CURRICULUM VITAE

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EDUCATION

1973	B.Sc. (Biology), Isabella Thoburn College, Lucknow, India
1975	M.Sc. (Biochemistry), Lucknow University, Lucknow, India
1980	Ph.D. (Biochemistry), Madurai Kamaraj University Madurai, India.

PROFESSIONAL –Work Experience

2007	Chief, GTTB, NIDCR, NIH
2006-2007	Acting Chief, MPTB, NIDCR, NIH.
1993 - present	Chief, Secretory Physiology Section Molecular Physiology and Therapeutics Branch NIDCR, NIH.
1988 - 1993	Senior Staff Fellow (Tenure-track) Clinical Investigations and Patient Care Branch, NIDR, NIH, Bethesda, MD.
1991 –1996	Adjunct Assistant Professor Department of Pathology, University of Maryland, School of Medicine, Baltimore, MD.
1985-1988	Visiting Associate Clinical Investigations and Patient Care Branch, NIDR, NIH, Bethesda, MD.
1984-1985	Research Assistant Professor Department of Pathology, School of Medicine, Baltimore, MD.
1980-1983	Research Associate Department of Biological Chemistry, University of Maryland, School of Medicine, Baltimore, MD.

RECENT HONORS AND AWARDS, ACTIVITIES, etc. (selected-current)

NIH Merit Award, 2000.
Member, Oral Biology and Medicine, Study Section, 1997-2000.

Administrative
Chair WSA Committee, NIH (2005-2008)
Woman Scientists' Advisor to the Scientific Director, NIDR, 1993-1998, 2002-present.
Member of the NIH Women's Advisory group.
Co-Chair, NIH-Calcium Interest Group, 1997-present.

Meetings/Conferences
NIH Ca^{2+} Day, 2007.
Chair, Gordon Conference on Calcium Signaling, 2007.
Co-Chair; Gordon Conference on Calcium Signaling, 2005.
Vice-Chair Elect; Salivary gland and excocrine secretion GRC, 2011
Chair Elect; Salivary gland and excocrine secretion GRC, 2013

Editorial
Faculty Member, Faculty of 1000 Biology
Review Editorial Board of Frontiers in Pharmacology of Ion Channel and Channelopathies
Editorial Board Member: Cell Calcium
Editorial Board member: Journal of Biological Chemistry
Member Editorial Board, Journal of Dental Research. 1996-1999
Member Editorial Board, Membrane Biochemistry. 1991-1996.

PUBLICATIONS
Selected publications (papers+review articles, last ten years).

Ma X, Cheng KT, Wong CO, O'Neil RG, Birnbaumer L, **Ambudkar IS**, Yao X. Heteromeric TRPV4-C1 channels contribute to store-operated Ca(2+) entry in vascular endothelial cells. Cell Calcium. 2011 Sep 17. [Epub ahead of print]

Pla AF, Avanzato D, Munaron L, **Ambudkar IS**. VASCULARIZING THE TUMOR: TRP CHANNELS AS MOLECULAR TARGETS. Am J Physiol Cell Physiol. 2011 Aug 10. [Epub ahead of print]

Ong HL, **Ambudkar IS**. The dynamic complexity of the TRPC1 channelosome. Channels (Austin). 2011 Sep 1;5(5):424-31. Epub 2011 Sep 1.

Fiorio Pla A, Ong HL, Cheng KT, Brossa A, Bussolati B, Lockwich T, Paria B, Munaron L, **Ambudkar IS**. TRPV4 mediates tumor-derived endothelial cell migration via arachidonic acid-activated actin remodeling. Oncogene. 2011. Jun 20. doi: 0.1038/onc.2011.231. [Epub ahead of print]

Ambudkar IS. Dissection of calcium signaling events in exocrine secretion. Neurochem Res. 2011, 36(7):1212-21. Epub 2011 May 2. *Invited Review*.

Cheng KT, Liu X, Ong HL, Swaim W, **Ambudkar IS**. Local Ca^{2+} entry via Orai1 regulates plasma membrane recruitment of TRPC1 and controls cytosolic Ca^{2+} signals required for specific cell functions. PLoS Biol. 2011. 9(3):e1001025. Epub 2011 Mar 8.

