

## **Bruce Pomeranz**

### **Curriculum Vitae**

Born: July 24, 1937

Degrees B.Sc. (Honours Physiology) McGill University 1961

M.D., C.M. (Medicine) McGill University 1961

Ph.D. (Physiology) Harvard University 1967

Title of graduate thesis : Effect of stimulation of the renal nerves on intrarenal blood flow distribution

#### **Research and teaching appointments:**

1961-62 Internship, Montreal General Hospital

1963-66 Postdoctoral Fellow, Harvard University

1966-68 Assistant Professor, Biology and Engineering, Massachusetts Institute of Technology (M.I.T.)

1968-73 Assistant Professor, Zoology, University of Toronto

1973-79 Associate Professor, Zoology, University of Toronto

1979- Professor, Zoology, University of Toronto, Faculty of Arts and Science

1982- Professor, Physiology, University of Toronto, Faculty of Medicine

#### **Honours**

1954-57 McGill Scholar (for ranking in upper five percent of university)

1959-60 McGill Wilson Scholarship, McGill Medical School

1961 Beatty Scholarship, McGill (to do postdoctoral research at Harvard)

1962 Parker Scholarship, Harvard (for ranking 1st in Harvard's graduate school with straight A's)

1963-66 Research Fellow, Harvard (for ranking 1st in graduate school)

1986 International Dag Hammarskjöld Prize for outstanding contribution to science (Pain and Acupuncture)

1987 D.Sc. (hon) - Sri Lanka Open University 1987-97 Canadian Who's Who

1988 Man of the Year Award, International Conference on Acupuncture, San Francisco, August

1988 1991 Wiegand Foundation Lectureship (University of Toronto)

1992 German Medical Acupuncture Association Seirin Prize for Acupuncture (\$10,000)

1992-97 President, American Society of Acupuncture (The leading society of MDs in the U.S.A.)

1994 Prestigious lecture award — Temple University, Philadelphia

1994 Clifford G. Woolf Award Acupuncture Foundation of Canada

1995 Clinical Research Society of Toronto — Award for the best paper presented

1994-97 American Men and Women of Science

#### **Professional Affiliations and Activities**

Ontario Graduate Scholarships — Selection Panel

Society for Neuroscience

Acupuncture Foundation of Canada — Board of Directors

International Association of Acupuncture and Electrotherapeutics (Fellow)

American Foundation of Traditional Chinese Medicine — Advisory Committee

World Federation of Chinese Medicine — Scientific Committee

Acupuncture: The Scientific International Journal — Editorial Board

Journal of Chinese Medicine (Taichung Taiwan) — Editorial Board  
American Journal of Chinese Medicine — Editorial Board  
Acupuncture and Electrotherapeutics Research — Editorial Board  
Complimentary Therapies in Medicine — Editorial Board  
Bulletin of the European Postgraduate Center of Acupuncture — Editorial Board  
Alternative Therapies in Health and Medicine — Editorial Board  
American Society of Acupuncture — President  
University of Maryland — NIH Center for Alternative Medical Research — Advisory Board  
Harvard Medical School — NIH Center for Alternative Medical Research — Advisory Board

### **Research Endeavours**

1. Neurobiology of pain: relief of pain by endorphins (morphine-like chemicals in the brain) and its relationship to acupuncture and electrotherapy.
2. Neurobiology of nerve regeneration and its relationship to acupuncture.
3. Neurobiology of wound healing and its relationship to acupuncture.
4. Alternative medicine: its role in modern medicine.

### **Scholarly and Professional Work**

Refereed Publications Articles (\* indicates students or postdocs under my supervision)

1. Pomeranz, B.H., A.C. Birtch and A.C. Barger. Neural control of intrarenal blood flow. *Am. J. Physiol.* 215, 1067-1081, 1968.
2. Pomeranz, B.H., P.D. Wall and W.V. Weber. Cord cells responding to fine myelinated afferents from viscera, muscle and skin. *J. Physiol.* 199, 511-532, 1968.
3. Wall, P.D. and B.H. Pomeranz. Cord cells responding to fine myelinated afferents from viscera, muscle and skin. *XXIV Int. Congr. Physiol.* Vol. 6, 237-238, 1968.
4. Pomeranz, B.H. and S.H. Chung. Dendritic tree anatomy codes form-vision physiology in tadpole retina. *Science* 170, 983-984, 1970.
5. Pomeranz, B.H. Metamorphosis of frog vision: changes in ganglion cell physiology and anatomy. *Exp. Neurol.* 34, 187-199, 1972.
6. Pomeranz, B.H. Specific nociceptive fibers projecting from spinal cord neurons to the brain: a possible pathway for pain. *Brain Res.* 50, 447-451, 1973.
7. \*Gillette, R. and B.H. Pomeranz. A study of neuron morphology in *Aplysia californica* using procion yellow dye. *Comp. Biochem. Physiol.* 44, 1257-1259, 1973.
8. \*Gillette, R. and B.H. Pomeranz. Neuron geometry and circuitry in the electron microscope. Intracellular staining with osmiophilic polymer. *Science* 182, 1256-1258, 1973.
9. \*Dostrovsky, J.O. and B.H. Pomeranz. Morphine blockade of amino acid putative transmitters on cat spinal cord sensory interneurons. *Nature* 246, 222-224, 1973.
10. Atwood, H.L. and B.H. Pomeranz. Crustacean motor neuron connections traced by backfilling for electron microscopy. *J. Cell Biol.* 63, 329-334, 1974.
11. \*Gillette, R. and B. Pomeranz. Ultrastructural correlates of interneuronal function in the abdominal ganglion of *Aplysia californica*. *J. Neurobiol.* 6, 463-474, 1975.
12. Atwood, H.L. and B.H. Pomeranz. Bottlenecks in electrical synapses on giant fibers in crustacea. *J. Neurocytol.* 6, 251-268, 1977.
13. \*Dostrovsky, J.O. and B.H. Pomeranz. Interaction of iontophoretically applied morphine with responses of interneurons in cat spinal cord. *Exp. Neurol.* 52, 325-338, 1976.

