drug for Brain Cancer: Enhanced Atovaquone Amorphous Solid Dispersion by Combining a Spontaneously Emulsifying Component with a Polymer Carrier. *Pharmaceutics.* 2018 May 19;10(2). Pii: E60. Doi:10.3390/pharmaceutics10020060
62. Tania F. Bahamondez-Canas, Silvia Ferrati, Daniel F. Moraga-Espinoza, Hugh D.C. Smyth, Development, characterization, and in vitro testing of co-delivered antimicrobial dry powder formulation for the treatment of *Pseudomonas aeruginosa* biofilms, *Journal of Pharmaceutical Sciences* , Accepted 2018
63. Xu Liu, Mingshuang Li, Hugh Smyth, Feng Zhang, Otic Drug Delivery Systems: Formulation Principles and Recent Developments, *Drug development and industrial pharmacy*, Accepted 2018
64. Daniel Moraga-Espinoza, Eli Eshaghian, Hugh D.C. Smyth, Mass Median Plume Angle: A novel approach to characterize plume geometry in solution based pMDIs, *International Journal of Pharmaceutics*, Volume 543, Issues 1–2, 2018, Pages 376-385,
65. Tania F. Bahamondez-Canas, Hairui Zhang, Frederic Tewes, Jasmim Leal, and Hugh D.C. Smyth *Molecular Pharmaceutics*, PEGylation of Tobramycin Improves Mucus Penetration and Antimicrobial Activity against *Pseudomonas aeruginosa* Biofilms in Vitro, Article ASAP, DOI: 10.1021/acs.molpharmaceut.8b00011

66. Zachary N. Warnken, Hugh D.C. Smyth, Daniel A. Davis, Steve Weitman, John G. Kuhn, and Robert O. Williams, III, Personalized Medicine in Nasal Delivery: The Use of Patient-Specific Administration Parameters To Improve Nasal Drug Targeting Using 3D-Printed Nasal Replica Casts *Molecular Pharmaceutics* Article ASAP DOI: 10.1021/acs.molpharmaceut.7b00702
67. Ferrati, S., Wu, T., Fuentes, O., Brunaugh AD., Kanapuram SR., Smyth, HDC., Influence of Formulation Factors on the Aerosol Performance and Stability of Lysozyme Powders: a Systematic Approach, AAPS PharmSciTech (2018). <https://doi.org/10.1208/s12249-018-0980-9>
68. Bahamondez-Canas T. and **Smyth HDC**. Influence of excipients on the antimicrobial activity of tobramycin against *Pseudomonas aeruginosa* biofilms. *Pharmaceutical Research*. Accepted (Manuscript ID: PHAM-D-17-00484)
69. Herpin, M.J. & Smyth, H.D.C. Super-heated aqueous particle engineering (SHAPE): a novel method for the micronization of poorly water soluble drugs, *Journal of Pharmaceutical Investigation* (2017). <https://doi.org/10.1007/s40005-017-0368-y>
70. Brunaugh, A. & Smyth, H.D.C., Process optimization and particle engineering of micronized drug powders via milling *Drug Deliv. And Transl. Res.* (2017). <https://doi.org/10.1007/s13346-017-0444-x>
71. Smyth Hugh D., Colthorpe Paul, George Maureen, Jansen Paul, Fuglsang Anders, Armstrong Katherine E., and Lyapustina Svetlana., Highlights from the 2017 IPAC-RS/ISAM Joint Workshop “New Frontiers in Inhalation Technology” *Journal of Aerosol Medicine and Pulmonary Drug Delivery*. November 2017, ahead of print. <https://doi.org/10.1089/jamp.2017.1425>
72. Mohadeseh Hashemi; Meisam Omid; Bharadwaj Muralidharan; Lobat Tayebi ; Matt Herpin; Mohammad Ali Mohagheghi ; Hugh D Smyth ; Thomas E Milner, Javad Mohammadi, Layer-by-layer assembly of graphene oxide on thermosensitive liposomes for photo-chemotherapy, *Acta Biomaterialia*, Accepted.
73. Mohadeseh Hashemi, Meisam Omid, Bharadwaj Muralidharan, Hugh Smyth, Mohammad A. Mohagheghi, Javad Mohammadi, and Thomas E. Milner, Evaluation of the Photothermal Properties of a Reduced Graphene Oxide/Arginine Nanostructure for Near-Infrared Absorption, *ACS Applied Materials & Interfaces* **2017** 9 (38), 32607-32620 DOI: 10.1021/acsami.7b11291
74. Ashlee D. Brunaugh, Syed Umer Jan, Silvia Ferrati, and Hugh D. C. Smyth, Excipient-Free Pulmonary Delivery and Macrophage Targeting of Clofazimine via Air Jet Micronization, *Molecular Pharmaceutics*, DOI: 10.1021/acs.molpharmaceut.7b00690

75. Jasmim Leal, Hugh D.C. Smyth, Debadyuti Ghosh, Physicochemical properties of mucus and their impact on transmucosal drug delivery, In International Journal of Pharmaceutics, Volume 532, Issue 1, 2017, Pages 555-572, ISSN 0378-5173, <https://doi.org/10.1016/j.ijpharm.2017.09.018>.
76. Gadok A., Zhao C., Meriwether A., Rowley T. G., Ferrati S., **Smyth H. D. C.**, Stachowiak J*. Display of Single-Domain Antibodies on the Surfaces of Connectosomes Promotes Efficient and Specific Drug Delivery Through Gap Junctions, *Biochemistry* 2017, Accepted (Manuscript ID: bi-2017-00688n).
77. Ferrati S, Gadok AK, Brunaugh AD, Zhao C, Heersema LA, **Smyth HD**, Stachowiak JC*. Connexin membrane materials as potent inhibitors of breast cancer cell migration. *J R Soc Interface*. 2017 Aug; 14 (133).
78. Herpin J. M., **Smyth HD***. Precision Ocular Drug Delivery via Aerosol Ring Vortices. *Pharm. Res.* 2017 Aug 7
79. Javier O. Morales*, Kristin R. Fathe, Ashlee Brunaugh, Silvia Ferrati, Song Li, Miguel Montenegro-Nicolini, Jason T. McConville, Mark R. Prausnitz, **Hugh D.C. Smyth***. Challenges and Future Prospects for the Delivery of Biologics: Oral Mucosal, Pulmonary, and Transdermal Routes, *AAPS Journal*, Accepted.
80. Yin* J, Bovet J, **Smyth HD**, Clark AR, Hannon J, An Add-on to a Dry Powder Inhaler Device that Can Improve Dose Delivery to the Lungs, *RDD Europe* 2017. Volume 2, 2017: 185-188.
81. Xin Hua, Wanjiang Zhang, Zhimin Dong, Jiashuo Zhang, Shengnan Tan & **Hugh Smyth*** Magnetically Triggered Drug Release from Nanoparticles and Its Applications in Anti-Tumor Treatment, *Drug Delivery*, Accepted, DOI:10.1080/10717544.2016.1256001
82. Gema Alas ; Ronald E. Pagano ; Jane Q. Nguyen ; H. M. H. Nihal Bandara ; Sergei A. Ivanov ; Gennady A. Smolyakov ; Dale L. Huber ; **Hugh D. C. Smyth** ; Marek Osiński*; Effects of iron-oxide nanoparticles and magnetic fields on oral biofilms. *Proc. SPIE* 10078, Colloidal Nanoparticles for Biomedical Applications XII, 1007806 (February 22, 2017); doi:10.1117/12.2256221.
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(2011 – Present)**

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**Assistant Professor at The University of New Mexico
(2005-2009)**

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POSTER PRESENTATIONS IN PROFESSIONAL SCIENTIFIC MEETINGS, SYMPOSIA, AND CONFERENCES

**Professor with Tenure at the University of Texas at Austin
(2018– Present)**

1. Nair VV, Smyth HDC “A High Dose Dry Powder Formulation for an Unstable Antimicrobial Active Pharmaceutical Ingredient” (2022, May 2-3) RDD 2022, Championsgate, Florida
2. Jamie E. Spahn, Amr Hefnawy, Hugh D.C. Smyth, Feng Zhang “A Continuous Process for Blending Dry Powders for Inhalation” Respiratory Drug Delivery (RDD) Conference, May 1-5, Orlando, Florida, 2022
3. Nair VV, Hefnaway A, Herpin MJ, Feng K, Reed N, Ma T, Bielski E, Dhapare S, Newman B, Box S, Smyth HDC “Development of a low volume in vitro dissolution method for assessing variability in fine particle doses of dry powder inhalers.” (2022, October 16-19) AAPS 2022, Boston, MA
4. Ren, A., Spahn, J., Smyth HDC, Zhang F., Continuous Manufacturing of Inhalation Powders: Effects of Processing Parameters 2022, October 16-19) AAPS 2022, Boston, MA
5. Nair VV, Hefnway A, Smyth HDC, Lee J, Feng K, Bielski E, Dhapare S, Newman B, Conti DS, Herpin MJ “In vitro evaluation of Batch-to-Batch variability in Fluticasone Propionate

and Salmeterol Dry Powders for Inhalation” (2021, October 17-20) AAPS 2021, Philadelphia, Pennsylvania

6. Shahzeb Khan, Hajra Afeera, Syed Noor Shah, Hugh Smyth “Engineering of Piroxicam Loaded Polymer Hybrid Microspheres: Development, Characterization and In Vivo Evaluation” American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
7. Clara Luisa Domínguez-Delgado, Braden Siyi Wu, Khavvia Shanmugasundararaj, Hugh Smyth “Effect of PEG 400 and Polyvinyl Alcohol (PVA) on the pH-Sensitive Nanoparticles Formation and Stability” American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
8. Ashlee D. Brunaugh, Tian Wu, Sekhar R. Kanapuram, Hugh D.C. Smyth, “Characterization and Aerosol Performance of Respirable Biologic Protein Powders Produced by Spray Drying or Spray Freeze Drying” American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
9. Li Ding, Ashlee D. Brunaugh, Christian Lee, Qingyan (Jenny) Zhao, Justin Kalafat, Sanjay Powale, Jnanadeva Bhat, Dorene Almeida, Anita Solanki, Hugh DC Smyth, “A study using budesonide formulation for investigating the impact of HPMC inhalation- grade capsules suppliers on aerosol performance”, American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
10. Li Ding, Ashlee D. Brunaugh, Christian Lee, Qingyan (Jenny) Zhao, Justin Kalafat, Sanjay Powale, Jnanadeva Bhat, Dorene Almeida, Anita Solanki, Hugh DC Smyth, “Investigating HPMC inhalation-grade capsule type on aerosol performance of an excipient-free formulation of Rifampicin” American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
11. Daniel Davis, Zachary Warnken, Patricia Martins, Michael Zamloot, Shawn Kucera, Robert Williams, Hugh Smyth, “Matrix Transdermal Patches: Manufacturing When Interchanging Active Pharmaceutical Ingredients”, American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019
12. Yajie Zhang, Hairui Zhang, Hugh Smyth, “Dry Powder Inhalation System for Non-Viral Gene Editing”, American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, Nov 3-6, San Antonio, Texas, 2019

