

Curriculum Vitae

Hoshang J. Unwalla, PhD.

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Academic Training

EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Bombay, Mumbai, India	B. S.	1995	Microbiology
Maharaja Sayajirao University of Baroda, Vadodara, India	M.S.	1997	Microbiology
National Institute of Immunology affiliated to Jawaharlal Nehru University, New Delhi, India	Ph. D.	2002	Virology

A. Positions and Honors.

Positions and Employment

Post-doctoral Appointment

2002 - 2008 Post-doctoral Research Fellow, Department of Molecular Biology, Beckman Research Institute at The City of Hope National Medical Center, Duarte, CA, USA. Mentor: Dr. John J. Rossi (Ph.D.)

Academic Appointment

2014– Present Associate Professor (Tenure track), Department of Immunology and Nanomedicine, Herbert Wertheim College of Medicine, Florida International University.

2011- 2014 Assistant Professor (Research), Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, University of Miami, Miller School of Medicine.

2010- 2011 Assistant Scientist, Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, University of Miami, Miller School of Medicine.

2008- 2009 Assistant Professor (Research), Department of Microbiology and Immunology,

Director, Aptamer Development Unit, University of Miami, Miller School of Medicine.

2002- 2008 Post-doctoral Research Fellow, Department of Molecular Biology, Beckman Research Institute of the City of Hope National Medical Center.

Patents: US Patent Application called “Inducible Systems and Methods for Controlling siRNA Expression.” United States Patent 8,138,327. Issued March 20, 2012

Honors and Awards

2011-2013: American Lung Association Biomedical Research Award for the proposal, “The role of the airway epithelium in the pharmacokinetics and dynamics of inhaled bronchodilators”

- 2006- 2008: AmFAR Fellowship award for the proposal, “Designing inducible Pol II systems for RNA interference of HIV-1” (One of the four awarded worldwide that cycle).
- 2001: Best Poster award “Biohorizon 2001” Indian Institute of Technology, New Delhi, India.
- 2001: Best Speaker Award Intercity Debate Competition, New Delhi, India, on, “Stem Cell Research; Interfering in God’s plan.”
- 1997: A.N. Kacchi Gold Medallion for outstanding achievement. First position in Master’s degree in the Division of Microbiology and Biotechnology, Maharaja Sayajirao University, Vadodara, India.
- 1995 The J.R.D. Tata Award for Academic excellence in Bachelor of Science.

B. Selected peer-reviewed publications (in chronological order).

1. Dutta RK,; Chinnapaiyan S.; Rasmussen, L.; Raju, VS.; **Unwalla HJ**. A Neutralizing Aptamer to TGFBR2 and MiR-145 Antagonism Rescue Cigarette Smoke-and TGF- β -Mediated CFTR Expression. *Mol Ther.* 2018 Dec 6. pii: S1525-0016(18)30583-5. doi: 10.1016/j.ymthe.2018.11.017. [Epub ahead of print] (Cell Press; *Impact factor 7.02*).
2. Chinnapaiyan S.; Dutta. RA.; Bala J.; Parira T.; Agudelo M.; Nair, M; **Unwalla HJ**. Cigarette Smoke Promotes HIV Infection of Primary Bronchial Epithelium and Additively Suppresses CFTR function. *Sci Rep.* 2018 May 22;8(1):7984. doi: 10.1038/s41598-018-26095-z.
3. Bala J., Chinnapaiyan S., Dutta R., **Unwalla HJ**. Aptamers in HIV Research Diagnosis and Therapy. *RNA Biology* 2018. 15:3, 327-337. doi: [10.1080/15476286.2017.1414131](https://doi.org/10.1080/15476286.2017.1414131).
4. Chinnapaiyan S., Parira T., Dutta R., Agudelo M., Morris A., Nair M. and **Unwalla HJ**. HIV Infects Bronchial Epithelium and Suppresses Components of the Mucociliary Clearance Apparatus. *PLOSOne* 2017, 12(1): e0169161.
5. Ivonnet P., **Unwalla HJ**, Salathe M., Conner G. Soluble Adenylyl Cyclase Mediates Hydrogen Peroxide-induced Changes in Epithelial Barrier Function. *Respir Res.* 2016 Feb 8;17(1):15. doi: 10.1186/s12931-016-0329-4.
6. Chinnapaiyan S and **Unwalla HJ**. Mucociliary Dysfunction in HIV and Substance Abuse. *Front Microbiol.* 2015 Oct 14;6:1052. doi: 10.3389/fmicb.2015.01052. eCollection 2015.
7. **Unwalla HJ**, Ivonnet P., Dennis J., Conner G. and Salathe M. Transforming Growth Factor- β 1 and Cigarette Smoke Inhibit the Ability of β 2-adrenergic Receptor Agonists to Enhance Mucociliary Clearance. *Am J Respir Cell Mol Biol.* 2015 Jan;52(1):65-74. (**Unwalla H. is first and corresponding author**).
8. **Unwalla H** and Rossi JJ (2012). Screening Effective Target Sites on mRNA: A Ribozyme Library Approach. *Methods Mol Biol.* 2012 **848**: 329-36. (**Unwalla H. and Rossi JJ. are corresponding authors**)