14. **Pomeranz, B.H. and \*D. Chiu. Naloxone blockade of acupuncture analgesia: endorphin implicated. Life Sci. 19, 1757-1762, 1976.**
15. **Pomeranz, B.H., \*R. Cheng and \*P. Law. Acupuncture reduces electrophysiological and behavioural responses to noxious stimuli: pituitary is implicated. Exp. Neurol. 54, 172-178, 1977.**
16. \*Aldridge, J.W. and B.H. Pomeranz. Marijuana derivative enhances excitatory synaptic potentials through a presynaptic mechanism in crayfish neuromuscular junction. Comp. Physiol. Biochem. 57C, 75-77, 1977.
17. \*Glickman, R. and B.H. Pomeranz. Frog retinal ganglion cells show species differences in their optimal stimulus sizes. Nature 265, 51-53, 1977.
18. \*Dostrovsky, J.O. and B.H. Pomeranz. Desensitization of glutamate responses. Evidence for glutamate receptors in cat spinal cord. Neurosci. Lett. 4, 315-319, 1977.
19. **\*Peets, J. and B. Pomeranz. CXBK mice deficient in opiate receptors show poor electroacupuncture analgesia. Nature 273, 675-676, 1978.**
20. Kornatowski, J.Z. and \*R.D. Glickman. Putting Ranids on line or computer-controlled CAMAC equipment in neurophysiological research. Proc. Dig. Equip. Corp. Users Soc. 3, 959-964, 1978.
21. \*Kalaska, J. and B. Pomeranz. Chronic paw denervation causes an age-dependent appearance of novel responses from forearm in "paw cortex" of kittens and adult cats. J. Neurophysiol. 42, 618-633, 1979.
22. Pomeranz, B. and \*N. Gurevitch. Enkephalin analogue depresses dorsal root potentials in cat spinal cord; naloxone reverses this effect but produces no effects when given alone. Eur. J. Pharmacol. 60, 307-313, 1979.
23. \*Cheng, R., B. Pomeranz and \*G. Yu. Dexamethasone partially reduces and 2% saline treatment abolishes electroacupuncture analgesia: these findings implicate pituitary endorphins. Life Sci. 24, 1481-1486, 1979.
24. Pomeranz, B. and \*R. Cheng. Suppression of noxious responses in single neurons of cat spinal cord by electroacupuncture and its reversal by the opiate antagonist naloxone. Exp. Neurol. 64, 327-341, 1979.
25. \*Cheng, R. and B. Pomeranz. Correlation of genetic differences in endorphin systems with analgesic effects of D-amino acids in mice. Brain Res. 177, 583-587, 1979.
26. Pomeranz, B. and \*D. Paley. Electroacupuncture hypalgesia is mediated by afferent nerve impulses: an electrophysiological study in mice. Exp. Neurol. 66, 398-402, 1979.
27. \*Cheng, R. and B. Pomeranz. Electroacupuncture analgesia could be mediated by at least two pain-relieving mechanisms: endorphin and non-endorphin systems. Life Sci. 25, 1957-1962, 1979.
28. \*Cheng, R., L. McKibbin, \*B. Roy and B. Pomeranz. Electroacupuncture elevates blood cortisol levels in naive horses; sham treatment has no effect. Int. J. Neurosci. 10, 95-97, 1980.
29. \*Cheng, R. and B. Pomeranz. The D-amino acids induce antinociceptive responses and increase electroacupuncture analgesia in mice: naloxone reverses these effects. Pain 8, 231-236, 1980.
30. \*Cheng, R. and B. Pomeranz. Electroacupuncture analgesia is mediated by stereospecific opiate receptors and is reversed by antagonists of Type I receptors. Life Sci. 26, 631-638, 1980.
31. \*Cheng, R., B. Pomeranz and \*C. Yu. Electroacupuncture treatment of morphine dependent mice reduces signs of withdrawal without showing cross tolerance. Eur. J. Pharmacol. 68, 477-481, 1980.
32. \*Cheng, R. and B. Pomeranz. Monoaminergic mechanisms of electroacupuncture analgesia. Brain Res. 215, 77-92, 1981.
33. \*Kalaska, J. and B. Pomeranz. Chronic peripheral nerve injuries alter the somatotopic

- nerve organization of cuneate nucleus in kittens. *Brain Res.* 236, 35-47, 1982.
34. \*Markus, H., B. Pomeranz and \*D. Krushelnycky. Spread of saphenous somatotopic projection map in spinal cord and hypersensitivity of the foot after chronic sciatic denervation in the adult rat. *Brain Res.* 296, 27-39, 1984.
35. **Pomeranz, B., \*M. Mullen and \*H. Markus. Effect of applied electric fields on sprouting of intact saphenous nerve in adult rat. *Brain Res.* 303, 331-336, 1984.**
36. \*Peets, J.M., \*C. Power and B. Pomeranz. Long latency spinal cord dorsum potential; suppression by intrathecal morphine and enkephalin analogue. *Brain Res.* 304, 279-284, 1984.
37. Pomeranz, B., \*R.J.B. MacCauley, \*M.A. Caudill, \*I. Kutz, \*D. Adam, R.E. Cohen, A.C. Barger and H. Benson. Heart rate spectral analysis allows non-invasive quantification of autonomic function. *Am. J. Physiol.* 248, H151-H155, 1985.
38. Pomeranz, B.H. and \*G. Niznik. Codetron (see d. Patents), a new electrotherapy device overcomes the habituation problems of conventional TENS devices. *Am. J. Electromed.* 2, 22-26, 1987.
39. \*Cheng, R.S. and B. Pomeranz. Electrotherapy of chronic musculo-skeletal pain: comparison of electroacupuncture and acupuncture-like transcutaneous nerve stimulation. *Clin. J. Pain* 2, 143-149, 1987.
40. \*Markus, H. and B. Pomeranz. Saphenous has weak ineffective synapses in sciatic territory of rat spinal cord: electrical stimulation of the saphenous or application of drugs reveal these somatotopically inappropriate synapses. *Brain Res.* 416, 315-321, 1987.
41. \*McDevitt, L., \*P. Fortner and B. Pomeranz. Application of weak electric field to the hind paw enhances sciatic motor-nerve regeneration in the adult rat. *Brain Res.* 416, 308-314, 1987.
42. \*Peets, J.M. and B. Pomeranz. Studies of suppression of nocifensive reflexes using tail flick electromyograms and intrathecal drugs in barbiturate anesthetized rats. *Brain Res.* 416, 301-307, 1987.
43. Pomeranz, B. and \*L. Bibic. Naltrexone, an opiate antagonist, prevents but does not reverse the analgesia produced by electroacupuncture. *Brain Res.* 452, 227-231, 1988.
44. Pomeranz, B. and \*N. Warma. Potentiation of analgesia by two repeated electroacupuncture treatments: the first opioid analgesia potentiates a second non-opioid analgesic response. *Brain Res.* 452, 232-236, 1988.
45. **Davenas, E., F. Beauvais, J. Amara, M. Alerbaum, B. Robinzoa, A. Miadonna, A. Tedeschi, B. Pomeranz, P. Fortner, P. Belon, J. Sainte-Laudy, B. Poitevin and J. Benveniste. Human basophil degranulation triggered by very dilute antiserum against IgE. *Nature* 333, 816-818, 1988.**
46. **Fargas-Babjak, A., P. Rooney and E. Gerecz. Randomized trial of Codetron for pain control in osteoarthritis of the hip/knee. *Clin J. Pain* 5, 137-141, 1989 (This was done under my close supervision; my name was omitted for FDA purposes.)**
47. \*Niznik, G., T. Shichijo, E. Transfeldt and B. Pomeranz. Motor and sensory spinal tract activation following epidural electrical stimulation. *Spine* 15, 623-629, 1991.
48. \*Rieb, L. and B. Pomeranz. Alterations in electric pain thresholds by use of acupuncture-like TENS in pain-free subjects. *Physical Therapy* 72, 658-668, 1992.
49. Fargas-Babjak, A.M., B. Pomeranz and R.I. Rooney. Acupuncture-like stimulation with Codetron for rehabilitation of patients with chronic pain syndrome and osteoarthritis. *Acupuncture & Electrotherapeutics Res. Int. J.* 17, 95-105, 1992.
50. \*Campbell, J.J. and B. Pomeranz. A novel methods of measuring motoneuron regeneration shows that sciatic regeneration slows with age in the rat. *Brain Res.* 603, 264-270, 1993.