***Associate Professor with Tenure at the University of Texas at Austin
(2011– 2018)***

13. Leal, J., Ghosh, D., **Smyth, H.D.C.** "High-Throughput Next Generation Sequencing Analysis of Phage Libraries". American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, San Diego, CA. 2017, (Accepted).
14. P. P. Martins, T. N. Tarbox, A-S. G. Eklöv, A. B. Watts, J. J. Koleng, R. O. Williams III, **H. D. Smyth** Combination of Kolliphor Cs20 And Kolliphor Rh40 to Improve Retention in the Skin When Compared to Individual Use in a Hydrophilic Gel, American Association of Pharmaceutical Scientists (AAPS) Annual Meeting and Exposition, San Diego, CA. 2017 (Accepted).
15. Bahamondez-Canas T. F., **Smyth H. D.C.**, "Synthesis and Characterization of PEGylated-Tobramycin and Evaluation of its Activity against *P. aeruginosa* Biofilms *in vitro*" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). San Diego, CA, 2017 (Accepted).
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17. D Moraga-Espinoza, E Eshaghian, **H Smyth**, "Investigation of the Influence of Temperature and Formulation on Deposition Patterns from Solution pMDIs using a High-Resolution Induction Port" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). San Diego, CA, 2017 (Accepted).
18. D Moraga-Espinoza, E Eshaghian, **H Smyth**, " Induction port deposition patterns from solution pMDIs" Annual meeting ISAM Santa Fe, NM, 2017.
19. A Brunaugh, SU Jan, **H Smyth** "Aerodynamic performance of milled clofazimine particles for pulmonary delivery" Annual meeting ISAM Santa Fe, NM, 2017.
20. Zhang, Hairui, Ferrati, Silvia, Heersema, Lara, Fathe, Kristin, **Smyth, Hugh**, "Chitosan-Derived Nanoparticle as a Carrier for Non-Viral CRISPR/Cas9 System Delivery" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
21. Ferrati, Silvia, Gadok, Avinash, Heersema, Lara, Brunaugh, Ashlee, **Smyth, Hugh**, Stachowiak, Jeanne, "Delivery of Membrane Protein Connexin to Metastatic Cancer Cells Using Cell-Derived Vesicles" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
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24. Heersema, Lara, **Smyth, Hugh**, "Functionally Engineered and Optimized Iron Oxide Nanoparticles for Treating Biofilms" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
25. Leal, Jasmim, Ghosh, Debadyuti, **Smyth, Hugh**, "Macrorheology Characterization of a Cystic Fibrosis Mucus Model" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
26. Bahamondez-Canas, Tania, Tewes, Frederic, **Smyth, Hugh**, "Modified Microtiter Plate Method for Biofilm Susceptibility Testing" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
27. Brunaugh, Ashlee, Moraga-Espinoza, Daniel, **Smyth, Hugh**, "Optimization of a Novel Active Dry Powder Inhaler" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
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29. Warnken, Zachary, Moraga-Espinoza, Daniel, Williams III, Robert, **Smyth, Hugh**, "Shadow Motion Analysis: Analyzing In Vivo Relevant Foam Stability by Image Analysis" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
30. Ferrati, Silvia, Hoxha, Besmir, Williams III, Robert, van Oort, Eric, **Smyth, Hugh**, "Spray Coating Optimization of Hygroscopic Substrates for Controlled Release" Annual Meeting of the American Association of Pharmaceutical Scientists (AAPS). Denver, CO, 2016.
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33. Ferrati S, Grattoni A, **Smyth HDC**, A Novel Microfluidic Device for Biovesicles Development. Annual Meeting of American Association of Pharmaceutical Sciences, Orlando, FL, USA, October 2015

34. Yazdi AK, **Smyth HDC** (2015) Effect of Capsule Fill Weight on Device Resistance in Dry Powder Inhalers. 2015 RDD Europe, Antibes, France.
35. Ping Du, Ju Du, **Hugh D. C. Smyth**. Evaluation of Granulated Lactose as a Carrier for DPI Formulations: Effect of Drug Loading. Respiratory Drug Delivery, Fajardo, Puerto Rico, 2014.
36. Du, Ping, Du, Ju, **Smyth, Hugh**, Effect of Device Design on Granulated Lactose Based DPI Formulations , Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6041, San Diego, CA, 2014
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38. Herpin, Matthew, **Smyth, Hugh**, Aqueous Based Aerosol Vehicles for Enhanced Ocular Drug Delivery, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: M1113, San Diego, CA, 2014
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40. Du, Ping, Du, Ju, **Smyth, Hugh**, Aerosol Performance of Granulated Lactose with Different Roughness Factors in Ordered Mixtures, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6156, San Antonio, TX, 2013
41. Maloney, Andy, **Smyth, Hugh**, Dynamic Observations and Modeling of Tapped Powders, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6276, San Antonio, TX, 2013
42. Guzman-Villanueva, Diana, El-Sherbiny, Ibrahim, Vlassov, Alexander, **Smyth, Hugh**, Herrera-Ruiz, Dea, Enhanced Nuclease Resistance and Internalization of siRNA Molecules in Lung Cancer Cell Lines Using Chitosan-Derivative Polyplexes, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: W5036, San Antonio, TX, 2013
43. Du, Ping, Du, Ju, **Smyth, Hugh**, Influence of Physical Aging on the Aerosol Performance of Granulated Lactose Based Dry Powder Inhalation Formulations, Annual Meeting of American Association of Pharmaceutical Sciences, San Antonio, TX, 2013

44. Du, Ping, Du, Ju, **Smyth, Hugh**, Manufacture of Engineered Lactose Carrier Particles by Wet Granulation for Inhalation, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6147, San Antonio, TX, 2013
45. Yazdi, Ashkan, Maloney, Roger, Buxton, Oliver, Clemens, Noel, **Smyth, Hugh**, Method for Determining Plume Geometries of Dry Powder Inhalers, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6185, San Antonio, TX, 2013
46. Herpin, Matthew, **Smyth, Hugh**, Non-aqueous Aerosol Deposition for Ocular Drug Delivery, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6124, San Antonio, TX, 2013
47. Du, Ju, Du, Ping, **Smyth, Hugh**, Novel Antibiotic Hydrogel Particles for Controlled Pulmonary Drug Delivery, Annual Meeting of American Association of Pharmaceutical Sciences, Poster Number: R6154, San Antonio, TX, 2013
48. Ibrahim M. El-Sherbiny; **Hugh D. C. Smyth**. Development and in-vitro assessment of non-covalently crosslinked respirable and biodegradable nano-microcarriers for efficient controlled pulmonary drug delivery. The 11th International Conference on Chemistry and its Role in Development, ICCRD-2013; 11-15 March, Mansoura – Sharm El-Sheikh. S8-PP8 (Please see page 14 in the attached Conf Program)
49. Ibrahim M. El-Sherbiny; **Hugh D. C. Smyth**. Novel approach for controlled drug delivery to and through the lung using polymeric nano-in-microparticles as potential carriers. The 11th International Conference on Chemistry and its Role in Development, ICCRD-2013; 11-15 March, Mansoura – Sharm El-Sheikh. S5-OP1
50. Patrick Wayne, Tennille Bernard, Clint Corbin, Garrett Kuehner, Peter Vorobieff, C. Randall Truman, **Hugh Smyth**, Andy Maloney. Shock-driven formation of a cloud from particles swept off a surface, Bulletin of the American Physical Society, 65th Annual Meeting of the APS Division of Fluid Dynamics, Volume 57, Number 17, November 18–20, 2012; San Diego, California
51. J. Du, N. Bandara, H. **Smyth**. A Novel Inhaled Dry Powder Formed via Ionic Binding between Alginate/Oligomer with Antibiotics, M1093, Annual Meeting of American Association of Pharmaceutical Sciences, Chicago, IL, Oct 2012
52. P. Du, R. Williams III, H. **Smyth**, Engineered Lactose with Various Physicochemical Properties by Ultra Rapid Freezing, M1094, Annual Meeting of American Association of Pharmaceutical Sciences, Chicago, IL, Oct 2012

53. M. Herpin, H. **Smyth**, A Novel Ocular Soft Mist Aerosol Device for Tunable Drug Delivery, T3163, Annual Meeting of American Association of Pharmaceutical Sciences, Chicago, IL, Oct 2012
54. P. Du, J. McConville, **H. Smyth**, In Vitro Models with Simulated Tear Flow for Screening Topical Ocular Formulations, W5340, Annual Meeting of American Association of Pharmaceutical Sciences, Chicago, IL, Oct 2012
55. Martin Donovan, Aileen Gibbons, Jacques Pappo, **Hugh D Smyth**, Novel Low Resistance DPI for High Efficiency Delivery in a Broad Range of Drug Classes, Respiratory Drug Delivery 2012 (2012), Vol 3, pp 717-720
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***Assistant Professor at The University of Texas at Austin
(2009 – 2011)***

57. Nicole A Beinborn, Ju Du, **Hugh D C Smyth**, Robert O Williams, Dry Powder Insufflation of Crystalline and Amorphous Voriconazole Formulations Produced by Thin Film Freezing to Mice, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
58. Y Vo, Martín J. Donovan, Stephen R. Marek, and **Hugh D.C. Smyth**, Re-evaluating the Influence of Size and Morphology of DPI Carrier Particle Performance, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
59. Scott Mosley, Ibrahim El-Sherbiny, **Hugh D C Smyth**, In Vitro Assesment Of Cytotoxicity And Activation Of Murine Macrophages After Exposure To Novel Swellable Particles Designed For Controlled Inhalation Therapy, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
60. S.L. McGill & **H.D.C. Smyth**, Tuning Particle Size Distributions in Commercially Available Nebulizers, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
61. Lucy Gong, Shayna McGill, **Hugh Smyth**, Surface Chemistry of Superparamagnetic Iron Oxide Nanoparticles Effects on Delivery Through Models of Cystic Fibrosis Extracellular Barriers, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011

62. Srimahitha Kaliki, Shayna McGill, **Hugh Smyth**, Analysis of Biofilm Mechanics To Predict Drug Transport Using Viscoelasticity, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
63. Diana Guzmán-Villanueva, Kacie Gardella, Ibrahim M. El-Sherbiny, Casey Wright, Dea Herrera-Ruiz, **Hugh Smyth**, Non-Toxic Chitosan Derivatives-Based Carriers for siRNA Delivery in Lung Cancer Cells, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
64. N. Maynard, **H Smyth**, Performance analysis of a novel dry powder delivery system at variable flow rates, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
65. Ju Du, **Hugh D. Smyth**, Intratracheal Administration of Ciprofloxacin – Loaded Swellable Particles for Cystic Fibrosis Treatment, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
66. Martin J. Donovan, Aileen Gibbons, **Hugh D.C. Smyth** and Jacques Pappo, Aerosol Performance of Large Drug-Coated Beads across Multiple Inhalation Flow Rates, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
67. Martin J. Donovan, Aileen Gibbons, **Hugh D.C. Smyth** and Jacques Pappo, Novel Dual-Chamber Dry Powder Inhaler for Combination Therapy, Annual Meeting of American Association of Pharmaceutical Sciences, Washington DC, Nov 2011
68. Osinski M, Vargas J, McGill S, **Smyth H**, Multifunctional Nanoparticles for Lung Delivery of Drugs (**Invited**), Fifth International Conference on Advanced Materials and Nanotechnology, 7th -11th February 2011, Wellington, New Zealand
69. McBride AA, Vargas JM, Menon T, Fichou Y, Akins BA, Smolyakov GA, Adolphi N, **Smyth H**, Osinski M, Synthesis and Characterization of Dimer Fe₃O₄-ZnSe Fluorescent Magnetic Nanoparticles, 55th Conference on Magnetism and Magnetic Materials 14 -18 Nov 2010; Atlanta, GA
70. Maynard NJ, **Smyth HDC**, Characterization of an Active Dry Powder Pulmonary Delivery System Modeling Ciprofloxacin. Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans LA, Nov 2010
71. Marek SR, Donovan MJ, **Smyth HDC**, Influence of Powder History on the Bulk-Flow Properties and In Vitro Dispersion Performance of Dry Powder Formulations for Inhalation Therapy. Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans, LA, Nov 2010

