

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
Photocopy this page or follow this format for each person.

| NAME | POSITION TITLE |
|-----------------|--|
| Sidney A. Simon | Professor of Neurobiology Professor of Biomedical Engineering |

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.*)

| INSTITUTION AND LOCATION | DEGREE (if applicable) | YEAR(s) | FIELD OF STUDY |
|--------------------------|---------------------------|---------|-------------------|
| IIT | B.S. | 1965 | Physics |
| Arizona State University | M.S. | 1968 | Physics |
| Northwestern University | Ph.D. | 1973 | Materials Science |

RESEARCH AND PROFESSIONAL EXPERIENCE:

1973-1975 Research Associate and Associate, Dept. of Physiology and Pharmacology, Duke University (D.C. Tosteson, advisor)
 1975-1980 Assistant Professor, Department of Physiology and Pharmacology,
 1981-1987 Associate Professor, Department of Physiology,
 1988 Professor, Department of Physiology, Duke University
 1988-Present Professor, Department of Neurobiology Duke University
 2001- Present Professor, Department of Biomedical Engineering

Honors

Fellow : American Academy of Arts and Science

Current Editorial Responsibilities

Assistant Editor Journal of General Physiology
 Co-Editor Frontiers in Neuroscience Book Series 60 Volumes
 Co-Editor: Current Topics in Membranes Book Series 67 Volumes
 Chief Editor: Frontiers of Integrative Neuroscience

Selected Publications 2006-2011

Gutiérrez R, Carmena JM, Nicoletis MAL and Simon, SA (2006) Orbitofrontal ensemble activity predicts licking and distinguishes among rewards. J. Neurophysiol. 95: 119-133.

Liu L, Yang TM, Liedtke W and Simon SA (2006) Chronic IL-1 β signaling potentiates voltage dependent sodium currents in trigeminal nociceptive neurons. J. Neurophysiol. 95: 1478-1490.

Shlyonsky VG, Markin VS, Andreeva I, Pedersen SE, Simon SA, Benos DJ, Ismailov II. (2006) Role of membrane curvature in mechano-electrical transduction: ion carriers nonactin and valinomycin sense changes in integral bending energy. Biochim Biophys Acta. 758(11):1723-1731.

Markin VS, Shlyonsky VG, Simon SA, Benos DJ, Ismailov II. (2006) Mechanosensitivity of gramicidin channels in bulged bilayer membranes at constant tension. *Biofizika* 51: 1014-1018.

McIntosh TJ and Simon SA (2006) Roles of bilayer material properties in function and distribution of membrane proteins. *Annu. Rev. Biophys. Biomol. Struct.* 35: 177-198.

Stapleton JR, Levine M, Wolpert R, Nicolelis MAL, and Simon SA (2006) Rapid taste responses in the gustatory cortex during licking. *J. Neuroscience* 26: 4126-4138.

de Araujo IE, Gutierrez R, Oliveira-Maia AJ, Pereira Jr A, Nicolelis MAL and Simon SA (2006) Neural Ensemble Coding of Satiety States. *Neuron* 51: 483-494.

Zampighi GA, Zampighi LM, Fain N, Lanzavecchia S, Simon SA, and Wright EM (2006) Docked synaptic vesicles are hemi-fused with the active zone. *Biophysical J.* 91: 2910-2018.

Simon SA, de Araujo IE, Gutierrez R and Nicolelis MAL (2006) The neural mechanisms of gustation: a distributed processing code. *Nat Rev Neurosci* 7:890-901.

Costa RM, Gutierrez R, Kloth AD, Coelho M., de Araujo IE, Gainetdinov RR, Caron MG, Nicolelis MAL and Simon SA (2007) Dopamine modulates the updating of tastant values. *Genes, Brain & Behavior* 6: 314-320.