51. **Pomeranz, B. and J. J. \*Campbell. Weak electric field accelerates motoneuron regeneration in the sciatic nerve of ten month old rats. Brain Res. 603, 271-278, 1993.**
52. Pomeranz, B. Acupuncture in America. American Pain Society Journal 3, 96-100, 1994.
53. Pomeranz, B. Scientific basis of acupuncture. Therapiewoche 9, 537-542, 1995.
54. Pomeranz, B. Acupuncture for chronic pain and addictions. Therapiewoche 9, 543-548, 1995.
55. Pomeranz, B. Scientific foundations of acupuncture for relief of pain. J. Alternative and Complimentary Medicine 1, 539-546, 1995.
56. **\*Spence, W.D. and B. Pomeranz. Surgical wound healing monitored repeatedly in vivo using electrical resistance of epidermis. Physiological Measurement 17, 1-13, 1996.**
57. Pomeranz, B. Recent advances in acupuncture research. Frontier Perspective, 1996.
58. Pomeranz, B. Scientific research into acupuncture for relief of pain. J. Alternative and Complimentary Medicine 2, 53-60, 1996.

#### **Invited Reviews (refereed)**

1. Pomeranz, B.H. Do endorphins mediate acupuncture analgesia? 7th International Conference on Cybematics IEEE: New York, 1977.
2. **Pomeranz, B. Endorphin, a morphine-like factor in the brain may mediate acupuncture relief of pain. New Scientist 87, 12-13, 1977.**
3. Pomeranz, B.H. Neural Mechanisms of Acupuncture Analgesia. In Persistent Pain. Editor S. Lipton. Academic Press, New York, 241-257, 1981.
4. \*Cheng, R. Electroacupuncture effect on cat spinal neurons and conscious mice: a new hypothesis is proposed. American Academy of Acupuncture Medicine 1, 1-8, 1981.
5. \*Cheng, R. Mechanism of electroacupuncture analgesia. Medical Journal, University of Toronto 14, 2-5, 1981.
6. Pomeranz, B. Acupuncture and Endorphins. Ethos 10, 385-393, 1982.
7. \*Cheng, R. Medical Journal, University of Toronto 14, 38-43, 1982.
8. Benson, H. and B. Pomeranz. Relaxation pain therapy. In Textbook of Pain. Editor P.D. Wall Churchill, Livingstone Edinburgh, pp. 817-823, 1984.
9. Pomeranz, B. Acupuncture neurophysiology. In Encyclopedia of Neuroscience. Birkhéuser, Boston, 1987, pp. 6-8.
10. Pomeranz, B. Transcutaneous electrical nerve stimulation. In Encyclopedia of Neuroscience (Yearbook). Editor G. Adelman. Birkhéuser, Boston, 1988, pp. 161-164.
11. **Pomeranz, B. Acupuncture research related to pain, drug addiction and nerve regeneration. In Scientific bases of acupuncture. Editor G. Stux. Springer Verlag, Berlin, 1989, pp. 35-52.**
12. Pomeranz, B. Scientific bases of acupuncture. In Naturheiberfaben. Editor M. Buhring. Springer Verlag, Heidelberg, Germany, 1993, pp. 85-93.
13. Pomeranz, B. Acupuncture neurophysiology. In Encyclopedia of Neuroscience. 2nd Edition. Editor G. Adelman. Elsevier, New York, 1996.
14. Pomeranz, B. Transcutaneous electrical nerve stimulation. In Encyclopedia of Neuroscience. 2nd Edition. Editor G. Adelman. Elsevier, New York, 1996.
15. Pomeranz, B. and B. Horrigan. Acupuncture and Alternative Medicine. In Alternative Therapies in Health and Medicine, 2, 84-91, 1996.

#### **Papers in Full Conference Proceedings (refereed)**

1. **Pomeranz, B. Do endorphins mediate acupuncture analgesia? In The Endorphins. Advances Biochem. Psychopharm., Vol. 18. Editor E. Costa. Raven Press, New York, 1978, pp. 351-359.**
2. \*Cheng, R. and B. Pomeranz. Acupuncture is mediated by stereospecific opiate receptors. Int. Narcotic Res. Conf., July 1978, Amsterdam. In Characteristics and Function of Opioids. Editors J.M. Van Ree and T.L. Elsevier, Holland, 1978, pp. 163-166.

3. Pomeranz, B. Breakfast Session: Chairman, L. Terenius; Pathways of access to endogenous analgesic mechanisms. Second World Congress on Pain, August 1978, Montreal.
4. Pomeranz, B. Endorphins and Acupuncture. Minerva Medica Symposium, June 1978, Rome, Italy.
5. \*Roy, B., \*R. Cheng, \*J. Phelan and B. Pomeranz. Pain threshold and brain endorphin levels. Int. Narcotic Res. Conf., June 1979, Falmouth, Mass. In Exogeneous and Endogeneous Opiate Agonists and Antagonists. Editor E.L. Way. Pergamon Press, N.Y., 1980, pp. 297-300.
6. \*Cheng, R. and B. Pomeranz. Antipeptidases increase electroacupuncture analgesia. Int. Narcotic Res. Conf., June 1979, Falmouth, Mass. In Exogeneous and Endogeneous Opiate and Antagonists. Editor E.L. Way. Pergamon Press, N.Y., 1980, pp. 383-386.
7. \*Cheng, R., B. Pomeranz and \*C. Yu. Electroacupuncture hypalgesia is enhanced in morphine dependent mice. Int. Narcotic Res. Conf., June 1979, Falmouth, Mass. In Exogeneous and Endogeneous Opiate Agonists and Antagonists. Editor E.L. Way. Pergamon Press, N.Y., 1980, pp. 533-535.
8. Pomeranz, B. Acupuncture and Endorphins. National Symposia of Acupuncture Anesthesia, 1979, Peking, China.
9. Pomeranz, B. Acupuncture and Endorphins. Canadian Association of Pharmacy, May 1980, Calgary. In Proceedings of Association of Faculties of Pharmacy, 1980.
10. Pomeranz, B. Neurochemische Grundlagen der Akupunktur. In Akupunktur - Theories und Praxis. Uelzen, Germany, 1982.
11. Pomeranz, B. Acupuncture mechanisms. Second International Conference on Acupuncture, 1982, Taipei, Taiwan.
12. Peets, J. and B. Pomeranz. Acupuncture-like TENS analgesia is influenced by spinal cord endorphins but not Serotonin: an intrathecal pharmacological study. In Advances in Pain Research and Therapy, Vol. 9. Editors H. Fields, et al. Raven Press, N.Y., 1985, pp. 519-525.
13. Pomeranz, B.H. Relation of stress-induced analgesia to acupuncture analgesia. Ann. NY Acad. Sci. 467, 444-447, 1986.
14. Pomeranz, B.H. Effects of applied DC fields on sensory nerve sprouting and motor nerve regeneration in adult rats. In Ionic Currents in Development. Alan R. Liss, Inc., 1986, pp. 25 1-260.
15. Pomeranz, B. Neural Mechanisms of Acupuncture. In Third Intemational Conference on Acupuncture. Editor R. Chung. Taipei, Taiwan 1986.
16. Pomeranz, B. Peripheral nerve lesions cause expansion of neighbouring inputs to spinal cord, cuneate nucleus and cerebral cortex. In Effects of Injury on Spinal and Trigeminal Somatosensory Systems. Editors L. Pubols and B. Sessle. Neurology and Neurobiology, Vol. 30 Alan Liss, N.Y., 1987, pp. 239-249.
17. Pomeranz, B. Acupuncture and subtle energies. In Energy Fields in Medicine. Editor M.A. Morton. Fetzer Foundation Publications, Kalamazoo, MI, 1989, pp. 66-78.
18. Fargas-Babjak, A., P. Rooney, J.B. Forrest and B. Pomeranz. Codetron-TENS, effective tool in chronic pain syndrome management. In Pain Clinic. Editors Hyodo et al. Vol. 4, 1992 pp. 301-307.
19. Pomeranz, B. Neural mechanisms of acupuncture. In Progress of Oriental Medicine. Proceedings of 6th Int. Congress of Oriental Medicine. Tokyo, Japan, 1992.
20. Pomeranz, B. Acupuncture analgesia. In International Seminar in Commemoration of 20th Anniversary of Kyung Hee University Medical Center. Seoul, Korea, 1992.
21. Pomeranz, B. Scientific research into acupuncture for relief of pain. In Conference in commemoration of 750th Anniversary of the University of Siena. Editor A. Forconi. Siena, Italy, p. 75-91, 1993.
22. Pomeranz, B. Past and future of acupuncture. In Third World Conference on Acupuncture. Editor H. Yamamura. Kyoto, Japan, p. 38-40, 1994.