72. McGill S, Adolphi NL, Osinski M, **Smyth HDC**, Magnetically Driven Superparamagnetic Iron Oxide Nanoparticles for Drug Delivery Through Biological Barriers. International Pharmaceutical Federation Pharmaceutical Sciences World Congress/Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans LA, Nov 2010
73. Hunter Z, **Smyth HDC**, Durfee P Chackerian B Comparison of antibody responses induced by a virus-like particle-based vaccine upon intramuscular, pulmonary, and vaginal delivery, The Journal of Immunology, 2010, 184, 48.14
74. El-Sherbiny IM, **Smyth HDC**, PLGA nanoparticles encapsulated in respirable/swellable hydrogel microspheres as potential carriers for sustained drug delivery to the lung. Annual Meeting of American Association of Pharmaceutical Scientists, New Orleans, LA, Nov 2010
75. El-Sherbiny IM, **Smyth HDC**, Novel non-covalently crosslinked hydrogel nano-microparticles for inhalation therapy. Annual Meeting of American Association of Pharmaceutical Scientists, New Orleans, LA, Nov 2010
76. El-Sherbiny IM, **Smyth HDC**, Nano-micro carrier systems for sustained pulmonary drug delivery. Biomedical Engineering Society Annual Meeting, Austin, TX, Oct 2010
77. Selvam P, El-Sherbiny IM, **Smyth HDC**, Swellable microparticles for sustained release drug delivery to the lung using propellant driven metered dose inhalers. Biomedical Engineering Society Annual Meeting, Austin, TX, Oct 2010
78. El-Sherbiny IM, **Smyth HDC**, Cryomilled physically crosslinked biodegradable hydrogel microparticles as novel potential carriers for inhalation therapy. Annual Meeting of American Association of Pharmaceutical Scientists, Los Angeles, CA, Nov 8-12 2009 (AM-09-01692) 2009
79. El-Sherbiny IM, **Smyth HDC**, Novel spray dried biodegradable semi-IPN hydrogel microspheres for pulmonary drug delivery. Annual Meeting of American Association of Pharmaceutical Scientists, Los Angeles, CA, Nov 8-12 2009 (AM-09-01708) 2009

***Assistant Professor at The University of New Mexico
(2005-2009)***

80. McGill SL, Adolphi NL, Osinski M, **Smyth H**, Magnetic nanoparticles for enhanced drug delivery through extracellular barriers in cystic fibrosis. International Society of Aerosols in Medicine, Annual Conference, Monterey CA, May 2009 (Invited Talk, Winner of Student Research Award)
81. Cuylear C, McGill S, **Smyth HDC**, Enhanced Cystic Fibrosis Therapeutic Drug Delivery Using Drug Conjugated Spions, ISAM, Monterey CA, May 2009

82. Donovan MJ, **Smyth HDC**, A New Method of Improving Dry Powder Dispersion using Large Carrier Particles, Respiratory Drug Delivery Europe 2009, Lisbon, Portugal **Invited**
83. McGill SL, Cuylear CL, Adolphi NL, Osinski M, **Smyth HDC**, Enhanced drug transport through alginate biofilms using magnetic nanoparticles. SPIE Photonics West, San Jose CA, Jan 2009, Invited
84. Donovan MJ, **Smyth HDC**, Prediction of DPI Formulation Performance Using a Physical Model of Particle Adhesion and Detachment. Annual Meeting of American Association of Pharmaceutical Sciences, Atlanta GA, Nov 2008
85. McGill S, Osinski M, **Smyth H**, Active Nanoparticles for Controlled Drug Delivery in Lung Diseases, Controlled Release Society Annual Meeting, 2008, New York, NY
86. Cuylear C, McGill S, **Smyth H** A novel approach to Cystic Fibrosis therapeutic drug delivery using drug conjugated superparamagnetic iron oxide nanoparticles, Society for Advancement of Chicanos and Native Americans in Science, 2008
87. Donovan M J, McGill S, **Smyth H**, Swellable Particles for Sustained Release Drug Delivery to the Lung, Dalby RN, Byron PR, Peart J, Young P and Suman, JD (eds), Respiratory Drug Delivery 2008, Davis Healthcare, River Grove, Illinois
88. Hunter Z, **Smyth H**, Chackerian B, Immune Responses to an Inhaled Virus-Like Nanoparticle Vaccine Dalby RN, Byron PR, Peart J, Young P and Suman, JD (eds), Respiratory Drug Delivery 2008, Davis Healthcare, River Grove, Illinois
89. McGill S, Osinski M, **Smyth H**, Enhanced Nanoparticle Transport through Models of Cystic Fibrosis Lung Disease Dalby RN, Byron PR, Peart J, Young P and Suman, JD (eds) Respiratory Drug Delivery 2008, Davis Healthcare, River Grove, Illinois
90. **Smyth H**, Isaacs K, Martonen T, Hickey A, In Silico Predictions of Lung Deposition for Solution HFA 134a pMDIs with Spacers Dalby RN, Byron PR, Peart J, Young P and Suman JD (eds), Respiratory Drug Delivery 2008, Davis Healthcare, River Grove, Illinois
91. **Smyth H**, Gallegos M, Truman C R, A Novel Mechanism of Dry Powder Inhaler Dispersion: Optimizing Flow-Induced Flutter Dalby RN, Byron PR, Peart J, Young P and Suman, JD (eds), Respiratory Drug Delivery 2008, Davis Healthcare, River Grove, Illinois
92. C R Truman, M Gallegos, **H Smyth**, Flow-induced flutter of thin elastic films, 60th Annual Meeting of the Division of Fluid Dynamics, American Physical Society, November 18–20, 2007; Salt Lake City, Utah

93. IY Saleem, H Liu, **H Smyth**, Permeability of anticancer agents through airway epithelia, Annual Meeting of American Association of Pharmaceutical Sciences, San Diego, CA, Nov 2007
94. Donovan M J, McGill S, Saleem I, Liu H, **Smyth H**, Microsystems and Nanoparticles for Controlled Aerosol Drug Delivery of Chemotherapeutics to the Lung, Second Annual NCI Nanotechnology Alliance Investigators Meeting, October 16-18, 2007, Chapel Hill, North Carolina
95. Donovan, M J, McGill S, **Smyth H**, Dual-Action Hydrogels for Enhanced Aerosolized Drug Delivery in Cystic Fibrosis, NSF IGERT Conference, Washington DC, May 2007
96. Saleem I, **Smyth H**, Chemosensitization of Multi-Drug Resistant Human Small Cell Lung Cancer Cells to Doxorubicin, Proceedings of the Controlled Release Society Annual Meeting, July 2007
97. Saleem I, **Smyth H**, Optimization of Jet Milling Conditions for Particle Size Reduction of Soft Materials, Proceedings of the Controlled Release Society Annual Meeting, July 2007
98. Donovan M J, McGill S, **Smyth HDC**, Particles For Enhanced Aerosol Drug Delivery In Cystic Fibrosis, Proceedings of the Controlled Release Society Annual Meeting, July 2007
99. Saleem I, **Smyth H**, Predicting the dispersion performance of dry powder inhalers from blending studies using budesonide as model drug, Annual Meeting of American Association of Pharmaceutical Sciences, San Antonio, TX, Oct 2006,
100. Saleem I, **Smyth H**, Modulation of Dry Powder Inhaler Performance by Controlling Micronized Drug Particle Size Distributions. Annual Meeting of American Association of Pharmaceutical Sciences, San Antonio, TX, Oct 2006
101. Saleem I, **Smyth H**, Prediction of dry powder dispersion performance from blending studies. British Pharmaceutical Conference: Manchester 4-6 September 2006
102. Mitran S, **Smyth H**, Hickey A, Acoustic modulation of pharmaceutical sprays, American Physical Society, Annual March Meeting 2006

Research Assistant Professor at The University of North Carolina at Chapel Hill (2004-2005)

103. Lu D, Cooney DJ, Cryan S, **Smyth HDC**, Garcia-Contreras L, Kazantseva M, Garmise RJ, Hickey AJ, Dry Powder Liposomes for Protein Delivery to the Lungs, Annual Meeting of American Association of Pharmaceutical Sciences, Baltimore, MD, Nov 2004

***Post-Doctoral Fellow at University of North Carolina at Chapel Hill
(2001-2003)***

104. **Smyth HDC**, Hickey AJ, Mechanisms of Multi-modal Particle Size Distributions Emitted from HFA 134a pMDIs, 14th Congress International Society for Aerosols in Medicine, Baltimore, MD, June 2003
105. **Smyth HDC**, Garcia-Contreras L, Kazantseva M, Hickey AJ, Particle Sizing Inhalation Aerosols: the need for complementary methods, AAPS Workshop on Particle Size Analysis, Arlington, Va., April 2003
106. **Smyth HDC**, Gallion JA, Grove JA, Brace G, Hickey AJ, Correlation of spray patterns with droplet size for pressurized metered dose inhalers, Annual Meeting of American Association of Pharmaceutical Sciences, Toronto, Canada, Nov 2002
107. **Smyth HDC**, Mejia-Millan EA, Williams DM Zeman KL, Bennett WD, Hickey AJ, The Effect of Formulation Variables on Lung Deposition: Labeling of pMDI Solutions. Annual Meeting of American Association of Pharmaceutical Sciences, Toronto, Canada, Nov 2002
108. **Smyth HDC***, Hickey AJ, Dynamic Particle Size Distributions Emitted from pMDIs as Determined by Laser Diffraction: A Function of Time and Space, Respiratory Drug Delivery VIII Volume II, Editors: Richard N Dalby, Peter R Byron, Joanne Peart and Stephen J Farr p727 – 730, 2002
109. **Smyth HDC***, Hickey AJ, Comparative Particle Size Analysis of Solution Propellant Driven Metered Dose Inhalers Using Cascade Impaction and Laser Diffraction, Respiratory Drug Delivery VIII Volume II, Editors: Richard N Dalby, Peter R Byron, Joanne Peart and Stephen J Farr p731 – 734, 2002
110. **Smyth HDC***, Mejia-Millan, EA, Hickey AJ, The Effect of Ethanol on Solvency, Vapor Pressure, and Emitted Droplet Size of Solution Metered Dose Inhalers Containing HFA 134a, Respiratory Drug Delivery VIII Volume II, Editors: Richard N Dalby, Peter R Byron, Joanne Peart and Stephen J Farr p735 – 738, 2002
111. **Smyth HDC***, Mehta SC, Becket GB, The Relationship Between Electroosmotic Flow And Electrical Potential Difference In The Human Epidermal Membrane. 4th Annual Conference on Formulation and Delivery of Bioactive, New Zealand Chapter- Controlled Release Society 15-16 February 2001, Dunedin, NZ

***Graduate Student at University of Otago, Dunedin, New Zealand
(1998-2000)***

112. **Smyth HDC**, Mehta SC, Becket G, The Relationship Between Electroosmotic Flow And Electrical Potential Difference In The Human Epidermal Membrane. Perspectives In Percutaneous Penetration, Volume 7b (Eds. KR Brain and KA Walters) 2000 Invited Talk

113. **Smyth HDC**, Mehta SC, Becket G, Electrically Assisted Delivery of Proteins and Peptides Across The Skin. Formulation And Drug Delivery Conference, 3rd Annual Conference, Dunedin, New Zealand, February 2000
114. **Smyth HDC**, Mehta SC, Becket GB, Effect of Permeation Enhancer Pretreatment on the Iontophoresis of Luteinizing Hormone Releasing Hormone (LHRH) Through Human Epidermal Membrane. Fourteenth Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans, LA, Nov 1999
115. **Smyth HDC**, Mehta SC, Becket GB, The Effect of Voltage on the Flux Enhancement of Different Molecular Weight Solutes Through Human Epidermal Membrane (HEM). Fourteenth Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans, LA, Nov 1999

INVITED ORAL PRESENTATIONS (in reverse order)

Professor with Tenure at The University of Texas at Austin (2018-Present)

