March 25, 2020

Biographical Sketch

William Louis Cleveland, Ph.D.

Professional Experience

Position	Institution	Dates
President and Founder	***Behaviorome Sciences, Inc.***	**2009-Present**
Research Scientist	**Department of Medicine, *Columbia University***	**2000-2008**
Research Scientist	**Department of Microbiology, *Columbia University***	**1990-2000**
Assistant Professor	**Department of Microbiology, *Columbia University***	**1982-1990**
Senior Staff Associate	**Department of Microbiology, *Columbia University***	**1980-1981**
Instrument Maker	**Department of Physics, *Columbia University***	**1965-1968**
Director, Laboratory for Molecular Mechanisms in Human Diseases	**Department of Medicine, *St. Luke's-Roosevelt Hospital Center***	**1985-2009**

Education

Institution	Degree	Field of Study	Years
Columbia University	**Postdoctoral Fellow**	**Immunology**	**1975-1979**
Rutgers University	**Ph. D.**	**Quantum Chemistry**	**1974**
Columbia University	**B. S.**	**Physics**	**1967**
Dartmouth College		**Mathematics**	**1960-1961**

Academic Honors

Dean's List, Dartmouth College, 1960.

Partial Academic Scholarship, Dartmouth College, 1960-1961.

Dean's List, Columbia University, 1963-64

Full Academic Scholarship, Columbia University, 1965-1967.

Colgate-Palmolive Co. Fellowship, Rutgers University, 1971-1972.

Research Summary

2009 - Present **Development of the *Behaviorome* concept and development of automated methods for remote monitoring of mentation and behavior based on sensors and statistical learning machines.**

2009 - Present **Further development of the Hypo-NMDAR-ST Theory of OCD and related disorders and development of new classes of treatments predicted by this theory.**

1997 - 2008	**Development of the Hypo-NMDA-Receptor Signal Transduction Theory of OCD and BDD and development of a new class of treatments predicted by this theory.**
2003 – 2008	**The Cellbot Project - a robotic toolbox for cell biology using statistical learning machines for automatic cell recognition and autonomous cell manipulation and analysis.**
1985 – 1997	**T-cell Recognition of Internal Images in the Idiotypic Network. Development of a General Model of the Idiotypic Network.**
1975 - 1984	**Mechanism of T-Cell receptor antigen recognition.**
	Immune Regulation and Idiotypic Networks.
	Myasthenia Gravis as an autoimmune idiotypic network disease.
	Single-cell methodology and hybridoma technology (protein-free media)
1968 - 1974	**The lowest triplet state and the ground state of benzoic acid – a high-resolution spectroscopic study at liquid helium temperature.**

Publications

Cleveland, WL, DeLaPaz, RL, Fawwaz RA, and Challop RS, *"High-Dose Glycine Treatment of Refractory Obsessive-Compulsive Disorder and Body Dysmorphic Disorder in a 5-Year Period,"* **Neural Plasticity, Volume 2009**, Article ID 768398, 25 pages, doi:10.1155/2009/768398

Greenberg W, Benedict M, Doerfer J, Perrin M, Panek L, Cleveland WL, and Javitt DC, *"Adjunctive glycine in the treatment of obsessive-compulsive disorder,"* **Journal of Psychiatric Research, 2009,** 43(6), 664-670.

Long X, Cleveland WL, Yao YL, ***"Multiclass Detection of Cells in Multicontrast Composite Images*****," Computers in Biology and Medicine 2010,** 40: 168-178.

Long X, Cleveland WL and Yao YL, *"Automatic Detection of Unstained Viable Cells in Brightfield Images Using A Support Vector Machine with an Improved Training Procedure,"* **Computers in Biology and Medicine 2006,** 36(4): 339-62.

Long X, Cleveland WL and Yao YL, *"A New Preprocessing Approach for Cell Recognition,"* **IEEE Transactions on Information Technology in Biomedicine 2005,** 9(3): 407-412.

Long X, Cleveland WL and Yao YL, *"Effective Automatic Recognition of Cultured Cells in Brightfield Images Using Fischer's Linear Discriminant Preprocessing,"* **Image and Computing Vision, 2005,** 23, pp.1203-1213.