23. Pomeranz, B. Basic mechanisms of acupuncture. In National Institutes of Health (NIH) Workshop on acupuncture. Editor D. Eskinazi. NIH. Bethesda, MD, p. 39-46, 1995.
24. Pomeranz, B. Scientific basis of acupuncture analgesia. In Scientific Research on Acupuncture. Medical Acupuncture Research Foundation. Washington, DC, 1997.

### **Patents**

1. Pomeranz, B. and N. Salansky. Electrotherapy Apparatus and Method. U.S. Patent granted February 1985. #4—556-064.

### **Books (Refereed)**

1. Stux, G. and B. Pomeranz. Acupuncture Textbook and Atlas Springer Verlag, Berlin , 1987, pp. 1-342.
2. Stux, G. and B. Pomeranz. Basics of Acupuncture Springer Verlag, Berlin, 1988, pp. 1-272.
3. Pomeranz, B. and G. Stux. Scientific Basics of Acupuncture. Springer Verlag, Berlin, 1988, pp. 1-200.
4. Stux, G. and B. Pomeranz. Akupunkter Lehrbuch und Atlas. 3rd edition Springer Verlag, Berlin, 1989, pp. 1-368.
5. Stux, G. and B. Pomeranz. Basics of Acupuncture. 2nd edition, completely revised. Springer Verlag, Berlin, 1991, pp. 1-291.
6. Stux, G., N. Stiller and B. Pomeranz. Akupunktur Lehrbuch und Atlas. 3rd edition Springer Verlag, Berlin, 1993, pp. 1-394.
7. Stux, G. and B. Pomeranz. Basics of Acupuncture. 3rd edition, completely revised and enlarged Springer Verlag, Berlin, 1995, pp. 1-309.
8. Stux, G. and B. Pomeranz. Akupunkter, Lehrbuch und Atlas. 5nd edition, completely revised and enlarged 1999 Springer Verlag, Berlin pp. 1-427.

### **Abstracts**

1. \*Gillette, R. and B. Pomeranz. Neuron geometry and circuitry in the electron microscope Intracellular staining. Society for Neuroscience, 1973 (Abstract).
2. \*Dostrovsky, J .0. and B. Pomeranz. Effects of glutamate and glutamate diethylester on natural cutaneous activation of cat spinal cord interneurons. Society for Neuroscience, 1973 (Abstract).
3. \*Hay, T. and B. Pomeranz. Responses of fish retinal ganglion cells to moving contours. Society for Neuroscience, 1977 (Abstract)..
4. \*Cheng, R. and B. Pomeranz. Protection of endorphin degradation causes analgesia and enhances electroacupuncture effects in mice. Society for Neuroscience, 1979 (Abstract).
5. \*Markus, H. and B. Pomeranz. Nerve sprouting in the rat hindleg after sciatic denervation. Society for Neuroscience, 1980 (Abstract).
6. Pomeranz, B. and \*R. Cheng. Electroacupuncture analgesia at 4 Hz may be endorphinergic while at 200 Hz it may be serotonergic. American Physiological Society, 1980 (Abstract).
7. Pomeranz, B. and \*H. Markus. Peripheral sprouting of high threshold afferents in the saphenous nerve after sciatic nerve section in the rat. Soc. Neurosci. Abstr. 6, 658, 1980.
8. \*Markus, H., \*D. Krushelnycky and B. Pomeranz. The effect of acute and chronic denervation on the rat spinal cord. Soc. Neurosci. Abstr. 7, 472, 1981.
9. \*Peets, J .M. and B. Pomeranz. Intrathecal or systemic naloxone antagonizes TNS analgesia in the rat. Pain, Suppl. 1, 215, 1981.
10. \*Mullen, M., \*H. Markus and B. Pomeranz. Low intensity direct electrical currents facilitate

- the rate of sciatic nerve regeneration in the adult rat. Society for Neuroscience, 1982 (Abstract).
11. Pomeranz, B., \*R.J.B. MacCauley, \*M.A. Caudill, \*I. Kutz, R.E. Cohen, A.C. Barger and H. Benson. Heart rate spectral analysis allows non-invasive quantification of autonomic function in healthy and hypertensive man. Society for Neuroscience, 1983 (Abstract).
  12. Hirsh, J. A., B. Pomeranz, \*R.J.B. MacCauley and D. Adam. Heart rate spectral analysis measures respiratory sinus arrhythmia. Fed. Proc. 42, 482, 1983.
  13. Pomeranz, B. Acupuncture Analgesia. Fourth World Congress on Pain, 1984 (Abstract).
  14. \*Peets, J. and B. Pomeranz. Extracellular recording of dorsal horn sensory neuron responses to noxious thermal stimuli: critical dependence on choice of anaesthetic. Society for Neuroscience, 1985 (Abstract).
  15. \*Markus, H. and B. Pomeranz. The effects of 4-aminopyridine and strychnine on rat spinal cord reorganization following sciatic nerve lesion. Society for Neuroscience, 1985 (Abstract).
  16. \*Chandross, D.M. and B. Pomeranz. Long intervals between stimulation of median nerve evokes P 300-like peak in human somatosensory evoked potentials. Society for Neuroscience, 1986 (Abstract).
  17. Pomeranz, B. Antinociception from peripheral nerve stimulation in rats and humans. Society for Neuroscience, 1987 (Abstract).
  18. Pomeranz, B. Electrotherapy in rats and humans. International Association for the Study of Pain, Hamburg, Germany, 1987 (Abstract).
  19. Pomeranz, B. D.C. therapy enhances nerve sprouting and growth. BRAGS, 1987 (Abstract).
  20. \*Niznik, G., F. Schichijo, B. Pomeranz, et al. Spinal sensory and motor tract activation. Society for Neuroscience, 1988 (Abstract).
  21. Pomeranz, B. Electrotherapy in rats and humans. American Society for Pain, 1988 (Abstract).
  22. \*Campbell, J. J. and B. Pomeranz. Length of lesion has no effect on the speed of regeneration in the rat sciatic nerve. Society for Neuroscience, 1989 (Abstract).
  23. Pomeranz, B. Pain suppression by acupuncture and TENS. Canadian Pain Society, Banff, 1989 (Abstract).
  24. Pomeranz, B. Analgesia from acupuncture in rats and a new TENS device in humans. ICMART 3rd International Congress, Rome, 1990 (Abstract).
  25. Pomeranz, B. Acupuncture for analgesia and nerve regeneration. Tokyo, Japan, 1990
  26. Pomeranz, B. Acupuncture mechanisms. International Association for Acupuncture and Electrotherapeutics, New York, 1991 (Abstract).
  27. Pomeranz, B. Acupuncture mechanisms. MEDICA, Dusseldorf, Germany, September 1992
  28. Pomeranz, B. Neural mechanisms of acupuncture. 20th Anniversary International Conference of Anglo-Dutch Acupuncture Society, Amsterdam, September 1992 (Abstract).
  29. Pomeranz, B. Methods of activating nerves with acupuncture. 20th Anniversary 29. International Conference of Anglo-Dutch Acupuncture Society, Amsterdam, September 1992
  30. Pomeranz, B. Current scientific research into acupuncture for wound healing, nerve regeneration and addiction. 20th Anniversary International Conference of Anglo-Dutch Acupuncture Society, Amsterdam, September 1992 (Abstract).
  31. Pomeranz, B. Alternative medicine, a clash of paradigms. American parapsychological association annual conference, Toronto, August 1993.
  32. Pomeranz, B. The past and the future of acupuncture. 3rd world conference on acupuncture, Kyoto, Japan, November 1993 (Abstract).
  33. Pomeranz, B. Wound healing. Symposium on healing, Esalen Institute, Big Sur, California, December 1994.
  34. Pomeranz, B. Intuitive Diagnosis. Noetic Sciences Institute Conference on Consciousness,



Sausalito, California, February 1995 (Abstract).

