

CURRICULUM VITAE

David Epel

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Date of Birth: March 26, 1937; Detroit, Michigan
Marital Status: Married 1960 to Lois S. Ambush; 3 children

Education: A.B., Wayne University, 1958
Ph.D., University of California, Berkeley, 1963

PRESENT POSITION

The Jane and Marshall Steel Jr. Professor Emeritus of Marine Sciences (2009-present)
The Jane and Marshall Steel Jr. Professor of Marine Sciences (1999-2009) and Professor of Biological Sciences (1977-present); Interim Director, 1984-1988; Associate Director (1988-2007).

PREVIOUS POSITIONS

Post-doctoral fellow, Johnson Research Foundation, Department of Biophysics and Biophysical Chemistry, University of Pennsylvania Medical School, 1963-1965
Assistant Professor of Biology, Hopkins Marine Station, Department of Biological Sciences, Stanford University, 1965-1970
Associate Professor of Biology, 1970-1974; then Professor, 1974-1977 - Department of Scripps Institution of Oceanography, University of California, San Diego

NATIONAL AND INTERNATIONAL TEACHING POSITIONS:

Faculty Member, Fertilization & Gamete Physiology Training Program, Marine Biological Laboratory, Woods Hole, MA; summer, 1974
Co-Director, Embryology Course, Marine Biological Laboratory, Woods Hole, MA; summers, 1975-1977; adjunct faculty, summer 1992.
Faculty, International Cell Research Organization/UNESCO Course on Developmental Biology, Palermo Italy, 1987.
Visiting Professor, Toho University, Japan 1989.
Faculty, NSF Antarctic Biology Course, McMurdo Sound, Antarctica, January 1996.
Faculty, International Cell Research Organization/UNESCO course on Early Embryonic Development, International Marine Research Centre, Sardinia Italy, October 1997.
Faculty, European Molecular Biology Organization Course on "Reproduction and Early Development: Marine Molecular Biology Aspects", Bergen Norway, October 1998.
Visiting Professor of Developmental Biology, Plymouth Environmental Research Center and the University of Plymouth, United Kingdom, 1998-2004.

HONORS

Guggenheim Fellow, 1976-1977

Overseas Fellow of Churchill College, Cambridge University, 1976-1977;

Fellow, AAAS (Elected 1978).

Fellow, California Academy of Sciences, (Elected 2000).

Distinguished Fellow in Science and Technology, California State University, Monterey Bay (Awarded, 2004).

Allan A. Cox Medal for Fostering Excellence in Undergraduate Research at Stanford University, 1995

Ed Ricketts Memorial Lecture Award for Lifetime Achievement in Marine Sciences, 2006

Life Fellow, Clare Hall, University of Cambridge, 2007

PROFESSIONAL SERVICE AND ACTIVITIES:

PROFESSIONAL SOCIETIES:

Member

A.A.A.S.

American Society for Cell Biology

International Cell Research Organization (UNESCO)

Marine Biological Laboratory, Corporation Member

Society for Comparative and Integrative Biology

Society for Developmental Biology

National Association of Biology Teachers

National Marine Educators Association

EDITORIAL ACTIVITIES--

Associate Editor:, Developmental Biology, 1974-1983; Gamete Research, 1977- 1986; Biological Bulletin, 1991-1997

Editorial Board, Cell Differentiation, 1982-1990; Experimental Cell Research, 1984-1989. Zygote, 1993-present; Animal Biology, 1993-present; Biological Bulletin, 1997-2004; Acta Histochemica, 1999-present. Aquatic Biology, 2008-present

Advisory Board, Development, Growth and Differentiation, 1995-present;; Zoological Science (Tokyo), 2002-present.

SERVICE TO PROFESSIONAL ORGANIZATIONS AND GOVERNMENT AGENCIES

Member-at-large, Section G (Biological Sciences) American Association for Advancement of Science (AAAS), 1979-1984;

Chairperson, Section G (Biological Sciences) AAAS, 1997-1998;

Council Member, AAAS, 1998-99.

