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United States District Court

District of Oregon

Portland Division

AHM, by and through
her Guardian *ad litem* and father,
David Mark Morrison, and
David Mark Morrison, individually,

v.

Portland Public Schools,

Defendant.

Civil Action No. 3:11-cv-00739-MO

**Amended Declaration of
Dr. David O. Carpenter, M.D.**

I, Dr. David O. Carpenter, M.D., under penalty of perjury pursuant to 28 U.S.C. § 1746, hereby make the following declaration in support of an injunction against Portland Public Schools' use of WI-FI:

1. I am a public health physician, educated at Harvard Medical School. My current title is Director of the Institute for Health and the Environment at the University at Albany and Professor of Environmental Health Sciences within the School of Public Health. Formerly, I was the Dean of the School of Public Health at the University of Albany and the Director of the Wadsworth Center for Laboratories and Research of the New York State Department of Health.

2. I served as the Executive Secretary to the New York State Powerlines Project in the 1980s, a program of research that showed children living in homes with elevated magnetic fields coming from powerlines suffered from an elevated risk of developing leukemia. After this I became the spokesperson on electromagnetic field (EMF) issues for the state during the time of my employment in the Department of Health. I have published several reviews on the subject and have edited two books.

3. I am a Co-Editor and a Contributing Author of the *BioInitiative: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF)*, www.bioinitiative.org. It documents bioeffects, adverse health effects and public health conclusions about impacts of electromagnetic radiation (electromagnetic fields including extremely-low frequency ELF-EMF and radiofrequency /microwave or RF-EMF fields). The public health chapter from this report was subsequently published in a peer-reviewed journal.

4. Additionally, I am a Co-Author of *Setting Prudent Public Health Policy for Electromagnetic Field Exposures*, *Reviews on Environmental Health*, Volume 23, No 2, 2008, attached as Addendum A-2.

5. In addition, in 2009, I was invited to present to the President's Cancer Panel on the subject of powerline and radiofrequency fields and cancer, and have testified on this issue before the United States House of Representatives.

6. In sum, I am a public health physician, professor and former public health school Dean with expertise in electrophysiology, low-frequency electromagnetic fields bioeffects, and

radiofrequency (RF) and microwave (MW) radiation bioeffects.

7. WI-FI deploys pulse-modulated (“PM”) microwave (“MW”) radiation (within the larger RF radiation spectrum) with a carrier frequency that is similar to that used by a microwave oven: about 2.45 GHz. This is the “Agent”. The 2.45 GHz frequency was chosen for the oven because of its wavelength and harmonic resonance with the water molecule, to ensure the most efficient absorption by living tissues and effective heating by way of the agitation of water at the molecular level. The pulse-modulation of a wave with lower frequencies in addition to the high-frequency carrier signal, increases the exposure complexity and in turn the bioeffects in an exposed population.

8. In the context of school development, WI-FI exposes building occupants including children and adults constantly from both computers and infrastructure antennas. Duration may be an even more potent contributing factor to RF/MW radiation bioeffects than exposure levels. Chronic, such as all-day, school exposure, is more likely than short and intermittent exposure, such as cell phone use, to produce harmful health effects, and is likely to do so at lower exposure levels.

9. Persons stationed close to school computers with WI-FI and especially those very near to any WI-FI infrastructure will receive considerably higher exposure than do others.

10. It is generally accepted within the relevant scientific community and has been established beyond any reasonable doubt that adverse human health effects occur at far lower levels of RF/MW radiation exposure than those that cause noticeable heating, particularly where the wavelength approaches body-part size and thus maximizes absorption, where the wavelength has resonance with the water molecule, where there is more complex, modulated wave, where there is chronic exposure duration, and where exposed persons lack the capacity voluntarily to remove themselves from radiation sources.

11. Some effects are shown to occur at several hundred thousand times below the FCC public exposure guidelines, which are set based on the fallacious assumption that there are no adverse health effects at exposures that do not cause easily measureable heating. FCC guidelines

also only apply to 30-minute public exposures; therefore do not even infer safety at durations >30 minutes, such as in a school setting.

12. Exposure to high-frequency RF and MW radiation and also the extreme low frequency (ELF) EM fields that accompany WI-FI exposure have been linked to a variety of adverse health outcomes. Some of the many adverse effects reported to be associated with and/or caused by ELF fields and/or RF/MW radiation include neurologic, endocrine, immune, cardiac, reproductive and other effects, including cancers.

13. Studies of isolated cells have shown that RF/MW exposures may cause changes in cell membrane function, cell communication, metabolism, activation of proto-oncogenes, and can trigger the production of stress proteins at exposure levels below FCC guidelines and also at and less than school WI-FI exposure levels and parameters. Resulting effects in cellular studies include without limitation DNA breaks and chromosome aberrations, cell death including death of brain neurons, increased free radical production, activation of the endogenous opioid system, cell stress and premature aging.

14. Human studies of comparable RF/MW radiation parameters show changes in brain function including memory loss, retarded learning, performance impairment in children, headaches and neurodegenerative conditions, melatonin suppression and sleep disorders, fatigue, hormonal imbalances, immune dysregulation such as allergic and inflammatory responses, cardiac and blood pressure problems, genotoxic effects like miscarriage, cancers such as childhood leukemia, childhood and adult brain tumors, and more.

15. There is consistent evidence for increased incidence of effects in individuals who live near to high-power short-wave, AM, FM and TV transmission towers. This is particularly relevant because, like WI-FI, radio-TV transmission towers give continuous, whole-body radiation, not just radiation to the head, constantly.

16. Since WI-FI transmitters, both infrastructural and on computers, are indoors, where children and teachers may be very close by, and since WI-FI, at 2.45 GHz, deploys a

wavelength, at ~12.2 cm or ~ 4.8 inches, more absorbable by children's and adults' bodies and brains than radio-TV wavelengths, the harmfulness of WI-FI radiation likely exceeds that of radio-TV towers.

17. Like second-hand smoke, EMF and RF/MW radiation involve complex mixtures, where different frequencies, intensities, durations of exposure(s), modulation, waveform and other factors are known to produce variable effects, often more harmful with greater complexity. Decades of scientific study have produced substantial evidence that EMF and RF/MW radiation may be considered neurotoxic, carcinogenic and genotoxic. Sources of fields and radiation, but are not limited to: power lines, navigational radar, cell phones, cordless phones [or Digitally Encoded Cordless Transmission Devices (D.E.C.T.) phones], cell towers, 'smart' meters and their grids or infrastructure, "smart" boards, meters and grids, WiMax and wireless internet (WI-FI).

18. The RF/MW radiation and low-frequency EMF science that currently exists includes tens of thousands of studies dating back to the 1920s. On the basis of this vast body of literature, many public health experts believe, myself included, that it is likely society will face epidemics of neurotoxic effects and degeneration, cancers and genotoxicity in the future, resulting from the extreme and mostly involuntary exposure to RF/MW radiation and EMFs. WI-FI radiation in schools exceeds natural background levels of microwave radiation by trillions of times. Thus, it is important that all of us restrict our use of cell phones, and be as free as possible from exposure to unnatural, background sources of MW radiation, particularly WI-FI.

19. In public health science, it is generally accepted fact that vulnerable subgroups exist within any human population. This is also recognized specifically for RF/MW radiation and fields. These groups include children, pregnant women, the elderly and those with preexisting illnesses and/or impairments. Children are more vulnerable to RF/MW radiation because of the susceptibility of their developing nervous systems. RF/MW penetration is greater relative to head size in children, who have a greater absorption of RF/MW energy in the tissues of the head at WI-FI frequencies.

Such greater absorption results because children's skulls are thinner, their brains smaller, and their brain tissue is more conductive than those of adults, and since it has a higher water content and ion concentrations. The Presidential Cancer Panel found that children 'are at special risk due to their smaller body mass and rapid physical development, both of which magnify their vulnerability to known carcinogens, including radiation.'


http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf

20. FCC public RF/MW radiation exposure guidelines are based on the height, weight and stature of a 6-foot tall man, not children or adults of smaller stature. The guidelines do not take into account the unique susceptibility of growing children to exposures. Since children are growing, their rate of cellular activity and division is more rapid, and they are at more risk for DNA damage and subsequent cancers. Growth and development of the central nervous system is still occurring well into the teenage years, such that the neurological impairments predictable by the extant science may have great impact upon development, cognition, learning, and behavior. Prenatal exposure has been identified as a risk factor for childhood leukemia, and is associated with miscarriage. Children are largely unable to remove themselves from exposures to harmful substances in their environments. Their exposure is involuntary.

21. When WI-FI is in operation in a school, children and their parents have no choice but to allow the school to expose them to trillions of times higher microwave radiation than exists naturally on Earth at the same frequencies. Children and other building users are exposed to as much as 30-40 hours per week of constant, digitally encoded WI-FI signals from each wireless device and infrastructural antenna in a school building. Based upon a review of the Mount Tabor WI-FI Floor Plan, a given child is subject to direct signals from multiple WI-FI transmitters, including rooms full of students and teachers transmitting numerous laptop and other wireless signals. There is a major legal difference between an exposure that an individual chooses to accept and one that is forced upon a person, especially a dependent, who can do nothing about it.