35. \*Kim, L. and B. Pomeranz. Local stimulation of sympathetic nerve terminals accelerates cutaneous wound healing. Society for Neuroscience, San Diego, California, October 1995

36. Pomeranz, B. Conflict between alternative medicine and conventional medicine. 3rd world congress of natural medicine, Edmonton, Alberta, August 1995 (Abstract).

37. Pomeranz, B. Scientific basis of acupuncture. 3rd world congress of natural medicine, Edmonton, Alberta, August 1995 (Abstract).

38. Pomeranz, B. Alternative medicine. 3rd world congress of natural medicine, Edmonton, Alberta, August 1995 (Abstract).

39. **\*Lazarou, J. and B. Pomeranz. How to design more rigorous adverse drug reaction studies. 11th international conference on pharmacoepidemiology, Montreal, Quebec, August 1995**

40. \*Kim, L. and B. Pomeranz. Local stimulation of sympathetic nerve terminals accelerates cutaneous wound healing. International conference of winners of best PhD students in Life Sciences, Houston, Texas, March 1996 (Abstract).

### **Manuscripts & Publications in Preparation and Submitted to Publishers**

1. \*Shu, R., B. Pomeranz and H. Cameron. First quantitative non-invasive method for measuring rate of skin wound healing: tested with a study of arthritic patients. J. Orthoped. Surgery

2. B. Pomeranz and \*Zalin, R.J. Adults with a history of food sensitivity exhibit a spontaneous basophil degranulation. J. Allergy Clin. Immunol.

3. B. Pomeranz, \*Zalin, R.J. and J. Krop. Adults with a history of food sensitivity showed a drop in circulating basophils during double blind food challenge. J. Allergy Clin. Immunol.

4. \*Shu, R., N. \*Allan and B. Pomeranz. Electrical resistance of human skin falls after acupuncture needling. J. Appl. Physiol

5. \*Kim, L.R., \*K. Whelpdale, \*M. Zurowski and B. Pomeranz. Effects of denervating sensory afferents and sympathetic efferents on the healing of skin incisions in rats. Brain Res

6. \*Spence, W.D. and B. Pomeranz. Electroacupuncture and TENS accelerate wound healing of skin incisions in the rat. Acta Physiol. Scand.

7. \*Kim, L. and B. Pomeranz. Local injection of bradykinin accelerates cutaneous wound healing. Nature

8. \*Kim, L.R. and B. Pomeranz. Activation of sympathetic terminals by six hydroxydopamine (6-OHDA) accelerates healing of skin incisions in rats. Neuroscience

9. Pomeranz, B. The best of health. Comparing the best of conventional and unconventional medicine. (Book in process of being written.)

10. \*Zurowski, M. and B. Pomeranz. Surgical denervation of peripheral nerves slows healing of skin incisions in rats. Brain Res

**11. \*Lazarou, J., B. Pomeranz and P. Corey. Incidence of Adverse Drug Reactions in Hospitalized Patients: A Meta-analysis of Prospective Studies.**

**JAMA, April 15 1998 – Vol 279, No. 15 1200-05**

### **Papers Presented at Symposia**

1. Pomeranz, B. Neuroscience Society, Special Interest Dinner. Endorphins, pain and acupuncture. 6th Neuroscience Society Meeting, November 1976, Toronto.

2. Pomeranz, B. Endorphins and Acupuncture. Ontario Medical Association, May 1977, Toronto.

3. Pomeranz, B. Acupuncture and endorphins. Gordon Research Conference on Opiates, June 1977, Wolfboro, New Hampshire.

4. Pomeranz, B. Endorphins and Pain. International Association for Study of Pain (Canadian Chapter),

September 1977, Toronto.

5. Pomeranz, B. Endorphins and Acupuncture. Ontario Medical Association, May 1978, Toronto.

6. Pomeranz, B. Endorphins and Acupuncture. Minerva Medica Symposium, June 1978, Rome

7. Cheng, R. and B. Pomeranz. Acupuncture is mediated by stereospecific opiate receptors. International Narcotic Research Conference, July 1978, Amsterdam.

8. Pomeranz, B. Breakfast Session: Chairman, L. Terenius; Pathways of access to endogenous analgesic mechanisms. Second World Congress on Pain, August 1978, Montreal.

9. Pomeranz, B. Endorphins. Symposium on From Cell to Psyche. University of Toronto, January 1979, Toronto.

10. Pomeranz, B. Acupuncture and Endorphins. Seminar on Chronic Pain. University of Toronto, Princess Margaret Hospital, February 1979, Toronto.

11. Cheng, R. and B. Pomeranz. Antipeptidases increase electroacupuncture analgesia. International Narcotic Research Conference, June 1979, Falmouth, Mass.

12. Roy, B., R. Cheng, J. Phelan and B. Pomeranz. Pain threshold and brain endorphin levels. International Narcotic Research Conference, June 1979, Falmouth, Mass.

13. Cheng, R., B. Pomeranz, and G. Yu. Electroacupuncture hypalgesia is enhanced in morphine dependent mice. International Narcotic Research Conference, June 1979, Falmouth, Mass.

14. Pomeranz, B. Acupuncture and Endorphins. National Symposia of Acupuncture Anesthesia, June 1979, Peking, China.

15. Pomeranz, B. Acupuncture and Endorphins. Tokyo Medical University, July 1979, Tokyo

16. Pomeranz, B. Endorphins and Pain. International Symposium on Sports Medicine, October 1979, Toronto.

17. Pomeranz, B. Acupuncture and Endorphins. Symposium of Use and Abuse of Drugs. University of Toronto Research Board, April 1980, Toronto.

18. Pomeranz, B. Acupuncture and Endorphins. New Directions in Health Care. University of Pennsylvania Medical School, April 1980, Philadelphia.

19. Pomeranz, B. Acupuncture and Endorphins. Canadian Association of Pharmacy, May 1980, Calgary.

20. Pomeranz, B. Acupuncture and Endorphins. Ontario Medical Association, June 1980, Toronto.

21. Pomeranz, B. Acupuncture and Endorphins. 1980, Plymouth, New Hampshire.

Gordon Research Conference on Endorphins

22. Pomeranz, B. Acupuncture and Endorphins. Conference on Shamans and Endorphins. McGill University, Department of Psychiatry, October 1980, Montreal.