Member of Council, American Society for Cell Biology (ASCB), 1979-1981. Chairman of Education Policy Committee, (ASCB), 1979-1981; Member, Public Policy Committee 1983-1984, .

Organizing Committee, Xth Congress of the International Society for Developmental Biology, 1984-1985;

Organizing Committee, NATO Advanced Research Workshop on Mechanism of Fertilization; Plants to Humans, 1989;
Organizing Committee, 1st, 2nd and 3rd International Conference on the Cell and Molecular Biology of Egg Coats, 1993, 1997 and 2004.
Chairman, Decennial Review Committee (Representative, National Academy of Sciences), Marine Biological Laboratory, 1984; Member, Decennial Review Committee, 1994.
Member, Visiting Committee, Naval Biological Laboratory, ONR, 1983-1985; Member, ONR Technical Advisory Group - Biological Sciences, 1988
Member, Organizing & Advisory Committee and Director Search Committee, Monterey Bay Aquarium Research Institute, 1986;
Board of Directors, Monterey Bay Aquarium Research Institute, 1987-1989;
Member, NIH Animal Resources Review Committee, 1989-1991
Member, NSF Developmental Biology Panel, 1988-1993
Member, University of California Coastal Toxic Research Advisory Board, 1992-2002
Chairperson, National Cooperative Program on Non-Human *in vitro* Fertilization and Pre-implantation Development (NIH), 1991-1998
Chairperson, Section on Developmental & Cell Biology, American Society of Zoologists, 1991-93. Chairperson, Endowment Committee, 1994-95. Member, Program Committee, 2000-2002.
Organizing Committee, 7th and 9th International Congress of Society for Invertebrate Reproduction, 1995 and 2001.
Organizing Committee, 8th-11th International Conference on Pollution Responses in Marine Organisms, 1997, 1999, 2001, 2003 and 2005.
Member, Monterey County Marine Research Task Force, 2000-present
Scientific Advisory Board, The Environment Agency, United Kingdom, 2003-2004
Founding member and organizer, Ocean Round Table, 2005-2009

RECENT CONGRESS & SYMPOSIA ADDRESSES

American Chemical Society Symposium on "Pharmaceuticals and Personal Care Products in the Environment" (San Francisco)
19th Annual Meeting of the Brazilian Society of Biochemistry and Molecular Biology. Plenary Lecture (Caxambu, Brazil).
International symposium "Molecular Mechanisms of Cell-Cell Interaction" (San Diego, CA).
13th and 14th Meeting on the Developmental Biology of the Sea Urchin (Woods Hole, MA)
XIth International Congress of Histochemistry and Cytochemistry (York, UK).
11th International Conference on Pollution Responses in Marine Organisms (Plymouth UK)
9th International Congress of Society of Invertebrate Reproduction, Plenary Speaker, (Grahamstown, South Africa)
Gordon Conference on Fertilization and Activation of Development (Holderness, NH).
Society for Integrative and Comparative Biology Symposium "Ecological Developmental Biology: Developmental Biology Meets The Real World."
American Society for Cell Biology, Organizer and Speaker, Symposium on "Emerging Environmental Contaminants: A Role for Cell Biology?" (San Francisco)

International Workshop on Sustainable Aquaculture: Animal Welfare, Human Health and Interactions with the Environment (Siena Italy)

4th International Symposium on Molecular and Cell Biology of Egg and Embryo Coats, Ise-Shima Japan

Plenary Speaker, 10th International Congress on Invertebrate Reproduction and Development Newcastle UK.