1. **Smyth, HDC**, “Overcoming Barriers To Inhaled Nucleic Acid Delivery” The University of Michigan, College of Pharmacy, March 9th, 2022, Ann Arbor, MI
2. **Smyth, HDC**, “Development of an Aerosolized Antiviral Therapy for Coronavirus Infections during the Pandemic.”, EPSRC Centre for Doctoral Training in Aerosol Science, University of Bristol, UK, The Aerosol Society, Thursday 9th December 2021.
3. **Smyth, HDC**, KEYNOTE talk: “Rapid Development of an Inhaled Antiviral Therapy Against Coronavirus” Inhalation Drug Delivery Virtual Summit 2021, December 7-8, 2021
4. **Smyth, HDC**, Panelist, “Non-invasive Delivery of Biologics: Potential for Pulmonary and Nasal Administration”, PODD: Partnerships in Drug Delivery, October 24-25, 2021 Boston, MA
5. **Smyth, HDC**, Panelist, Preclinical Tools, NIH Virtual SARS-CoV-2 Antiviral Therapeutics Summit, Friday, November 6, 2020, Invited
6. **Smyth, HDC**, “Important development considerations in the delivery of nucleic acids and proteins to the respiratory tract” Annual Meeting of American Association of Pharmaceutical Sciences, New Orleans/Virtual Conference, October 26- November 5, 2020, Invited.
7. **Smyth, HDC**, “Drug, Device and Formulation Considerations for Pulmonary Drug Delivery” Annual Meeting of American Association of Pharmaceutical Sciences, AAPS360, San Antonio, 2019, Invited

8. **Smyth HD**, Koleng J, Brunaugh AD. Inhaled Delivery of Clofazimine – A High Efficiency, Flow Independent, Cellular-Targeted System for Mycobacterial Infections Respiratory Drug Delivery April 2020. Virtual. Invited.
9. **Smyth HDC**, “Starting a company from university science” Universidad de Valparaíso, August 2020, Invited. Virtual.
10. **Smyth, HDC**, “ Drug, Device and Formulation Considerations for Pulmonary Drug Delivery” Annual Meeting of American Association of Pharmaceutical Sciences, San Antonio, TX, 2019, Invited.
11. **Smyth, HDC** “What’s Trending in Dry Powder Inhalers?” Invited presentation at InspireMe conference, San Francisco, CA, June 4-5, 2019
12. **Smyth, HDC** “Delivery Challenges for Lung Infections: Inhaling Drugs and Unveiling Bugs” Inhalation Drug Delivery Systems 2019, Ensuring Quality, Safety and Regulatory Compliance for Inhalation Drug Delivery Systems , May 28–29, 2019, Boston, MA
13. **Smyth HDC.**, “Engineering devices and designing carriers for drug delivery” Distinguish Faculty Presentation, University of Texas College of Pharmacy Celebrating Research Excellence Day, 2019, Invited.
14. **Smyth HDC** “Improving Drug and Gene Transport Through Biological Barriers” 2018 Chinese Pharmaceutical Conference, Invited, November, 2018, Guangzhou, China.
15. **Smyth HDC** “Designing Devices and Molecules for Drug Delivery” University of Kansas, Department of Pharmaceutical Chemistry, Invited, 2018, Lawrence, Kansas.
16. **Smyth, HDC** “Alternative Delivery Routes for Peptides” Exploring the Next Frontier in Diabetes Pharmacology, Annual Meeting of the American Diabetes Association, June 23, 2018, Invited
17. **Smyth HDC** “Challenges in Quantification of Orally Inhaled Products” National Institute for Pharmaceutical Technology and Education, Annual Meeting, Long Island University, Thursday, August 26, 2018, Invited.
18. **Smyth HDC** “Mechanisms of dry powder inhaler dispersion and novel devices” Siminhale Workshop (European Consortium), Belgrade, Serbia, February 26-27, 2018

***Associate Professor with Tenure at The University of Texas at Austin
(2011 – 2018)***

19. **Smyth, HDC** “Workshop on inhalation product development” Genentech, San Francisco, CA, Invited 2017.
20. **Smyth, HDC**, “Science, Clinical Applications, and Benefits of Gene Editing Technologies” Annual Meeting of American Association of Pharmaceutical Sciences, San Diego, CA, 2017, Invited.
21. **Smyth, HDC**, Moon, C., Williams RO III, “New delivery technologies for orally inhaled products (OIPs)”, International Society of Aerosols in Medicine, 2017 Congress, Santa Fe, NM, 3rd – 7th June 2017, Invited.
22. **Smyth, HDC** “Amorphous or Crystalline? Evaluating Particle Engineering Approaches for Inhalation Products” Respiratory Drug Delivery, Asia. Goa, India, November 8-11, 2016. Invited.
23. **Smyth, HDC** “Biophysical Barriers in Respiratory Drug Delivery” at Mechanisms and Barriers in Nanomedicine Workshop, Breckenridge, Colorado. July 16, 2016, Invited.
24. **Smyth, HDC** “Chitosan-Derived Nanoparticle-Mediated CRISPR/Cas9 Delivery” at Cystic Fibrosis Foundation conference: New Technologies Advancing Toward a One-Time Cure. Savannah, GA from June 26 – 30, 2016. Invited.
25. James Hannon, Martin Donovan, Aileen Gibbons, Zhen Xu, Robert Curtis, **Hugh Smyth**, and Andy Clark, “Novel High Efficiency Inhaler for PDE5i Lung Delivery” Respiratory Drug Delivery 2016, Scottsdale, Arizona. Invited.
26. **Smyth, HDC** “Engineering Drug Delivery Systems” Department of Cell Biology and Immunology, UNT Health Science Center, University of North Texas, Fort Worth, Texas, December 10 2015. Invited.
27. **Smyth, HDC** “Engineering Devices and Molecules for Pulmonary Drug Delivery” Texas Tech University, November 2015. Invited
28. **Smyth, HDC**, “Challenges and Future Prospects for pulmonary delivery of Biologics” Annual Meeting of American Association of Pharmaceutical Sciences, Orlando, FL, 2015
29. Smyth, HDC, Invited Plenary Speaker, International Symposium for Graduate Students in Pharmaceutical Sciences, Guangzhou, China August 2015
30. **Smyth HDC**, Invited 5 Day Workshop on “Pharmaceutical Engineering of Particulate Systems for Inhalation of Bioactive Molecules”, Universidad Nacional del Sur and The National Scientific and Technical Research Council (CONICET) of Argentina. Bahia Blanca, Argentina February 2015, included the following individual presentations:

- a. Macro- and Microstructure of the Airways for Drug Delivery
 - b. Pulmonary Drug Metabolism, Clearance, and Absorption
 - c. Engineering and Physics of Aerosol Drug Delivery to the Lung
 - d. Engineering inhaled Drug Delivery Systems to Overcome Lung Clearance Mechanisms
 - e. Science and Technology of Pressurized Metered Dose Inhalers
 - f. Science and Technology of Dry Powder Inhalers
 - g. Science and Technology of Aqueous Based Aerosols for Lung Delivery
 - h. Particle Engineering Technologies for Pulmonary Drug Delivery
 - i. In vitro performance testing for Pulmonary Drug Delivery
 - j. Future Perspectives
- 31. Smyth, HDC**, “Novel Dry Powder Inhaler Devices”, CFTR gene repair and oligonucleotide delivery workshop Dec. 2 – 3, 2014 Cystic Fibrosis Foundation, Bethesda, MD.
- 32. Smyth, HDC**, “Drug Device Combination Products for Pulmonary Drug Delivery”, Part of Mini-Symposium on Combination Products, Annual Meeting of American Association of Pharmaceutical Sciences, San Diego, TX, 2014
- 33. Smyth, HDC**, “Spindrift Therapeutics”, Venture Expo, Texas Venture Labs, 2014.
- 34. Smyth, HDC**, Achieving controlled pulmonary drug delivery, 19th International Symposium on Microencapsulation, Pamplona, Spain, Sept 9 -11, 2013.
- 35. Smyth HDC**, Covert Operations: Designing Controlled Drug Delivery Systems for Inhalation, Annual Meeting of American Association of Pharmaceutical Sciences, Chicago, IL, Oct 2012
- 36. Smyth HDC**, Excipient Challenges in the Development of Dry Powder Inhalers, AAPS Inhalation and Nasal Technology Focus Group Fall Symposium, Pittsburgh, September 2012.
- 37. Smyth HDC**, Controlling Respiratory Drug Delivery: dispersion, release, and transport, AAPS Inhalation and Nasal Technology Focus Group, Respiratory Drug Delivery 2012, Scottsdale, AZ
- 38. Smyth HDC**, Improvements with Inhalation Devices, 3rd Asthma and COPD Conference, IQPC, October 2011, Philadelphia, PA.
- 39. Smyth HDC**, Drug Delivery to the Lung: Navigating the Obstacle Course, University of Illinois, Chicago, College of Pharmacy, 2011.
- 40. Smyth HDC**, Overcoming Lung Clearance Mechanisms For Controlled Release Pulmonary Drug Delivery, CRS/AAPS Joint Workshop, AAPS Annual Meeting, 2011

Assistant Professor at The University of Texas at Austin

Hugh D C Smyth, Ph.D. Curriculum Vitae

Apotex v. Novo - IPR2024-00631

Petitioner Apotex Exhibit 1506-0041

(2009 – 2011)

- 41. Smyth HDC**, Widening the lens: Re-evaluating the Influence of Size and Shape of lactose carriers on Aerosol Performance of DPIs, Drug Delivery to the Lung 21, 8th – 10th December 2010, Edinburgh International Conference Centre, Edinburgh, Scotland, UK, Invited
- 42. Smyth HDC**, Designing Aerosol Formulations for Asthma and COPD, 2nd Annual Asthma and COPD Conference, June 28-30, 2010, Philadelphia, PA, Invited
- 43. Smyth H**, New Ways of Delivering Drugs to the Lungs University of Texas at Austin, May 2009 Invited
- 44. Smyth HDC**, Donovan M, Selvam P, Singh S, McNair D, Truman R, Tunable Dry Powder Inhalers: Future or Folly, Respiratory Drug Delivery, May 2009, Lisbon, Portugal, Invited
- 45. Smyth HDC**, Formulation Considerations for Sterile Controlled Release Aerosol Products 44th Annual Pharmaceutical Technologies Arden Conference, American Association of Pharmaceutical Scientists, West Point, NY. February 2009 Invited

Before joining The University of Texas at Austin

- 46. Smyth, H**, Gallegos, M, Truman C R, *A Novel Mechanism of Dry Powder Inhaler Dispersion: Optimizing Flow-Induced Flutter*, Respiratory Drug Delivery, Scottsdale, AZ, May 2008 Invited
- 47. Smyth HDC**, Nano/Microsystems for Lung Drug Delivery INCBN IGERT Seminar 24th September, Center for High Technology Materials, Albuquerque, NM, September 2007 Invited
- 48. Smyth HDC**, Sustained Release Pulmonary Drug Delivery Lovelace Respiratory Research Institute, Albuquerque, NM, July 2007 Invited
- 49. Smyth HDC**, Pulmonary Drug Delivery Systems Center for High Technology Materials, Science and Technology Park, Albuquerque, NM, Oct 2006 Invited
- 50. Smyth HDC**, Inhaled Chemotherapy Cancer Research and Treatment Center, UNM, August 2006 Invited
- 51. Smyth HDC**, Sustained Pulmonary Drug Delivery, Drug Delivery Systems, IVT Workshop, San Francisco, September 20-23, 2005 Invited
- 52. Smyth HDC**, Pulmonary Drug Delivery: Alternatives to CFC Metered Dose Inhalers University of New Mexico, Albuquerque, NM, Nov 2004 Invited

53. Smyth HDC, Particle size analysis and the impact this variable has on formulation development and product performance AAPS North Carolina Pharmaceutical Discussion Group (NCPDG), Durham, Nov 2004 Invited

54. Smyth HDC, Lectures on Pharmaceutical Inhalation Aerosol Technology at the PhIAT 2003 course and colloquia, Research Triangle Park, NC September 29-30, 2003 (Metered Dose Inhalers, Physicochemical characterization of aerosols)

