

# Stanford

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## Edward Bertaccini

Professor of Anesthesiology, Perioperative and Pain Medicine at the Palo Alto Veterans Affairs Health Care System

### Bio

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#### 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 - Med Center Line, Anesthesiology, Perioperative and Pain Medicine
- Member, Bio-X
- 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)

#### LINKS

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

### Research & Scholarship

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#### CURRENT RESEARCH AND SCHOLARLY INTERESTS

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

## Publications

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### PUBLICATIONS

- **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. 2019
- **AN IN VITRO MODEL FOR STUDYING THE CARDIOTOXICITY OF NEW ANESTHETICS** Bertaccini, E. J., Chang, A. C., Chang, A. C., Weber, G. J., Nicin, L., Davies, F., Blau, H. LIPPINCOTT WILLIAMS & WILKINS.2018: 35
- **The Role of the Hydroxyl Group in Propofol-Protein Target Recognition: Insights from ONIOM Studies.** *The journal of physical chemistry. B* Qiu, L., Lin, J., Liu, Q., Wang, S., Lv, G., Li, K., Shi, H., Huang, Z., Bertaccini, E. J. 2017; 121 (24): 5883–96
- **Identification of an Inhibitory Alcohol Binding Site in GABAA #1 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. 2016; 7 (1): 100–108
- **Assessment of Homology Templates and an Anesthetic Binding Site within the  $\gamma$ -Aminobutyric Acid Receptor.** *Anesthesiology* Bertaccini, E. J., Yoluk, O., Lindahl, E. R., Trudell, J. R. 2013; 119 (5): 1087-1095
- **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* Todorovic, J., Welsh, B. T., Bertaccini, E. J., Trudell, J. R., Mihic, S. J. 2010; 107 (17): 7987-7992
- **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
- **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
- **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 GABA(A) rho 1 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. 2016; 7 (1): 100-108
- **Insights into the Nature of Anesthetic Protein Interactions: An ONIOM Study** *JOURNAL OF PHYSICAL CHEMISTRY B* Qiu, L., Lin, J., Bertaccini, E. J.

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- **Invasive Mechanical Ventilation in California Over 2000-2009: Implications for Emergency Medicine.** *The western journal of emergency medicine*  
Mudumbai, S. C., Barr, J., Scott, J., Mariano, E. R., Bertaccini, E., Nguyen, H., Memtsoudis, S. G., Cason, B., Phibbs, C. S., Wagner, T.  
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- **Molecular Modeling of a Tandem Two Pore Domain Potassium Channel Reveals a Putative Binding Site for General Anesthetics** *ACS CHEMICAL NEUROSCIENCE*  
Bertaccini, E. J., Dickinson, R., Trudell, J. R., Franks, N. P.  
2014; 5 (12): 1246-1252
- **Structural Models of Ligand-Gated Ion Channels: Sites of Action for Anesthetics and Ethanol** *ALCOHOLISM-CLINICAL AND EXPERIMENTAL RESEARCH*  
Olsen, R. W., Li, G., Wallner, M., Trudell, J. R., Bertaccini, E. J., Lindahl, E., Miller, K. W., Alkana, R. L., Davies, D. L.  
2014; 38 (3): 595-603
- **Stabilization of the GluCl1 Ligand-Gated Ion Channel in the Presence and Absence of Ivermectin** *BIOPHYSICAL JOURNAL*  
Yoluk, O., Bromstrup, T., Bertaccini, E. J., Trudell, J. R., Lindahl, E.  
2013; 105 (3): 640-647
- **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.  
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- **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.  
2012; 25 (4): 405-410
- **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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- **Association of admission hematocrit with 6-month and 1-year mortality in intensive care unit patients** *TRANSFUSION*  
Mudumbai, S. C., Cronkite, R., Hu, K. U., Wagner, T., Hayashi, K., Ozanne, G. M., Davies, M. F., Heidenreich, P., Bertaccini, E.  
2011; 51 (10): 2148-2159
- **Microsecond Simulations Indicate that Ethanol Binds between Subunits and Could Stabilize an Open-State Model of a Glycine Receptor** *BIOPHYSICAL JOURNAL*  
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*  
Bertaccini, E. J., Wallner, B., Trudell, J. R., Lindahl, 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*  
Bertaccini, E. J., Trudell, J. R., Lindahl, E.  
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- **The Molecular Mechanisms of Anesthetic Action: Updates and Cutting Edge Developments from the Field of Molecular Modeling.** *Pharmaceuticals (Basel, Switzerland)*