Aquatic Models of Human Disease, Athens GA

XIIth Pollution Responses in Marine Organisms, Alessandria Italy

RECENT KEYNOTE OR PLENARY ADDRESSES:

Reproductive Strategies, National Institute Basic Biology, Okazaki Japan

Symposium in memory of Alberto Monroy...20 years later, Palermo Italy

European Society of Comparative Biochemistry and Physiology, Antwerp Belgium

Cell Signaling in Gamete Activation, Tokyo, Japan

10th Annual Green Chemistry and Engineering Conference, American Chemical Society, Washington DC

National Association of Biology Teachers, Albuquerque NM

ICCA-LRI workshop on Integrating new advances in exposure science and toxicity testing: next steps

DEPARTMENTAL AND UNIVERSITY COMMITTEES

Hopkins representative, Monterey Bay Sanctuary Research Advisory Panel

Stanford Environmental Initiative Pedagogy Committee

STANFORD ALUMNI ASSOCIATION AND CONTINUING EDUCATION ACTIVITIES

• **Alumni Association:**

Alumni College on “Biology of the Sea” , July 1999 and 2000.

Director and ‘Dean’ of this College for the 2nd year. The course enrolled 30+ alumni in a 4-day series of lectures and labs, which included lecturers from the Marine Station, Department of Engineering and Earth Sciences (on ocean currents), Law School (on environmental policy) and also a lecture on Ed Ricketts and John Steinbeck.

• **Alumni Travel/Study Program (Faculty Lecturer)**

Baja California Whale Watching, 1989

Belize Snorkeling Adventure, 1999

Galapagos Family Adventure, 2001

Alaska Family Adventure, 2002

- **Continuing Education:**

“The Ocean as a Laboratory” Every year since 1998.

STANFORD FUND RAISING ACTIVITIES—Campaign for Undergraduate Education

Participant in the Think Again Series, New York City and Orange County

Speaker at Alumni Re-union College, Fall 2002

COMMUNITY SERVICE

Trustee, Monterey Bay Aquarium, 1985-1988

Board Member, Hatton Canyon Foundation, 1989-present

Board Member, Sierra Club (Ventana Chapter), 1990-1996, 2001-present

Science Mentor, Seaside High School, since 1990

Guest Faculty, Outward Bound Program (UCSC), Stanford Young Medical Scientist

Program, Stanford Young Environmental Scientist Program [These programs promote interest of minority students in environmental science or medicine], 1996-present.

Board Member, Friends of Moss Landing Marine Laboratory, 1994-present.

Recent Research Grants:

- 1). National Science Foundation
“Efflux Transporters in Sea Urchin Development”
\$ 390,000
February 1, 2005-January 31, 2008; no-cost extension through 2008..
- 2).National Science Foundation-Instructional Materials Development
“Inquiry-based high school biology using sea urchin fertilization and development”.
\$574,935; no cost extension through 2008
- 3). Wallenberg Foundation and Stanford University
“Hands-On Possibilities and Experiences in Biology Education (Bio-HOPE)
\$50,000 planning grant in collaboration with Goteborg University 2006
- 4). Wallenberg Foundation and Stanford University
“Hands-On Possibilities and Experiences in Biology Education (Bio-HOPE)
\$250,000 grant in collaboration with Goteborg and Linkoping University 2006-2008
- 5). Wallenberg Foundation and Stanford University
“Inquiry and Insight: Investigating environmental problems”
\$113,00 planning grant in collaboration with the Sven Loven Centre for Marine Studies,
Kristineberg, Sweden 2009
- 6). Wallenberg Foundation and Stanford University
“Inquiry and Insight: Investigating environmental problems”
\$650,000 full grant in collaboration with the Sven Loven Centre for Marine Studies,
Kristineberg, Sweden 2009-2013