9. **Unwalla H.**, Horvath G., Roth F., Conner G. and Salathe M. Albuterol Modulates its Own Transepithelial Flux via Changes in Paracellular Permeability. *Am J Respir Cell Mol Biol.* 2012. **46**(4): 551-8.
10. **Unwalla H.**, and Rossi JJ. A Dual Function TAR Decoy Serves as an Anti-HIV siRNA Delivery Vehicle. *Virology*. 2010, **10** 7:33. (**Unwalla H. is the first and corresponding author**).
11. **Unwalla H**, Rossi JJ. Tat-regulated Expression of RNA Interference: Triggers for the Treatment of HIV Infection. *Curr HIV/AIDS Rep.* 2008 **5**(1):40-3.
12. **Unwalla HJ**, Li H, Li SY, Abad D, Rossi JJ. Use of a U16 snoRNA-containing Ribozyme Library to Identify Ribozyme Targets in HIV-1. *Mol Ther.* 2008 **16**(6):1113-9.
13. Sood V*, **Unwalla H***, Gupta N, Chakraborti S, Banerjea AC. Potent Knock down of HIV-1 Replication by Targeting HIV-1 Tat/Rev RNA Sequences Synergistically With Catalytic RNA and DNA. *AIDS* 2007 **21**(1):31-40. (***Unwalla and Sood contributed equally**).
14. **Unwalla, H**, Kim D and Rossi JJ. RNA Interference, Problem Areas and Potential Applications for the Treatment of Human Diseases. *L'Observatoire de la génétique* No 30; November 2006/January 2007 (Article also available in French).
15. **Unwalla, HJ** and John J Rossi. RNA Interference as a Potential Antiviral. *Future Virol.* 2006 **1**(4):501-8.
16. **Unwalla, HJ** and Rossi J.J. Promoting Gene Therapy: Expression Systems for Transgenes and Post-transcriptional Gene Silencing. *Biotechnol Genet Eng Rev* 2006 **23**, December 2006; 71-91.
17. **Unwalla, H**, Chakraborti S, Sood V, Gupta N, Banerjea AC. Potent Inhibition of HIV-1 Gene Expression and TAT-mediated Apoptosis in Human T cells by Novel Mono- and Multitarget anti-TAT/Rev/Env Ribozymes and a General Purpose RNA-cleaving DNA-enzyme. *Antiviral Res.* 2006 Nov; **72**(2):134-44.
18. **Unwalla, HJ**, Li, H.T., Bahner, I., Li, M-J., Kohn, D. and Rossi, J. J. (2006). Novel Pol II fusion promoter directs human immunodeficiency virus type 1-inducible coexpression of a short hairpin RNA and protein.. *J Virol* **80**(4) 1863-1873.
19. **Unwalla, HJ.**, Li, M-J., Kim, J.D., Li, H.T., Ehsani A., Alluin J. and Rossi, J.J. Negative feedback inhibition of HIV-1 by TAT-inducible expression of siRNA. *Nature Biotechnol.* 2004 **22**: 1573-1578.
20. Banerjea, AC Chakraborti, S., **Unwalla, HJ.**, Goila, R., Basu S, Dash BC., Sriram, B., Paramasivam, N. and Viswanathan, S. Potential Therapeutic Applications of DNA Enzymes and siRNAs against Viral and Cellular Genes. Synthetic Nucleic Acids as Inhibitors of gene expression. *Mechanisms, applications & Therapeutic Applications.* 2004
21. Kumarvelu, J., Shanmugasundaram, G. K., **Unwalla, H.**, Ramamoorti, N., Banerjea, A. C. Genetic Analyses of the promoter region of interleukin-10 gene in different species of monkeys: implications for HIV/AIDS progression. *Genes Immun* 2001 **2**: 404-407.

