Stanford

Edward Bertaccini

Professor of Anesthesiology, Perioperative and Pain Medicine (MSD), Emeritus

Bio

BIO

Edward J. Bertaccini, MD, is a native of San Jose, California. He is a Cardinal Bellarmine Award winning graduate of Bellarmine College Preparatory in San Jose. He completed his undergraduate training in Biochemistry and Quantum Physics at the University of California, Davis, where he graduated Summa Cum Laude. He subsequently attended the St. Louis University School of Medicine in St. Louis, MO.

Dr. Bertaccini returned home to complete his internship at the Santa Clara Valley Medical Center, and his anesthesiology residency with subsequent ICU fellowship at the Stanford University School of Medicine. Upon completion of his training in 1994, he joined the faculty of the Stanford University Department of Anesthesia and began service to his country via his post in anesthesia and critical care medicine at the VA Palo Alto Health Care System.

Dr. Bertaccini is currently a Professor of Anesthesiology and Intensive Care Medicine within the Stanford University School of Medicine and maintains an internationally recognized program in the molecular modeling of anesthetic action. He practices as a cardiac anesthesiologist and intensive care specialist at the VA Palo Alto Health Care System where he has served as both the director of the operating room and the acting co-director of the intensive care units. His clinical efforts have played an integral part of teams that have achieved national recognition for both cardiac surgery as well as intensive care outcomes.

ACADEMIC APPOINTMENTS

- Professor Emeritus, Anesthesiology, Perioperative and Pain Medicine
- Member, Bio-X
- Member, SPARK at Stanford
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

PROFESSIONAL EDUCATION

- Residency, Stanford University Department of Anesthesia , Anesthesiology (1993)
- fellowship, Stanford University Department of Anesthesia , Critical Care Medicine (1994)

PATENTS

- Edward Bertaccini MD, M. Frances Davies PhD. "United States Patent 62064670 NOVEL METHODS, COMPOUNDS, AND COMPOSITIONS FOR ANESTHESIA", Stanford University and US Department of Veterans Affairs, Dec 24, 2019

LINKS

- Bio Online at VA: http://www.paloalto.va.gov/services/anes/bios/bertaccini.asp

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Molecular structures of drugs related to clinical, anesthesia; molecular modeling related to biological activity.

Teaching

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Pritam Panda

Publications

PUBLICATIONS

- **Anesthesia, Coming of Age in the World of Modern In Silico Drug Design.** *Anesthesiology*
  Bertaccini, E. J.
  2023; 138 (2): 129-131
- **A newly developed anesthetic based on a unique chemical core.** *Proceedings of the National Academy of Sciences of the United States of America*
  Cayla, N. S., Dagne, B. A., Wu, Y., Lu, Y., Rodriguez, L., Davies, D. L., Gross, E. R., Heifets, B. D., Davies, M. F., MacIver, M. B., Bertaccini, E. J.
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- **AN IN VITRO MODEL FOR STUDYING THE CARDIOTOXICITY OF NEW ANESTHETICS**
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- **The Role of the Hydroxyl Group in Propofol-Protein Target Recognition: Insights from ONIOM Studies.** *The journal of physical chemistry. B*
  Qiu, L. n., Lin, J. n., Liu, Q. n., Wang, S. n., Lv, G. n., Li, K. n., Shi, H. n., Huang, Z. n., Bertaccini, E. J.
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- **Identification of an Inhibitory Alcohol Binding Site in GABAA ρ1 Receptors.** *ACS chemical neuroscience*
  Borghese, C. M., Ruiz, C. I., Lee, U. S., Cullins, M. A., Bertaccini, E. J., Trudell, J. R., Harris, R. A.
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- **Assessment of Homology Templates and an Anesthetic Binding Site within the ?-Aminobutyric Acid Receptor.** *Anesthesiology*
  Bertaccini, E. J., Yoluk, O., Lindahl, E. R., Trudell, J. R.
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- **Disruption of an intersubunit electrostatic bond is a critical step in glycine receptor activation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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- **The common chemical motifs within anesthetic binding sites** *ANESTHESIA AND ANALGESIA*
  Bertaccini, E. J., Trudell, J. R., Franks, N. P.
  2007; 104 (2): 318-324
- **Predicting the transmembrane secondary structure of ligand-gated ion channels** *PROTEIN ENGINEERING*
  Bertaccini, E., Trudell, J. R.
  2002; 15 (6): 443-453
- **Anesthetics and ion channels: Molecular models and sites of action** *ANNUAL REVIEW OF PHARMACOLOGY AND TOXICOLOGY*
  Yamakura, T., Bertaccini, E., Trudell, J. R., Harris, R. A.
  2001; 41: 23-51