PUBLICATIONS

- Epel, D. 1963. The effects of carbon monoxide inhibition on ATP level and the rates of mitosis in the sea urchin egg. *J. Cell Biol.* 17, 315-319.
- Epel, D. 1964. A primary metabolic change of fertilization: interconversion of pyridine nucleotides. *Biochem. Biophys. Res. Comm.* 17, 62-68.
- Epel, D. 1964. Simultaneous measurement of TPNH formation and respiration following fertilization of the sea urchin egg. *Biochem. Biophys. Res. Comm.* 17, 69-73.
- Epel, D. and R.M. Iverson. 1965. Some aspects of metabolic control in the fertilization transition of sea urchin eggs in "Control of Energy Metabolism" (B. Chance, R.W. Estabrook and J.R. Williamson, eds.), pp. 267-273, Academic Press, New York.
- Epel, D. 1967. Early biochemical events after fertilization of sea urchin eggs in "The Molecular Aspects of Development" (R. Dearing and M. Trask, eds.), NASA publication CR-673, Clearinghouse for Federal and Scientific Information, Springfield, Va., pp. 17-35.
- Epel, D. 1967. Protein synthesis in sea urchin eggs: a 'late' response to fertilization. *Proc. Nat. Acad. Sci.* 57, 899-906.
- Wilson, D.M. and D. Epel. 1968. The cytochrome system of sea urchin sperm. *Arch. Biochem. Biophys.* 126, 83-90.
- Abbott, D.P., D. Epel, J.H. Phillips, I.A. Abbott and R. Stohler, editors. 1968. The Biology of *Acmaea*. The Veliger 11, Supplement, pp. 1-112.
- Abbott, D.P., D. Epel, J.H. Phillips and I.A. Abbott. 1968. Undergraduate Research and the Biology of *Acmaea*. The Veliger 11, Supplement, pp. 1-5.
- Epel, D., B.C. Pressman, S. Elsaesser, and A.M. Weaver. 1969. The program of structural and metabolic changes following fertilization of sea urchin eggs in "The Cell Cycle: Gene-Enzyme Relationships" (G. Padilla, G.L. Whitson, and I. Cameron, eds.), pp. 279-298, Academic Press, New York.
- Epel, D., A.M. Weaver, A.V. Muchmore, and R.T. Schimke. 1969. β -1, 3- glucanase of sea urchin eggs: release from particles at fertilization. *Science* 163, 294-296.
- Muchmore, A.V., D. Epel, and R.T. Schimke. 1969. Purification and properties of an Exo β (1,3) glucanase from sea urchin eggs. *Biochem. Biophys. Acta* 178, 551- 560.
- Epel, D., A.M. Weaver, and D. Mazia. 1970. Methods for removal of the vitelline membrane of sea urchin eggs. I. Use of dithiothreitol (Cleland's Reagent). *Exp. Cell Res.* 61, 64-68.

- Epel, D. 1970. Methods for removal of the vitelline membrane of sea urchin eggs. II. Controlled exposure to trypsin to eliminate clumping of embryos. *Exp. Cell Res.* 61, 69-70.
- Epel, D. and W.L. Lee. 1970. Persistent chemicals in the marine ecosystem. *Amer. Biol. Teacher* 32, 207-212.
- Paul, M. and D. Epel. 1971. Fertilization-associated light scattering changes in eggs of the sea urchin, *Strongylocentrotus purpuratus*. *Exp. Cell Res.* 65, 281-288.
- Fedecka-Bruner, B., M. Anderson, and D. Epel. 1971. Control of enzyme synthesis in early sea urchin development: Aryl sulfatase activity in normal and hybrid embryos. *Devel. Biol.* 25, 655-671.
- Vacquier, V.D., L.S. Korn and D. Epel. 1971. The appearance of (-amylase activity during gut differentiation of sand dollar plutei. *Devel. Biol.* 26, 393-399.
- Vacquier, V.D., D. Epel and L. Douglas. 1972. Sea urchin eggs release protease activity at fertilization. *Nature* 237, 34-36.
- Epel, D. 1972. Activation of an Na⁺-dependent amino acid transport system upon fertilization of sea urchin eggs. *Exp. Cell Res.* 72, 74-89.
- Tegner, M.J. and D. Epel. 1973. Sea urchin sperm-egg interactions studied with the scanning electron microscope. *Science* 179, 685-688.
- Muchmore, D. and D. Epel. 1973. Effects of chlorination of wastewater on the external fertilization of marine invertebrates. *Marine Biology* 19, 93-95.
- Miller, J.M. and D. Epel. 1973. Studies on oogenesis in *Urechis caupo* II. Accumulation during oogenesis of carbohydrate, RNA, microtubule protein and soluble, mitochondrial and lysosomal enzymes. *Devel. Biol.* 32, 331- 344.
- Epel, D. 1973. Germ cells and early embryonic development in "Cell Biology in Medicine" (E.E. Bittar, ed.), pp. 413-440, John Wiley, New York.
- Vacquier, V.D., M.J. Tegner and D. Epel. 1972. Protease activity establishes the block against polyspermy in sea urchin egg. *Nature* 240, 352-354.
- Vacquier, V.D., M.J. Tegner and D. Epel. 1973. Protease released from sea urchin eggs at fertilization alters the vitelline layer and aids in preventing polyspermy. *Exp. Cell Res.* 80, 111-119.
- Finegold, L., E.A. Baker and D. Epel. 1974. Sea urchin egg fertilization studied with a fluorescent probe (ANS). *Exp. Cell Res.* 86, 248-252.