22. Shanmugasundaram, G. K., Sundaresan, G., Shoeb, F., Arumugam, N., Kumaravelu, J., **Unwalla, H.**, Chakraborti, S., Banerjea, A. C. *Genetic Analyses of Cis-acting Sequences Controlling Expression of Human Immunodeficiency Virus Type 1 Coreceptor-CCR5 Gene in Rabbits and CXCR4 Gene in Monkeys.* *J Hum. Virol.* 2001 **4**: 188-194.
23. **Unwalla, H.**, Banerjea, A. C. *Novel mono- and di-DNA-enzymes targeted to cleave TAT or TAT-REV RNA inhibit HIV-1 gene expression.* *Antiviral Res.* 2001 **51**: 127-139.
24. **Unwalla, H.**, Banerjea, A. C. *Inhibition of HIV-1 Specific Gene Expression by Novel Macrophage-tropic DNA Enzymes Targeted to Cleave HIV-1 TAT/Rev RNA.* *Biochem J* 2001 **357**: 147-155.
25. Dash, B. P., Harikrishnan, T. A., Goila, R., Shahi, S., **Unwalla, H.**, Husain, S., Banerjea, A. C. *Targeted Cleavage of HIV-1 Envelope Gene by a DNA-enzyme and Inhibition of HIV-1 Envelop-CD4 mediated cell fusion.* *FEBS Letters* 1998 **431**: 395-399.

1.

2. **Manuscripts under preparation, review or revision.**

3.

1. Chinnapaiyan S., Dutta R., Nair M., and **Unwalla HJ.** *TGF-beta1 Promotes HIV-1 Latency In Primary Differentiated Human Bronchial Epithelial Cells.* (Manuscript under review with *SCI. Rep*).
2. +Salaudiddin Ahmed, +Dutta, RK; Prakash M; Chinnapaiyan S; **Unwalla, H***; Moon, Joong Ho*. Guanylurea-functionalized conjugated polymer enables RNA interference in ex vivo human airway epithelium. [Manuscript in revision with *ACS Applied Materials & Interfaces* (Impact factor 8.1)]. ***Unwalla and Moon are co-corresponding authors; + contributed equally**).
3. Dutta R., Chinnapaiyan S., Nair M. and **Unwalla HJ.** HIV Tat alters the bronchial microRNAome to promote CFTR dysfunction. (Manuscript under preparation).

4.