22. WI-FI in the Portland Schools deploys similar PM MW radiation, at 2.45 and 5 GHz, to that of cell and cordless phones and their infrastructure. There is clear and strong evidence that intensive use of cell phones increases incidence of brain cancer, tumors of the auditory nerve, and cancer of the parotid gland, the salivary gland in the cheek by the ear. Cell and cordless phone radiation closely resembles that of WI-FI radiation exposure, except that WI-FI is more hazardous by way of frequency, duration, and the involuntary nature of exposure. While a cell or cordless phone is used only intermittently and primarily voluntarily, a WI-FI radiation microenvironment is constant in duration, with unavoidable radiation exposure even when nearby students are not actively using it. Because WI-FI radiation is essentially the same as, but more hazardous than, that for cell and cordless phones, there is every reason to understand that the health effects will be the same or worse, varying in relation to the total dose of radiation, and intensified by the constancy of duration. There is evidence from Scandinavian studies of cell phone usage that children who use cell phones are about five times more likely to develop brain cancer than if their usage starts as an adult. Thus, it is especially necessary to protect children from pulse-modulated MW radiation such as both cell phones and WI-FI deploy.

23. Based on a high degree of scientific certainty, Portland Public Schools' use of WI-FI is causing and will continue to cause AHM, other students, and school staff and faculty adverse health effects, and should be discontinued immediately. Educating by way of the Internet via cabled systems only decreases MW radiation exposure and is of minimal expense.

24. Having reviewed hundreds, possibly thousands, of studies in RF/MW radiation and ELF fields, published from decades ago to the present, I would provide you the following primary evidence, without limitation. Due to the active suppression of the RF/MW literature, some researchers in public health science are less aware of these studies. However, the forefront experts specializing in these areas, RF/MW radiation and ELF fields, recognize the certainties in this large body of scientific literature, which establishes with  limitation that PM MW radiation with chronic duration is quite harmful to humans, particularly children, as well as to animals and plants.

25. It is not surprising that even as of 1990, the US Environmental Protection Agency ("EPA") had determined RF/MW radiation a "probable carcinogen". Now that we have much more confirming study in the interim, the conclusion is yet more certain. And when we focus on MW radiation, particularly pulse-modulated radiation, on long, non-intermittent duration and on more vulnerable subgroups such as children, we see that the cancer outcome is very certain, indeed. Amongst the epidemiologic studies showing cancer outcomes, the following are particularly strong:

- a. Dode AC, Leao M, Tejo FdeAF, gomes ACR, Dode DC, Dode MC, Moreira CW, Condessa VA, Albinatti C and Calaffa WT. Mortality by neoplasia and cellular telephone base stations in the Belo Horizonte municipality, Minas Gerais State, Brazil. *Sci Total Environ* 409: 3649-3665:2011. This study shows higher rates of cancer in people living close to cell phone towers than for people living further away. Cell phone radiation is similar to but likely not as harmful as 2.45 GHz radiation from WI-FI. The exposure levels in this study are lower than those that Portland school building occupants receive from WI-FI.
- b. Oberfeld G. Environmental Epidemiology Study of Cancer Incidence in the Municipalities of Hausmannstatten & Vasoldsberg (Austria), 2008. This government-commissioned study found significantly increased cancer risk relative to a lower-exposure reference category, 23x higher for breast cancer and 121x higher for brain tumors, with strong exposure-effect relations.
- c. Michelozzi P, Capon A, Kirchmayer U, Forastiere F, Biggeri A, Barca A and Perucci CA. Adult and childhood leukemia near a high-power radiostation in Rome, Italy. *Am J Epidemiol.* 155: 1098-1103: 2002. The authors show that there is a significant elevation of childhood leukemia among residents living near to Vatican Radio, and that the risk declines with distance away from the transmitter. This is RF radiation in frequencies similar to that of WI-FI.

- d. Ha M, Im H, Lee M, Kim HJ, Kim BC, Gimm YM and Pack JK. Radio-frequency radiation exposure from AM radio transmitters and childhood leukemia and brain cancer. *Am J Epidemiol* 166: 270-279: 2007. Leukemia and brain cancer in children in Korea were investigated in relation to residence within 2 km of AM radio transmitters. There was a significant elevation in rates of leukemia but not of brain cancer. WI-FI radiation is more harmful than AM.
- e. Park SK, Ha M, Im HJ. Ecological study on residences in the vicinity of AM radio broadcasting towers and cancer death: preliminary observations in Korea. *Int Arch Occup Environ Health*. 2004 Aug;77(6):387-94. This study found higher mortality areas for all cancers and leukemia in some age groups in the area near the AM towers.
- f. Hallberg O. Johansson O. *Med Sci Monit* 2004 Jul;10(7):CR336-40. Malignant melanoma of the skin – not a sunshine story! Increased incidence and mortality from skin melanoma are concluded to result from continuous disturbances of cell repair mechanisms by body-resonant EMFs from FM/TV networks.
- g. Hallberg O. Johansson O. 2005. FM Broadcasting exposure time and malignant melanoma incidence, *Electromagnetic Biology and Medicine* 24;1-8. Age-specific incidence of malignant melanoma of the skin is related to FM broadcasting radiation at whole-body resonant frequencies. This is very relevant to children, since the smaller wavelengths of WI-FI are at resonant frequencies with dimensions of the human head, particularly the child's head.
- h. Dolk H, Shaddick G, Walls P, Grundy C, Thakrar B, Kleinschmidt I, Elliot P. Cancer Incidence near radio and television transmitters in Great Britain. I – Sutton-Colfield transmitter, and II. A1 high-power transmitters. *Am J Epidemiol* 1997; 145(1):1-9 and 10-17. In the first study, there was a statistically significant

increase in cancer; in the second, a small but significant increase in adult leukemia.

i. Hocking B, Gordon IR, Grain HL, Harfield GE. Cancer incidence and mortality and proximity to TV towers. *Medical J of Australia*. 1965;601-605. At extremely low exposure levels, there was an association between increased childhood leukemia incidence and mortality and proximity to TV towers. TV radiation, in the VHF and UHF bands, is similar to but not as harmful as WI-FI radiation at 2.45 GHz.

j. Grayson JK. Radiation exposure, socioeconomic status, and brain tumor risk in the US Air Force: A nested case-control study. *Am J Epidemiol* 1996; 143:480-6. This study found an association between exposure to ELF and RF/MW radiation and brain tumors.

k. Szmigielski S. Cancer morbidity in subjects occupationally exposed to high frequency (radiofrequency and microwave) electromagnetic radiation. *Sci Total Environ* 1996;180:9-17. This study showed huge increases in leukemia and Non-Hodgkin's lymphomas. Though exposure levels are higher in this study than they would be with school WI-FI, it is possible that certain students or teachers stationed immediately next to the WI-FI infrastructure could receive comparable levels in radiation peaks.

26. Additional studies show neurologic, immune, endocrine, reproductive and cardiac, adverse health effects from low-dose, chronic exposure to RF/MW radiation in humans:

a. Papageorgiou CC, Hountala CD, Maganioti AE, Kyprianou MA, Rabavilas AD, Papadimitriou GN, Capsalis CN. Effects of WI-FI signals on the p300 component of event-related potentials during an auditory hayling task. *J Integr Neurosci* 2011 Jun;10(2):189-202. This study concludes that WI-FI exposure may exert gender-related alterations on neural activity.

- b. Altpeter ES, Roosli M et al. Effect of Short-wave magnetic fields on sleep quality and melatonin cycle in humans: The Schwarzenburg shut-down study. *Bioelectromagnetics* 27:142-150, 2006. Sleep quality improved and melatonin excretion increased when the transmitter was shut down.
- c. Abelin T et al. Sleep disturbances in the vicinity of the short-wave broadcast transmitter Schwarzenburg. *Somnologie* 9:203-209, 2005. There is strong evidence of a causal relationship between operation of a short-wave radio transmitter and sleep disturbances in the surrounding population.
- d. Hutter HP et al. Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occup Environ Med* 2006;63:307-313, 2006. There was a significant relation of some symptoms, especially headaches, to measured power density, as well as effects on wellbeing and performance.
- e. Preece AW, Georgious AG, Duunn EJ, Farrow SC. *Occup Environ Med* 2007 Jun;64(6):402-8. Compared to control village, there were highly significant differences in the reporting of migraine, headache and dizziness military and cell phone antenna systems.
- f. Buchner K, Eger, H. Changes of clinically important neurotransmitters under the influence of modulated RF fields – a long-term study under real-life conditions. *Umwelt-Medizin-Gesellschaft* 24(1):44-57, 2011. There is clear evidence of health-relevant effects, including increase in adrenaline/noradrenaline, subsequent decrease in dopamine from a new MW-emitting base station. During counterregulation, trace amine PEA decreased and remained decreased. Clinically documented increases in sleep problems, cephalgia, vertigo, concentration problems and allergies followed the onset of new microwave transmissions.

- g. Eliyahu I, Luria R, Hareuveny R, Margalioth M, Neiran N and Shani G . Effects of radiofrequency radiation emitted by cellular telephones on the cognitive functions of humans. *Bioelectromagnetics* 27: 119-126: 2006. A total of 36 human subjects were exposed to PM MW and were tested on four distinct cognitive tasks. Exposure to the left side of the brain slows left-hand response time in three of the four tasks.
- h. Barth A, Winker R, Ponocny-Seliger E, Mayrhofer W, Ponocny I, Sauter C and Vana N. *Occup Environ Med* 65: 342-345: 2008. A meta-analysis for neurobehavioural effects due to electromagnetic field exposure emitted by GSM mobile phones. The authors looked at 19 studies of cognitive function in cell phone users, and found in the meta-analysis that there is evidence for a decreased reaction time, altered working memory and increased number of errors in exposed persons.
- i. Augner C, Hacker GW, Oberfeld G, Florian M, Hitzl W, Hutter J and Pauser G. Effects of exposure to base station signals on salivary cortisol, alpha-amylase and immunoglobulin A. *Biomed Environ Sci* 23: 199-207: 2010. This was a human experimental study with exposure to PM MW radiation wherein immune indicators were monitored after five 50-minute sessions. The researchers found dose-dependent changes in cortisol and alpha-amylase.
- j. Avendano C, Mata A, Sanchez Sarimiento CA and Doncel GF. Use of laptop computers connected to internet through WI-FI decreases human sperm motility and increases sperm DNA fragmentation. *Fert Steril*, 2012, In press. In this study human sperm were exposed to WI-FI from a laptop, and were found to show reduced motility after a 4-hour exposure. The results are consistent with other publications (see Agarwal et al., *Fert Steril* 89: 124-128: 2008) that reported that those who use cell phone regularly have reduced sperm count.

k. Baste V, Riise T and Moen BE (2008) *Int J Epidemiol* 23: 369-377: 2008. Radiofrequency electromagnetic fields: male infertility and sex ratio of offspring. This is a study of Norwegian Navy personnel chronically exposed to RF fields on the job. The rates of infertility were related to level of exposure in a dose-dependent fashion.