- **Putative RNA editing of a nicotinic receptor increases acetylcholine sensitivity.** *The Journal of general physiology*
  Borghese, C. M., Lu, Y., Bertaccini, E. J., Zakon, H. H.
  2026; 158 (3)
- **Assessment of a new class of slow γ-aminobutyric acid type A receptor anesthetic on mouse neuronal and astrocyte mitochondrial function.** *Research square*
  Stary, C. M., Griffiths, B., Sun, X., Davies, F., Jahangir, A., Manis, E., Russo, I., Dean, C. A., Montague, L., Bertaccini, E.
  2025
- **Comparative Electroencephalographic Profile of a New Anesthetic and Anticonvulsant That Is Selective for the GABAAR Slow Receptor Subtype.** *Anesthesia and analgesia*
  Maciver, M. B., McCarren, H. S., Eagleman, S. L., Davies, F. M., Jahangir, A., Pal, D., Mashour, G. A., Bertaccini, E. J.
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- **EEG Profile for a Selective GABAA-Slow Agonist, Compared to Propofol, in Rats**
  Maciver, B., Davies, F., Mashour, G. A., Pal, D., McCarren, H., Bertaccini, E. J., Eagleman, S.
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- **Pursuing the Next Generation of Anesthetic and Anticonvulsant Compounds**
  Bertaccini, E. J., Davies, F., Jahangir, A., McCarren, H., Lam, R. K., Shamloo, M., Cayla, N., Maciver, B.
  LIPPINCOTT WILLIAMS & WILKINS.2021: 81-82
- **Modulation of alpha1beta3gamma2 GABAA receptors expressed in X. laevis oocytes using a propofol photoswitch tethered to the transmembrane helix.** *Proceedings of the National Academy of Sciences of the United States of America*
  Borghese, C. M., Wang, H. L., McHardy, S. F., Messing, R. O., Trudell, J. R., Harris, R. A., Bertaccini, E. J.
  2021; 118 (8)
- **Assessment of New Drug Class with both Anesthetic and Antiepileptic Efficacy on Mouse Neuronal and Astrocyte Mitochondrial Function**
  Griffiths, B., Sun, X., Davies, F., Jahangir, A., Bertaccini, E. J., Stary, C. M.
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- **An In Vitro Model for Identifying Cardiac Side Effects of Anesthetics** *ANESTHESIA AND ANALGESIA*
  Chang, A. C. Y., Chang, A. C. H., Nicin, L., Weber, G. J., Holbrook, C., Davies, M., Blau, H. M., Bertaccini, E. J.
  2020; 130 (1): E1–E4
- **An In Vitro Model for Identifying Cardiac Side Effects of Anesthetics.** *Anesthesia and analgesia*
  Chang, A. C., Chang, A. C., Nicin, L., Weber, G. J., Holbrook, C., Davies, M. F., Blau, H. M., Bertaccini, E. J.
  2018
- **Insights Into Receptor-Based Anesthetic Pharmacophores and Anesthetic-Protein Interactions.** *Methods in enzymology*
  Fahrenbach, V. S., Bertaccini, E. J.
  2018; 602: 77–95
- **Insights Into Receptor-Based Anesthetic Pharmacophores and Anesthetic-Protein Interactions** *CHEMICAL AND BIOCHEMICAL APPROACHES FOR THE STUDY OF ANESTHETIC FUNCTION, PT A*
  Fahrenbach, V. S., Bertaccini, E. J.
  edited by Eckenhoff, R. G., Dmochowski, I. J.
  2018; 602: 77–95
- **Design and Implementation of a Perioperative Surgical Home at a Veterans Affairs Hospital.** *Seminars in cardiothoracic and vascular anesthesia*
  Walters, T. L., Howard, S. K., Kou, A., Bertaccini, E. J., Harrison, T. K., Kim, T. E., Shafer, A., Brun, C., Funck, N., Siegel, L. C., Stary, E., Mariano, E. R.
  2016; 20 (2): 133-140
- **IDENTIFICATION OF AN INHIBITORY ALCOHOL BINDING SITE IN GABAA RHO1**
  Trudell, J. R., Borghese, C. M., Ruiz, C. I., Lee, U. S., Cullins, M. A., Bertaccini, E. J.
  WILEY-BLACKWELL.2016: 199A
- **Principal Components from Ligand-Gated Ion Channel Structures Enable Ensemble Studies of Microsecond-Scale Transitions**
  Yoluk, O., Orellana, L., Bertaccini, E. J., Trudell, J. R., Lindahl, E.