Cheng KT, Ong HL, Liu X, **Ambudkar IS**. Contribution of TRPC1 and Orai1 to Ca(2+) entry activated by store depletion. Adv Exp Med Biol. 2011;704:435-49. *Invited Review*.

Hong JH, Li Q, Kim MS, Shin DM, Feske S, Birnbaumer L, Cheng KT, **Ambudkar IS**, Muallem S. Polarized but differential localization and recruitment of STIM1, Orai1 and TRPC channels in secretory cells. Traffic. 2011. 12(2):232-45.

Hwei Ling Ong, Kwong Tai Cheng, Xibao Liu, and **Indu S. Ambudkar**. Recent progress in the regulation of TRPC1 by store depletion. (2010) *in press* Cell Membranes and Free Radical Research (CMFRR).

IS. Ambudkar, X. Liu, B. Paria. (2010) Transient receptor potential channels. in *Encyclopedia of Biochemistry*. *In press Invited Chapter*

Hwei Ling Ong and **Indu S. Ambudkar** (2011) "Role for lipid rafts in the regulation of store-operated Ca^{2+} channels". In: *Cholesterol Regulation of Ion Channels and Receptors*, Irena Levitan and Francisco Barrantes (Eds.). John Wiley & Sons, New York. *Manuscript submitted*. *Review*

Indu S. Ambudkar, Kwong Tai Cheng, Hwei Ling Ong, and Xibao Liu (2011) "Function and regulation of TRPC1: Contribution to Ca^{2+} entry activated by store depletion". In: *Store-operated Ca^{2+} entry pathways*, Klaus Groschner and Christoph Romanin (Eds.). Springer, Heidelberg. *Manuscript submitted*. *Review*

Hwei Ling Ong and **Indu S. Ambudkar**. (2011) "The dynamic complexity of the TRPC1 channelosome." *C*hannels (Austin). 2011 Sep 1;5(5). [Epub ahead of print]

Ma X, Cao J, Luo J, Nilius B, Huang Y, **Ambudkar IS**, Yao X. Depletion of intracellular Ca2+ stores stimulates the translocation of vanilloid transient receptor potential 4-c1 heteromeric channels to the plasma membrane. Arterioscler Thromb Vasc Biol. 2010, 30(11):2249-55.

Suzuki R, Liu X, Olivera A, Aguiniga L, Yamashita Y, Blank U, **Ambudkar I**, Rivera J Loss of TRPC1-mediated Ca2+ influx contributes to impaired degranulation in Fyn-deficient mouse bone marrow-derived mast cells. J Leukoc Biol. 2010, 88(5):863-75.

Liu X, Ong HL, Pani B, Johnson K, Swaim WB, Singh B**, Ambudkar I**. Effect of cell swelling on ER/PM junctional interactions and channel assembly involved in SOCE. Cell Calcium. 2010, 47(6):491-9.

Indu S. Ambudkar, Hwei L. Ong and Brij B. Singh (2010) "Molecular and functional determinants of Ca^{2+} signaling microdomains". In: *Signal Transduction: Pathways, Mechanisms and Diseases,* Ari Sitaramayya (Ed.). Springer, Heidelberg. Pp 237-253. *Review*

Lockwich T., Markey, S., and **Ambudkar, IS**. Proteomic analysis of TRPC channels. Methods in Signaling Transduction Series entitled "TRP channels". pp. *113-134.* CRC press, ed. M.X. Zhu.

Biswaranjan Pani*, Hwei Ling Ong*[1] , So-ching W. Brazer[1], Xibao Liu[1], Kristina Rauser, Brij B. Singh, and **Indu S. Ambudkar[1]**.Activation of TRPC1 by STIM1 in ER-PM microdomains involves release of the channel from its scaffold Caveolin1 Proc Natl Acad Sci U S A. 2009 Nov 24;106(47):20087-92. Epub 2009 Nov 6.

Ambudkar IS. Invited Editorial Comment on Deletion of TRPC4 and TRPC6 in miceimpairs smooth muscle contraction and intestinal motility by Tsvilovskyy et al. for Gastroenterology October, 2009.