Long X, Cleveland WL, and Yao YL*, "Effective Automatic Recognition of Cultured Cells in Brightfield Images Using Fischer's Linear Discriminant Preprocessing,"* **Proceedings of IMECE04: 2004 ASME International Mechanical Engineering Congress,** November 13-19**, 2004,** Anaheim, California USA.

Batterman J, Mazza DS, Meriney DK, Cleveland WL, Reddy MM, Grieco MH, *"In vitro release of soluble CD23 by human lymphocytes in ragweed-sensitive versus nonatopic patients following stimulation with ragweed antigen E,"* **Ann Allergy Asthma Immunol. 1996** Apr; 76(4):359-62.

Bodo I, Vloka JD, Cleveland WL. *"CD4 but not CD8 is comodulated with the T-cell antigen receptor (TCR) after activation of a CD4+ CD8+ human leukemia line with staphylococcal enterotoxin,"* **Immunol Lett. 1993** Jul; 37(1):53-62.

Cacalano NA, Chen BX, Cleveland WL, Erlanger BF. *"Evidence for a functional receptor for cyclosporin A on the surface of lymphocytes."* **Proc Natl Acad Sci USA. 1992** May 15; 89(10):4353-7.

Cacalano NA, Aggarwal R, Quesniaux VF, Cleveland WL, Erlanger BF. *'Novel monoclonal antibodies to cyclosporine A: characterization and epitope mapping with cyclosporine analogs and cyclophilin,"* **Mol Immunol. 1992** Jan; 29(1):107-18.

Cacalano NA, Cleveland WL, Erlanger BF. "*Characterization of a monoclonal anti-idiotypic antibody that mimics cyclosporine A in a single binding system***," J Immunol. 1991** Nov 1; 147(9): 3012-7.

Hashim GA, Galang AB, Srinivasan JV, Carvalho EF, Offner H. Vandenbark AA, Cleveland WL, Day ED. *"Defective T helper cell epitope responsible for the failure of region 69-84 of the human myelin basic protein to induce experimental allergic encephalomyelitis in the Lewis rat.,"* **J Neurosci Res. 1989** Oct; 24(2):222-30.

Cacalano NA, Cleveland WL, Erlanger BF. "*Antibodies to cyclosporine A (CsA) by a novel route and their use to monitor cyclosporine levels by radioimmunoassay (RIA),"* **J Immunol Methods. 1989** Mar 31; 118(2):257-63.

Cleveland WL. *"Crime and Punishment in the Society of Lymphocytes: A Speculation on the Structure of the Putative Idiotype Network***," In: "Anti-idiotypes, Receptors, and**

Molecular Mimicry" (D. S. Linthicum and N. Farid, eds.) Springer Verlag, New York, **1987.**

Ku HH, Cleveland WL, Erlanger BF. "*Monoclonal antibodies to adenosine receptor by an auto-anti-idiotypic approach***," J Immunol. 1987** Oct 1; 139(7):2376-84.

Erlanger BF, Cleveland WL, Wassermann NH, Ku HH, Hill BL, Sarangarajan R, Penn AS. "*Autoantibodies to receptors by an autoantiidiotypic route***," Ann N Y Acad Sci. 1987;** 505:416-22.

Erlanger BF, Cleveland WL, Wassermann NH, Ku HH, Hill BH, Sarangarajan R, Rajagopalan R, Tsilianos E, Edelman IS, Penn AS, Wan KK. *"Antireceptor antibodies by an autoantiidiotypic route,"* **In: Idiotypes (**M Reichlin and JD Capra, eds.) Academic Press, Orlando, pp. 157-178**, 1986.**

Erlanger BF, Cleveland WL, Wassermann NH, Ku HH, Hill BL, Sarangarajan R, Rajagopalan R, Cayanis E, Edelman IS, Penn AS. "*Auto-anti-idiotype: a basis for autoimmunity and a strategy for anti-receptor antibodies,"* **Immunol Reviews 1986** Dec; 94:23-37.