C. Papers (Abstracts) accepted for presentations in conferences (in chronological order).

1. S Chinnapaiyan, R Dutta, M Nair, AM Morris, **HJ Unwalla.** Cigarette smoke enhances HIV-1 infection of NHBE cells and suppresses CFTR function. Abstract presented at the 2017 American Thoracic Society (ATS), Washington DC.
2. Chinnapaiyan S., Dutta R., Bala J, Nair M, Morris AM, **Unwalla H.** Suppression of CFTR function by synergistic effects of HIV-1 infection and Cigarette smoke on NHBE cells. Abstract presented at the 2017 NanoFlorida Meeting, Miami FL.
3. Chinnapaiyan S., Dutta R., Bala J, Parira T., Agudelo M., Nair M, Morris AM, **Unwalla H.** Dysregulation of CFTR function by synergistic effects of Cigarette smoke and HIV-1 infection on NHBE cells. Abstract presented at the 2017 meeting of the Society of Personalized Nanomedicine (SPNM), Miami, FL

4. **Unwalla H.**, Ivonett P., and Morris A. Mucociliary Dysfunction in HIV Patients. Abstract presented at the 2015 meeting of the Society of Neuroimmune Pharmacology (SNIP) Miami FL.
5. **Unwalla H.**, Ivonett P., and Morris A. HIV Proteins Tat And gp120 Promote Oxidative Stress And Suppress Components Of The Mucociliary Clearance Apparatus. Abstract presented at the 2014 American Thoracic Society (ATS), San Diego, CA.
6. **Unwalla H.**, Ivonnet P., Dennis J., Conner G. and Salathe M., Cigarette Smoke And TGF-beta1 Suppress The Ability Of CFTR Activators To Enhance Epithelial Permeability. Abstract accepted for presentation for the 2014 American Thoracic Society (ATS), San Diego, CA.
7. **Unwalla H.**, Conner G. and Salathe M., (2012) Cigarette Smoke And TGF-β1 Inhibit Albuterol's Ability To Enhance Its Own Transepithelial Transport. Presented at the 2012 American Thoracic Society (ATS), San Francisco, CA
8. **Unwalla H.**, Horvath G., Roth F., Conner G. and Salathe M. (2011) The ability to modulate the paracellular permeability contributes to the rapid transepithelial crossing of albuterol. Presented at the 2011 American Thoracic society (ATS), Denver CO.
9. **Hoshang Unwalla**, Ingrid Bahner, Ha-Tang Li, Ming-Jie Li, Donald Kohn, John J. Rossi and Yuliya Gokhgauzer. The HIV-1 LTR-hsp70 Fusion Promoter Directs HIV-1 Inducible Expression of Anti-Rev siRNA along with HIV-1 Rev Transdominant Mutant RevM10. Presented at the 2006 meeting of The American Society of Gene Therapy, Baltimore MD.
10. **Hoshang Unwalla**, James Kim, Hai-Tang Li, John J. Rossi (2003) Novel approaches to HIV-1 Gene Therapy: 'The Last Man Standing'. Presented at June 2003 meeting of The American Society of Gene Therapy, Baltimore MD.

D. Book Chapters

1. Akhil C. Banerjea, Samitabh Chakraborti, **Hoshang Unwalla**, Ritu Goila, Basu Shrabani, Bipin C. Dash Bandi Sriram, Natrajan Paramasivam, and Saraswathi Viswanathan. (2004) Potential Therapeutic Applications of DNAEnzymes and siRNAs against Viral and Cellular Genes. Synthetic Nucleic Acids as Inhibitors of gene expression. Mechanisms, applications & Therapeutic Applications. Ed: L. M. Khachiagian, CRC Press, Florida.
2. Vashist, Arti & Kaushik, A & Bala, Dr Jyoti & **Unwalla, Hoshang** & Bhardwaj, V & Sagar, Vidya & Nair, Madhavan. (2018). Chapter 6: Nanogels for Brain Drug Delivery. RSC Smart Materials. 94-108. 10.1039/9781788010481-00094.
3. Jyoti Bala, Anupam Das, **Hoshang Unwalla**. (2018) Chapter 17: Senescence-Associated Markers. Senescence Signaling and Control in Plants. 273-281. Elsevier Press ISBN 978-0-12-813187-9.