27. Many toxicologic and other animal studies, of which the following are but a few, support conclusions of cancer, genotoxicity, neurotoxicity and other health outcomes from RF/MW radiation.

a. Sinha R. Chronic non-thermal exposure of modulated 2450 MHz microwave radiation alters thyroid hormones and behavior of male rats. *Int. J. Radiation Biol.* 84:6:505-513, 2008. This study of 2.45 GHz at levels and durations comparable to and less than those of school WI-FI concluded that the radiation was sufficient to alter the levels of thyroid hormone as well as emotional reactivity compared to controls.

b. Nittby H, Grafstrom G, Tian DP, Malmgren L, Brun A, Persson BRR, Salfors LG and Eberhardt J. *Bioelectromagnetics* 29: 219-232: 2008. This study showed cognitive impairment in rats after long-term exposure to PM MW radiation. This study of rats shows that after 2 hours per week for 55 weeks there was impaired memory for objects in exposed as compared to sham animals.

c. Kimmel S et al. Electromagnetic radiation: Influences on honeybees (*Apis mellifera*). A significant difference between non-exposed and fully irradiated bees was the result of the influence of high-frequency PM RF/MW radiation.

d. Panagopoulos DJ et al. Bioeffects of mobile telephony radiation in relation to its intensity or distance from the antenna. *Int. J Radiat Biol*, 86;(5):345-357, 2010. The PM MW radiations at 900 and 1800 MHz decreased the reproductive capacity by cell death induction, with an increased bioactivity “window” at 10

uW/cm², and still evident down to 1 uW/cm².

e. Everaert J, Bauwens D. A possible effect of electromagnetic radiation from mobile phone base stations on the number of breeding house sparrow (*passer domesticus*). *Electromagnetic Biology and Medicine*, 26:63-72, 2007.

Long-term exposure to higher-level low-intensity PM MW radiation negatively affects the abundance or behavior of House Sparrows in the wild.

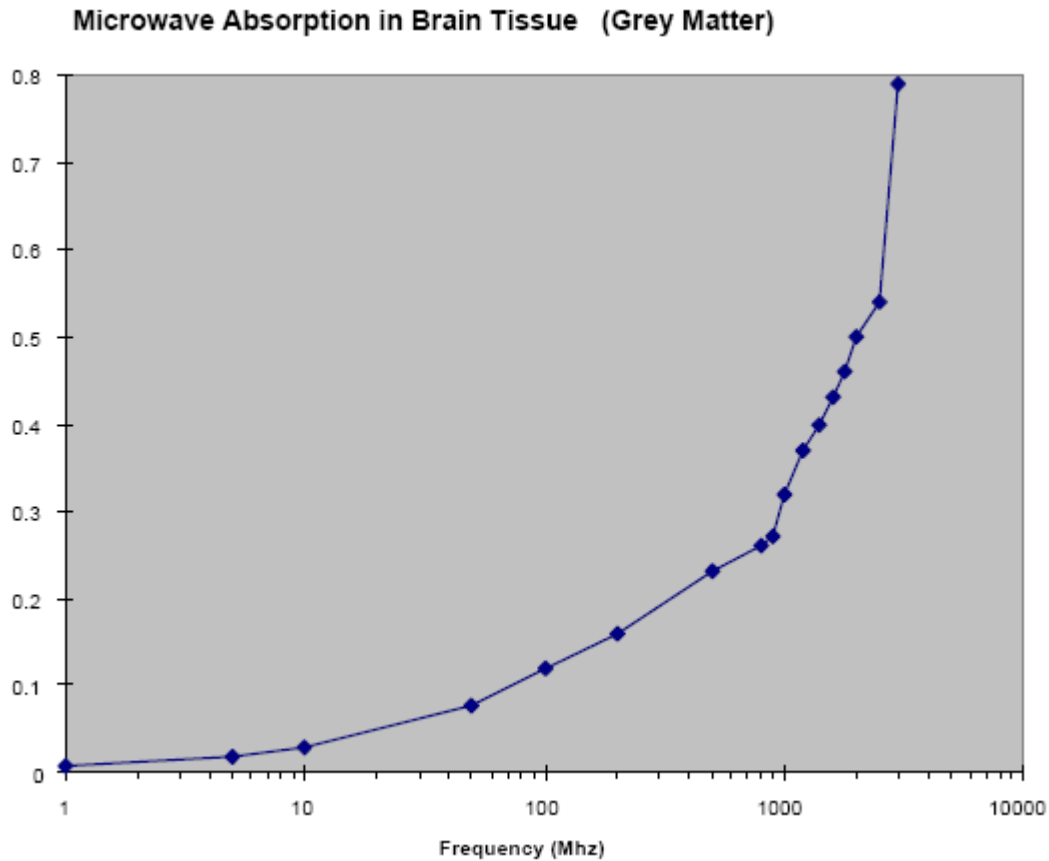
f. Magras I, Xenos T. RF Radiation-Induced Changes in the Prenatal Development of Mice. *Bioelectromagnetics* 18:455-461, 1997. Near almost 100 TV and FM broadcast transmitters, with exposure levels between 0.168 uW/cm² and 1.053 uW/cm², found in the more exposed groups testicular damage and decreasing size of litters to irreversible infertility.

g. Balmori A. Electromagnetic pollution from phone masts. *Effects on wildlife, Pathophysiology* 2009. This large review of wildlife effects concludes, “pulsed telephony microwave radiation can produce effects on nervous, cardiovascular, immune and reproductive systems,” including damage to the nervous system by altering EEG and changes to the blood-brain barrier, disruption of the circadian rhythms (sleep-wake) by interfering with the pineal gland and hormonal imbalances, changes in heart rate and blood pressure, impairment of health and immunity towards pathogens, weakness, exhaustion, growth problems, problems in building the nest or impaired fertility, embryonic development, hatching percentage, genetic and developmental problems, problems of locomotion, promotion of tumors and more.

28. Exposure thresholds for harmful effects are lowered in human populations and individuals when duration is increased. Due to the variability of thresholds for harmful effects both in the population and within the individual, there is no exposure power density that is safe. The School's WI-FI deploys arguably the worst possible frequency of 2.45 GHz, that of the

microwave oven, worst because it is most absorbable by the brain and most resonant with the water molecule, such that:

- a. absorption-per-exposure is maximized, dramatically lowering effects thresholds for population and individual effects; and
- b. water molecules in tissues and cells are highly agitated.



Curry, Ph.D., *Wireless LANs in the schoolroom*

29. This above graph, from physicist William Curry PhD's presentation *Wireless LANs in the Schoolroom*, shows how absorption in brain tissue (grey matter) increases exponentially toward the ultra-high frequency (UHF) area of the microwave oven and WI-FI.

30. In the case of the Portland Schools, the additional, unused but still deployed carrier frequency of 5 GHz would likely increase absorption in other, smaller organs, such as the thyroid.

31. The graph also illustrates the problem with the drive of the wireless industry toward ever higher frequencies within the cm microwave band. While nearly all the lower frequency bands have already been allocated by the FCC for specific types of radio transmissions, and transmission of ever more information content on any given channel requires greater bandwidth, each new deployment undermines further the integrity of the population's health. Engineers who design these systems have no training that would qualify them to consider the effects on biologic systems, which is why public health scientists need to be called in to policymaking *prior to* contracting and deployment, not after the fact.

32. The following studies explain the mechanisms of interaction between RF/MW radiation and biologic systems at the cellular level.

- a. The cell membrane recognition process -- which includes signal transduction and 'heat-shock protein' release -- was first discerned by Litovitz and his co-workers at Catholic University of America in the mid-1990s.

Below are a few citations that make the point.