Liu L, Chen L, Liedtke W and Simon SA (2007) Changes in osmolality sensitize the response to capsaicin in trigeminal sensory neurons. *J. Neurophysiol.* 97: 2001-2015.

Soares E, Stapleton JR, Fitzsimmons N, Rodriguez A, Oliveria L, Nicolelis MAL and Simon SA (2007) Behavioral and neural responses to gustatory stimuli delivered non-contingently through intraoral cannulas. *Physiology and Behavior* 92:629-642.

Riera CE, Vogel H, Simon SA and le Coutre J (2007) Artificial sweeteners and salts producing metallic taste sensation activate TRPV1 receptors. *Am J. Physiology* 293: R626-R634.

McIntosh TJ and Simon SA (2007) Bilayers as protein solvents: role of bilayer structure and elastic properties. *J. Gen. Physiol.* 130 225-227.

Stapleton, JR, Lavine, ML, Nicolelis MAL and Simon, SA (2007) Ensembles of gustatory cortical neurons anticipate and discriminate between tastants in a single lick. *Frontiers of Neuroscience* 1: 161-174.

de Araujo IE, Nicolelis, MAL and Simon SA (2007) *Evolution of Gustation*. In: Volume 4 329-336.- *Evolution of Nervous System in Mammals*. Elsevier. Ed Jon Kass.

Rosenbaum, T. and Simon, S.A. (2006) TRPV1 Receptors and Signal Transduction. In: *TRP ion channel function in sensory transduction and cellular signaling cascades* Ed. W. Liedtke and S Heller CRC Press LLC of Taylor and Francis Books, Inc., (Boca Raton, FL). Chapter 5, pp. 69-84.

de Araujo I E., Oliveira-Maia AJ., Sotnikova TD, Gainetdinov RR, Caron MG, Nicolelis MAL and Simon SA (2008) Reward in the absence of taste receptor signaling. *Neuron* 57: 930-941.

Rawicz WW, Smith B, McIntosh TJ, Simon SA, and Evans EA (2008) Elasticity, permeability, and strength of lipid membranes containing raft microdomains. *Biophysics J.* 94:4725-4736

Simon SA, de Araujo IE, Stapleton JR and Nicolelis MAL (2008) Multisensory processing of gustatory stimuli. *Chem. Percept.* 1:95-102.

Tong J, Nguyen L, Vidal A, Simon SA, Skene JH, and McIntosh TJ. (2008) Role of GAP-43 in sequestering phosphatidylinositol 4,5-bisphosphate to raft bilayers. *Biophys J.* ;94: 125-133.

Simon SA and Liedtke W (2008) How irritating: the role of TRPA1 in sensing cigarette smoke and aerogenic oxidants in the airways. *J. Clin. Invest.* 118: 2383-2386.

Oliveira-Maia AJ, Simon SA, and Nicolelis MAL (2008) Neural Ensemble Recordings from Central Gustatory-Reward Pathways in Awake and Behaving Animals *In Methods for Neural Ensemble Recordings* 2nd Edition. Chapter 10. pp 190-218. CRC Press Taylor and Francis Group. Boca Raton, FL USA.

Jara-Oseguera A, Simon SA and Rosenbaum T (2008) TRPV1: On the Road to Pain Relief (2008) *Current Molecular Pharmacology* 1(3): 255-269.

Simon SA (2008) The Merging of the Senses. *Front. Neurosci.* 2: 13-14.

Riera CE, Vogel H, Simon SA, Damak S and le Coutre J (2008) The capsaicin receptor participates in artificial sweetener aversion. *BBRC* 376: 653-657.

Gutierrez R and Simon SA (2008) Perinatal choline supplementation: a smart lifelong solution to age-related dementia (Commentary). *Frontiers of Neuroscience* 2: 135-136.

Oliveira-Maia AJ, Stapleton-Kotloski JR, Lyall V, Phan Tam-Hao T, Mummalaneni S, Melone P, DeSimone JA, Nicolelis MAL and Simon SA (2009) Nicotine activates TRPM5-dependent and independent taste pathways. *PNAS* 106: 1596-1601.

