

# Carlos J. Vera M.D., Ph.D.

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## Personal Data

Name: Carlos José Martín Vera Hernández (Carlos J. Vera)

Birth date: 10/4/1962 Birth place: México D.F.

Current Employment: - Professor of Medicine (Molecular Biology, Biophysics)  
Facultad de Medicina y Psicología,  
Universidad Autónoma de Baja California.  
- Postgraduate Researcher / Lecturer  
UCSD Bioengineering.

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C.P. 22710

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Phone (USA): (619) 465-7148  
Cellular Phone: (619) 791-9962

## Education

Instituto Tecnológico de Tijuana. Tijuana B.C.	1980-1985	BSE - Industrial Engineering in Electronics
Centro de Graduados. Instituto Tecnológico de Tijuana Tijuana B.C.	1987-1988	Specialization Certificate: Mathematics in Computers
Universidad Autonoma de Baja California. Zona Costa, Facultad de Medicina Tijuana B.C.	1989-1993	M.D. (General Practice)
Hospital General de Tijuana Tijuana B.C.	1993	Medical Intern
Centro Universitario Médico Asistencial y de Investigación. U.A.B.C. / Facultad de Medicina. Tijuana B.C.	1994	Social Service in Medicine
University of California, San Diego Jacobs School of Engineering Department of Bioengineering La Jolla CA.	1996-2000	M.S. Bioengineering
University of California, San Diego Jacobs School of Engineering Department of Bioengineering La Jolla CA.	1996-2002	Ph.D. Bioengineering
University of California, San Diego Jacobs School of Engineering Department of Bioengineering Molecular Bioengineering Laboratory La Jolla CA.	2002- current	Postdoctoral Studies

**Honors and Awards**

- Medal of Distinguished Student.  
Bachillerato en Ciencias Físico - Matemáticas, Técnico en Electrónica.  
Instituto Tecnológico Regional No. 21  
June 1980.
- Medal of Academic Excellence  
Ingeniería Industrial en Electrónica.  
Instituto Tecnológico de Tijuana.  
October 1985.
- Deputy Member of the University Technical Council.  
Facultad de Medicina, Universidad Autónoma de Baja California.  
1991-1992.
- Member of the University Technical Council  
Universidad Autónoma de Baja California.  
1991-1992.
- Civic Merit Award, Tijuana Flash Floods.  
H. XIV Ayuntamiento, Tijuana B.C.  
November 1993.
- Medical Fellowship "Solidaridad de Excelencia Académica"  
Secretaría de Desarrollo Social.  
Centro Universitario Médico Asistencial y de Investigación.  
1994.
- Academic Excellence Award in Medicine.  
Médico General.  
Facultad de Medicina, Universidad Autónoma de Baja California.  
March 17, 1995, Mexicali B.C.
- McNally Endow Bioengineering Fellowship.  
UCSD - Bioengineering.  
October, 1997 – June, 1998.
- Foreign Graduate Predoctoral Fellowship.  
Consejo Nacional de Ciencia y Tecnología (CONACYT), México  
September 1998 - August 2001.
- Predoctoral Fellowship,  
UC-MEXUS / CONACYT  
September 2001 – June 2002.
- PROMEP Fellowship for New Full -Time Professors.  
Subsecretaria de Educación Superior e Investigación Científica, México.  
January 2004 – December 2005.
- Candidate to National Researcher in Medicine.  
Sistema Nacional de Investigadores, México.  
January 2005 – December 2007.
- Member of the Academy of Health Sciences  
Universidad Autonoma de Baja California.  
2007-2008.
- Fellow, UC Institute on Global Conflict and Cooperation  
Public Policy and Biological Threats: Summer Training Program  
July 23 - August 4, 2007.