Korn, L.J., V.D. Vacquier and D. Epel. 1974. Further studies on the glucose inhibition of α -1, 3-glucanohydrolase increase during gut differentiation of sand dollar larvae. *Devel. Biol.* 36, 1-7.

Steinhardt, R.A. and D. Epel. 1974. Activation of sea urchin eggs by a calcium ionophore. *Proc. Nat. Acad. Sci. USA* 71, 1915-1919.

Houk, M.S. and D. Epel. 1974. Protein synthesis during hormonally induced meiotic maturation and fertilization in starfish oocytes. *Devel. Biol.* 40, 298-310.

Epel, D., R. Steinhardt, T. Humphreys, and D. Mazia. 1974. An analysis of the partial metabolic derepression of sea urchin eggs by ammonia. The existence of independent pathways. *Devel. Biol.* 40, 245-255.

Steinhardt, R.A., D. Epel, E.J. Carroll, Jr. and R. Yanagimachi. 1974. Is calcium ionophore a universal activator for unfertilized eggs? *Nature* 252, 41-43.

Epel, D. 1975. The program and mechanisms of fertilization in the echinoderm egg. *Amer. Zool.* 15, 507-522.

Carroll, E.J., Jr. and D. Epel. 1975. Elevation and hardening of the fertilization membrane in sea urchin eggs. Role of the soluble fertilization product. *Exp. Cell Res.* 90, 429-432.

Carroll, E.J., Jr. and D. Epel. 1975. Isolation and biological activity of the proteases released by sea urchin eggs following fertilization. *Devel. Biol.* 44, 22-32.

Epel, D. and A. Monroy. 1975. Report on "Workshop on the Egg Surface and Metabolic Activation at Fertilization." *Devel. Biol.* 43, F17-F22.

Ziomek, T.A. and D. Epel. 1975. Polyspermy block of *Spisula* eggs is prevented by cytochalasin B. *Science* 189, 139-142.

Epel, D. and E.J. Carroll, Jr. 1975. Molecular mechanisms for prevention of polyspermy. *Research in Reproduction* 7, 2-3.

Paul, M. and D. Epel. 1975. Formation of fertilization acid by sea urchin eggs does not require specific cations. *Exp. Cell Res.* 94, 1-6.

Epel, D. 1976. Sperm-egg interactions of marine organisms: clues for fertility regulation. *Oceanus* 19(2), 34-39.

Epel, D. 1976. Reorganization of the sea urchin egg surface at fertilization and the activation of development in "Biogenesis and Turnover of Membrane Molecules" (John S. Cook, ed.), pp. 105-120, Raven Press, New York.

Johnson, J.D. and D. Epel. 1975. A relationship between release of surface proteins and the metabolic activation of sea urchin eggs at fertilization. *Proc. Nat. Acad. Sci., USA*, 72 4474-4478.

Johnson, J.D., Epel, D. and Paul, M. 1976. Na^+ - H^+ exchange is required for activation of sea urchin eggs after fertilization. *Nature* 262, 661-664.