Cayanis E, Rajagopalan R, Cleveland WL, Edelman IS, Erlanger BF. "*Generation of an auto-anti-idiotypic antibody that binds to glucocorticoid receptor***," J Biol Chem. 1986** Apr 15; 261(11): 5094-103.

Erlanger BF, Cleveland WL, Wassermann NH, Ku HH, Hill BL, Wan KK, Sarangarajan R, Penn AS. "*The auto-anti-idiotypic route to antireceptor antibodies***," Ann NY Acad Sci.1986;** 475: 219-26.

Cleveland WL, Erlanger BF. "*The auto-anti-idiotypic strategy for preparing monoclonal antibodies to receptor combining sites***," Methods Enzymol. 1986;** 121: 95-107.

Erlanger BF, Cleveland WL, Wassermann NH, Hill BL, Penn AS, Ku HH, Sarangarajan R. *"Anti-idiotypic Antibody to the Acetylcholine and Adenosine Receptors"* **In: Molecular Basis of Nerve Activity,** (JP Changeux, F Hucho, A Maelicke, E Neuman, eds.) Proceedings of International Symposium in Berlin, Germany, Oct. 11-13, 1984**,** Walter deGruyter & Co., Berlin & NY, pp. 523-526, **1985**.

Cleveland WL, Wasserman NH Penn AS, Ku HH, Hill BL, Sarangarajan R, Erlanger BF*. "Idiotypic Routes to Monoclonal Anti-Receptor Antibodies***." In: Monoclonal Antibodies and Cancer Therapy,** Vol 27, "UCLA Symposia on Molecular and Cellular Biology, New Series" (R. A. Reisfeld and S. Sell, eds.) Alan R. Liss, Inc. New York, NY, pp. 345-347, **1985.**

Erlanger BF, Cleveland WL, Wasserman NH, Hill BL, Penn AS, Ku HH, Sarangarajan R. "*Anti-Receptor Antibodies by the Auto-Anti-Idiotypic Route,"* **In: "Investigation and Exploitation of Antibody Combining Sites, Vol. 15**

Methodological Surveys in Biochemistry and Analysis" (E. Reid, GMW Cook, and DJ Moore, eds.) Plenum, New York, pp. 91-107, **1985**.

Cleveland WL, Erlanger BF. "*Hypothesis: the MHC-restricted T-cell receptor as a structure with two multistate allosteric combining sites***," Mol Immunol. 1984** Nov; 21(11):1037-46.

Santella RM, Lin CD, Cleveland WL, Weinstein IB. "*Monoclonal antibodies to DNA modified by a benzo[a]pyrene diol epoxide***," Carcinogenesis. 1984** Mar; 5(3):373-7.

Erlanger BF, Wassermann NH, Cleveland WL, Penn AS, Hill BL, Sarangarajan R. *"Anti-idiotypic route to antibodies to the acetylcholine receptor and experimental myasthenia gravis,"* **In: Monoclonal and Anti-Idiotypic Antibodies: Probes for Receptor Structure and Function** (JC Venter, CM Fraser, and J Lindstrom, eds.) Alan R. Liss, New York, NY pp. 163-176, **1984**.

Cleveland WL, Wassermann NH, Sarangarajan R, Penn AS, Erlanger BF. "*Monoclonal antibodies to the acetylcholine receptor by a normally functioning auto-anti-idiotypic mechanism***," Nature. 1983** Sep 1-7; 305(5929):56-7.

Cleveland WL, Wood I, Erlanger BF. "*Routine large-scale production of monoclonal antibodies in a protein-free culture medium***," J Immunol Methods. 1983** Jan 28; 56(2):221-34.

Wassermann NH, Penn AS, Freimuth PI, Treptow N, Wentzel S, Cleveland WL, Erlanger BF. "*Anti-idiotypic route to anti-acetylcholine receptor antibodies and experimental myasthenia gravis***," Proc Natl Acad Sci U S A. 1982** Aug; 79(15):4810-4.