**Professional Data**

- UCSD Department of Bioengineering  
Bioengineering Physiology (BE140B) Lecturer, Spring 2006, Spring 2007.  
Biotechnology Lab (BE162) Lecturer, Fall 2007.
- UCSD California Summer School for Mathematics and Science (COSMOS)  
Instructor, 2006, 2007.
- Universidad Autonoma de Baja California, Facultad de Medicina y Psicología  
Research Coordinator, 2003-current.
- Tijuana Red Cross  
Disaster Response Coordinator, 2003-2005.
- Molecular Bioengineering Lab (UCSD-Bioengineering)  
Postdoctoral Researcher, 2002-current.
- Universidad Autonoma de Baja California, Facultad de Medicina y Psicología  
Professor of Medicine (Molecular Biology, Biophysics), 2002-current.
- Baja California Emergency Management Office (Proteccion Civil Estatal).  
Planning Officer, 1997-1999.
- Hazardous Materials Response Team, Tijuana Fire Department  
Planning Officer, 1996-2002.
- Tijuana's Fire and Emergency Management Office (Bomberos y Proteccion Civil Municipal)  
Emergency Management Director, 1992-1997.
- MEDIDA AHR y Asociados (Medical Equipment Repair)  
Field Engineer, 1989-1990.
- Hospital "Gustavo Aubanel Vallejo"  
Emergency Department and Intensive Care Unit Nurse, 1988-1989.
- Halcones Rescue Team  
Paramedic-Rescuer, 1988-1989.
- Uniradio Broadcast Company (XEMO, XHFG)  
Transmissions and Audio Engineer, 1985-1988.
- Trans-Mex International (Electronic Assembly)  
Quality Control Manager, 1983-1988.
- USE Elevators  
Electronic Technician, 1983.
- Electrol S.A. (Electronic Assembly)  
Electronic Technician, 1980.

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### External Professional Activities

- Baja California Red Cross  
Advisor, 2007-current.
- Tijuana RADIUS Task Force (Risk Assessment Tools for Diagnosis of Urban Areas against Seismic Disasters)  
Directive Board Member, 2005-current.
- Tijuana's Council for Certification of Emergency Prehospital Services and Rescue (CCESPUR) Founder,  
2002.
- Baja California Major Emergencies Response Team (GEREM)  
Team Leader, 1998-2002.
- Volunteer Instructor, Tijuana Red Cross/ Tijuana Fire Department/ Volunteer Rescue Groups, 1985-  
current.
- Halcones Rescue Team  
Directive Board Member, 1982-1997.
- Mexico City Earthquake, Halcones Urban Search and Rescue Team  
Team Leader, 1985.
- Tijuana Red Cross  
Paramedic, 1979-1982.
- Instituto Tecnológico de Tijuana Rescue Team  
Team Leader, 1978-1982.

### Academic Contracts and Grants

Title	Agency	Amount of award	Date and period of contract/grant	Role, e.g. PI, co-investigator, project leader, etc.
Role of E-Tmod in the Cardiovascular System	NIH - Heart, Lung and Blood Institute	\$143,493/yr	2002-2007	Postgraduate Researcher
hTM5 Mutant Proteins	PROMEP-SESI (Mexico)	\$40,000	8/2004-8/2005	PI
Protofilaments and Topology of Erythrocyte Membrane Skeleton	UABC (Mexico)	\$8,000	8/2005-8/2006	PI
Vasodilation effects from cocoa derivatives	UABC (Mexico)	\$8,000	1/2007-12/2007	PI

## Bibliography

### In Mexican Government:

1. Vera C., Millán M. (1993) Plan Municipal de Contingencias (Municipal Major Incident Response Plan), H. XIV Ayuntamiento de Tijuana B.C.

### Primary Published or Creative Work:

1. Vera, C., Sood, A., Gao, K.-M., Yee, L., Lin, J. and Sung, L.A. (2000) Tropomodulin-binding site mapped to residues 7-14 at the N-terminal heptad repeats of tropomyosin isoform 5. *Arch. Biochem. Biophys.* 378,16-24.
2. Chu, X., Chen, J., Reedy, M.C., Vera, C., Sung, Paul K.L., and Sung, L. A. (2003) E-Tmod capping of actin filaments at the slow-growing end is required to establish mouse embryonic circulation. *Am J Physiol Heart Circ Physiol* 284: H1827-38.
3. Sung, L.A., and Vera, C. (2003) Protofilament and Hexagon: A three-dimensional mechanical model for the junctional complex in the erythrocyte membrane skeleton. *Annals of Biomedical Engineering*, Vol 31:1314-1326.
4. Vera, C., Skelton, R., Bossens, F., and Sung A. (2005) 3-D Nano-mechanics of an Erythrocyte Junctional Complex in Equibiaxial and Anisotropic Deformations. *Annals of Biomedical Engineering*, Vol 33(10):1387-1404.
5. Vera, C., Lao, J., Hamelberg, D., and Sung, L.A. (2005) Mapping the Tropomyosin Isoform 5 Binding Site on Human Erythrocyte Tropomodulin: Further Insights into E-Tmod/TM5 Interaction. *Archives of Biochemistry and Biophysics* 444(2): 130-8.
6. Zhu, Q., C. Vera, et al. (2007). "A hybrid model for erythrocyte membrane: a single unit of protein network coupled with lipid bilayer." *Biophysical Journal* 93(2): 386-400.