55. Smyth HDC, Analytical Techniques for Determining Particle Size for Micronization, Barnett Micronizing and Particle Size Reduction Conference, Philadelphia, June 2003 Invited

56. Smyth HDC, Mehta, SC, Becket, G, Electrically Assisted Delivery of Proteins and Peptides Across The Skin. Formulation And Drug Delivery Conference, 3rd Annual Conference, Dunedin, New Zealand, February 2000 Invited

57. Smyth HDC, Mehta SC, Becket G, The Relationship Between Electroosmotic Flow And Electrical Potential Difference In The Human Epidermal Membrane, Perspectives In Percutaneous Penetration, 7th International Conference, La Grande Motte, France, April 2000, Invited

58. Smyth HDC, Mehta, SC, Becket G, Can We Deliver Proteins and Peptides Across The Skin? GlaxoWellcome Inc, Research Triangle Park, NC, October 1999 Invited

NON PEER REVIEWED PUBLICATIONS

Smyth HDC, Saleem I, Donovan M J, Emerging Carriers For Pulmonary Drug Delivery, Cover Story, American Association of Pharmaceutical Sciences News Magazine, 2006, 9(8) 12-15

Yun M, **Smyth HDC**, Kompella UB, Particle engineering for sustained pulmonary drug delivery, Business Briefing: Drug Delivery 2006

Saleem I, **Smyth HDC**, Carriers in Pulmonary Dry Powder Drug Delivery, in Future Drug Delivery, 2006, Touch Briefings, London, UK

Smyth HDC, Factors Influencing Particle Size Analysis of Micronized Powders, American Pharmaceutical Review, Fall issue, Pages 100-104, 2003

ISSUED PATENTS

1. Methods for increasing wellbore strength. Inventors: Van Oort E, Hoxha BB, Vajargah AK, Williams III RO, Smyth H, Ferrati S, United States patent US 11,008,832. 2021 May 18.
2. Compounds for treating biofilm infection. Inventors: Smyth H, Du J, University of Texas System, assignee. United States patent US 10,967,065. 2021 Apr 6

3. Methods for treatment of pulmonary hypertension. Inventors: Weers J, Romero A, Smyth H, Curtis R, Frost A, Xu Z, Shreeniwas R, Donovan M, inventors; Respira Therapeutics Inc, assignee. United States patent US 10,912,778. 2021 Feb 9.
4. **Methods for fine particle manufacture**, HDC Smyth, M Herpin – US Patent 9,370,514, 2016.
5. **Dry powder inhaler with flutter dispersion member**, Inventors: Hugh D. C. Smyth, Parthiban Selvam, Charles Randall Truman US 9492625 B2, Issued November 15, 2016
6. **Active nanoparticles and method of using**, Inventors:  HD Smyth, M Osinski, SL McGill, US Patent 9,186,317, 2015
7. **Toroidal Pharmaceutical Formulations**, Inventors: Hugh D C Smyth, Matthew Herpin, US Patent 9,119,773B2, Issued Sept 1, 2015.
8. **“Dry Powder Nebulizer”** developed by Hugh Smyth and Nicola Jeanne Maynard. U.S. Patent No.9,078,985 issued on July 14, 2015. U.S. Patent No. 9,731,088 issued on August 15, 2017. Licensed by Nob Hill Therapeutics.
9. **Coated filament for evaporation/condensation aerosol generation of therapeutic agents and methods for using**, Inventors: Hickey, Anthony J., Smyth, Hugh D. C., United States Patent 8165460 Issued, April 24, 2012
10. **“Methods to Dose and Coat Inhalation Powders Onto Surfaces”** developed by Hugh Smyth and Martin Joseph Donovan. U.S. Patent No. 8,962,063 issued on February 24, 2015.
11. **Aerosol-Mediated Particle Synthesis**, Inventors: Hugh D C Smyth and Ibrahim M. El-Sherbiny US Patent 8,652,366B2, Issued 2014
12. **Bead-containing dry powder inhaler**. Martin J. Donovan, Jacques Pappo, Hugh Smyth, US 8651104 B2 Issued Feb 18 2014.
13. **Apparatuses and methods for microparticle dry coating of surfaces**, Martin Donovan, Parthiban Selvam, Hugh D C Smyth, United States Patent 8715770 Issued May 6, 2014.
14. Swellable particles for drug delivery, Inventors: Hugh D. Smyth, Martin J. Donovan, United States Patent 8440231, Issued May 14, 2013.
15. **Dry powder inhaler**, Inventors: Martin J. Donovan, Jacques Pappo, Hugh Smyth, United States Patent 8561609. Issued Oct 22, 2013

16. Swellable particles for drug delivery, Inventors: Hugh D. Smyth, Martin J. Donovan, United States Patent 8257685 Issued September 4, 2012
17. **Dry powder aerosol generator**, Inventors: Hickey, Anthony J., Smyth, Hugh D. C., Telko, Martin J. United States Patent 8205612, Issued, June 26, 2012.
18. **Methods of acoustic measurement and control of pharmaceutical sprays, Inventors:** Hickey, Anthony J., Smyth, Hugh D. C., Mitran, Sorin, United States Patent 8156829, Issued April 24, 2012
19. **Dry powder inhaler with aeroelastic dispersion mechanism** developed by Hugh Smyth and Charles Randall Truman. U.S. Patent No. 8,127,763 issued on March 6, 2012. Chinese National Application No.200780015893.5 filed on November 3, 2008. Hong Kong National Application No. 9110550.2 filed on November 12, 2009. (Licensed to Cerner Corp)

PUBLISHED PATENT APPLICATIONS

1. Weers J, Romero A, Smyth H, Curtis R, Frost A, Xu Z, Shreeniwas R, Donovan M, inventors; RESPIRA THERAPEUTICS Inc, assignee. Methods and compositions for treatment of pulmonary hypertension and other lung disorders. United States patent application US 17/146,173. 2021 Jul
2. Van Oort E, Hoxha BB, Vajargah AK, Williams III RO, Smyth H, Ferrati S, inventors; University of Texas System, assignee. Methods for increasing wellbore strength. United States patent application US 17/005,583. 2021 Apr 22.
3. Smyth H, MARTINS PP, inventors; University of Texas System, assignee. Methods and apparatus for high-throughput screening for testing permeability and retention of compounds across biological barriers. United States patent application US 17/015,293. 2021 Mar 11.
4. Maynard NJ, Smyth HD, inventors; STC UNM, assignee. Dry powder nebulizer. United States patent application US 16/892,900. 2020 Nov 26.
5. **Compounds For Treating Biofilm Infection**, Developed by: Hugh D Smyth, Ju Du – United States Patent Application 20170143842
6. **Plasma membrane vesicles comprising functional transmembrane proteins**, Jeanne Stachowiak, Hugh Smyth, Avinash Kaur Gadok, Silvia Ferrati, Chi Zhou, US 20170112773 A1, Publication Date April 27, 2017
7. **Methods and Compositions for Antimicrobial Treatment**, developed by: OSINSKI, Marek A.; SMYTH, Hugh D.C. ; ARMIJO, Leisha Marie; NIHAL BANDARA, Hennaka Mudiyansele Herath , US Patent App. 62/113,838, 2015, International Application No.: PCT/US2016/017163, filed 2016

8. **Powder dispersion methods and devices**, US Patent App. 14/996,011, 2016. Inventors: RM Curtis, D Deaton, J Hannon, Z Xu, H Smyth, [SEP]
9. **SOLID COMPOSITIONS FOR PHARMACEUTICAL USE**, Inventors: Hugh D.C. Smyth, Ibrahim M. El-Sherbiny, United States Patent Application 20140141094
10. **Dry powder inhaler with flutter dispersion member**, US 20120234322 A1, Inventors: Parthiban Selvam; Hugh D.C. Smyth; Charles Randall Truman.
11. **Dry powder inhaler with aeroelastic dispersion mechanism**, US 2012/0125331 A1, Inventors: [SEP] Hugh Smyth, Charles Randall Truman.
12. **Formulations Containing Large-Size Carrier Particles For Dry Powder**, US 2011/0253140 A1, Inventors: Hugh D.C. Smyth, Martin Donovan

CURRENT FUNDING AND RESEARCH SUPPORT

Source ▾	Begin Date ↕	End Date ↕	Sponsor Name ↕	Project Title ↕	Role ↕	Total Award Amount ↕	Project FY Expenditures ↕	Investigator FY Expenditures ↕	Percent Contribution ↕	OSP Nbr ↕
Central	2017-08-15	2023-04-30	Dhhs-National Institutes Of Health (Nih)	Viral-Inspired Nanoparticles For Mucus Penetrating Gene Delivery	Co-PI	\$1,648,104	\$114,290	\$57,145	50.00%	201603076
Central	2018-02-15	2021-12-31	Dhhs-National Institutes Of Health (Nih)	Harnessing The Gap Junction Network For Direct Intracellular Delivery Of Sima And Chemotherapeutics	Co-PI	\$416,425	\$20,760	\$10,380	50.00%	201700534
Central	2018-09-13	2022-12-31	Dhhs- Us Food & Drug Administration	Evaluating Batch To Batch Variability And Its Origins In Drypowder Inhalers	PI	\$1,154,732	\$189,639	\$189,639	100.00%	201802114
Central	2018-11-01	2021-08-31	Via Therapeutics, Llc	Preclinical Evaluation Of Co-Delivery Of Tnf-A Sima And A Glucocorticoid For Rheumatoid Arthritis	PI	\$74,250	\$-3704	\$-3704	100.00%	201704073
Central	2020-01-01	2021-12-31	Cystic Fibrosis Fdn	Mucus-Penetrating Lipid Nanoparticles For Gene Editing In Cystic Fibrosis	Co-PI	\$128,550	\$22,034	\$11,017	50.00%	201900832
Central	2020-08-12	2022-08-11	Amgen	Advanced Inhaled Targeted Delivery Systems	PI	\$326,285	\$34,350	\$34,350	100.00%	202002203
Central	2021-11-01	2022-07-31	Cassava Sciences, Inc.	Abuse Deterrent Fentanyl Patch	PI	\$39,999	\$1,274	\$1,274	100.00%	202000397
Faculty	2017-07	2022-06	NIH, NHLBI	Virus-inspired nanoparticles for mucus penetrating gene delivery	Co-PI	\$1,514,640			50.00%	201603076

OTHER RESEARCH EXPERIENCE AND PROGRAMS

Development of topical formulations for the treatment of actinic keratosis

Preformulation and formulation development of novel oncology compounds

Development of transdermal formulations for analgesia

Development of transdermal formulations for consumer non-prescription products

Hugh D C Smyth, Ph.D. Curriculum Vitae

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Development of corticosteroid nasal spray systems

Evaluation of biodegradable polymer implants

Assessment of powders for parenteral delivery

Development of oral films for biologic delivery

Development of formulations for dental applications

Development and assessment of emugel formulations

Development of opioid films and patches with abuse deterrent technologies

TEACHING AND ADVISING

Pharm.D.COURSES (Professional Students)

Assistant Professor, Associate Professor, and Professor with tenure at The University of Texas at Austin

2017 – Present	PHM 388M Pharmaceutics. Flipped class room, team based learning environment, 14 x 3 hour classes, ~ 125 students. Co-Taught with Dr R. O. Williams III
2016 – 2017	PHM 281C, Foundations For Interprofessional Collaborative Practice, Faculty Facilitator.
2014-2016	PHR356C Pharmaceutics (Spring). Transformed didactic course into a team-based flipped class room model with Dr Williams. Approximately 14 modules x 3 hours per week. Co-developed all new syllabus, course materials, quizzes, exams, assignments.
2013 – 2018	PHR270N Intro To Nuclear Pharmacy, Local Coordinator for UT-Austin.
2010-2013	PHR 156P (Spring) Pharmaceutics Laboratory and Lectures Course Coordinator: Hugh Smyth Lecture course on pharmaceutical calculations to 1st year Pharm.D. students. Developed new syllabus, generated new course handouts, study guides, and participated in electronic “lecture capture” to enable students to remotely access the lecture audio and visual materials to supplement lectures. Approximately 130 students, 12 lectures Laboratory compounding course for 1st year Pharm.D. students. Includes introductory presentations in lab and directing practical demonstrations of compounding techniques. Approximately 25 students per lab, 5 labs per week, 10 weeks.
2010-2014	PHR 356C. Pharmaceutics (Spring) Lecture course on pharmaceutics.