Paul, M., Johnson, J.D. and Epel, D. 1976. Fertilization acid of sea urchin eggs is not a consequence of cortical granule exocytosis. *J. Exp. Zool.* 197, 121-127.

Tegner, M.J. and Epel, D. 1976. Scanning electron microscope studies of sea urchin fertilization. I. Eggs with vitelline layers. *J. Exp. Zool.* 197, 31-58.

Fahey, R.C., Mikolajczyk, S.D., Meier, G.P., Epel, D. and Carroll, E.J. Jr. 1976. The glutathione thiol-disulfide status in the sea urchin egg during fertilization and the first division cycle. *Biochim. Biophys. Acta* 437, 445-453.

Epel, D., Cross, N.S. and Epel, N. 1977. Flagellar motility is not involved in the incorporation of the sperm into the egg at fertilization. *Devel. Growth, and Differentiation* 19, 15-21.

Collins, F.D. and Epel, D. 1977. The role of calcium ions in the acrosome reaction of sea urchin sperm: regulation of exocytosis. *Exp. Cell Res.* 106, 211-222.

Epel, D. 1977. The egg surface in relation to metabolic activation and fertilization in "Immunobiology of Gametes" (M. Edidin and M.H. Johnson, eds.), pp. 235-254, Cambridge University Press, Cambridge.

Epel, D. 1977. The Program of Fertilization. *Scientific American* 237(5), 128-139.

Carroll, E.J., Byrd, E.W. and Epel, D. 1977. A novel procedure for obtaining denuded sea urchin eggs and observations on the role of the vitelline layer in sperm reception and egg activation. *Exp. Cell Res.* 108, 365-374.

Epel, D. 1978. Mechanisms of activation of sperm and egg during fertilization of sea urchin gametes in "Current Topics in Developmental Biology" (A. Monroy and A. Moscona, eds.), Academic Press, New York, Vol. 12, pp. 186- 246.

Epel, D. 1978. Regulation of cell activity at fertilization by intracellular Ca^{+2} and intracellular pH in "Molecular Basis of Cell-Cell Interactions" (R. Lerner, ed.), pp. 377-388, A. Liss, New York.

Epel, D. 1978. The triggering of development at fertilization in "The Mechanisms of Cell Change" (J.D. Ebert and T.S. Okada, eds.), pp. 17-31, J. Wiley & Sons, New York.

Epel, D. and Vacquier, V.D. 1978. Membrane fusion events during invertebrate fertilization in "Cell Surface Reviews" (G. Nicolson & G. Poste, eds.), Vol. 5, pp. 1-63. North-Holland Publishers, Amsterdam.

Epel, D., Nishioka, D. and Perry, G. 1978. The role of Ca^{+2} in triggering development at fertilization. *Biol. Cell.* 32, 135-140.

Epel, D. 1978. Intracellular pH and activation of the sea urchin egg at fertilization in "Cell Reproduction: In Honor of Daniel Mazia" (E.R. Dirksen, D.M. Prescott & C.F. Fox, eds.), pp. 367-378. Academic Press, New York.

Epel, D. 1978. Regulation of cell activity at fertilization by intracellular Ca^{+2} and intracellular pH. *Birth Defects*, 14: 377-88

Lambert, C. and Epel, D. 1979. Calcium-mediated mitochondrial movement in ascidian sperm during fertilization. *Devel. Biol.* 69, 296-304.

Epel, D. 1980. Experimental analysis of the role of intracellular calcium in the activation of the sea urchin egg at fertilization in "The Cell Surface: Mediator of Developmental Processes." 38th Symposium of the Society for Developmental Biology (S. Subtelny & N.K. Wessells, eds.) pp. 169-186, Academic Press, New York.

Epel, D. 1980. Ionic triggers in the fertilization of sea urchin eggs. *Ann. N.Y. Acad. Sci.* 339, 74-85.

Epel, D. 1980. Fertilisation. *Endeavour*, New Series 4, 26-31.