23. Pomeranz, B. Endorphins and Pain. Conference on Pain. Toronto Western Hospital, January 1981, Toronto.

24. Pomeranz, B.. Endorphins. McNeil Laboratories Symposium on Pain, February 1981, Toronto.

25. Pomeranz, B. Acupuncture and TENS. Ontario Medical Association, June 1981, Toronto.

26. Pomeranz, B. Acupuncture and Endorphins. World Health Organization Symposium on Acupuncture, August 1981, New York.

27. Pomeranz, B. Acupuncture. International Paraphysics Association World Conference, August 1981, Toronto.

28. Pomeranz, B. Acupuncture physiology. Institute for Advanced Research in Asian Science and Medicine, March 1982, New York.

29. Pomeranz, B. Pain physiology. Harvard Medical School Symposium on Behavioral Medicine, May 1982,

Boston.

30. Pomeranz, B. Neural mechanisms of acupuncture. Ontario Medical Association Convention, June 1982, Toronto.
31. Pomeranz, B. Acupuncture mechanisms. Second International Conference on Acupuncture, November 1982, Taipei, Taiwan.
32. Pomeranz, B. International Symposium on Veterinarian Acupuncture, November 1982, Taichung, Taiwan.
33. Pomeranz, B. Physiology of healing. Healing Symposium, McMaster University, January 1983, Hamilton.
34. Pomeranz, B. Neural mechanisms acupuncture. Institute for Advanced Research in Asian Science and Medicine, February 1983, New York.
35. Pomeranz, B. Electric fields promote nerve regeneration. University of Toronto, Sunnybrook Hospital, February 1983, Toronto.
36. Pomeranz, B. Electroacupuncture and TENS. Ontario Medical Association Convention, June 1983, Toronto.
37. Pomeranz, B. Electroacupuncture mechanisms. California Association of Acupuncturists, June 1983, San Francisco.
38. Pomeranz, B. Neural mechanisms of electroacupuncture. Society of Acupuncture for Physicians and Dentists, November 1983, New York.
39. Pomeranz, B. Pain in sports medicine. Canadian Association for Sports Medicine, January 1984, Toronto.
40. Pomeranz, B. Acupuncture physiology. Institute for Advanced Research in Asian Science and Medicine, February 1984, New York
41. Pomeranz, B. Neural effects of acupuncture. Ontario Medical Association Convention, June 1984, Toronto.
42. Pomeranz, B. Acupuncture mechanisms. 4th World Congress on Pain, September 1984, Seattle.
43. Pomeranz, B. Nerve regeneration. Toronto Group on Biological Effects of Electric Fields, September 1984, Toronto.
44. Pomeranz, B. Acupuncture physiology. Institute for Advanced Research in Asian Science and Medicine, March 1985, New York.
45. Physiology of pain. Ontario Association of Family Physicians and the Palliative Care Foundation, Symposium on Pain Management, April 1986, Toronto.
46. Review of acupuncture research. Joint Conference of the Second World Congress of Chinese Medicine and Pharmacy and the Second International Symposium on Acupuncture and Moxibustion, June 1986, Taipei, Taiwan.
47. Acupuncture mechanisms. Chairman and Organizer of First International Congress of Complementary Medicine, June 1986, Jerusalem, Israel.
48. Pomeranz, B. Spinal cord plasticity. Somatosensory Satellite Meeting of the Canadian Physiological Society and the International Physiological Society, July 1986, Timberline, Oregon.
49. Neural Mechanisms of Acupuncture. International Conference of Medicina Alternativa, September 1986, Colombo, Sri Lanka.
50. Acupuncture Mechanisms. Freiburg University, September 1986, Freiburg, Germany.
51. Pomeranz, B. Physiology of Endorphins. Science Teachers Association of Ontario, November 1986, Toronto.
52. Pomeranz, B. Neural Mechanisms of Acupuncture Analgesia. Acupuncture Foundation of Canada-Symposium on the Scientific Basis of Acupuncture, November 1986, Toronto.

53. Energy Medicine. Symposium on Alternative Medicine, Esalen Institute, June 1987, Big Sur, California.
54. Chairman, International Conference on Acupuncture-Basic Science, July 1987, Dusseldorf, Germany.
55. Electrotherapy in Rats and Humans. International Association for Study of Pain, August 1987, Hamburg, Germany.
56. Nerve Regeneration. BRAGS International Symposium on Bioelectromagnetics, October 1987, Toronto.
57. Acupuncture Mechanisms. International Association of Acupuncture and Electrotherapeutics, October 1987, New York.
58. Alternative Medicine. University of Ottawa Symposium on Alternative Medicine, November 1987, Ottawa.
59. Electrotherapy in Rats and Humans. Society for Neuroscience, November 1987, New Orleans.
60. Codetron for Pain Relief. World Congress on Rehabilitation Medicine, April 1988, Toronto.
61. Nerve Plasticity. Toronto Neuroscience Symposium at Mount Sinai Hospital, April 1988, Toronto.
62. Subtle Energies. Conference on Quantum Mechanics in Medicine and Biology, April 1988, Bermuda.
63. Acupuncture Neural Mechanisms. International Conference Medical Acupuncture and Related Therapies, June 1988, Prague.
64. Acupuncture and Nerve Regeneration. International Conference Medical Acupuncture and Related Therapies, June 1988, Prague.
65. Acupuncture Analgesia. Satellite Conference to International Conference Medical Acupuncture, June 1988, Brno, Czechoslovakia.
66. Mechanisms of Acupuncture. International Conference of Acupuncture, July 1988, San Francisco.
67. Keynote Address: Scientific Basis of Acupuncture. International Conference of Acupuncture, July 1988, San Francisco.
68. Acupuncture Analgesia. International Congress of Physics in Medicine, August 1988, San Antonio.
69. Electroacupuncture. Conference on Electrical Effects in Biology, August 1988, Houston.
70. High Dilution Effects on Basophils. Conference on High Dilution Effects, August 1988, Los Angeles.
71. Acupuncture Analgesia. Symposium on Acupuncture, August 1988, Tel Aviv.
72. Electrotherapy and Acupuncture. Congress of Physical Medicine, September 1988, Toronto.
73. Acupuncture Analgesia, workshop. American Pain Society, November 1988, Toronto.
74. Healing mechanisms. Symposium on Scientific Basis of Healing. Esalen Institute, Big Sur, California, August 1989.
75. Energy medicine. Noetics Science Institute. San Francisco, CA, August 1989.
76. Acupuncture and subtle energies. International Round Table on Energy Fields. Fetzer Foundation, Kalamazoo, Michigan, September 1989.
77. Keynote Address on scientific basis of acupuncture. Pacific Symposium on Oriental Medicine. Pacific College of Oriental Medicine. San Diego, CA, August 1990.
78. Keynote Address on neurological basis of acupuncture. International Council for Medical Acupuncture, 3rd World Congress. Rome, Italy, May 1990 (I was Chair of the Symposium).
79. Scientific research into acupuncture analgesia. University of Sienna, 750th Anniversary Celebration Keynote Lecturer. Sienna, Italy, May 1991.
80. Electrotherapy for nerve regeneration. Zoology Department Symposium on Development in the Nervous System. University of Toronto, Toronto, March 1991.
81. Ethics in scientific research. Institute of Biomedical Ethics, University of Toronto, Toronto, January 1991.
82. Acupuncture for analgesia and nerve regeneration. Japanese Association for Acupuncture. Tokyo, Japan, October 1990.
83. Scientific research on acupuncture. Kyung Hee International Seminar in Commemoration of 20th