Ambudkar IS., Hwei L. Ong and Brij B. Singh. Molecular and functional determinants of Ca^{2+} signaling microdomains. Chapter in Signal Transduction pathways, mechanisms and Diseases. Ed. A. Sitaramayya, Pub: Springer–Verlag; 2009, *in press.*

Lockwich TP, Liu X, Paria BC, Singh BB, **Ambudkar IS**. TRPC3 controls agonist-stimulated intracellular Ca2+ release by mediating the interaction between inositol 1,4,5-trisphosphate receptor and RACK1. Bandyopadhyay BC, Ong HL, **J Biol Chem**. 2008 Nov 21;283(47):32821-30. Epub 2008 Aug 28. PMID: 18755685 [PubMed - indexed for MEDLINE]

Pani B,Ong HL, Liu X, Rauser K, **Ambudkar IS**, Singh BB. Lipid rafts determine clustering of STIM1 in endoplasmic reticulum-plasma membrane junctions and regulation of store-operated Ca2+ entry (SOCE). J Biol Chem. 2008 Jun 20;283(25):17333-40. Epub 2008 Apr 22. PMID: 18430726.

Cheng KT, Liu X, Ong HL, **Ambudkar IS**. Functional requirement for Orai1 in store-operated TRPC1-STIM1 channels. J Biol Chem. 2008 May 9;283(19):12935-40. Epub 2008 Mar 7. PMID: 18326500.

Lockwich T, Pant J, Makusky A, Jankowska-Stephens E, Kowalak JA, Markey SP, **Ambudkar IS**. Analysis of TRPC3-Interacting Proteins by Tandem Mass Spectrometry. J Proteome Res. 2008 Mar 7;7(3):979-989.

Liu X, Cheng KT, Bandyopadhyay BC, Pani B, Dietrich A, Paria BC, Swaim WD, Beech D, Yildrim E, Singh BB, Birnbaumer L, **Ambudkar IS.** Attenuation of store-operated Ca2+ current impairs salivary gland fluid secretion in TRPC1(-/-) mice. Proc Natl Acad Sci U S A. 2007 Oct 30;104(44):17542-7. Epub 2007 Oct 23.

Ambudkar IS, Ong HL. Organization and function of TRPC channelosomes. Pflugers Arch. 2007 Nov;455(2):187-200. Epub 2007 May 8. Review. [Epub ahead of print] PMID: 17486362

Ambudkar IS, Ong HL, Liu X, Bandyopadhyay B, Cheng KT. TRPC1: The link between

functionally distinct store-operated calcium channels. Cell Calcium. 2007 Aug;42(2):213-23. [Epub ahead of print] PMID: 17350680 [PubMed - as supplied by publisher]

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Liu X, Bandyopadhyay BC, Singh BB, Groschner K, **Ambudkar IS**. Molecular analysis of a store-operated and 2-acetyl-sn-glycerol-sensitive non-selective cation channel. Heteromeric assembly of TRPC1-TRPC3. J Biol Chem. 280(22):21600-6 (2005).

Pla AF, Maric D, Brazer SC, Giacobini P, Liu X, Chang YH, **Ambudkar IS**, Barker JL. Canonical transient receptor potential 1 plays a role in basic fibroblast growth factor (bFGF)/FGF receptor-1-induced Ca2+ entry and embryonic rat neural stem cell

proliferation. J Neurosci. 25(10):2687-701 (2005).

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Liu, X., Groschner, K. and **Ambudkar, I.S**. Distinct Ca^{2+}-permeable cation channels are activated by internal Ca^{2+} store depletion in RBL-2H3 cells and the human salivary gland cells, HSG and HSY. J. Membr. Biol. 200:93-104 (2004).

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Singh, B.B., Lockwich, T.P., Bandyopadhyay, B.C., Liu,X., Bollimuntha, S., Brazer, S., Combs, C., Das, S., Leenders, M.A.G., Sheng, Z., Knepper, M.A., Ambudkar, S.V., and **Ambudkar, I.S**. VAMP-2-dependent exocytosis regulates plasma membrane insertion of TRPC3 channels and contributes to agonist-stimulated Ca^{2+} influx. Molecular Cell. 15, 635-646 (2004).