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- **Identification of an Inhibitory Alcohol Binding Site in GABAaRho1**
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  Borghese, C. M., Ruiz, C. I., Lee, U. S., Cullins, M. A., Bertaccini, E. J., Trudell, J. R., Harris, R. A.
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- **Insights into the Nature of Anesthetic Protein Interactions: An ONIOM Study** *JOURNAL OF PHYSICAL CHEMISTRY B*
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  Bertaccini, E. J., Dickinson, R., Trudell, J. R., Franks, N. P.
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  Olsen, R. W., Li, G., Wallner, M., Trudell, J. R., Bertaccini, E. J., Lindahl, E., Miller, K. W., Alkana, R. L., Davies, D. L.
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  Yoluk, O., Riederer, E. A., Andersson, M., Klement, G., Trudell, J. R., Bertaccini, E. J., Howard, R. J., Lindahl, E.
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- **Stabilization of the GluCl Ligand-Gated Ion Channel in the Presence and Absence of Ivermectin** *BIOPHYSICAL JOURNAL*
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- **Association of age and packed red blood cell transfusion to 1-year survival - an observational study of ICU patients** *TRANSFUSION MEDICINE*
  Mudumbai, S. C., Cronkite, R., Hu, K. U., Heidenreich, P. A., Gonzalez, C., Bertaccini, E., Stafford, R. S., Cason, B. A., Mariano, E. R., Wagner, T.
  2013; 23 (4): 231-237
- **Molecular Mechanism for the Dual Alcohol Modulation of Cys-loop Receptors** *PLOS COMPUTATIONAL BIOLOGY*
  Murail, S., Howard, R. J., Broemstrup, T., Bertaccini, E. J., Harris, R. A., Trudell, J. R., Lindahl, E.
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- **Teaching an Old GABA Receptor New Tricks** *ANESTHESIA AND ANALGESIA*
  Trudell, J. R., Bertaccini, E., MacIver, M. B.
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- **Induced changes in protein receptors conferring resistance to anesthetics** *CURRENT OPINION IN ANESTHESIOLOGY*
  Bertaccini, E. J., Trudell, J. R.
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- **NEW HOMOLOGY MODELS OF GLYR AND GABAAR PROVIDE NEAR ATOMIC LEVEL RESOLUTION AND ARE SUITABLE FOR STUDIES OF GATING MOTIONS WITH MOLECULAR DYNAMICS** *35th Annual Scientific Meeting of the Research-Society-on-Alcoholism (RSA)*
  Trudell, J. R., Bertaccini, E., Davies, D., ALKANA, R., Perkins, D., Lindahl, E., Murail, S., Harris, R. A., Howard, R.
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- **EPIDEMIOLOGY AND RISKS OF TRANSFUSION AMONG DIFFERENT AGE STRATA IN ICU PATIENTS**
  Mudumbai, S., Cronkite, R., Bertaccini, E., Cason, B., Mariano, E., Wagner, T.