- i. Litovitz, T., C. Montrose, et al. (1994). "Superimposing spatially coherent electromagnetic noise inhibits field induced abnormalities in developing chick embryos." *Bioelectromagnetics* **15**(2): 105-113.
- ii. DiCarlo, A., J. Farrell, et al. (1998). "A simple experiment to study electromagnetic field effects: Protection induced by short term exposures to 60 Hz magnetic fields." *Bioelectromagnetics* **19**(8): 498-500.
- iii. Penafiel, L., T. Litovitz, et al. (1997). "Role of modulation on the effect of microwaves on ornithine decarboxylase activity in L929

- cells." *Bioelectromagnetics* **18**(2): 132-141.
- iv. Dicarlo, A. L., Michael T. Hargis, L. Miguel Penafiel, Theodore A. Litovitz, A. (1999). "Short-term magnetic field exposures (60Hz) induce protection against ultraviolet radiation damage." *International journal of radiation biology* **75**(12): 1541-1549.
 - v. Litovitz, T., C. Montrose, et al. (1990). "Amplitude windows and transiently augmented transcription from exposure to electromagnetic fields." *Bioelectromagnetics* **11**(4): 297-312.
 - vi. Litovitz, T., M. Penafiel, et al. (1997). "The role of temporal sensing in bioelectromagnetic effects." *Bioelectromagnetics* **18**(5): 388-395.
 - vii. Litovitz, T., L. Penafiel, et al. (1997). "Role of modulation in the effect of microwaves on ornithine decarboxylase activity in L929 cells." *Bioelectromagnetics* **18**: 132-141.]
 - viii. Litovitz, T., D. Krause, et al. (1993). "The role of coherence time in the effect of microwaves on ornithine decarboxylase activity." *Bioelectromagnetics* **14**(5): 395-403.
- b. Cell membrane reaction is lipid peroxidation.
 - i. Serban, M. and V. Ni (1994). "Lipid peroxidation and change of plasma lipids in acute ischemic stroke." *Romanian journal of internal medicine= Revue roumaine de médecine interne* **32**(1): 51.

- ii. Vileno, B., S. Jeney, et al. (2010). "Evidence of lipid peroxidation and protein phosphorylation in cells upon oxidative stress photo-generated by fullerols." *Biophysical chemistry*.
 - iii. Maaroufi, K., E. Save, et al. (2011). "Oxidative stress and prevention of the adaptive response to chronic iron overload in the brain of young adult rats exposed to a 150 kilohertz electromagnetic field." *Neuroscience*.
 - iv. Nelson, S. K., S. K. Bose, et al. (1994). "The toxicity of high-dose superoxide dismutase suggests that superoxide can both initiate and terminate lipid peroxidation in the reperfused heart." *Free Radical Biology and Medicine* **16**(2): 195-200.
 - v. Alvarez, J. G. and B. T. Storey (1989). "Role of glutathione peroxidase in protecting mammalian spermatozoa from loss of motility caused by spontaneous lipid peroxidation." *Gamete research* **23**(1): 77-90.
 - vi. Devasagayam, T., K. Bloor, et al. (2003). "Methods for estimating lipid peroxidation: An analysis of merits and demerits." *Indian journal of biochemistry & biophysics* **40**(5): 300-308.
- c. Free-Radical Damage:
- i. Ozgur, E., G. Güler, et al. (2010). "Mobile phone radiation-induced free radical damage in the liver is inhibited by the antioxidants n-acetyl cysteine and epigallocatechin-gallate." *International journal of radiation biology*(00): 1-11.

- ii. Gutteridge, J. and X. C. Fu (1981). "Enhancement of bleomycin-iron free radical damage to DNA by antioxidants and their inhibition of lipid peroxidation." *FEBS letters* **123**(1): 71.
- d. mRNA:
 - i. Yan, J. G., M. Agresti, et al. (2009). "Qualitative Effect on mRNAs of Injury-Associated Proteins by Cell Phone Like Radiation in Rat Facial Nerves." *Electromagnetic Biology and Medicine* **28**(4): 383-390.
 - ii. Yan, J. G., M. Agresti, et al. (2008). "Upregulation of specific mRNA levels in rat brain after cell phone exposure." *Electromagnetic Biology and Medicine* **27**(2): 147-154.
 - iii. Simbürger, E., A. Stang, et al. (1997). "Expression of connexin43 mRNA in adult rodent brain." *Histochemistry and cell biology* **107**(2): 127-137.
 - iv. Chen, J., H. C. He, et al. (2010). "Effects of Pulsed Electromagnetic Fields on the mRNA Expression of RANK and CAII in Ovariectomized Rat Osteoclast-Like Cell." *Connective Tissue Research* **51**(1): 1-7.
- e. Epigenetic changes.... environmentally induced genetic change:
 - i. Migliore, L. and F. Copped (2009). "Genetics, environmental factors and the emerging role of epigenetics in neurodegenerative diseases." *Mutation Research/Fundamental and Molecular*

Mechanisms of Mutagenesis **667**(1-2): 82-97.

- ii. Currenti, S. (2009). "Understanding and Determining the Etiology of Autism." *Cellular and Molecular Neurobiology* **30**(2): 161-171.
- f. Micronuclei formation:
 - i. Tice, R. R., G. G. Hook, et al. (2002). "Genotoxicity of radiofrequency signals. I. Investigation of DNA damage and micronuclei induction in cultured human blood cells." *Bioelectromagnetics*, **23**(2): 113-126.
 - ii. Lerchl, A. (2009). "Comments on "Radiofrequency electromagnetic fields (UMTS, 1,950 MHz) induce genotoxic effects in vitro in human fibroblasts but not in lymphocytes" by Schwarz et al. (Int Arch Occup Environ Health 2008: doi: 10.1007/s00420-008-0305-5)." *Int Arch Occup Environ Health* **82**(2): 275-278.
 - iii. Vijayalaxmi and T. J. Prihoda (2009). "Genetic damage in mammalian somatic cells exposed to extremely low frequency electro-magnetic fields: a meta-analysis of data from 87 publications (1990-2007)." *Int.J Radiat Biol* **85**(3): 196-213.
 - iv. Sannino, A., M. Sarti, et al. (2009). "Induction of adaptive response in human blood lymphocytes exposed to radiofrequency radiation." *Radiat Res* **171**(6): 735-742.
- g. DNA repair disruption:
 - i. Brusick, D., R. Albertini, et al. (1998). "Genotoxicity of radiofrequency radiation. DNA/Genetox Expert Panel." *Environ*

- Mol Mutagen* **32**(1): 1-16.
- ii. Belyaev, I. Y., E. Markova, et al. (2009). "Microwaves from UMTS/GSM mobile phones induce long-lasting inhibition of 53BP1/gamma-H2AX DNA repair foci in human lymphocytes." *Bioelectromagnetics* **30**(2): 129-141.
 - iii. Sun, L. X., K. Yao, et al. (2006). "[Effect of acute exposure to microwave from mobile phone on DNA damage and repair of cultured human lens epithelial cells in vitro]." *Zhonghua Lao Dong Wei Sheng Zhi Ye Bing Za Zhi* **24**(8): 465-467.
 - h. Immune response suppression:
 - i. Lyle, D. B., P. Schechter, et al. (1983). "Suppression of T-lymphocyte cytotoxicity following exposure to sinusoidally amplitude-modulated fields." *Bioelectromagnetics* **4**(3): 281-292.
 - ii. Elekes, E., G. Thuroczy, et al. (1996). "Effect on the immune system of mice exposed chronically to 50 Hz amplitude-modulated 2.45 GHz microwaves." *Bioelectromagnetics* **17**(3): 246-248.
 - iii. DABALA, D., D. SURCEL, et al. (2008). "Oxidative and Immune Response in Experimental Exposure to Electromagnetic Fields." *Electromagnetic field, health and environment: proceedings of EHE'07*: 105.
 - iv. Surcel, D., D. Dabala, et al. (2009). "Free Radicals, Lipid Peroxidation and Immune Response in Experimental Exposure to Electromagnetic Fields." *Epidemiology* **20**(6): S118.

Conclusions

33. To understand the seriousness of this Agent of PM RF/MW radiation in interaction with populations and individuals, we need to consider some basic facts in addition to the many relevant and reliable studies above. For example, where shortwave, AM, FM, TV and cell phone infrastructure frequencies are demonstrated to be harmful, as they consistently are shown to be at low intensities with long duration, then, all other factors being equal, MW radiation at 2.45 GHz will likely be more harmful yet, due to its higher absorption-per-exposure and water molecule resonance. Increasing the constancy and length of exposure toward the maximum of occupational and 24-7 durations will lower the threshold for effects in populations and individuals. Complex radiation microenvironments with pulse-modulated wave and multiple sources, such as are deployed in WI-FI-equipped schools, are more harmful than a single, isolated MW radiation exposure at the same power density and duration. There are only a few of the many studies of RF/MW radiation infrastructure such as base stations that fail to show their studied effect. However, even were the reverse true, i.e., if there existed greater number than those that do show adverse effects, it is the case that positive studies (those that show adverse effects) hold more weight than negative studies (those that show no effect).

34. The FCC-appointed guideline-setting Commission, ASTM-IEEE, in 1991 referred in its conclusions to RF/MW radiation, the Agent, as a ‘Hazard,’ specifically setting a ‘Hazard Threshold.’ It has been discovered that, even amongst the 120 studies chosen by the Committee to prove the validity of its Hazard Threshold, there were 15 studies that concluded adverse effects at levels *lower* than the Hazard Threshold, thus disproving its validity. Three of these studies actually showed adverse effects at less than 10 percent of the Hazard Threshold. Thus the guidelines have no credibility.

35. The large body of scientific literature moreover redundantly proves this Agent to be a hazard. The media-promulgated notion that the relevant scientific studies are inconsistent and inconclusive is false and misleading. Chronic exposure to PM MW radiation harms every individual in a population in some ways, even if these are not always detectable by the individual or consciously attributed to the responsible RF/MW radiation sources. This Agent injures some individuals into a condition in which symptoms will be more easily retriggered with subsequent exposure. And for *a priori* susceptible individuals and those using electronic medical devices, it can respectively exacerbate the extant medical conditions and disrupt medical device operation, even to the point of death. Bassen 1997 discusses the hundreds of excess deaths, even at that time, from wireless communications radiation. See also *Radiofrequency Interference with Medical Devices*, IEEE Engineering in Medicine and Biology Magazine 17(3):111-114(1998), <http://ewh.ieee.org/soc/embs/comar/interfer.htm>.