5.

E. Teaching and Mentoring:

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|---------------------------|--|
| 1. Summer 2005
intern. | Ms. Yuliya Gokhgauzer, Undergraduate student |
| 2. Summer 2007 | Ms. Shi Yang Li, Undergraduate student intern. |

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| 3. Summer 2009 | Mr. Danny Abad, Undergraduate student intern. |
| 4. 2008 – 2009 | Dr. Rajivkumar Vaidya, Research Scientist. |
| 5. 2008 –2009 | Dr. Divya Patel, Post-doctoral research fellow. |
| 6. 2012 –2014 | Mr. John Dennis, Technician. |
| 7. 2014 – present
research fellow. | Dr. Srinivasan Chinnapaiyan, Post-doctoral |
| 8. 2017 –2018 | Dr. Jyoti Bala, Post- doctoral research fellow. |
| 9. 2015 – 2016
volunteer. | Ms. Isabella Corzo, Undergraduate student |
| 10. 2016 – 2016
volunteer. | Ms. Maria Mosquesra, Undergraduate student |
| 11. 2016 – 2018
<i>Committee.</i> | Ms. Tiyash Parira, Graduate student, <i>Dissertation</i> |
| 12. 2016 – present
<i>Committee.</i> | Ms. Sneham Tiwari, Graduate student, <i>Dissertation</i> |
| 13. 2016 – present
<i>Advisor.</i> | Mr. Rajib Dutta Graduate student, <i>Dissertation</i> |
| 14. 2018 – present
volunteer. | Ms. Farnaz Kachelo, Undergraduate student |

Ms Shi Yang Li and Mr. Danny Abad in summer of 2007 and 2008 respectively during my tenure as a post-doctoral research fellow at the City of Hope National Medical Center. They share authorships in the manuscript; **Unwalla HJ**, Li H, Li SY, Abad D, Rossi JJ.(2008). *Use of a U16 snoRNA-containing ribozyme library to identify ribozyme targets in HIV-1.* *Mol Ther.* **16**(6):1113-9.

Courses Taught:

- | | |
|-----------------|---|
| 2016 – present: | Cell Mediated Immunity and Humoral Immunity. <i>FIU HWCOC Graduate Certificate Program.</i> |
| 2014 – 2015 | Prion diseases. <i>FIU HWCOC Graduate School Program.</i> |

E. Services to Florida International University:

- | | |
|----------------|---|
| 2016 – present | Member, COM Graduate School Admissions Committee. |
| 2016 – present | Chair, Department IBC Committee. |
| 2017 | Member, College of Medicine Admissions Interview Panel. |
| 2018 – present | Member, COM Faculty Affairs Steering Committee. |
| 2017– present | Member, Faculty Senate Academic Affairs Committee. |

Other Services.

Judges Panel, Poster presentation, Society of Personalized Nanomedicine, 2016.

Judges Panel, Poster presentation, Society of Personalized Nanomedicine, 2016.

Judges panel, Summer intern presentation, Florida International University, 2014

F. Oral presentations.

2004: Negative Feedback inhibition of HIV-1: **A novel HIV-1 LTR-hsp70 fusion promoter directs HIV inducible siRNA expression**. Presented at 2004 American Society of Gene Therapy meeting.

2007: **In Search of an Effective Target: In Vivo Approach Using HIV-1 Specific siRNA and Ribozyme Libraries**. Presented at 2007 American Society of Gene Therapy meeting.

2012: **Transepithelial Flux of albuterol in smoking asthmatics**. Guest lecture, University of Miami Department of Medicine, Pulmonary Grand Rounds.

2013: **Transforming Growth Factor-beta and Cigarette Smoke Suppress the Ability of Albuterol to Modulate Paracellular Permeability**. Invited speaker Department of Molecular Biology seminar series at City of Hope National Medical Center.