Approximately 130 students, 2-3 lectures (Team Taught Course).
Course Coordinator: R O Williams

Assistant professor at University of New Mexico

- 2006 - 2009 **PHARM 701: Pharmaceutics I, Fall Semester**
Course Coordinator: Linda Felton
Study of pharmaceutical dosage forms and relevant physico-chemical and biopharmaceutical principles. Introduction to the metrology and calculations involved in the compounding and dispensing of pharmaceutical preparations. Dosage forms discussed include ophthalmics, otics, nasal products, aerosols, and transdermal products.
Approximately 85-90 students, 12 lectures
- 2006 - 2009 **PHARM 702: Pharmaceutics II, Spring Semester**
Course Coordinator: Hugh Smyth
Study of pharmaceutical dosage forms and relevant physico-chemical and biopharmaceutical principles. Introduction to the metrology and calculations involved in the compounding and dispensing of pharmaceutical preparations. Dosage forms discussed include ophthalmics, otics, nasal products, aerosols, and transdermal products.
Approximately 85-90 students, 14 lectures

Research assistant professor at The University of North Carolina at Chapel Hill

- 2003 **Pharm 411, Basic Pharmaceutics 2**
Course Coordinator: Anthony Hickey
2 Lectures, Inhalation Aerosols

University of Otago, New Zealand

- 2000 **Pharmaceutics I,**
Course Coordinator: Nigel Davies
2 Lectures, Transdermal Drug Delivery

Graduate Curriculum

Assistant Professor and Associate professor with tenure at The University of Texas at Austin

- 2011 - Present **PHR 380Q, Fall**
Advanced Manufacturing Pharmacy
Approximately 12 Students, Co-Coordinator.
- 2010 - Present **PHR 382, Summer**
Recent Advances in Pharmaceutics
Course Coordinator: Hugh Smyth
Approximately 10 Students, 6 x 4 hr Lectures

Assistant professor at University of New Mexico

- 2007 – 2008 **PHARM/BIOMED 576: Molecular and Cellular Pharmacology**, Fall Semester,
Course Coordinator: Joe Masserano
The course reviews general principles of pharmacology, including receptor interaction and signaling, ADME, drug design, pharmacogenomics, and toxicology. One lecture was provided on the Respiratory Pharmacology
Approximately 5 students
- 2006 – 2009 **PHARM/BIOMED 581: General Toxicology**
Course Coordinators: Mary Walker/Craig Marcus
An in-depth introduction to the basic principles and concepts of toxicology. Categories of chemicals causing toxic effects, the manner of exposure to toxic substances, the environmental and biological effects, and the laws and regulations will be considered. Two lectures on Respiratory Toxicology
Approximately 5 students
- 2007 **ECE 590 Graduate Seminar (Electrical and Computer Engineering):**
Course Coordinator: Marek Osinski
One lecture, Nanocrystals and Nanoparticles for Drug Delivery
Approximately 10 students.

Other Courses Taught

- 2017 Workshop on “Foundations of inhalation product design and development”,
Genentech, South San Francisco, CA.
- 2015 5 Day Workshop on "Pharmaceutical Engineering of Particulate Systems for
Inhalation of Bioactive Molecules", Universidad Nacional del Sur and The
National Scientific and Technical Research Council (CONICET) of Argentina.
Bahia Blanca, Argentina, February 2015.
- 2005 Workshop “Sustained Pulmonary Drug Delivery”
The Institute of Validation Technology
Drug Delivery Systems Conference, September 20-23
San Francisco.
- 2004 Department of Biomedical Engineering, University of North Carolina at Chapel
Hill; Undergraduate lectures on “Drug Delivery”
- 2003 Faculty Speaker
Pharmaceutical Inhalation Aerosol Technology Course and Colloquia
September 29-30
Research Triangle Park, North Carolina
- 2000 Teaching Assistant
Biopharmacy, Physical Pharmacy, & Aseptic Dispensing
School of Pharmacy, University of Otago, NZ
- 1997 Teaching Assistant
Biopharmacy, Physical Pharmacy, & Aseptic Dispensing
School of Pharmacy, University of Otago, NZ

Students Supervised

Post-Doctoral Fellows / Visiting Scientists / Research Scientist

2022 – Present	Charan Singh, Ph.D. Visiting Scholar
2020 - Present	Amr Hefnawy, Postdoctoral Fellow
2019 – 2020	Dr Shahzeb Khan (Fulbright Postdoctoral Scholar)
2019 – 2020	Amr Hefnawy, Visiting Scholar, Zewail City of Science and Technology
2017 – 2019	Dr. Clara Dominguez (ConTex postdoctoral fellowship awardee) Current Position, postdoctoral fellow at UT Austin
2017 – 2018	Dr. Weijun Liu (University of Tianjin Nankai Hospital, Integrated Chinese and Western Medicine Institute)
2016 – Present	Dr. Matthew Herpin (The University of Texas at Austin)
2016 – 2017	Prof. Veronica Ramirez-Rigo (Universidad Nacional de Córdoba Conicet-Baiha Blanca) Current Position, Faculty at Universidad Nacional de Córdoba Conicet-Baiha Blanca, Argentina
2016 – Present	Neerali Shah, B.Pharm., MSc (Pharm Sci)
2016 – 2017	Dr Ashkan Yazdi (The University of Texas at Austin)
2016 – 2017	Dr Yuan Zhu (Jiangsu University, Center For Nano Drug/Gene Delivery and Tissue Engineering)
2016	Dr Syed Umer Jan (University of Balochistan) Current Position, faculty at University of Balochistan, Pakistan
2016	Dr Frederic Tewes (University of Poitiers) Current Position, Associate professor at the University of Poitiers, France
2014 – 2017	Dr. Silvia Ferrati, (University of Texas at Houston) <i>“Biomimetic Vesicles for Drug Delivery”</i> Current Position, Research Assistant Professor at UT Austin
2014 – 2016	Dr Kristin Fathe, (University of Texas at Austin) Editorial Assistant and Pharmaceutical Analysis. Current Position, Technical Application Trainer at Luminex Corporation
2014 – 2015	Dr Xianfei Xie, “Controlled pulmonary drug delivery to alter and optimize the pharmacokinetics of therapeutic molecules”
2013 – 2014	Dr Xin Li “Microfluidic Synthesis of Shape Controlled Particles”
2012 – 2014	Dr Nihal Bandara, (University of Hong Kong, Microbiology and Oral Biosciences). “Drug Delivery in Biofilms” Current Position, Faculty at Univeristy of Bristol, UK

2011 – 2014	Dr. Roger Andrew Maloney, (University of New Mexico, Physics) “Particle Adhesion and Detachment” Current Position, Senior data scientist at Bold Metrics
2011-2012	Aileen Gibbons, Ph.D. (Royal College of Surgeons, Dublin, Ireland) “Dry Powder Inhaler Formulations” Current Position, Director Health Care Investment Banking.
2009 – 2011	Stephen Marek, Ph.D. (The University of Texas) “Interparticulate Forces” Subsequent Position, Lecturer, Biomedical Engineering, The University of Texas at Austin.
2008 – 2010	Ibrahim El-Sherbiny, Ph.D. (Massey University, New Zealand) “Hydrogels for Drug Delivery” Current Position: Associate Professor, Mansoura University Egypt.
2008 – 2010	Parthiban Selvam, Ph.D. (Wayne State University) “Dry Powder Inhaler Development” Subsequent Position: Scientist, Savara Pharmaceuticals
2008 – 2009	Satya Singh, Ph.D., (Indian Institute of Technology, Kanpur, India) “Computational Fluid Dynamics for Inhalers” Subsequent Position: Scientist, Indian Institute of Technology
2006 – 2008	Imran Saleem, Ph.D. (Aston University, United Kingdom) “Inhalation Aerosols for Lung Cancer Treatment” Current Position: Faculty at John Moores University, Liverpool, United Kingdom

Graduate Students (as primary advisor)

2021 – Present	Arifnur Karaman, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2020 – Present	Rex Moore, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2020 – Present	Varsha Nair, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2019 – Present	Jamie Spahn, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2019 – Present	Shihao Cai, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2019 – 2021	Li Ding, MS, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2017 – 2019	Hairui Zhang, MS, Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin

2016 – 2020	Ashlee Branuagh, Pharm.D., Graduate Student, Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2016 – 2019	Lara Heerasema Graduate Student Biomedical Engineering Ph.D. Graduate Program, The University of Texas at Austin
2015 – 2019	Jasmim Leal Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2015 – 2021	Patricia Martins, M.Pharm. Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2015	Nazareth Ceschan, Ph.D. Graduate Student on Fellowship from CONICET & Universidad Nacional del Sur, Bahia Blanca Argentina. Graduated 2017
2014 – 2018	Zachary Warnken, Pharm.D., Ph.D. Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin Co-Supervised with Dr Williams.
2013 – 2018	Tania Bahamóndez, Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2013 – 2018	Daniel F Moraga-Espinoza, Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin
2012 – 2016	Ashkan Yazdi, Pharm.D., Graduate Student Pharmaceutics Ph.D. Graduate Program, The University of Texas at Austin Graduated 2016 Current Position: Visiting Scientist, UT-Austin
2011 – 2015	Ping Du. Pharmaceutics Graduate Program, The University of Texas at Austin Graduated 2015 Current Position: Scientist at Catalent Pharma Solutions
2010 – 2015	+Matt Herpin, Graduate Student Pharmaceutics Graduate Program, The University of Texas at Austin Graduated 2016
2010 – 2015	+Ju Du, Graduate Student Pharmaceutics Graduate Program, The University of Texas at Austin “Novel Therapeutics Delivered as Inhalation Aerosols” Graduated 2015 Current Position: Scientist at Catalent Pharma Solutions
2011 – 2014	Srimahitha Kaliki, Graduate Student Biomedical Engineering Graduate Program, The University of Texas at Austin Graduated 2014 Current Position: Data Analyst at Aduro health
2010 – 2013	Diana Guzman, Graduate Student at Facultad de Farmacia

Universidad Autonoma Del Estado De Morelos
Co-Advisor: Dr Dea Herrera Ruiz
Graduated 2013
Current Position: Post Doctoral Fellow, Arizona.