### Other Work:

1. Vera, C., Lin, J., and Sung, L.A. (1998) The residues at "a" and "d" positions in the N-terminal heptad repeats of tropomyosin isoform 5 are critical for its binding to erythrocyte tropomodulin. 40<sup>th</sup> Annual Meeting, American Society of Hematology. Miami FL. Dec. 4-8, 1998. Poster 11-I. Published in *Blood* Vol. 92, No. 10, Suppl. 1:6a.
2. Chu, X., Chen, J., Chien, K.R., Vera, C. and Sung, L.A. (1999) Targeted disruption of the tropomodulin gene in mice. *BMES/EMBS 99 Conference*, Atlanta GA, Oct. 13-16, 1999. Poster 15.2.3,1.
3. Chu, X., Chen, J., Chien, K.R., Vera, C. and Sung, L.A. (1999) Tropomodulin null-mutation arrest cardiac development, vasculogenesis, and hematopoiesis during embryogenesis. *Mol. Cell. Biol.* 10, 153a.
4. Vera, C., Lao, J., Lin, J., and Sung, L.A. (2000) Erythrocyte tropomyosin-binding site on human tropomodulin. *Experimental Biology 2000*, San Diego CA. April 15- 18, 2000. Poster 104.6. Published on *The FASEB Journal* Vol. 14, Number 4: A100.
5. Chu, X., Chen, J., Chien, K.R., Vera, C. and Sung, L.A. (2000) Defective heart development, vasculogenesis, and hematopoiesis in mice lacking tropomodulin. *Experimental Biology 2000*, San Diego CA. April 15- 18, 2000. Poster 79.1. Published on *The FASEB Journal* Vol. 14, Number 4: A53.
6. Sung, L.A., Chu, X., Vera, C., Sung, Paul K.L. (2003) Mechanical defects of E-Tmod null cells and membranes. *BMES Annual Fall Meeting*, Nashville, Tennessee, Oct. 1-4, 2003. Poster 9.P2.73
7. Vera, C., Chu, X., Sung, Paul K.L., and Sung, L.A. (2003) Alterations of mechanical properties in E-Tropomodulin null erythroid cells. 45<sup>th</sup> Annual Meeting and Exposition, American Society of Hematology. San Diego, CA. Dec. 6-9, 2003. Published on *Blood*, Vol. 102, Issue 11: Poster #895.

8. Vera, C., Lao, J., and Sung, L.A. (2003) Binding site for tropomyosin isoform 5 on human E-Tropomodulin. 45<sup>th</sup> Annual Meeting and Exposition, American Society of Hematology. San Diego, CA. Dec. 6-9, 2003. Published on Blood, Vol. 102, Issue 11: Poster #3734
9. Sung, L.A. and Vera, C. (2005) A 3-D Mechanical Model for the Junctional Complex of the Erythrocyte Membrane Skeletal Network. XXXV International Congress of Physiological Sciences, San Diego CA. April 4<sup>th</sup>, 2005. Seminar 721.1 (pg. 305), Poster 503.14 (pg. 200)
10. Castillo-Valenciana, A., Rodriguez-Hernandez, E., and Vera, C. (2005) Re-ingeniería del Eritrocito: Arquitectura Molecular del Complejo de Union y su Relación con la Topología del Esqueleto de Membrana. Expociencias – Red Nacional de Actividades Juveniles en Ciencia y Tecnología, Universidad Popular Autónoma del Estado de Puebla, Puebla, Mexico. Mayo 2005.
11. Vera, C., Bossens, F., de Oliveira, M., Skelton, R., and Sung L.A. (2005) Nano-mechanics of the junctional complex in a single unit of erythrocyte membrane skeleton and its potential roles during cell deformation (2005) Joint Meeting of the 5th International Congress of Biorheology and the 12th International Conference of Clinical Hemorheology, May 30th - June 3rd, 2005, Chongqing, China. Seminar S4-4. Published in Biorheology Journal Vol. 42, Numbers 1,2: 33-34.
12. Vera, C., de Oliveira, M., Skelton, R., and Sung L.A. (2005) Nano-mechanics of a multi-unit network of the erythrocyte membrane skeleton. Joint Meeting of the 5th International Congress of Biorheology and the 12th International Conference of Clinical Hemorheology, May 30th - June 3rd, 2005, Chongqing, China. Seminar S17-6. Published in Biorheology Journal Vol. 42, Numbers 1,2: 71.
13. Sung, L.A., and Vera, C. (2005) Two mechanisms for the actin protofilament length control and a 3D mechanical model for the junctional complex in the erythrocyte membrane skeleton network. Joint Meeting of the 5th International Congress of Biorheology and the 12th International Conference of Clinical Hemorheology, May 30th - June 3rd, 2005, Chongqing, China. Seminar S4-2. Published in Biorheology Journal Vol. 42, Numbers 1,2: 32-33.
14. Rebolledo, O., Vera, C., Huang, X., Go, S., Opella, S., and Sung, L.A. (2005) Expression and Characterization of Recombinant Human Tropomyosin Isoform 5 and Mutant. Society for Advancement of Chicanos and Native Americans in Science (SACNAS). Science for America's Future. Denver, CO. Sept. 29 – Oct. 2, 2005.
15. Zhu, Q., Vera, C., Asaro, R., Skelton, R., and Sung, A. (2006) Hybrid Model of the Erythrocyte Membrane Skeleton Coupled with Its Lipid Bilayer. 5<sup>th</sup> World Congress in Biomechanics, Munich Germany. July 29<sup>th</sup> – August 4<sup>th</sup>, 2006.
16. Skelton, R., de Oliveira, M., Vera, C., and Sung, A. (2006) Nano-mechanics of a Tensegrity Network for the Erythrocyte Membrane Skeleton. . 5<sup>th</sup> World Congress in Biomechanics, Munich Germany. July 29<sup>th</sup> – August 4<sup>th</sup>, 2006.