Cleveland WL, Wood I, Cone RE, Iverson GM, Rosenstein RW, Gershon RK, Erlanger BF. "*Detection of T cells that secrete molecules which share determinants with antigen-specific T-cell factors***," Proc Natl Acad Sci U S A. 1981** Dec; 78(12):7697-701.

Cleveland WL, Wood I, Jacobs IN, Erlanger BF. "*A general method for studying the secretion of macromolecules by single cells. II. A simplified procedure with enhanced sensitivity,"* **Cell Immunol. 1981** Sep 1; 63(1):154-63.

Cleveland WL, Erlanger BF. "*A general method for studying the secretion of macromolecules by single cells. I. Detection of immunoglobulin-secreting cells,"* **Cell Immunol. 1978** Apr; 37(1):229-42.

Schugar HJ, Soloman EI, Cleveland WL, Goodman L. "*Simultaneous Pair Electronic Transitions in Ytterbium Oxide***," J. Amer. Chem. Soc. 1975,** 97, 6442-6450.

Cleveland WL. "*A High-Resolution Spectroscopic Study of the Ground State and Lowest Triplet State of Benzoic Acid***," Ph.D. Thesis, 1975,** Department of Chemistry, Rutgers University, Piscataway, NJ.

Issued Patents

Cleveland WL. High dose glycine as a treatment for obsessive-compulsive disorder and obsessive-compulsive spectrum disorders. 9,504,665.

Cleveland WL. High dose glycine as a treatment for obsessive-compulsive disorder and obsessive-compulsive spectrum disorders. 9,415,030.

Cleveland WL. High dose glycine as a treatment for obsessive-compulsive disorder and obsessive-compulsive spectrum disorders. 8,604,080.

Long, X, Cleveland, WL, Yao, YL. Methods and systems for identifying and localizing objects based on features of the objects that are mapped to a vector. 7,958,063.

Erlanger BF, Cleveland WL, Cacalano NA. Derivatives of cyclosporine A, antibodies directed thereto and uses thereof. 5,405,785.

Erlanger BF, Cleveland WL, Cacalano NA. Derivatives of cyclosporine A, antibodies directed thereto and uses thereof. 5,350,574.

Erlanger BF, Cleveland WL. Method of producing monoclonal auto-anti-idiotypic antibodies. 5,144,010.

Edelman IS, Erlanger BF, Tsilianos E, Cleveland WL. Auto-anti-idiotypic monoclonal antibodies to steroid receptors and uses thereof. 4,818,684.

Cleveland WL, Erlanger BF. Protein-free culture medium. 4,767,704.

Grant/Manuscript Review

Journals: ***Science, Journal of Immunology, BMC Bioinformatics, Autoimmunity, Analytical Biochemistry***

National Institutes of Health: ***IMAT Study Section***

Teaching Activities

Department of Microbiology, Columbia University:

From 1982 thru 1997, I lectured in the immunology section of the departmental course given to medical, dental, and graduate students. My lectures covered the complement system, antigen-antibody interactions, T-cell immunology, and Types II-IV hypersensitivity. I also taught courses for graduate students, such as *Introductory Immunology* and *Advanced Immunology* and was on departmental committees that reviewed Ph.D. qualifying examinations and oral defenses of Ph.D. theses. Periodic lectures to House Staff in the Department of Medicine at St. Luke's-Roosevelt Hospital Center were also given.

Invited Symposium Speaker

International Symposium on *"Molecular Basis of Nerve Activity"* in Berlin-Dahlem, F. R. Germany, Oct. 1984.

International Symposium *on "Hybridomas in Human Systems: Technology and Biomedical Problems*," College of Physicians and Surgeons of Columbia University, May 1985.

UCLA Symposium on *"Monoclonal Antibodies and Cancer Therapy"* in Park City, Utah, January 1985.

International Symposium on *"Anti-Idiotypes as Probes for the Study of Receptors*" in Montebello, Canada, July 1986, Session Chairman.

Society Memberships

American Association of Immunologists
The Harvey Society of New York

Biographical Listings

American Men and Women of Science
Marquis Who's Who in the World
Marquis Who's Who in Medicine and Healthcare