36. For these reasons, WI-FI must be banned from school deployment.

37. I will receive no compensation for my testimony beyond out-of-pocket expenses.

Dated this 20th day of December, 2011.



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Director, Institute for Health and the Environment
University at Albany

CURRICULUM VITAE

Name: David O. Carpenter

Home Address: 2749 Old State Road
Schenectady, New York 12303

Positions Held:
Director, Institute for Health and the Environment
University at Albany
Professor, Environmental Health Sciences
School of Public Health, University at Albany
5 University Place, A217, Rensselaer, NY 12144

Education: 1959 B.A., Harvard College, Cambridge, MA
1964 M.D., Harvard Medical School, Boston, MA

Positions Held:

- 9/61-6/62 Research Fellow, Department of Physiology, University of Göteborg, Sweden with Professor Anders Lundberg
- 7/64-6/65 Research Associate, Department of Physiology, Harvard Medical School, Boston, MA under the direction of Dr. Elwood Henneman
- 7/65-2/73 Neurophysiologist, Laboratory of Neurophysiology, National Institutes of Mental Health, Dr. Edward V. Evarts, Chief, Assistant Surgeon, USPHS, currently a Reserve Officer in the USPHS.
- 2/73-3/80 Chairman, Neurobiology Department Armed Forces Radiobiology Research Institute, Defense Nuclear Agency, Bethesda, MD
- 3/80-9/85 Director, Wadsworth Center for Laboratories and Research, New York State Department of Health, Albany, NY
- 9/85-1/98 Dean, School of Public Health, University at Albany
- 9/85-Pres. Professor, Departments of Environmental Health Sciences and Biomedical Sciences, School of Public Health, University at Albany.
- 9/85-7/98 Research Physician, Wadsworth Center for Laboratories and Research, New York State Department of Health, Albany, NY
- 1/98-1/05 Adjunct Professor in the Center for Neuropharmacology & Neuroscience, Albany Medical College, Albany, NY
- 2001-Pres. Director, Institute for Health and the Environment, University at Albany, SUNY, Rensselaer, NY. The Institute was named a Collaborating Center of the World Health Organization in 2011.
- 2005-Pres. Senior Fellow, Alden March Bioethics Institute, Albany Medical College/Center, Albany, New York

Editor-in-Chief: Cellular and Molecular Neurobiology, 1981 - 1987

Editorial Advisor: Cellular and Molecular Neurobiology, 1987 - Present

Editorial Boards: Journal of Public Health Management and Practice, 1995 - 2002
International Journal of Occupational Medicine & Environmental Health
1996 – Present

Journal of Alzheimer's Disease– Associate Editor,2007-2009
Reviews in Environmental Health; 2008-present
International Archives of Occupational and Environmental Health; 2009-present.
Journal of Environmental and Public Health, 2009-present.
Environmental Health Perspectives, 2010-present

National and International Committees:

- 1978, 1981 Physiology Study Section (Ad hoc member)
- 1979-1985 NIH International Fellowship Study Section
- 1974-1981 Member, Steering Committee of the Section on the Nervous System, American Physiological Society (Chairman of the Committee, 9/76-4/80)
- 1981-1989 Member, USA National Committee for the International Brain Research Organization
- 1985-1986 Committee on Electric Energy Systems of the Energy Engineering Board, National Research Council
- 1986-1987 Member, Neurophysiology Peer Panel for the National Aeronautics and Space Administration
- 1987-1989 Member, Science Advisory Council of the American Paralysis Association
- 1987-1990 Advisory Panel for the Electric Energy System Division, U.S. Department of Energy
- 1985-1993 Committee #79, National Council on Radiation Protection and Measurements
- 1986-1997 Member, Legislative and Education Committees, Association of Schools of Public Health
- 1989-1994 Member, Neuroscience Discipline Working Group, Life Sciences Division of the NASA
- 1994, 1995 Federation of American Societies for Experimental Biology Consensus Conference on FY 1995 Federal Research Funding
- 1994-1997 Member, Legislative Committee of the Association of Schools of Public Health
- 1997 Member, Executive Committee of the Association of Schools of Public Health
- 1997-2000 National Advisory Environmental Health Sciences Council of the National Institutes of Health
- 1998-Pres. Member, U.S. Section of the Great Lakes Science Advisory Board of the International Joint Commission
- 2000-Pres. Member, Board of Directors, Pacific Basin Consortium for Hazardous Waste Health and Environment; Treasurer, 2001-2004, 2008-pres; Chair, 2004-2008
- 2001-2008 United States Co-Chair, Workgroup on Ecosystem Health of the Science Advisory Board of the International Joint Commission
- 2002-2003 Member, Committee on the Implications of Dioxin in the Food Supply, The National Academies, Institute of Medicine
- 2003-2008 Member, United States Environmental Protection Agency, Children's Health Protection Advisory Committee
- 2003-Pres. Chair, Advisory Committee to the World Health Organization and National Institute of Environmental Health Sciences on collaborative activities.
- 2007-2011 Chair, Workgroup on Risks vs. Benefits of Fish Consumption, Science Advisory Board, International Joint Commission.

State and Local Committees:

- 1980-1987 Executive Secretary, New York State Power Lines Project
- 1985-1989 Board of Scientific Advisors, Institute of Basic Research, OMRDD, N.Y.
- 1986-1989 Member, Steering Committee, Health Policy and Administrative Consortium of the Capital District
- 1991-1992 Member, Connecticut Academy of Sciences and Engineering Committee on Electromagnetic Field Health Effects
- 1991-1992 Member, Board of Directors of the Capital District Chapter of the Alzheimer's Disease and Related Disorders Association, Inc.
- 1991-1992 Member, State Task Force for the Reform of Middle Level Education in NY State
- 1992-1993 Member, State Needs Task Force on Health Care and Education
- 1987-1998 Delegate-at-Large, New York State Public Health Association
- 1991-1995 Member, Board of Directors of the Capital District Amyotrophic Lateral Sclerosis Association
- 1994 Chair, Council of Deans, University at Albany, SUNY
- 1997-2008. Member, Board of Directors, (Chair 1998-2004) Albany-Tula Inc.: A Capital Region Alliance
- 2000-Pres. Member, Board of Directors, Healthy Schools Network, Inc.
- 2000-2003 Member, Medical Advisory Board, Hepatitis C Coalition, New York
- 2000-2004 Member, Environmental Protection Agency /National Association of State Universities and Land Grant Colleges Task Force
- 2001-2008 Member, Board of Directors, Environmental Advocates of New York
- 2004-2007 Member, Ad Hoc Advisory Group on Brownfield Cleanup Standards
- 2005-Pres. Member, Schooling Chefs Curriculum Advisory Board
- 2005-2008 Member, Board of Directors, Citizens Environmental Coalition
- 2006-2009 Member, Board of Directors, Marine Environmental Research Institute
- 2007-2009 Member, New York State Renewable Energy Task Force

Honors, Awards and Fellowships:

- 1959 B.A. awarded magna cum laude. Thesis entitled "Metamorphosis of visual pigments: A study of visual system of the salamander, Ambystoma tigrinum" (Thesis advisor, Professor George Wald)
Elected to Phi Beta Kappa and to Sigma Xi
- 1964 M.D. awarded cum laude for a thesis in a special field. Thesis entitled "Electrophysiological observations on the importance on neuron size in determining responses to excitation and inhibition in motor and sensory systems" (Thesis advisor, Dr. Elwood Henneman)
- 1964 Awarded the Leon Resnick Prize given to a Harvard Medical School graduate showing promise in research
- 1970 Awarded the Moseley Traveling Fellowship for study in England (Fellowship declined)
- 1971 Invited as Visiting Professor of Physiology, Centro de Investigacion y de Estudios Avanzados, del Institute Politecnico Nacional, Mexico 14, D.F., Mexico, for 3 months

- 1982, 1986 Visiting Professor of Physiology, Department of Physiology, Kyushu
 1987 University, Fukuoka, Japan, for a period of three months each
 1989 Awarded Jacob Javits Neuroscience Investigator Award from the National
 Institute of Neurological and Communicative Diseases and Stroke
 1999 Awarded Homer N. Calver Award from the American Public Health
 Association for studies in environmental health.
 2001 Awarded 2001 Academic Laureate from the University at Albany
 Foundation.
 2010 Awarded the Albion O. Bernstein, M.D. Award in recognition of an
 outstanding contribution to public health and the prevention of disease through
 lifelong research of environmental health hazards and for limitless devotion to
 medical education by the Medical Society of the State of New York.