**Medical Emergency / Rescue / Emergency Management Training**

- Basic First Aid  
Cruz Roja Mexicana, Delegación Rosarito B.C. - 1980
- Cardiopulmonar Resuscitation  
American Red Cross  
San Diego Ca. - 1981
- Emergency Medical Technician 1/A  
Naval Regional Medical Center  
Long Beach Ca. - August 1982
- Cliff Rescue  
Los Angeles Sheriff Department - 1983.
- Vehicle Rescue  
LUKAS Co. / Instructor : Ron Roy. - 1983.
- Cliff Rescue  
STAR Team ( Special Trauma and Rescue)  
San Diego Ca. - 1984.
- Shelter Management  
American Red Cross.  
San Diego Ca. - 1984.
- Open Water Diver  
Professional Association of Diving Instructors  
Certificate No. 84278133  
August 1984
- Advanced Open Water Diver  
Professional Association of Diving Instructors  
Certificate No. 84278133  
September 1984
- Commercial Broadcast Course  
Canal 12 Televisa. - Ing. Carlos Hernández Barnett  
Hermosillo Son. - November 1985
- IX Radio Broadcast Course  
Asociación de Ingenieros y Técnicos en Radiodifusión ( AMITRA ).  
Tequesquitengo Mor. , April 1986.
- General Radiotelephone Operator 1/A  
Permit No. 02/00316  
Secretaria de Comunicaciones y Transportes. - November 1986
- Advanced Cardiopulmonar Resuscitation  
Grupo de Rescate Halcones A.C. - August 1988
- First Responder Operational - Hazardous Materials Course.  
California Specialized Training Institute.  
Southwestern College, Chula Vista Ca. - August 1990.
- Handling Hazardous Materials Incidents, First Responders Course.  
Federal Emergency Management Agency.  
Southwestern College, Chula Vista Ca. - August 1990
- Ninth Annual Binational Pediatric Conference.  
Mercy Hospital, San Diego Ca. - December 1990
- Prehospital Trauma Life Support  
COT - ACS ( Comittee of Trauma / American Collage of Surgeons)  
NAEMT ( National Association of Emergency Medical Technicians )  
Secretaria de la Defensa Nacional - Escuela Militar de Oficiales de Sanidad.  
Mexico D.F. - August 1992
- Mountain and Aquatic Rescue  
Secretaria de la Defensa Nacional - Escuela Militar de Oficiales de Sanidad  
México D.F. - August 1992