Epel, D., Patton, C., Wallace, R.W. and Cheung, W.Y. 1981. Calmodulin activates NAD kinase of sea urchin eggs: an early event of fertilization. *Cell* 23, 543-549.

Johnson, C.H. and Epel, D. 1981. Intracellular pH of sea urchin eggs measured by the DMO method. *J. Cell Biol.* 89, 284-291.

Perry, G. and Epel, D. 1981. Ca^{+2} -stimulated production of H_2O_2 from naphthoquinone oxidation in *Arbacia* eggs. *Exp. Cell Res.* 114, 65-72.

Rapraeger, A.C. and Epel, D. 1981. The appearance of an extracellular aryl sulfatase during morphogenesis of the sea urchin *Strongylocentrotus purpuratus*. *Devel. Biol.* 88, 269-278.

Lee, H.C., Forte, J.G. and Epel, D. 1982. The use of fluorescent amines for the measurement of pHi: Applications in liposomes, gastric microsomes, and sea urchin gametes in "Intracellular pH: Its Measurement, Regulation and Utilization in Cellular Functions" (Richard Nuccitelli & David W. Deamer, eds.) pp. 135-160. Alan R. Liss, Inc., New York.

Epel, D. 1982. The physiology and chemistry of calcium during the fertilization of eggs in "Calcium and Cell Function", Vol. 2 (W.Y. Cheung, ed.), pp. 356-385. Academic Press, New York.

- Epel, D. 1982. Relevance of studies on fertilization of eggs to the comprehension of cellular hypertrophy in "Perspectives in Differentiation and Hypertrophy", (W.A. Anderson & W. Sadler, eds.), pp. 3-12, Elsevier/North-Holland Publishers, New York.
- Johnson, C.H. and Epel D. 1982. Starfish oocyte maturation and fertilization: Intracellular pH is not involved in activation. *Devel. Biol.* 92, 461-469.
- Schmidt, R., C. Patton and Epel, D. 1982. Is there a role for the Ca²⁺ influx during fertilization of the sea urchin egg? *Devel. Biol.* 90, 284-290.
- Meijer, L., Paul, M. and Epel, D. 1982. Stimulation of protein phosphorylation during fertilization-induced maturation of *Urechis caupo* oocytes. *Devel. Biol.* 94, 62- 70.
- Epel, D. 1982. The cascade of events initiated by rises in cytosolic Ca²⁺ and pH following fertilization in sea urchin eggs in "Cell Proliferation and Cancer" (A. Boynton, W. McKehan & J.F. Whitfield, eds.) pp. 327-339, Academic Press, New York.
- Epel, D., Perry, G. and Schmidt, T. 1982. Intracellular calcium and fertilization: Role of the cation and regulation of intracellular calcium levels in "Membranes in Growth and Development", (J.F. Hoffman, G.H. Giebisch & L. Bolis, eds.), pp. 171-183, Alan Liss Inc., New York.
- Clapper, D.L. and Epel, D. 1982. Sperm motility in the Horseshoe Crab. III. Isolation and characterization of a sperm motility initiating peptide. *Gamete Research* 6, 315-326.
- Clapper, David L. and D. Epel. 1982. Sperm motility in the Horseshoe Crab. IV. Extracellular ions and intracellular pH are not mediators of motility initiation. *Gamete Research* 6, 327-342.
- Lee, H.C., Johnson, C. and Epel, D. 1983. Changes in internal pH associated with initiation of motility and acrosome reaction of sea urchin sperm. *Devel. Biol.* 95, 31-45.
- Epel, D., Schmidt, T. and Sasaki, H. 1983. The relationship between cortical granule fusion and transport change at fertilization of sea urchin eggs *in* "Cell Fusion: Gene Transfer and Transformation", 14th Miles International Symposium (R.F. Beers & E.G. Bassett, eds.), pp. 39- 48, Raven Press.
- Schmidt, T. and Epel, D. 1983. High hydrostatic pressure and the dissection of fertilization responses I. The relationship between cortical granule exocytosis and proton efflux during fertilization of the sea urchin egg. *Exp. Cell Research* 146, 235-248.
- Sasaki, H. and Epel, D. 1983. Cortical vesicle exocytosis in isolated cortices of sea urchin eggs: Description of a turbidometric assay and its utilization in studying effects of different media on discharge. *Devel. Biol.* 98, 327-337.
- Lee, H.C. and Epel, D. 1983. Changes in intracellular acidic compartments in sea urchin eggs after activation. *Devel. Biol.* 98, 446-454.