- Anniversary of Kyung Hee University Medical Center. Seoul, Korea. Keynote Address, September 1991.
84. Neural mechanisms of acupuncture. International Association Acupuncture and Electrotherapeutics. New York, September 1991.
  85. Recent scientific research on acupuncture. Kaiser Permanent Physical Medicine Symposium, Los Angeles, June 1991.
  86. Neural effects of acupuncture: analgesia, nerve regeneration and wound healing. First Pan Pacific Conference on Acupuncture. Vancouver, BC, May 1992.
  87. Nerve regeneration and acupuncture. Presidential Address. American Society of Acupuncture. New York, February 1992.
  88. Scientific basis of acupuncture. Keynote Address. Anglo-Dutch College of Acupuncture, 20th Anniversary. Amsterdam, Holland, November 1992.
  89. Neurophysiology of acupuncture. Dusseldorf Acupuncture Society. Dusseldorf, Germany, November 1992.
  90. Scientific basis of acupuncture. German Medical Association Annual Conference. Dusseldorf, Germany, November 1992.
  91. Scientific research on acupuncture. Atlantic Symposium on Oriental Medicine. Pacific College of Oriental Medicine. Boston, October 1992.
  92. Alternative medicine. Canadian Memorial Chiropractic College. Toronto, March 1993.
  93. Alternative medicine, a clash of paradigms. Keynote Address, American Parapsychological Association Annual Conference. Toronto, August 1993.
  94. Alternative medicine, a clash of paradigms. Department of Pharmacy, University of Toronto. Toronto, October 1993.
  95. The past and the future of acupuncture. Keynote Lecture, Third World Conference on Acupuncture. Kyoto, Japan, November 1993.
  96. Acupuncture: Should it be covered by Blue Cross? Blue Cross Conference. Toronto, November 1993.
  97. Alternative medicine. Presidential Address to American Society of Acupuncture. New York, February 1994.
  98. Acupuncture research. Keynote address, National Institutes of Health conference on acupuncture, Bethesda, MD, April 1994 (reviewed in Science 264, 770, 1994).
  99. Acupuncture research. Keynote lecture, Acupuncture Foundation of Canada 20th Anniversary Conference, Toronto, June 1994.
  100. Alternative medicine. New York College of Medical Acupuncture, New York, November 1994.
  101. Acupuncture research. New York College of Medical Acupuncture, New York, November 1994.
  102. Healing mechanisms. Symposium on healing. Esalen Institute, Big Sur, California, December 1994.
  103. Intuitive diagnosis in medicine. Noetic Science Institute conference on consciousness. Sausalito, California, February 1995.
  104. Scientific basis of acupuncture. Keynote speaker at 3rd world congress of natural medicine, Edmonton, Alberta, August 1995.
  105. Alternative medicine. Keynote speaker at 3rd world congress of natural medicine. Edmonton, Alberta, August 1995.
  106. Scientific basis of acupuncture analgesia. Conference on scientific research into acupuncture. Medical Acupuncture Research Foundation. Washington, DC, September 1996.

#### **Invited Lectures**

1. Workmen's Compensation Board Hospital, December 1976, Toronto. 2. Acupuncture Foundation of Canada, January 1977, Toronto.
3. Pharmacology Department Seminar Series, University of Toronto, February 1977, Toronto.
4. Clarke Institute, Department of Psychiatry, University of Toronto, March 1977, Toronto.

5. Ottawa Neuroscience Society, May 1977, Ottawa.
6. Harvard Medical School, May 1977, Boston.
7. International Association of Acupuncture, June 1977, Paris.
8. Addiction Research Foundation, September 1977, Toronto.
9. Canadian Hospital Association Convention, November 1977, Toronto.
10. Acupuncture Foundation of New York, December 1977, New York.
11. Workmen's Compensation Board Hospital, May 1978, Toronto.
12. University of Toronto Neurology Series, December 1978, Toronto.
13. CBC Radio: Ideas, February 1979, Canada.
14. Physiology Department Seminar Series, University of Toronto, March 1979, Toronto.
15. Pharmacology Department Seminar Series, University of Toronto, April 1979, Toronto.
16. Department of Preventive Medicine, University of Toronto, May 1979, Toronto.
17. Shanghai Medical Association, June 1979, Shanghai, China.
18. Peking Medical Association, June 1979, Peking, China.
19. Sri Lanka Medical School, July 1979, Colombo, Sri Lanka.
20. Sri Lanka Acupuncture Society, July 1979, Colombo, Sri Lanka.
21. Hong Kong Chinese University, July 1979, Hong Kong.
22. American Association of Acupuncture, October 1979, Chicago.
23. Toronto East General Hospital, November 1979, Toronto.
24. Department of Psychology, University of Toronto, January 1980, Toronto.
25. Acupuncture and Endorphins. Acupuncture Foundation of Canada, October 1980, Vancouver.
26. Acupuncture and Endorphins. University of Toronto Chinese Students Association 1980, Toronto.
27. Acupuncture and Endorphins. Acupuncture Foundation of Canada, November 1980, Toronto.
28. Endorphins and Pain. Grand Rounds. Princess Margaret and Wellesley Hospitals 1981, Toronto.
29. Endorphins. Addiction Research Foundation, February 1981, Toronto.
30. Acupuncture and Endorphins. Harvard Medical School, July 1981, Boston.
31. Acupuncture and Endorphins. Workmen's Compensation Board Hospital, December 1981, Toronto.
32. Heart rate spectral analysis in healthy and hypertensive man. Harvard Medical School, Physiology Department, March 1982, Boston.
33. Neuronal plasticity. University of Toronto, Department of Physiology, March 1982, Toronto.
34. Neuronal mechanisms of acupuncture. Veteran's Administration Hospital, Boston University Medical School, June 1982, Boston.
35. Neural mechanisms of acupuncture. New England School of Acupuncture, June 1982, Boston.
36. Heart rate spectral analysis in healthy and hypertensive man. Massachusetts Institute of Technology, Department of Health Sciences and Technology, September 1982, Cambridge.
37. Heart rate spectral analysis in healthy and hypertensive man. Beth Israel Hospital, Harvard Medical School, November 1982, Boston.
38. Neural mechanisms of acupuncture. Tokyo Medical and Dental University, Department of Anesthesiology, November 1982, Tokyo, Japan.
39. Neural mechanisms of acupuncture. McLeans Hospital, Harvard Medical School, December 1982, Boston.
40. A new kind of TENS. Toronto Hospital for Sick Children, September 1983, Toronto.
41. Mechanisms of electroacupuncture and TENS. Workmen's Compensation Board Hospital, November 1983, Toronto.
42. Mechanisms of acupuncture. Graduate Seminar Series, McMaster Medical Centre, January 1984, Hamilton.
43. Mind-Brain interactions. Toronto Psychological Society, January 1984, Toronto.