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- XXII Medical Congress  
Federación Médica de Baja California. - October 1992.
- Instructor - P.H.T.L.S. ( Prehospital Trauma Life Support ).  
COT - ACS ( Comité of Trauma / American Collage of Surgeons )  
NAEMT ( National Association of Emergency Medical Technicians )  
Secretaria de la Defensa Nacional - Hospital Central Militar.  
México D.F. - November 1992.
- Rescue Diver  
Professional Association of Diving Instructors.  
Tijuana B.C. - July 1994.
- Courses with the San Diego Local Emergency Planning Committee and Unidad Estatal de Protección Civil :
  - Education and Equipment to Respond to Hazardous Materials Incidents  
Naval Training Center- San Diego Fire Dept.      November 1994
  - Incident Command System  
Departamento de Bomberos de Tecate B.C.      January 1995
  - Risk Analysis, Contingency Plans and Public Information in Hazardous Materials Incidents  
Naval Training Center - San Diego Fire Dept.      April 1995
  - Medical Treatment in Hazardous Materials Incidents  
Departamento de Bomberos de Tecate B.C.      July 1995
  - Protective Equipment in Hazardous Materials Incidents  
Departamento de Bomberos de Tecate B.C.      July 1995
  - Field Instruments to Identify Hazardous Materials  
Southwestern College, Chula Vista      August 1995
  - Mobile Lab to Identify Hazardous Materials  
Southwestern College, Chula Vista      August 1995
  - Safety for First Responders: Clandestine Labs and Explosive Devices  
Garita de Otay      September 1995
- Rescue Systems I  
San Diego County Fire Chief's Association.  
Camp Elliot, Miramar Naval Air Station  
San Diego CA.      June 1997
- Radiation Safety Course  
Environment, Health & Safety - Radiation Division, UCSD  
La Jolla CA.      September 1997
- Hazardous Materials Response: Operations Level (24 Hrs.)  
Dirección Municipal de Protección Civil      January 1999
- Hazardous Materials Emergency Management  
Dirección Estatal de Protección Civil      February 1999
- Incident Command System in Hazardous Materials Incidents  
Dirección Estatal de Protección Civil      February 1999
- Cardiopulmonar Resuscitation for Health Providers  
American Heart Association      February 1999
- Hazardous Materials Emergency Response Incident Commander  
California Specialized Training Institute      April 1999
- Vehicle Rescue  
California State Fire Marshall  
Corona CA.      April 1999
- Advanced Cardiac Life Support  
Soporte Cardiaco Avanzado de Vida, A.C.  
Hospital Notre Dame      April 1999
- Emergency Medical Response to Nuclear, Biological and Chemical Agents  
California Specialized Training Institute  
San Luis Obispo, CA.      June 1999



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- Rescue Practices III  
Texas A&M University  
Texas Engineering Extension Service June 1999
- Rescue Systems II  
San Diego County Fire Chief's Association.  
San Diego CA. October 1999
- Trench Rescue  
California Shores Inc. October 2000
- Workshop to Review and Evaluate the Earthquake Response Plan  
Dirección Municipal de Protección Civil. January 2001
- Public Policy and Biological Threats: Summer Training Program  
UC Institute on Global Conflict and Cooperation  
La Jolla, CA. July 23 - August 4, 2007.

### **Courses Offered in Medical Emergency / Rescue / Emergency Management Training**

- Instructor: Vehicle Rescue.  
Grupo de Rescate Halcones A.C. / Instituto México  
Tijuana B.C. - 1988.
- Instructor: Vehicle Rescue with Hydraulic Tools  
Cruz Roja Mexicana, Delegación Tijuana B.C. - 1989
- Instructor: Spinal Immobilization Skill Station  
A.T.L.S. ( Advanced Trauma Life Support ).  
Hospital General de Tijuana. - September 1992
- Secretary: "1st. Congress of Medical Students".  
Facultad de Medicina, Tijuana B.C.- November 1992
- Industrial Safety  
Centro Regional de Seguridad en el Trabajo, Capacitación y Productividad - IMSS  
June 1993
- Geographical Information Systems and Hazardous Materials  
Colegio de Auditores Ambientales de Baja California A.C. Septiembre de 1995
- Local Coordinator: PHTLS Course  
95avo. Curso Nacional.  
Facultad de Medicina Tijuana U.A.B.C September 1995
- Instructor: Emergency Medical Technician – Intermediate Level  
Dirección de Protección Civil, H. XV Ayuntamiento. 1997-1998.
- Coordinator: First Aid Course  
Dirección de Bomberos, H. XV Ayuntamiento. 1998
- Instructor: Basic Electrocardiography  
Dirección de Bomberos, H. XVI Ayuntamiento. 1999
- Instructor: Emergency Medical Technician – Intermediate Level  
Dirección de Bomberos, H. XVI Ayuntamiento. 2000-2001
- Coordinator: Urban Rescue  
Grupo Estatal de Respuesta para Emergencias Mayores  
Dirección Estatal de Protección Civil 1999-2001
- Instructor: PHTLS Course  
Dirección Estatal de Protección Civil. September 2001
- Instructor: First MegaCourse of CPR  
Dirección Estatal de Protección Civil. September 2002
- Medical Director: PHTLS Course  
Cruz Roja Estatal, Baja California 2005, 2006

**Hobbies:** SCUBA Diving, Kayaking, Camping, Family Activities, Home Improvement, Dogs.