2017: **Suppression of CFTR function by synergistic effects of HIV-1 infection and Cigarette smoke on NHBE cells**. Nanoflorida 2017.

2018: **Unwalla HJ**. Role of Bronchial Epithelium in HIV Associated Lung Comorbidities. NHLBI HIV/AIDS Grantees Meeting, NIH, Bethesda, MD.

G. Editorial responsibilities

Ad-hoc reviewer

Virology Journal

Nucleic Acids research

BMC Pulmonary Medicine

Scientific Reports

Study sections:

NIH Scientific Review Group 2016/05 ZDA1 SXM-M (13), National Institutes of Health.

NIH Scientific Review Group 2017/05 ZRG1 CVRS-Q (11), National Institutes of Health.

NIH Scientific Review Group 2017/07 ZRG1 CVRS Q(07), National Institutes of Health.

NIH Scientific Review Group 2019/02 ZRG1 CVRS G (80), National Institutes of Health.

H. Accomplishments

Press Release: Therapy may work to ward off HIV: City of Hope researchers have developed a gene therapy that shows promise at protecting human cells against deadly viruses. Research cited on the front page by the Pasadena Star-News on Tuesday, December 7, 2004.

Invitation to write a review in Volume 23 of '**Biotechnology and Genetic Engineering Reviews**' Promoting Gene Therapy: Expression Systems for Transgenes and Post-transcriptional Gene Silencing. based on work published in Nature Biotechnology.

Invitation to write a review in Volume 1 issue 4 of **Future Virology** based on work published in Nature Biotechnology and Journal of Virology.

Invited to write an article in **L'Observatoire de la Génétique**, No 30; November 2006/January 2007 (Article also available in French) RNA Interference, Problem Areas and Potential Applications for the Treatment of Human Diseases.

I. Grant Support:

Ongoing support:

- | | |
|---|-----------------------------|
| 1. Flight Attendant Medical Research Institute
07/01/2016 – 06/30/2019
<i>Will be requesting 1 year no-cost extension.</i>
"Gene Silencing in Chronic Bronchitis"
Role: Principal Investigator. | CIA150086
\$300,000 |
| 2. NIH/NHLBI
07/01/2016 - 06/30/2019
"Tracheobronchial Mucociliary Dysfunction in HIV patients"
Role: Principal Investigator | 1R21HL128141A1
\$275,000 |

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| <p>3. NIH/NIDA
1
03/01/2018 – 02/28/2020
“Lung comorbidities in HIV patients”
Role: Principal Investigator.</p> | <p>(A-START)
1R03DA04268
\$200,000</p> |
| <p>4. Department of Defense
07/01/2018 – 03/31/2020
“Novel approaches to Eliminating HIV Latency”
Role: Principal Investigator</p> | <p>DM171044
\$224,000</p> |
| <p>5. NIDA/NIH
03/31/13 – 12/31/19
“Multifunctional nanocarrier to eradicate HIV from latently infected CNS cells and Eradicating CNS reservoirs in HIV patients who also abuse methamphetamine”
Role: Principal Investigator.</p> | <p>Nair
5R01DA037838-03
(PI)</p> |

Completed Support:

1. **The Foundation for AIDS Research (amFAR), fellowship.**
01/01/06 – 12/31/08
“Designing inducible Pol II systems for RNA interference of HIV-1”.
Role: Principal Investigator
2. **American Lung Association**
07/01/2011- 06/30/2013
The role of the airway epithelium in the pharmacokinetics and dynamics of inhaled bronchodilators”.
Role: Principal Investigator
RG-196042-N
3. **Florida Department of Health**
07/01/2012 – 06/30/2016
“Restoring the Mucociliary clearance enhancing properties of inhaled beta-2-agonist bronchodilators in chronic bronchitis”.
Role: Principal Investigator.
3KN07-50996