Federal Grants Held: (Principal Investigator Only)

- 1980-1983 United States Air Force, "Mechanisms of Radiation-Induced Emesis in Dogs",
 \$76,847 total direct costs.
 1982-1988 National Institute of Health, "Mechanisms of Desensitization at Central Synapses",
 \$464,786 total direct costs.
 1984-1986 Defense Nuclear Agency, "Mechanisms of Radiation-Induced Emesis in Dogs@,
 \$330,504 total direct costs.
 1986-1996 National Institute of Health, "Mechanisms of Excitatory Amino Acids Actions and
 Toxicity", 1986-1989 \$231,848 total direct costs; 1990-1996 \$562,926 total direct
 costs.
 1989-1993 National Institute of Health, "Mechanisms of Lead Neurotoxicity" \$373,576 total
 direct costs
 1990-1995 National Institute of Environmental Health Sciences, Superfund Basic Research
 Program, "Multidisciplinary Study of PCBs and PCDFs at a Waste Site", D.O.
 Carpenter, P.I. \$5,783,419 total direct costs.
 1995-2001 Fogarty International Center, National Institutes of Health, International Training
 Program in Environmental and Occupational Health. A Central/Eastern European
 Environ/Occup Training Program@, D.O. Carpenter, P.I. \$657,520 total costs.
 1995-2001 National Institute of Environmental Health Sciences, Superfund Basic Research
 Program, "Multidisciplinary Study of PCBs," D.O. Carpenter, P.I. \$12,653,709 total
 direct costs.
 1998-1999 Environmental Protection Agency, A Indoor Air Risk at Akwesasne - Pilot Project@,
 D.O. Carpenter, P.I. \$9,996 total costs.
 2000-2002 Association Liaison Office for University Cooperation in Development,
 A Cooperative Program in Environmental Health between the Institute of Public
 Health at Makerere University, Kampala, Uganda and the School of Public Health,
 University at Albany, USA@, D.O. Carpenter, P.I. \$96,432 total costs.
 2001-2007 Fogarty International Center, National Institutes of Health, International Training
 Program in Environmental and Occupational Health. A Multidisciplinary
 Environmental Health Training@, D.O. Carpenter, P.I. \$850,000 total costs.
 2006-2011 Pakistan-US Science and Technology Cooperative Program (US National
 Academy of Sciences). "Association of particulate matter with daily morbidity in

- an urban population,” D.O. Carpenter, P.I., \$391,104 total costs.
- 2009-2013 Exploratory Center on Minority Health and Health Disparities in Smaller Cities. Project 2: Environmental contaminants and reproductive health of Akwesasne Mohawk women. \$387,825 for year 1. D.O. Carpenter, Co-PI.
- 2010-2013 Department of the Army, “Gulf War Illness: Evaluation of an Innovative Detoxification Program: D.O. Carpenter, P.I., \$636,958 total costs.
- 2010-2013 Higher Education for Development of the United States Agency for International Development, “Drinking Water Supply, Sanitation, and Hygiene Promotion : Health Interventions in Two Urban Communities of Kampala City and Mukono Municipality, Uganda”. D. O. Carpenter, P.I., \$299,736 total costs.
- 2011-2016 National Institute of Environmental Health Sciences (1R01ES019620), “Protecting the health of future generations: Assessing and preventing exposures.” PK Miller, FA von Hippel, CL Buck and DO Carpenter, Co-P.I.s, \$471,521 for the period 8/08/11-4/30/12, \$2,354,871 for the period 2011-2016.

Research Interests:

- Exposure to persistent organic pollutants and risk of diabetes, cardiovascular disease, and hypertension.
- Cognitive and behavioral effects of environmental contaminants on children (IQ, ADHD) and older adults (dementias, Parkinson’s Disease and ALS).
- Ionizing and non-ionizing radiation biology.
- Effects of air pollution on respiratory and cardiovascular function.

Other Professional Activities:

Host, The Public Radio Health Show (a 30 min public health information show carried on 170+ stations nationwide), plus the Armed Forces Radio Network and Voice of America, 1985-2001. Authored a biweekly health column in The Troy Record, a local newspaper, 1997-1999.

Major Peer-Reviewed Publications:

1. Carpenter, D.O., Lundberg, A. and Norrsell, U. Effects from the pyramidal tract on primary afferents and on spinal reflex actions to primary afferents. Experientia, 18:337, 1962.
2. Carpenter, D.O., Engberg, I. and Lundberg, A. Presynaptic inhibition in the lumbar cord evoked from the brain stem. Experientia, 18:450, 1962.
3. Carpenter, D.O., Lundberg, A. and Norrsell, U. Primary afferent depolarization evoked from the sensorimotor cortex. Acta Physiol. Scand., 59:126-142.
4. Carpenter, D.O., Engberg, I., Funkenstein, H. and Lundberg, A. Decerebrate control of reflexes to primary afferents. Acta Physiol. Scand., 59:424-437, 1963.
5. Carpenter, D.O., Engberg, I. and Lundberg, A. Differential supraspinal control of inhibitory and excitatory actions from the FRA to ascending spinal pathways. Acta Physiol. Scand., 63:103-110, 1965.

6. Henneman, E., Somjen, G.G. and Carpenter, D.O. Excitability and inhibibility of motoneurons of different sizes. J Neurophysiol, 28:599-620, 1965.
7. Henneman, E., Somjen, G.G. and Carpenter, D.O. Functional significance of cell size in spinal motoneurons. J Neurophysiol, 28:560-580, 1965.
8. Somjen, G.G., Carpenter, D.O. and Henneman, E. Selective depression of alpha motoneurons of small size by ether. J Pharmacol, 148:380-385, 1965.
9. Somjen, G., Carpenter, D.O. and Henneman, E. Response of motoneurons of different sizes to graded stimulation of supraspinal centers of the brain. J Neurophysiol, 28:958-965, 1965.
10. Carpenter, D.O., Engberg, I. and Lundberg, A. Primary afferent depolarization evoked from the brain stem and the cerebellum. Arch Ital Biol, 104:73-85, 1966.
11. Carpenter, D.O. and Henneman, E. A relation between the threshold of stretch receptors in skeletal muscle and the diameter of axons. J Neurophysiol, 29:353-368, 1966.
12. Carpenter, D.O. Temperature effects on pacemaker generation, membrane potential, and critical firing threshold in *Aplysia* neurons. J Gen Physiol, 50:1469-1484, 1967.
13. Chase, T.N., Breese, G., Carpenter, D., Schanberg, S. and Kopin, I. Stimulation-induced release of serotonin from nerve tissue. Adv Pharmacol, 6A:351-364, 1968.
14. Carpenter, D.O. and Alving, B.O. A contribution of an electrogenic Na⁺ pump to membrane potential in *Aplysia* neurons. J Gen Physiol, 52:1-21, 1968.
15. Olson, C.B., Carpenter, D.O. and Henneman, E. Orderly recruitment of muscle action potentials. Arch Neurol, 19:591-597, 1968.
16. Carpenter, D.O. Membrane potential produced directly by the Na⁺ pump in *Aplysia* neurons. Comp Biochem Physiol, 35:371-385, 1970.
17. Carpenter, D.O. and Gunn, R. The dependence of pacemaker discharge of *Aplysia* neurons upon Na⁺ and Ca⁺⁺. J Cell Physiol, 75:121-127, 1970.
18. Kraus, K.R., Carpenter, D.O. and Kopin, I. R. Acetylcholine-induced release of norepinephrine in the presence of tetrodotoxin. J Pharmacol Exp Therap, 73:416-421, 1970.
19. Barker, J.L. and Carpenter, D.O. Thermosensitivity of neurons in the sensorimotor cortex of the cat. Science, 169:597-598, 1970.
20. Carpenter, D.O., Hovey, M.M. and Bak, A. Intracellular conductance of *Aplysia* neurons and squid axon as determined by a new technique. Intl J Neurosci, 2:35-48, 1971.
21. Carpenter, D.O., Breese, G., Schanberg, S. and Kopin, I. Serotonin and dopamine: Distribution and accumulation in *Aplysia* nervous and non-nervous tissues. Intl J Neurosci, 2:49-56, 1971.
22. Hovey, M.M., Bak, A.F. and Carpenter, D.O. Low internal conductivity of *Aplysia* neuron somata. Science, 176:1329-1331, 1972.
23. Carpenter, D.O. Electrogenic sodium pump and high specific resistance in nerve cell bodies of the squid. Science, 179:1336-1338, 1973.
24. Carpenter, D.O. and Rudomin, P. The organization of primary afferent depolarization in the isolated spinal cord of the frog. J Physiol (Lond), 229:471-493, 1973.
25. Shain, W., Green, L.A., Carpenter, D.O., Sytkowski, A.J. and Vogel, Z. *Aplysia* acetylcholine receptors: Blockage by and binding of α -bungarotoxin. Brain Res, 72:225-240, 1974.
26. Pierau, Fr.-K., Torrey, P. and Carpenter, D.O. Mammalian cold receptor afferents: Role of an electrogenic sodium pump in sensory transduction. Brain Res, 73:156-160, 1974.