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- **Combined functional-computational approach to characterize sites of anesthetic modulation of ligand-gated ion channels**
  Howard, R. J., Murail, S., Broemstrup, T., Horani, S., Lee, U. S., Ondricek, K. E., Corringer, P., Lindahl, E., Bertaccini, E. J., Trudell, J. R., Harris, R.
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- **Anesthetic binding sites in a GABAR model based on the GluCl ion channel template**
  Bertaccini, E. J., Trudell, J. R., Lindahl, E.
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- **Molecular mechanism of the dual anesthetic modulation effect on Cys-loop receptors**
  Murail, S., Broemstrup, T., Howard, R., Trudell, J., Bertaccini, E. J., Lindahl, E.
  AMER CHEMICAL SOC.2012
- **Electrostatic interaction at the interface of the ligand-binding and transmembrane domains in the GABAa receptor**
  Trudell, J. R., Bertaccini, E. J.
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- **The Molecular Mechanism for the Dual Alcohol Modulation of Cys-Loop Receptors**
  Lindahl, E., Murail, S., Howard, R. J., Broemstrup, T., Trudell, J., Bertaccini, E. J.
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- **Tracing the Closing of a Ligand-Gated Ion Channel in Atomic Detail: An Unconstrained Four-Microsecond Simulation of GLIC Leads to a Closed State Remarkably Similar to ELIC**
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  Murail, S., Wallner, B., Trudell, J. R., Bertaccini, E., Lindahl, E.
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- **Modeling Anesthetic Binding Sites within the Glycine Alpha One Receptor Based on Prokaryotic Ion Channel Templates: The Problem with TM4** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*
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  Trudell, J. R., Bertaccini, E.
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- **Normal Mode Gating Motions of a Ligand-Gated Ion Channel Persist in a Fully Hydrated Lipid Bilayer Model** *ACS CHEMICAL NEUROSCIENCE*
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- **The Molecular Mechanisms of Anesthetic Action: Updates and Cutting Edge Developments from the Field of Molecular Modeling.** *Pharmaceuticals (Basel, Switzerland)*
  Bertaccini, E. J.
  2010; 3 (7): 2178-2196
- **ICU Management after Thoracic Aorta Surgery** *Pocket ICU Management, 2nd edition (electronic)*
  Bertaccini E, Wall M, Roberts P, Farmer JC
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- **Microsecond Simulations Show that Ethanol Binds between Subunits and Stabilizes the Open Form of a Glycine Receptor Model**
  Murail, S., Wallner, B., Trudell, J. R., Bertaccini, E., Lindahl, E.

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  Bertaccini E, Wall M, Roberts P, Farmer JC
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- **The Molecular Mechanisms of Anesthetic Action: Updates and Cutting Edge Developments from the Field of Molecular Modeling** *Pharmaceuticals*
  Bertaccini E
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- **Roles for Loop 2 residues of alpha 1 glycine receptors in agonist activation** *JOURNAL OF BIOLOGICAL CHEMISTRY*
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  Perkins, D. I., Kelly, R. L., Tom, J. C., Trudell, J. R., Bertaccini, E. J., Davies, D. L., Alkana, R. L.
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- **Normal Mode Analysis Reveals the Channel Gating Motion within a Ligand Gated Ion Channel Model** *Proceedings of the 7th International Conference on Basic and Systematic Mechanisms of Anesthesia Nara, Japan 25-27 February 2005, International Congress Series*
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- **Homology modeling of a human glycine alpha 1 receptor reveals a plausible anesthetic binding site** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*
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- **Non-steady state analysis of the pharmacokinetic interaction between propofol and remifentanil** *ANESTHESIOLOGY*
  Bouillon, T., Bruhn, J., Radu-Radulescu, L., Bertaccini, E., Park, S., Shafer, S.
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  2001; 48: 141-166
- **Patients' physiological responses to weaning from mechanical ventilation using Pressure Support Ventilation and Proportional Assist Ventilation**
  Thompson, L. F., Carrieri-Kohlman, Bertaccini, E., Stotts, N., Barr, J., Geller, E.
  LIPPINCOTT WILLIAMS & WILKINS.2000: A85
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