- 2006 – 2011 Martin Donovan, Graduate Student
Awarded NSF IGERT scholarship for Nanoscience and Microsystems
Biomedical Sciences Graduate Program, UNM, transferred to:
Pharmaceutics Graduate Program, The University of Texas at Austin
Graduated August 2011
Current Position, Senior Scientist, Xeris Therapeutics, Austin Texas
- 2007 – 2011 Shayna McGill, Graduate Student
Biomedical Sciences Graduate Program, UNM, transferred to:
Pharmaceutics Graduate Program, The University of Texas at Austin
Awarded NSF IGERT fellowship for “Integrating Nanotechnology with Cell
Biology and Neuroscience”
Winner of International Society for Aerosols in Medicine, Biennial Student
Research Award
Graduated, August 2011
Current Position: Clinical Research Associate at INC Research
- 2007 – 2009 *Leah Mitchell, Ph.D. Biomedical Sciences, University of New Mexico
“Mechanisms of Inhaled Multiwalled Carbon Nanotube-Induced
Immunosuppression in Mice”
Major Advisor: Scott Burchiel
Graduated May 2009
- 2007 Sonya Flores, Graduate Student, Biomedical Sciences Graduate Program
On Rotation
- 2005 – 2008 *Michelle B. Gallegos, Masters Student,
Mechanical Engineering Program, University of New Mexico
Major Advisor: C Randall Truman
Graduated 2008

Pharm. D. Students (Research)

- 2017 Omar Fuentes, Pharm.D. Student, Research Rotations
Albert Shaver, Pharm.D. Student, Research Rotations
- 2016 Jaynish Amin, Pharm.D. Student, Honors Program

Ashlee Brunaugh, Pharm.D., Ph.D. Student, Research Rotations
- 2015 Autumn Lee, Pharm.D. Student, Research Rotations. Honors Program

Allison Dietert, Pharm.D. Student, Research Rotations, Honors Program

Andee Shaunessy, Pharm.D. Student, Research Rotations, Honors Program

Jaynish Amin, Pharm.D. Student, Research Rotations, Honors Program

2014	Ashlee Brunaugh, Pharm.D., Ph.D. Student, Research Rotations. Maliha Ahmed, Pharm.D. Student, Research Rotations, Honors Program The University of Texas at Austin Sarah Hallowell, Pharm.D. Student, Research Rotations, Honors Program The University of Texas at Austin
2013	Stephanie Hufnagel, Pharm.D. Student, Research Rotations, Honors Program The University of Texas at Austin
2010 – 2013	Lucy Gong, Pharm.D. Student, Research Rotations, Honors Program The University of Texas at Austin
2010 – 2012	Scott Mosley, Pharm.D. Student, Research Rotations, Honors Program The University of Texas at Austin
2010 – 2012	Tommy Cai, Student, Research Rotation, The University of Texas at Austin
2009 – 2012	Nicola Maynard, Pharm.D. Student, College of Pharmacy University of New Mexico
2009	Samantha Torres, Pharm.D. Student, College of Pharmacy University of New Mexico Summer Fellow
2008	Vincent Agustin, Pharm.D. Student, College of Pharmacy University of New Mexico Summer Fellow
2007 – 2008	HongChao Liu, Pharm.D. Student, College of Pharmacy University of New Mexico Pfizer Fellow, UNM 2007-2008

Undergraduate Students (Research)

2017	Dalton Kotilinek, NSF Student chemical engineering (South Dakota School of Mines and Technology). Lucy Cai, (Biochemistry, UT Austin) Eli Eshaghian, (Public Health, UT Austin) Micaela Beussman, chemical engineering (UT Austin)
2015	Heather Klein (BME) Jessica Musler (BME) Sarah Maguire (BME) Bianca Wu (Pre-Pharmacy)
2014	Alejandro Harb David Kolacny Heather Klein (BME) Jessica Musler (BME) Kevin Gandingco (BME) Jeanette Lee (Intellectual Entrepreneurship Program)

2012 – 2013 Danielle Stolley,
Tyler Fields
Damian Jimenez
Sarah D Labianca
Giovanni A Campagna
Khurram Qazi
Jihyun Yoo
Howard Lin
Joiesah Sunga
Samantha Salcedo
Alejandro Harb
David Kolacny
Johnny Thai

2011 – 2012 Johnny Thai - Biochemistry Major
Stivaly Gomez - Biomedical Engineering
Michael Huang - Pre-Med
Kunnel Zachariah - Chemical Engineering
Mashal Awais - Chemistry
David Yang - Biomedical Engineering
Charlie Nguyen - Biology
Kevin Zhao - Intellectual Entrepreneurship Program, Pre-Pharm

2010 – 2012 Y Vo, Chemical Engineering, The University of Texas at Austin

2009 Kristi Mascarenas, McNair Scholar, University of New Mexico

2008 – 2009 Abdullah Feroz, Regents Scholar, Undergraduate, University of New Mexico
Carla Cuylear, Minority Access to Research Careers (MARC) Scholar
Undergraduate, University of New Mexico

2007 – 2008 Poonam Patil, Pre-Pharmacy Student, University of New Mexico
2006 – 2007 Laura Rogers, Pre-Pharmacy Student, University of New Mexico

Student Committees

Doctoral Thesis Committees (denotes chair of committee)*

Start Date	End Date	Role	Student	Program
2010-06-03	2011-08-31	Supervisor	DONOVAN, MARTIN J	Pharmacy
2010-08-26	2011-12-31	Supervisor	MCGILL, SHAYNA LORRAINE	Pharmacy
2011-01-28	2011-12-31	Member	O'DONNELL, KEVIN P	Pharmacy
2010-12-22	2011-12-31	Member	CARDOSO CARVALHO, THIAGO	Pharmacy
2011-08-31	2012-05-31	Member	HUGHEY, JUSTIN R	Pharmacy
2011-01-14	2012-08-31	Member	BOSELTMANN, STEPHANIE	Pharmacy
2011-04-29	2012-12-31	Member	MORALES, JAVIER O	Pharmacy

2012-07-18	2013-08-31	Member	KUMAR, AMIT	Pharmacy
2013-11-19	2013-12-31	Member	KEEN, JUSTIN M	Pharmacy
2012-09-12	2013-12-31	Member	CARVALHO, SIMONE RAFFA	Pharmacy
2012-09-12	2013-12-31	Member	WANG, YI-BO	Pharmacy
2012-09-04	2013-12-31	Member	LI, XINRAN	Pharmacy
2012-05-31	2014-05-31	Member	BENNETT, RYAN C	Pharmacy
2013-03-21	2014-12-31	Supervisor	KALIKI, SRIMAHITHA	Biomedical Engineering
2013-05-20	2015-05-31	Supervisor	DU, JU	Pharmaceutical Sciences
2013-06-12	2015-05-31	Member	IBRAHIM, YOUSSEF WAHIB NAGUIB	Pharmaceutical Sciences
2013-04-02	2015-05-31	Supervisor	DU, PING	Pharmaceutical Sciences
2013-11-08	2015-12-31	Supervisor	HERPIN, MATTHEW	Pharmaceutical Sciences
2015-08-31	2016-08-31	Member	LAFOUNTAIN, JUSTIN SCOTT	Pharmaceutical Sciences
2015-09-01	2016-08-31	Member	PRASAD, LEENA K	Pharmaceutical Sciences
2014-06-23	2016-08-31	Supervisor	YAZDI, ASHKAN KHAKPARVAR	Pharmaceutical Sciences
2014-11-07	2017-05-31	Member	HUANG, SIYUAN	Pharmaceutical Sciences
2015-08-18	2017-05-31	Member	GADOK, AVINASH K	Biomedical Engineering
2016-01-21	2017-12-31	Member	MAINCENT, JULIEN P	Pharmaceutical Sciences
2016-08-29	2017-12-31	Member	HASER, ABBE JEANNE	Pharmaceutical Sciences
2015-11-06	2017-12-31	Member	THAKKAR, SACHIN	Pharmaceutical Sciences
2016-01-28	2018-05-31	Supervisor	MORAGA-ESPINOZA, DANIEL F	Pharmaceutical Sciences
2015-12-17	2018-05-31	Supervisor	BAHAMONDEZ-CANAS, TANIA F	Pharmaceutical Sciences
2017-01-24	2018-05-31	Supervisor	WARNKEN, ZACHARY N	Pharmaceutical Sciences
2014-10-28	2018-08-31	Member	ALDAYEL, ABDULAZIZ M	Pharmaceutical Sciences
2017-03-31	2018-08-31	Member	IMAM, ZACHARY	Biomedical Engineering
2017-05-03	2018-12-31	Member	KOVACH, KRISTIN NICOLE	Physics
2017-09-13	2019-05-31	Member	MOON, CHAEHO	Pharmaceutical Sciences
2016-05-31	2019-05-31	Supervisor	HEERSEMA, LARA	Biomedical Engineering
2017-05-08	2019-12-31	Member	MENG, FAN	Pharmaceutical Sciences

2017-01-24	2019-12-31	Supervisor	LEAL, JASMIM	Pharmaceutical Sciences
2018-01-08	2019-12-31	Supervisor	ZHANG, HAIRUI	Pharmaceutical Sciences
2019-03-04	2019-12-31	Member	JERMAIN, SCOTT VICTOR	Pharmaceutical Sciences
2018-09-08	2019-12-31	Member	LOWINGER, MICHAEL B	Pharmaceutical Sciences
2019-01-16	2019-12-31	Member	GALA, URVI H	Pharmaceutical Sciences
2018-01-26	2020-05-31	Member	ZHANG, YAJIE	Pharmaceutical Sciences
2018-09-11	2020-05-31	Member	SAHAKIPIJARN, SAWITTREE	Pharmaceutical Sciences
2017-05-03	2020-05-31	Member	LIU, XU	Pharmaceutical Sciences
2017-01-30	2020-08-31	Member	LIU, XINQUAN	Pharmaceutical Sciences
2018-09-10	2020-08-31	Member	KITTIKUNAKORN, NADA	Pharmaceutical Sciences
2019-01-16	2020-08-31	Member	MA, XIANGYU	Pharmaceutical Sciences
2017-10-26	2020-12-31	Member	BAJROVIC, IRNELA	Pharmaceutical Sciences
2018-02-07	2020-12-31	Supervisor	BRUNAUGH, ASHLEE DAWN	Pharmaceutical Sciences
2018-12-13	2021-05-31	Member	HUFNAGEL, STEPHANIE JEAN	Pharmaceutical Sciences
2020-09-04	2021-05-31	Member	DAVIS, DANNY ALAN	Pharmaceutical Sciences
2019-11-12	2021-08-31	Member	TREMENTOZZI, ANDREA	Biomedical Engineering
2017-04-11	Ongoing	Member	KIM, JAE YOU	Biomedical Engineering
2020-09-04	Ongoing	Supervisor	DING, LI	Pharmaceutical Sciences
2018-09-11	Ongoing	Member	TARBOX, TAMARA	Pharmaceutical Sciences
2018-01-18	Ongoing	Supervisor	PEREIRA MARTINS, PATRICIA	Pharmaceutical Sciences
2021-09-22	Ongoing	Member	THAKKAR, RISHI CHINMAY	Pharmaceutical Sciences
2021-08-31	Ongoing	Member	WANG, JIELIANG	Pharmaceutical Sciences
2021-03-05	Ongoing	Member	DOAN, TRANG NGUYEN KIEU	Pharmaceutical Sciences

Masters Thesis Committees

2008

Michelle Gallegos

Mechanical Engineering, UNM

External Examiner for Doctoral Students

2016

Sumit Arora, "Dry Powder Inhalable formulations of voriconazole for effective pulmonary delivery", National Institute of Pharmaceutical Education and Research (NIPER), Nagar, Punjab, India.

Hugh D C Smyth, Ph.D. Curriculum Vitae

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Jesslyn Ooi, "The Determination Of Physical And Chemical Stability Of Pressurised Metered Dose Inhaler Formulations", University of Sydney, Australia.