27. Saavedra, J.M., Brownstein, M.J., Carpenter, D.O. and Axelrod, J. Octopamine: Presence in single neurons in *Aplysia* suggests neurotransmitter function. *Science*, 185:364-365, 1974.
28. Willis, J.A., Gaubatz, G.L. and Carpenter, D.O. The role of the electrogenic sodium pump in modulation of pacemaker discharge of *Aplysia* neurons. *J. Cell. Physiol.*, 84:463-472, 1974.
29. Brownstein, M.J., Saavedra, J.M., Axelrod, J., Zeman, G.H. and Carpenter, D.O. Coexistence of several putative neurotransmitters in single identified neurons of *Aplysia*. *Proc. Natl. Acad. Sci. (USA)*, 71:4662-4665, 1975.
30. Carpenter, D.O. and Gaubatz, G.L. Octopamine receptors on *Aplysia* neurons mediate hyperpolarization by increasing membrane conductance. *Nature*, 252:483-485, 1974.
31. Pierau, Fr.-K., Torrey, P. and Carpenter, D.O. Afferent nerve fiber activity responding to temperature changes of the scrotal skin of the rat. *J. Neurobiol.*, 38:601-612, 1975.
32. Carpenter, D.O. and Gaubatz, G.L. H₁ and H₂ histamine receptors on *Aplysia* neurons. *Nature*, 254:343-344, 1975.
33. Carpenter, D.O., Hovey, M.M. and Bak, A.F. Resistivity of axoplasm. II. Internal resistivity of giant axons of squid and *Myxicola*. *J. Gen. Physiol.*, 66:139-148, 1975.
34. Zeman, G.H. and Carpenter, D.O. Asymmetric distribution of aspartate in ganglia and single neurons of *Aplysia*. *Comp. Biochem. Physiol.*, 52C:23-26, 1975.
35. Pierau, Fr.-K., Torrey, P. and Carpenter, D.O. Effect of ouabain and potassium-free solution on mammalian thermosensitive afferents *in vitro*. *Pflugers Arch.*, 359:349-356, 1975.
36. Swann, J.W. and Carpenter, D.O. The organization of receptors for neurotransmitters on *Aplysia* neurons. *Nature*, 258:751-754, 1975.
37. Yarowsky, P.J. and Carpenter, D.O. Aspartate: distinct receptors on *Aplysia* neurons. *Science*, 192:806-809, 1976.
38. Foster, K.R., Bidinger, J.M. and Carpenter, D.O. The electrical resistivity of aqueous cytoplasm. *Biophys. J.*, 16:991-1001, 1976.
39. Carpenter, D.O., Greene, L.A., Shain, W. and Vogel, Z. Effects of eserine and neostigmine on the interaction of α -bungarotoxin with *Aplysia* acetylcholine receptors. *Mol. Pharmacol.*, 12:999-1006, 1976.
40. Saavedra, J.M., Ribas, J., Swann, J. and Carpenter, D.O. Phenylethanolamine: A new putative neurotransmitter in *Aplysia*. *Science*, 195:1004-1006, 1977.
41. Carpenter, D.O., Swann, J.W. and Yarowsky, P.J. Effect of curare on responses to different putative neurotransmitters in *Aplysia* neurons. *J. Neurobiol.*, 8:119-132, 1977.
42. Yarowsky, P.J. and Carpenter, D.O. GABA mediated excitatory responses on *Aplysia* neurons. *Life Sci.*, 20:1441-1448, 1977.
43. Willis, J.A., Myers, P.R. and Carpenter, D.O. An ionophoretic module which controls electroosmosis. *J. Electrophysiol. Tech.*, 6:34-41, 1977.
44. Yarowsky, P.J. and Carpenter, D.O. Receptors for gamma-aminobutyric acid (GABA) on *Aplysia* neurons. *Brain Res.*, 144:75-94, 1978.
45. Carpenter, D.O., Gaubatz, G., Willis, J.A. and Severance, R. Effects of irradiation of *Aplysia* pacemaker neurons with 20 MeV electrons. *Rad. Res.*, 76:32-47, 1978.
46. Yarowsky, P.J. and Carpenter, D.O. A comparison of similar ionic responses to gamma-aminobutyric acid and acetylcholine. *J. Neurophysiol.*, 41:531-541, 1978.
47. Blum, B., Auker, C.R. and Carpenter, D.O. A head holder and stereotaxic device for the rattlesnake. *Brain Res. Bull.*, 3:271-274, 1978.

48. Swann, J.W., Sinback, C.N. and Carpenter, D.O. Dopamine-induced muscle contractions and modulation of neuromuscular transmission in *Aplysia*. Brain Res., 157:167-172, 1978.
49. Swann, J.W., Sinback, C.N. and Carpenter, D.O. Evidence for identified dopamine motor neurons to the gill of *Aplysia*. Neurosci. Lett., 10:275-280, 1978.
50. Kebabian, P.R., Kebabian, J.W. and Carpenter, D.O. Regulation of cyclic AMP in heart and gill of *Aplysia* by the putative neurotransmitters, dopamine and serotonin. Life Sci., 24:1757-1764, 1979.
51. Carpenter, D.O. Interchangeable association of neurotransmitter receptors with several ionophores. Brain Res. Bull., 4:149-152, 1979.
52. Pellmar, T.C. and Carpenter, D.O. Voltage-dependent calcium current induced by serotonin. Nature, 277:483-484, 1979.
53. Ruben, P.C., Swann, J.W. and Carpenter, D.O. Neurotransmitter receptors on gill muscle fibers and the gill peripheral nerve plexus in *Aplysia*. Canad. J. Physiol. Pharmacol., 57:1088-1097, 1979.
54. Pellmar, T.C. and Carpenter, D.O. Serotonin induces a voltage-sensitive calcium current in neurons of *Aplysia californica*. J. Neurophysiol., 44:423-439, 1980.
55. Parver, L.M., Auker, C. and Carpenter, D.O. Choroidal blood flow as a heat dissipating mechanism in the macula. Am. J. Ophthalmol., 89:641-646, 1980.
56. Mell, L.D., Jr. and Carpenter, D.O. Fluorometric determination of octopamine in tissue homogenates by high-performance liquid chromatography. Neurochem. Res., 5:1089-1096, 1980.
57. Braitman, D.J., Auker, C.R. and Carpenter, D.O. Thyrotropin-releasing hormone has multiple actions in cortex. Brain Res., 194:244-248, 1980.
58. Meszler, R.M., Auker, C.R. and Carpenter, D.O. Fine structure and organization of the infrared receptor relay, the lateral descending nucleus of the trigeminal nerve in pit vipers. J. Comp. Neurol., 196:571-584, 1981.
59. Auker, C.R., Parver, L.M., Doyle, T. and Carpenter, D.O. Choroidal blood flow: I. Ocular tissue temperature as a measure of flow. Arch. Ophthalmol., 100:1323-1326, 1982.
60. Parver, L.M., Auker, C., Carpenter, D.O. and Doyle, T. Choroidal blood flow: II. Reflexive control in the monkey. Arch. Ophthalmol., 100:1327-1330, 1982.
61. Hori, N., Auker, C.R., Braitman, D.J. and Carpenter, D.O. Lateral olfactory tract transmitter: Glutamate, aspartate or neither? Cell Mol. Neurobiol., 1:115-120, 1981.
62. Scappaticci, K.A., Dretchen, K.L., Carpenter, D.O. and Pellmar, T.C. Effects of furosemide on neural mechanisms in *Aplysia*. J. Neurobiol., 12:329-341, 1981.
63. Pellmar, T.C. and Carpenter, D.O. Cyclic AMP induces a voltage-dependent current in neurons of *Aplysia californica*. Neurosci. Lett., 22:151-157, 1981.
64. Parver, L., Auker, C. and Carpenter, D.O. Stabilization of macular temperature: The stabilizing effect of the choroidal circulation on the temperature environment of the macula. Retina, 2:117-120, 1982.
65. Green, R.W. and Carpenter, D.O. Biphasic responses to acetylcholine in mammalian reticulospinal neurons. Cell Molec. Neurobiol., 1:401-405, 1981.
66. Hori, N., Auker, C.R., Braitman, D.J. and Carpenter, D.O. Pharmacologic sensitivity of amino acid responses and synaptic activation of *in vitro* prepyriform neurons. J. Neurophysiol., 48:1289-1301, 1982.
67. Slater, N.T. and Carpenter, D.O. Blockade of acetylcholine-induced inward currents in *Aplysia* neurons by strychnine and desipramine: effect of membrane potential. Cell. Molec. Neurobiol., 2:53-58, 1982.

68. Swann, J.W., Sinback, C.N., Pierson, M.G. and Carpenter, D.O. Dopamine produces muscle contractions and modulates motoneuron-induced contractions in *Aplysia* gill. Cell Molec Neurobiol, 2:291-308, 1982.
69. Swann, J.W., Sinback, C.N., Keabian, P.R. and Carpenter, D.O. Motoneurons which may utilize dopamine as their neurotransmitter. Cell Molec Neurobiol, 2:309-324, 1982.
70. Auker, C.R., Meszler, R.M. and Carpenter, D.O. Apparent discrepancy between single unit activity and ¹⁴C-deoxyglucose labelling in the optic tectum of the rattlesnake. J Neurophysiol, 49:1504-1516, 1983.
71. Slater, N.T., Carpenter, D.O., Freedman, J.E. and Snyder, S.H. Vipoxin both activates and antagonizes three types of acetylcholine response in *Aplysia* neurons. Brain Res, 278:266-270, 1983.
72. ffrench-Mullen, J.M.H., Hori, N., Nakanishi, H., Slater, N.T. and Carpenter, D.O. Assymmetric distribution of acetylcholine receptors and M channels on prepyriform neurons. Cell Molec Neurobiol, 3:163-182, 1983.
73. Carpenter, D.O., Briggs, D.B. and Strominger, N. Responses of neurons of canine area postrema to neurotransmitters and peptides. Cell Molec Neurobiol, 3:113-126, 1983.
74. Slater, N.T. and Carpenter, D.O. Blocking kinetics at excitatory acetylcholine responses on *Aplysia* neurons. Biophys J, 45:24-25, 1984.
75. Chesnut, T.J. and Carpenter, D.O. Two-component desensitization of three types of responses to acetylcholine in *Aplysia*. Neurosci Lett, 39:285-290, 1983.
76. Haas, H.L., Jeffreys, J.G.R., Slater, N.T. and Carpenter, D.O. Modulation of low calcium induced field bursts in the hippocampus by monoamines and cholinomimetics. Pflugers Arch, 400:28-33, 1984.
77. Parvar, L.M., Auker, C.R. and Carpenter, D.O. Choroidal blood flow. III. Reflexive control in human eyes. Arch Ophthalmol, 101:1604-1606, 1983.
78. Slater, N.T., Haas, H.L. and Carpenter, D.O. Kinetics of acetylcholine-activated cation channel blockade by the calcium antagonist D-600 in *Aplysia* neurons. Cell Molec Neurobiol, 3:329:344, 1983.
79. McCreery, M.J. and Carpenter, D.O. Modulation of neuronal responses to L-glutamate in *Aplysia*. Cell Molec Neurobiol, 4:91-95, 1984.
80. Carpenter, D.O., Briggs, D.B. and Strominger, N. Peptide-induced emesis in dogs. Behav Brain Res, 11:277-281, 1984.
81. ffrench-Mullen, J.M.H., Hori, N. and Carpenter, D.O. N-methyl-D-aspartate and L-aspartate activate distinct receptors in prepyriform cortex. Cell Molec Neurobiol, 4:185-189, 1984.
82. Slater, N.T. and Carpenter, D.O. A study of the cholinolytic actions of strychnine using the technique of concentration jump relaxation analysis. Cell Molec Neurobiol 4:263-271,1984.
83. Slater, N.T., Hall, A.F. and Carpenter, D.O. Kinetic properties of cholinergic desensitization in *Aplysia* neurons. Proc Roy Soc Lond B, 223:63-78, 1984.
84. Akaike, N., Hattori, K., Oomura, Y. and Carpenter, D.O. Bicuculline and picrotoxin block gamma-aminobutyric acid-gated Cl⁻ conductance by different mechanisms. Experientia, 41:70-71, 1985.
85. Slater, N.T., Carpenter, D.O., Freedman, J.E. and Synder, S.H. Dual effects of the snake venom polypeptide vipoxin on receptors for acetylcholine and biogenic amines in *Aplysia* neurons. Neurosci, 14:723-733, 1985.