- Johnson, C.H., Clapper, D.L., Winkler, M.M. Lee, H.C. and Epel, D. 1983. A volatile inhibitor immobilizes sea urchin sperm in semen by depressing the intracellular pH. *Devel. Biol.* 98, 493-501.
- Johnson, C.H. and Epel, D. 1983. Heavy metal chelators prolong motility and viability of sea urchin sperm by inhibiting spontaneous acrosome reactions. *J. Exp. Zool.* 226, 431-440.
- Epel, D. 1984. An overview of fertilization in a comparative and evolutionary context in "Advances in Invertebrate Reproduction 3" (W. Engels, ed.), pp. 53-65, Elsevier Science Publishers, Amsterdam.
- Perry, G. and Epel, D. 1985. Characterization of a Ca^{+2} -stimulated lipid peroxidizing system in the sea urchin egg. *Devel. Biol.* 47-55.
- Perry, G. and Epel, D. 1985. Fertilization stimulates lipid peroxidation in the sea urchin egg. *Devel. Biol.* 56-65.
- Dube, F., Schmidt, T., Johnson, C.H. and Epel, D. 1985. The hierarchy of requirements for an elevated intracellular pH during early development of sea urchin embryos. *Cell* 40, 657-666.
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- Epel, D. and Patton, C. 1985. Cortical granules of sea urchin eggs do not undergo exocytosis at the site of sperm-egg fusion. *Devel. Growth & Diff.*, 27, 361-368.
- Clapper, D.L., Lamothe, P.J., Davis, J.A. and Epel, D. 1985. Sperm motility in the horseshoe crab V. Zinc removal mediates chelator initiation of motility. *J. Exp. Zool.* 236, 83-91.
- Clapper, D.L. and Epel, D. 1985. The *Limulus* sperm motility initiating peptide initiates acrosome reactions in sea water lacking potassium. *J. Exp. Zool.* 236, 211-217.
- Zimmerberg, J., Sardet, C. and Epel, D. 1985. Exocytosis of sea urchin egg cortical vesicles in vitro is retarded by hyperosmotic sucrose: kinetics of fusion monitored by quantitative light-scattering microscopy. *J. Cell Biol.* 101, 2398- 2410.
- Dube, F. and Epel, D. 1986. The relation between intracellular pH and rate of protein synthesis in sea urchin eggs and the existence of a pH-independent event triggered by ammonia. *Exp. Cell Res.* 162, 191-204.
- Swezey, R.R. and Epel, D. 1986. Regulation of glucose-6-phosphate dehydrogenase activity in sea urchin eggs by reversible association with cell structural elements. *J. Cell Biol.* 103, 1509-1515.

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- Swezey, R.R., Schmidt, T. and Epel, D. 1987. Effects of hydrostatic pressure on actin assembly and initiation of amino acid transport upon fertilization of sea urchin eggs. in "Current Perspectives in High Pressure Biology" (H.W. Jannasch, R.E. Marquis & A.M. Zimmerman, eds.) pp. 95-110. Academic Press, London.
- Poenie, M. and Epel, D. 1987. Ultrastructural localization of intracellular calcium stores by a new cytochemical method. *J. Histo. Cytochem.* 35, 939- 956.
- Prigent, C., Maniey, D., Lefresne, J., Epel, D. Signoret, J. and David, J.C. 1987. Changes in the catalytic properties of DNA ligases during early sea urchin development. *Devel. Biol.* 124, 281-286.
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