2013 Diana Guzman Villanueva, Facultad de Farmacia, UAEM Cuernavaca, Morelos, Mexico

Student Awards (under my direct supervision)

2017 Jasmim Leal and Daniel Moraga-Espinoza, Graduate Students
Dr. Bill and Jill Williams and Dr. Jim and Kitty McGinity Graduate Fellowship
Daniel Moraga-Espinoza, Graduate Student
Max and Mary Burlage Fellowship

2016 Tania F Bahamondez-Canas and Daniel Moraga-Espinoza, Graduate Students
Dean's prestigious fellowship

2015 Tania F Bahamondez-Canas and Daniel Moraga-Espinoza, Graduate Students
Dean's prestigious fellowship
Duane A. Boyle fellowship in Pharmaceuticals

2014 Tania F Bahamondez-Canas, Graduate Student
Dean's prestigious fellowship

2011 Matthew Herpin, Graduate Student
Pharmaceutical Researchers and Manufacturers Association (PhRMA)
Foundation, Graduate Student Fellowship in Pharmaceuticals (Full Stipend
Support, 2 years)

2010 Shayna McGill, Graduate Student
Dr. Bill and Jill Williams and Dr. Jim and Kitty McGinity Graduate Fellowship

2009 Shayna McGill, Graduate Student
Nominee, Teaching Excellence Award
College of Pharmacy, The University of Texas at Austin

2009 Martin Donovan, Graduate Student
Nominee, Teaching Excellence Award
College of Pharmacy, The University of Texas at Austin

2009 Shayna McGill, Graduate Student
Winner of the International Society for Aerosols in Medicine, Biennial Student
Research Award

2008 Hongchao Liu, Pharmaceutical Sciences Pharm.D. Research Award
University of New Mexico, College of Pharmacy

2007 – 2009 Shayna McGill, Graduate Student
Awarded NSF IGERT fellowship for "Integrating Nanotechnology with Cell
Biology and Neuroscience"

2006 – 2009 Martin Donovan, Graduate Student

Awarded NSF IGERT scholarship for Nanoscience and Microsystems

SERVICE

Professional Leadership

2020 - Current	Member, Leadership Team, Inhalation and Nasal Community (INC) for the American Association of Pharmaceutical Sciences
2019 - Current	Founder, Cloxero Therapeutics
2018 - Current	Founder, Via Therapeutics
2017 - 2018	Co-Chair of the New devices and emerging therapy group, International Society of Aerosols in Medicine (ISAM)
2017 - Current	Co-Founder and Consulting Chief Scientist, Nob Hill Therapeutics, San Diego, CA. Start-up company based on intellectual property and patents licensed from my laboratory.
2016 - 2017	Chair-Elect, Inhalation and Nasal Technologies, Focus Group, American Association of Pharmaceutical Scientists.
2016	Member of Organizing Committee, American Association of Pharmaceutical Scientists, Arden House Conference on Drug/Device Combination Products.
2015	Executive Committee Member, Inhalation and Nasal Technology Focus Group of the American Association of Pharmaceutical Scientists.
2014	Member of Organizing Committee, International Society of Microencapsulation International Meeting 2015.
2011	Co-Chair, Workshop on: Developing Pharmaceutical Products for Controlled Pulmonary Delivery, October 23, 2011, Walter E. Washington Convention Center, Washington, D.C., U.S.A. Controlled Release Society & American Association of Pharmaceutical Scientists
2010 – 2021	Consulting Chief Scientist, Respira Therapeutics Start-up company based on intellectual property and patents licensed from my laboratory.
2010	Programming Committee “Lactose as a Carrier for Inhalation Products” Conference Parma, Italy
2008	Pulmonary Advisory Board Mannkind Corporation, Danbury, Connecticut
2007	Member Business Advisory Board Zia Scientific, Albuquerque, New Mexico

2005 – Present	Scientific Consultant to various Law Firms
2003	Scientific Analyst, Evaluation of Existing Inhaler Products in Developing Nations United Nations Development Program

Ad Hoc Scholarly Review

2000 – Present	European Journal of Pharmaceutics and Biopharmaceutics Molecular Pharmaceutics Journal of Microencapsulation Nature Reviews Drug Discovery International Journal of Pharmaceutics Journal of Pharmaceutical Sciences Journal of Aerosol Medicine Journal of Controlled Release AAPS PharmSciTech Journal of Pharmacy and Pharmacology Pharmaceutical Research Drug Development and Industrial Pharmacy Langmuir Powder Technology Journal of Environmental Management
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Editorial Review

2016	Guest Editor, Current Pharmaceutical Design, Special Issue “Pulmonary delivery of systemic drugs - from Aerosol Generation to Efficacious Delivery”
2014 – 2022	Editor-in-Chief, Drug Development and Industrial Pharmacy.
2012 – Present	Editorial Board Member, Journal of Bioequivalence & Bioavailability
2010 – Present	Editorial Advisory Board, Drug Delivery Letters
2010	Guest Editor, Journal of Nanomaterials, Special Issue Nanostructured Aerosol Particles: Fabrication, Pulmonary Drug Delivery, and Controlled Release
2008 – 2012	Editorial Advisory Board for Books Controlled Release Society
2007 – 2010	Editorial Advisory Committee for Books American Association of Pharmaceutical Scientists
2007 – Present	Reviewer, Annual Meeting American Association of Pharmaceutical Scientists
2006 – 2014	Editorial Board Member Drug Development and Industrial Pharmacy

National / International Grant Review

2021	Nanotechnology Study Section, National Institutes of Health (2022/01 NANO), October 13- 14, 2021
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2017	Study Section member, National Institutes of Health: ZAI1 BLG-M (S1) 1	SRO: Brenda Lange-Gustafson
2016	Study Section member, National Institutes of Health:	
	NIDA, ZDA1-SXM-M-71	SRO: Susan McGuire
	CSR, ZRG1-ETTN-J-50	SRO: Kristin Kramer
	NIDA, ZDA1-SXM-M-13	SRO: Susan McGuire
	CSR, ZRG1-ETTN-G-50	SRO: Paek-Gyu Lee
	CSR, ZRG1-ETTN-G-50	SRO: Paek-Gyu Lee
	CSR, Gene and Drug Delivery (GDD)	SRO: Amy Rubinstein
2015 - Present	Grant Reviewer, Cystic Fibrosis Foundation.	
2013 - Present	Ad-Hoc Study Section Member Center for Scientific Review National Institutes of Health	
2012	Ad-Hoc Study Section Member (2 Study Sections) Center for Scientific Review National Institutes of Health	
2010	Panelist SBIR/STTR Program National Science Foundation	
2010	Reviewer Ohio Cancer Research Associates Foundation	
2009	Panelist SBIR/STTR Program National Science Foundation	
2009	Reviewer North Carolina Biotechnology Center	
2007	Panelist "Drug Discovery and Development" National Science Foundation	
2006	Panelist "Drug Delivery in Biotechnology" National Science Foundation	
2005	Special Emphasis Panel: "Delivery Systems and Nanotechnology" Center for Scientific Review National Institutes of Health	
2004	Reviewer Alberta Heritage Foundation for Medical Research, Canada	

2001 Panelist “Drug Delivery in Biotechnology”
National Science Foundation

External Tenure and Promotion Reviewer

2021 University of Michigan

2021 King’s College London, UK

2020 University of Michigan

2016 Texas Tech University Health Sciences Center

University of New Mexico, College of Pharmacy

2013 Mylan School of Pharmacy and Graduate School of Pharmaceutical Sciences
Duquesne University, Pittsburgh, PA

College of Pharmacy, University of Iowa, Iowa City, Iowa

2012 Massachusetts College of Pharmacy and Health Sciences, Boston, MA

University Service

The University of Texas at Austin

2020 Executive Committee member, College of Pharmacy

2017 Executive Committee member, Department of Biomedical Engineering
Graduate Studies Committee.

2016 Steering Committee, Lester Pharmaceutical Entrepreneurship Program,
College of Pharmacy, UT Austin

Chair, Task Force on Pharmacokinetics, College of Pharmacy.

2014 Co-Chair, Faculty Retreat Committee, College of Pharmacy.
Member, Center for Infectious Diseases, UT Austin

2012 Chair, Faculty Search Committee, Pharmaceutics (2013).

Steering Committee, Improving Course Outcome and Student Achievement,
(ICOSA)

Continuing Education Committee

Graduate Studies Administrative Sub-Committee*

Teaching Credentials & Assignments Committee*

Division of Pharmaceutics Graduate Advisor.

2010 – 2013	Steering Committee, TherapUTex, Drug Dynamics Institute College of Pharmacy
2010 – present	Curriculum Committee College of Pharmacy
2010 – 2014	Program Assessment Team College of Pharmacy
2010 – present	Accreditation Self-Study Committee 5 College of Pharmacy
2010	Seminar Coordinator Division of Pharmaceutics College of Pharmacy

University of New Mexico

2009	Faculty Advisor for Pharm.D. Class of 2012
2007 – 2008	University of New Mexico Intellectual Property Policy Committee
2007 – 2009	Organizational Planning & Evaluation Committee College of Pharmacy
2007	Faculty Search Committee, Pharmacokinetics College of Pharmacy
2006 – 2009	Steering Committee Member, Biomedical Sciences Graduate Program The Biomedical Sciences Graduate Program is the graduate program for the entire Health Sciences Center. The steering committee has members from each participating unit and oversees the graduate program from admissions, qualifying exams, assessment, etc.
2006 – 2009	Lung Cancer Working Group Cancer Research and Treatment Center
2006 – 2009	Phase 1 Working Group Cancer Research and Treatment Center
2006 – 2007	Assessment Task Force College of Pharmacy
2005	Scholarships, Student Loans and Awards Committee College of Pharmacy

Professional Development

2013	Member of University of Texas at Austin learning community program on “Flipping the Classroom”
2011	College Wide Workshop on Objective Writing, Speaker: Dr. John Littlefield

Director of the Academic Center for Excellence in Teaching (ACET) at the UT Health Science Center, San Antonio

- 2009 – Present Teaching Conversations, The University of Texas at Austin,
College of Pharmacy
Coordinator: Patrick Davis, Senior Associate Dean
- 2006 – 2009 Faculty Development Series, College of Pharmacy, University of New Mexico
Coordinators: Craig Marcus, Division Chair, Laurie Hudson, Regents Professor
- 2004 – 2005 Teaching Methods and Teaching Enhancement
Center for Teaching and Learning / Center for Faculty Excellence
University of North Carolina at Chapel Hill

Outreach and Community Service

- 2017 Eanes Elementary Science Day, Facilitator
Presented crystal formation, fossilization, and earth science
5 Kindergarten Classes
- 2015 Eanes Elementary Science Day, Facilitator
Chemistry of Pharmaceuticals
5 Second Grade Classes
- 2013 UT SAGE™ (Seminars for Adult Growth and Enrichment) seminar "Inhaled
Pharmaceuticals" at the Thompson Conference Center
- 2009 – 2015 Explore UT "Hogwarts Jungle Potion Class"
Compounding of reversible gels

AWARDS AND HONORS

- 2017 Co-Chair, Drug Delivery Networking Group, International Society for Aerosols in
Medicine
- 2016 Vice Chair / Chair-Elect, Executive Committee, Inhalation and Nasal
Technology Focus Group of the American Association of Pharmaceutical
Scientists.
- 2015 Executive Committee Member, Inhalation and Nasal Technology Focus Group
of the American Association of Pharmaceutical Scientists.
- Invited Plenary Speaker, International Symposium for Graduate Students in
Pharmaceutical Sciences, Guangzhou, China
- 2014 Editor-in-Chief, Drug Development and Industrial Pharmacy, Taylor and Francis
Press (September, 2014 - current).
- American Association of Colleges of Pharmacy, Academic Research Fellow

	Nominee for 2014 Edith and Peter O'Donnell Engineering Award, The Academy of Medicine, Engineering & Science of Texas
2013	Nominee for 2014 Edith and Peter O'Donnell Technology Innovation Award, The Academy of Medicine, Engineering & Science of Texas
2012	Bergen-Brunswig Fellow, University of Texas at Austin.
2008	Best Poster, Respiratory Drug Delivery 2008, Scottsdale, AZ
2007	New Investigator Award in Pharmaceuticals, Drug Delivery, and Pharmaceutical Technologies American Association of Pharmaceutical Scientists
2007	New Investigator in Pharmaceuticals Award, Pharmaceutical Research and Manufacturers of America (PhRMA) Foundation
2007	Winning Team, Second Annual Technology Business Plan Competition University of New Mexico
1997 – 1999	Vernon Tews - GlaxoWellcome Inc. Education Scholarship