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Ambudkar IS, Brazer SC, Liu X, Lockwich T, Singh B.B. (2004) Plasma membrane localization of TRPC channels: role of caveolar lipid rafts. Mammalian TRP Channels as Molecular Targets (Chadwick DJ and Goode J, eds) Wiley InterScience Publications, 258: 63-70 (2004).

Liu X, Singh BB, **Ambudkar IS.** TRPC1 is required for functional store-operated Ca2+ channels. Role of acidic amino acid residues in the S5-S6 region. J Biol Chem. 28;278(13):11337-11343 (2003).

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Singh, B.B., Liu, X., Tang, J., Zhu, M.X., and **Ambudkar, I.S.** Calmodulin regulates Ca^{2+}-dependent feedback inhibition of store-operated Ca^{2+} influx by interaction with a site in the C-terminus of Trp1. Molecular Cell. 9, 739-750 (2002).

Kim, B.C., Kim, H.T., Mamura, M., **Ambudkar, I.S**., Choi, K.S., and Kim SJ. Tumor necrosis factor induces apoptosis in hepatoma cells by increasing Ca^{2+} release from the endoplasmic reticulum and suppressing Bcl-2 expression J Biol Chem. 277, 31381-31389 (2002).

Xie, Z-H, **Ambudkar, I.S.**, and Siraganian, R.P. The adapter molecule Gab2 regulates Fc□RI-mediated signal transduction in mast cells. J Immunol. 168, 4682-4691 (2002).

Radhika Basheer, Elda Arrigoni, Hemant S. Thatte, Robert W. Greene, **Ambudkar, I.S**, Robert

W. McCarley. Adenosine induces IP_3 receptor-mediated mobilization of intracellular calcium stores in basal forebrain cholinergic neurons J. Neuroscience. 22, 7680-7686 (2002).

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Liu X, & **Ambudkar IS**. Characteristics of a store-operated calcium-permeable channel: sarcoendo-plasmic reticulum Ca2+ pump function controls channel gating. J Biol Chem. 276, 29891-29898 (2001).

Singh, B.B., Zheng, C., Liu, X., Lockwich, T.P., Liao, D., Zhu, M.X., Birnbaumer, L., and **Ambudkar, I.S.** Trp1-dependent enhancement of salivary gland fluid secretion: role of store-operated calcium entry. FASEB J. 15, 1652-1654, (2001).

Lockwich, T., Singh, B.B., Liu, X., and **Ambudkar, I.S**. Stabilization of cortical actin induces internalization of Trp3-associated caveolar Ca^{2+} signaling complex and loss of Ca^{2+} influx without disruption of Trp3-IP_3R association. J. Biol. Chem., 276, 42401-42408, 2001.

Shamsul Hoque, A.T.M., Liu, X., Kagami, H., Swaim, W.D., Wellner, R.B., O' Connell, B.C., **Ambudkar, I.S.**, and Baum, B.J. Construction and function of a recombinant adenovirus encoding a human aquaporin 1-green fluorescence protein fusion product. Cancer Gene Therapy, 7, 476-485, (2000).

Liu, X., Wang, W., Lockwich, T., Singh, B.B., Wellner, R., Jadloweic, J., O' Connell, B., Zhu, X., and **Ambudkar, I.S.** Trp1, a candidate for the store-operated Ca2+ influx mechanism in salivary gland cells. J. Biol. Chem**.**, 275, 3403-3413, (2000).

Lockwich, T.P., Liu, X., Singh, B.B., Jadloweic, J. and **Ambudkar, I.S.** Assembly of hTrp1 in a signaling complex with caveolin-scaffolding lipid raft domains. J. Biol. Chem., 275, 11934-11942, (2000).

Singh, B.B., Liu, X., and **Ambudkar, I.S.** Expression of truncated Trp1α: Evidence that the Trp1 C-terminus modulates store-operated Ca^{2+} entry. J. Biol. Chem. 275, 36483-36486, (2000).