Li J, Ghio AJ, Cho S-H, Brinckerhoff CE, Simon SA and Liedtke W (2009) Diesel-exhaust particles activate the matrix-metalloproteinase-1 gene in human bronchial epithelia in a β -arrestin-dependent manner via activation of RAS. *Environmental Health Perspectives* 117: 400-409.

Riera CE, Vogel H, Simon SA, Damak S and le Coutre J (2009) Sensory attributes of complex tasting divalent salts are mediated by TRPM5 and TRPV1 channels. *J. Neurosci.* 25: 2654-2662.

de Araujo IE and Simon SA (2009) The gustatory system and multisensory integration. *Int J. Obesity* 33: Supp 2: S34-S43.

Riera C, Menozzi-Smarrito C, Affolter M, Michlig S, Munari C, Fabien R, Vogel H, Simon SA, and le Coutre J (2009) Covalent and non-covalent ligand interactions in TRPA1 and TRPV1 channels with spicity molecules from Sichuan and Melegueta peppers. *Br J. Pharm* 157:1398-409.

Macdonald C, Meck W, Simon SA and Nicolelis MAL (2009) Taste-guided response-selection differentially engages neuronal ensembles across gustatory cortices. *J. Neuroscience* 29:11271-82.

Gutierrez R, Simon SA, Nicolelis MAL (2009) Spike timing precision of licking-synchronized neurons in the taste-reward circuit is enhanced upon learning. *J Neuroscience* 30: 287-303

Kuhn C; Johnson, M, Thomae A, Luo B, Simon SA, Zhau G, Walker QD (2010) The emergence of gonadal hormone influences on addictive behaviors during puberty. *Hormones and Behavior* 58(1):122-137.

Rosenbaum T, Simon SA and Islas LD (2010) Ion channels in analgesia research– *Methods in Molecular Biology* 617: 223-236.

Carleton A, Accolla R, and Simon SA (2010) Coding in the mammalian gustatory system. *TINS* 33: 326-334.

Oliveira-Maia J, Roberts, CD, Simon SA, Nicolelis MAL (2010) Gustatory and reward brain circuits in the control of food intake. *Adv Tech Stand Neurosurgery*. 36:31-59.

Li J, Kanju P, Patterson M, Chew W-L, Cho S-H, Simon SA and Liedtke W (2011) TRPV4-Mediated Calcium Influx into Human Bronchial Epithelia upon Exposure to Diesel Exhaust Particles. *Environ Health Perspect* 119: 784-793.

Gutierrez R and Simon SA (2011) Chemosensory processing in the taste – reward pathway *Flavours and Fragrances*. *J*. 26: 231-238.

Picazo-Juárez G, Romero-Suárez S, Llorente I, Briggs M, McIntosh TJ, Simon S A, De Guevara EL, Islas LD, and Rosenbaum T (2011) Identification of a Binding Motif in the S5 Helix That Confers Cholesterol Sensitivity to the TRPV1 Ion Channel. *Journal of Biological Chemistry* 286: 24966-24976.

Oliveira-Maia AJ, Roberts CD, Walker QD, Luo B, Kuhn C, Simon SA and Nicolelis MAL (2011) Intravascular Food Reward. *PloS One* (in press).

MacDonald CJ , Meck WH and Simon SA (2012) Distinct neural ensembles in rat gustatory cortex encode for water, osmotic pressure and the intensity of NaCl. *J. Physiol* (submitted).

Tandon S., Simon SA, and Nicolelis MAL (2012) Salt appetite

Tellez LA, Simon SA and Gutierrez R, (2012) Neuronal Dynamics in the Nucleus Accumbens Shell during Feeding and Sleep-Awake States

Principal Investigator/Program Director (Last, first, middle): Simon, Sidney A