44. Mind-Brain interactions. Toronto Psychical Society, January 1985, Toronto.
45. Mind-Brain interactions. Toronto Psychical Society, March 1985, Toronto.
46. Acupuncture mechanisms. Workmen's Compensation Board Hospital, May 1985, Toronto.
47. Acupuncture Analgesia, Ontario Medical Association Convention, June 1985, Toronto.
48. Physiology of pain. Mississauga General Hospital, February 1986, Toronto.
49. Physiology of pain. Ontario Association of Family Physicians and the Palliative Care Foundation Symposium on Pain Management, April 1986, Toronto.
50. Review of acupuncture research. Joint Conference of the Second World Congress of Chinese Medicine and Pharmacy and the Second International Symposium on Acupuncture and Moxibustion, June 1986, Taipei, Taiwan.
51. Acupuncture mechanisms. First International Congress of Complementary Medicine, June 1986, Jerusalem, Israel.
52. Physiology of Endorphins. Keynote address at Science Teachers Association of Ontario, November 1986, Toronto.
53. Neural Mechanisms of Acupuncture Analgesia. Acupuncture Foundation of Canada, November 1986, Toronto.
54. Endogenous Analgesia. Addiction Research Foundation, January 1987, Toronto.
55. Acupuncture Mechanisms. Wellesley Hospital, February 1987, Toronto.
56. Alternative Medicine. Toronto Psychical Society, March 1987, Toronto.
57. Electrotherapy. University of Toronto Pain Interest Group, April 1987, Toronto.
58. Nerve Regeneration. Department of Physics, University of Toronto, October 1987, Toronto.
59. Neurophysiology of Acupuncture. University of Toronto Physiological Interest Group, November 1987, Toronto.
60. Paraphysics. Toronto Psychical Research Society, February 1988, Toronto.
61. Electrotherapy with Codetron. Workman's Compensation Hospital, March 1988, Toronto.
62. Acupuncture Mechanisms. New Brunswick Annual Medical Association Conference, April 1988, St. John.
63. Electrotherapy. Workman's Compensation Hospital, April 1988, St. John.
64. Acupuncture Mechanisms. Ontario Naturopathic College, April 1988, Toronto.
65. Nerve Regeneration. Neuroscience Group, Hospital for Sick Children, May 1988, Toronto.
66. Acupuncture Research. Prague Medical School, June 1988, Prague.
67. Acupuncture Mechanisms. Los Angeles Acupuncture Association, September 1988, Los Angeles.
68. High Dilution Effects on Human Basophils. Bioron Foundation, November 1988, Lyon, France.
69. Electrotherapy with Codetron. Canadian College of Medical Chiropractic, December 1988, Toronto.
70. Scientific Heresies. University of Toronto for Anomalies, January 1989, Toronto.
71. High Dilution Effects on Human Basophils. Natural Philosophers, Department of Physics, University of Toronto, March 1989, Toronto.
72. Heresies in science. Royal Canadian Institute, Youth Science Academy, Toronto, April 1990.
73. Acupuncture and TENS. Canadian Pain Society. Banff, Alberta, October 1989.
74. Endorphins and analgesia. Pain Interest Group, University of Western Ontario, London, Ontario, October 1989.
75. Keynote Address on scientific research on healing. International Convention of Therapeutic Touch Nurses. Toronto, September 1990.
76. Scientific basis of acupuncture. Food and Drug Administration (USA), Washington, DC, June 1991.
77. Alternative medicine: A clash of paradigms. Wiegand Foundation Lecture Series, University of Toronto (Honourary Lecture), Toronto, November 1991.

78. Scientific basis of acupuncture. Charité Hospital. East Berlin, May 1992.
79. Scientific research in alternative medicine. Dusseldorf Acupuncture Society. Dusseldorf, Germany, May 1992.
80. Acupuncture research. Prestigious Lecture Series: Center for Frontier Research, Temple University, Philadelphia, April 1994.
81. Alternative medicine. Zoology Undergraduate Society, University of Toronto, Toronto, April 1994.
82. Alternative medicine: New York University School of Medicine, New York, November 1994. 83. Acupuncture research: New York University School of Medicine, New York, November 1994.
84. Sympathetics accelerate wound healing. Physiophest seminar series. University of Toronto, October 1995.
85. Adverse drug reactions. Physiophest seminar series. University of Toronto, October 1995. 86. Acupuncture pain relief. Pacific College of Oriental Medicine, San Diego, June '1996.
87. Alternative medicine (Keynote Lecture). Pacific College of Oriental Medicine, San Diego, June 1996.
88. Scientific basis of acupuncture. British College of Acupuncture, London, UK, October 1996.
89. Alternative medicine (Keynote Lecture). British College of Acupuncture, London, UK, October 1996.

### **Thesis Supervised**

1. Elliott, C. The effects of uracil, uridine and adenosine on retention of motor-learning task in goldfish. M.Sc. thesis, 1973.
2. Gillette, R. Microstructural and ultrastructural studies on identified neurons in the abdominal ganglion of *Aplysia californica*. Ph.D. thesis, 1974.  
Present position: Associate Professor, Department of Physiology, University of Illinois.
3. Dostrovsky, J.O. Microiontophoretic studies of neurotransmitters and morphine on cat spinal cord sensory interneurons. Ph.D. thesis, 1974.  
Present position: Associate Professor, Department of Physiology, University of Toronto.
4. Musgrave, E. Responses of genitopericardial ganglion of *Aplysia* (snails) to nerve stimulation and putative transmitters. M.Sc. thesis, 1975.
5. Aldridge, W. Effects of morphine and marijuana on the neuromuscular junction of the crayfish. M.Sc. thesis, 1975.
6. Glickman, R.D. Size preferences of frog class 2 retinal ganglion cells. Ph.D. thesis, 1977.
7. Kalaska, J. Development of cortical somatic projections in the kitten: effects of denervation. Ph.D. thesis, 1978.  
Can. Soc. Zool. Award for best thesis in Canada (1979).
8. Cheng, R. Effects of acupuncture on cat spinal cord neurons. M.Sc. thesis, 1977.  
Acupuncture analgesia. Role of endorphins and monoamines. Ph.D. thesis, 1980.
9. Peets, J. Genetic factors in acupuncture analgesia. M.Sc. thesis, 1978.
10. Gencheff, N. Comparison of electroacupuncture and transcutaneous electrical nerve stimulation. M.Sc. thesis, 1981.
11. McDevitt, L. Application of weak electrical fields enhances sciatic motoneuron regeneration in the adult rat. M.Sc. thesis, 1984.
12. Markus, H. Collateral sprouting in peripheral nerve. Ph.D. (in progress).
13. Chandross, D. Effect of attention on cerebral evoked potentials. M.Sc. thesis, 1986.
14. Rieb, L. The effect of transcutaneous electrical nerve stimulation on somatosensory cortical evoked potentials. M.Sc. thesis, 1988.
15. Niznik, G. Evoked potentials and chronic pain. M.Sc. thesis, 1988.
16. Geen, J. Receptor effects of ultralow doses. M.Sc. thesis, 1989.
17. Campbell, J. Nerve regeneration. M.Sc. thesis, 1990.
18. Spence, W. Acupuncture and wound healing. Ph.D. (in progress).
19. Whelpdale, K. Wound healing. M.Sc. thesis, 1993.



20. Zurowski, M. Wound healing. M.Sc. thesis, 1994.
21. Kim, L. Wound healing. Ph.D. (in progress).
22. Lazarou, J. Side effects of medical drugs. M.Sc. thesis, 1996.
23. Dimitrijevic, A. Neural mechanisms of acupuncture and wound healing, M.Sc. (in progress).

**Postdoctoral Fellows**

1. Law, P. Effects of acupuncture on CNS responses. 1975.
2. Chiu, D. Effects of acupuncture on pain threshold. 1975-77.
3. Hay, T. Size and directional preferences of retinal ganglion cells. 1976-78.
4. Gurevitch, N. Endorphins and presynaptic inhibition. 1977-79.
5. Roy, B. Biochemistry of endorphins. 1977-79.
6. Nakano, S. Spinal cord electrophysiology. 1983.
7. Allen, N.B. Resistance of human skin. 1984-
8. Cheng, R. Acupuncture analgesia. 1985-88.
9. Tulbert, D. Receptor effects of ultralow doses. 1987-88.
10. Zalin, R. High dilution effects on basophils. 1988-94.
11. Shapiro, S. Acupuncture for heroin addicts. 1994.