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- **ICU Management after Thoracic Aorta Surgery** *Pocket ICU Management, 2nd edition (electronic)*  
Bertaccini E, Wall M, Roberts P, Farmer JC  
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- **ICU Management after Cardiac Surgery** *Pocket ICU Management, 2nd edition (electronic)*  
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*  
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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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- **Effect of cobratoxin binding on the normal mode vibration within acetylcholine binding protein** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*  
Bertaccini, E. J., Lindahl, E., Sixma, T., Trudell, J. R.  
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- **Molecular Modeling and mutagenesis reveals a tetradentate binding site for Zn<sup>2+</sup> in GABA(A) alpha beta receptors and provides a structural basis for the modulating effect of the gamma subunit** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*  
Trudell, J. R., Yue, M. E., Bertaccini, E. J., Jenkins, A., Harrison, N. L.  
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- **Evidence that ethanol acts on a target in Loop 2 of the extracellular domain of alpha 1 glycine receptors** *29th Annual Meeting of the Research-Society-on-Alcoholism*  
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- **Normal-mode analysis of the glycine alpha1 receptor by three separate methods** *JOURNAL OF CHEMICAL INFORMATION AND MODELING*  
Bertaccini, E. J., Trudell, J. R., Lindahl, E.  
2007; 47 (4): 1572-1579
- **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*  
Bertaccini E, Trudell JR, Lindahl E  
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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*  
Bertaccini, E. J., Shapiro, J., Brutlag, D. L., Trudell, J. R.  
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- **Comparative modeling of a GABAA alpha1 receptor using three crystal structures as templates** *JOURNAL OF MOLECULAR GRAPHICS & MODELLING*  
Trudell, J. R., Bertaccini, E.  
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- **Use of a fully simulated intensive care unit environment for critical event management training for internal medicine residents** *CRITICAL CARE MEDICINE*  
Lighthall, G. K., Barr, J., Howard, S. K., Gellar, E., Sowb, Y., Bertaccini, E., Gaba, D.  
2003; 31 (10): 2437-2443
- **Correlation of approximate entropy, bispectral index, and spectral edge frequency 95 (SEF95) with clinical signs of "anesthetic depth" during coadministration of propofol and remifentanyl** *ANESTHESIOLOGY*  
Bruhn, J., Bouillon, T. W., Radulescu, L., Hoeft, A., Bertaccini, E., Shafer, S. L.  
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- **Non-steady state analysis of the pharmacokinetic interaction between propofol and remifentanyl** *ANESTHESIOLOGY*  
Bouillon, T., Bruhn, J., Radu-Radulescu, L., Bertaccini, E., Park, S., Shafer, S.  
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- **Molecular modelling of specific and non-specific anaesthetic interactions** *BRITISH JOURNAL OF ANAESTHESIA*  
Trudell, J. R., Bertaccini, E.  
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- **Meperidine exerts agonist activity at the alpha(2B)-adrenoceptor subtype** *Annual Meeting of the American-Society-of-Anesthesiologists*  
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- **Molecular modelling of anesthetic binding sites in ligand-gated ion channels** *Molecular and Basic Mechanisms of Anesthesia, Pabst Science Publishers*  
Trudell JR, Bertaccini, E  
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- **Molecular modelling of anesthetic binding sites in ligand-gated ion channels** *6th International Conference on Molecular and Basic Mechanisms of Anesthesia*  
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- **A double-blind, randomized comparison of IV lorazepam versus midazolam for sedation of ICU patients via a pharmacologic model** *Annual Meeting of the Society-for-Critical-Care-Medicine*  
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- **Evidence for a common binding cavity for three general anesthetics within the GABA(A) receptor** *JOURNAL OF NEUROSCIENCE*  
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- **Molecular modeling of ligand-gated ion channels: Progress and challenges** *INTERNATIONAL REVIEW OF NEUROBIOLOGY, VOL 48*  
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- **The Interface Of Molecular Modeling and Molecular Genetics: A Search for Sites of Anesthetic Action** *Progress in Anesthesia Mechanisms*  
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- **Evaluation of forcefields for molecular mechanics/dynamics calculations involving halogenated anesthetics.** *Toxicology letters*  
Trudell, J. R., Bertaccini, E.  
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- **Evaluation of forcefields for molecular mechanics/dynamics calculations involving halogenated anesthetics** *5th International Conference on Molecular and Cellular Mechanisms of Anaesthesia*  
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- **ICU sedation: A review of its pharmacology and assessment** *JOURNAL OF INTENSIVE CARE MEDICINE*  
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- **MOLECULAR-DYNAMICS SIMULATION OF ANESTHETIC-PHOSPHOLIPID BILAYER INTERACTIONS** *JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS*  
Huang, P., Bertaccini, E., Loew, G. H.  
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- **Benzodiazepine Antagonists And Their Role In Anesthesia And Critical Care** *Anaesthetic Pharmacology Review*  
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- **USE OF WHOLE BOWEL IRRIGATION IN AN INFANT FOLLOWING IRON OVERDOSE** *AMERICAN JOURNAL OF EMERGENCY MEDICINE*

EVERSON, G. W., Bertaccini, E. J., OLEARY, J.  
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