86. Mizuno, Y., Oomura, Y., Hori, N. and Carpenter, D.O. Action of vasopressin on CA1 pyramidal neurons in rat hippocampal slices. Brain Res., 309:241-246, 1984.
87. Slater, N.T., Hall, A.F. and Carpenter, D.O. Trifluoperazine and calcium antagonists accelerate cholinergic desensitization in *Aplysia* neurons. Brain Res., 329:275-279, 1985.
88. French-Mullen, J.M.H., Koller, K., Zaczek, R., Coyle, J.T., Hori, N. and Carpenter, D.O. N-acetylaspartylglutamate: Possible role as the neurotransmitter of the lateral olfactory tract. Proc Nat Acad Sci., 82:3897-3900, 1985.
89. Greene, R.W. and Carpenter, D.O. Actions of neurotransmitters on pontine medial reticular formation neurons of the cat. J Neurophysiol., 54:520-531, 1985.
90. Hori, N., French-Mullen, J.M.H. and Carpenter, D.O. Kainic acid responses and toxicity show pronounced Ca²⁺ dependence. Brain Res., 358:380-384, 1985.
91. Gaillard, W.D. and Carpenter, D.O. Spectra of neurotransmitter receptors and ionic responses on cerebral A and B neurons in *Aplysia californica*. Brain Res., 373:303-310, 1986.
92. Gaillard, W.D. and Carpenter, D.O. On the transmitter at the A-to-B cell in *Aplysia californica*. Brain Res., 373:311-315, 1986.
93. French-Mullen, J.M.H., Hori, N. and Carpenter, D.O. A comparison on the effects of quinolinate and N-methyl-aspartate on neurons in rat piriform cortex. Neurosci Lett., 63:66-70, 1986.
94. French-Mullen, J.M.H., Hori, N. and Carpenter, D.O. Receptors for the excitatory amino acids on neurons in rat pyriform cortex. J Neurophysiol., 55:1283-1294, 1986.
95. Slater, N.T., David, J.A. and Carpenter, D.O. Relaxation studies on the interaction of hexamethonium with acetylcholine-receptor channels in *Aplysia* neurons. Cell Molec Neurobiol., 6:191-211, 1986.
96. Leung, M.K., S-Rozsa, K., Hall, A., Kuruvilla, S., Stefano, G.B. and Carpenter, D.O. Enkephalin-like substance in *Aplysia* nervous tissue and actions of leu-enkephalin on single neurons. Life Sci., 38:1529-34, 1986.
97. Slater, N.T., Filbert, M. and Carpenter, D.O. Multiple interactions of anticholinesterases with *Aplysia* acetylcholine responses. Brain Res., 375:407-412, 1986.
98. Carpenter, D.O. and Briggs, D.B. Insulin excites neurons of the area postrema and causes emesis. Neurosci Lett., 68:85-89, 1986.
99. Carpenter, D.O., Briggs, D.B., Knox, A.P. and Strominger, N.L. Radiation-induced emesis in the dog: Effects of lesions and drugs. Rad Res., 108:307-316, 1986.
100. Briggs, D.B. and Carpenter, D.O. Excitation of neurons in the canine area postrema by prostaglandins. Cell Molec Neurobiol., 6:421-426, 1986.
101. Chesnut, T.J., Carpenter, D.O. and Strichartz, G.R. Three effects of venom from *Conus striatus* on the delayed rectifier potassium current of molluscan neurons. Toxicon, 25:267-278, 1987.
102. Yakushiji, T., Tokutomi, N., Akaike, N. and Carpenter, D.O. Agonists of GABA responses, studied using internally perfused frog dorsal root ganglion neurons. Neuroscience 22:1123-1133, 1987.
103. Akaike, N., Yakushiji, T., Tokutomi, N. and Carpenter, D.C. Multiple mechanisms of antagonism of GABA responses. Cell Molec Neurobiol., 7:97-103, 1987.
104. Hori, N., Galeno, T. and Carpenter, D.O. Responses of pyriform cortex neurons to excitatory amino acids: Voltage dependence, conductance changes and effects of divalent cations. Cell Molec Neurobiol., 7:73-90, 1987.

105. Oyama, Y., King, W.M. and Carpenter, D.O. Edrophonium-induced membrane current in single neurons physically isolated from *Aplysia californica*. Brain Res., 438:95-100, 1988.
106. Jahan-Parwar, B., S.-Rozsa, K., Salanki, J., Evans, M.L. and Carpenter, D.O. *In vivo* labeling of serotonin containing neurons by 5,7-dihydroxytryptamine in *Aplysia*. Brain Res., 426:173-178, 1987.
107. King, W.M. and Carpenter, D.O. Distinct GABA and glutamate receptors may share a common channel in *Aplysia* neurons. Neurosci. Lett., 82:343-348, 1987.
108. Carpenter, D.O., Briggs, D.B., Knox, A.P. and Strominger, N. Excitation of area postrema neurons by transmitters, peptides and cyclic nucleotides. J. Neurophysiol., 59:358-369, 1988.
109. Carpenter, D.O., Hall, A.F. and Rahmann, H. Exogenous gangliosides induce direct voltage and conductance changes on isolated neurons. Cell Molec. Neurobiol., 8:245-250, 1988.
110. Hori, N., Carpenter, D.O. and Katsuda, N. Effect of acetylcholine on the pyramidal cell in the rat piriform cortex *in vitro*. Neurosciences, 13:172-174, 1987 (in Japanese).
111. Hori, N. and Carpenter, D.O. Excitatory amino acid receptors in piriform cortex do not show receptor desensitization. Brain Res., 457:350-354, 1988.
112. Allen, C.N., Brady, R., Swann, J., Hori, N. and Carpenter, D.O. N-methyl-D-aspartate (NMDA) receptors are inactivated by trypsin. Brain Res., 458:147-150, 1988.
113. Oyama, Y., Akaike, N. and Carpenter, D.O. Strychnine decreases the voltage-dependent Ca^{2+} current of both *Aplysia* and frog ganglion neurons. Cell Molec. Neurobiol., 8:307-314, 1988.
114. Oyama, Y., King, W.M., Allen, C.N., Hori, N. and Carpenter, D.O. Characterization of an inward current elicited by edrophonium in physically isolated and internally perfused *Aplysia* neurons. Brain Res., 463:124-132, 1988.
115. Hori, N., Akaike, N. and Carpenter, D.O. Piriform cortex brain slices: Techniques for isolation of synaptic inputs. J. Neurosci. Methods, 25:197-208, 1988.
116. Oyama, Y., Evans, M.L., Akaike, N. and Carpenter, D.O. Electrophysiological detection of acetylcholinesterase activity using concentration clamp on physically isolated *Aplysia* neurons. Neuroscience Res., 6:174-180, 1988.
117. Tsuda, Y., Oyama, Y., Carpenter, D.O. and Akaike, N. Effects of Ca^{2+} on the transient outward current of single isolated *Helix* central neurones. Brit. J. Pharmacol., 95:526-530, 1988.
118. Oyama, Y., Hori, N., Evans, M.L., Allen, C.N. and Carpenter, D.O. Electrophysiological estimation of the actions of acetylcholinesterase inhibitors on acetylcholine receptor and cholinesterase in physically isolated *Aplysia* neurones. Brit. J. Pharmacol., 96:573-582, 1989.
119. King, W.M. and Carpenter, D.O. Voltage-clamp characterization of Cl⁻ conductance gated by GABA and L-glutamate in single neurons of *Aplysia*. J. Neurophysiol., 61:892-899, 1989.
120. Evans, M.L. and Carpenter, D.O. Desensitization kinetics of a chloride acetylcholine response in *Aplysia*. Brain Res., 495:309-318, 1989.
121. Salanki, J., Evans, M.L. and Carpenter, D.O. Desensitization kinetics of a K⁺ acetylcholine response in *Aplysia*. Brain Res., 495:298-308, 1989.
122. Büsselberg, D., Evans, M.L., Rahmann, H. and Carpenter, D.O. Effects of exogenous ganglioside and cholesterol application on excitability of *Aplysia* neurons. Membrane Biochemistry, 8:19-26, 1989.

123. Carpenter, D. Neural mechanisms of emesis. Canad J Physiol Pharmacol, 68:230-236, 1990.
124. Oyama, Y., Hori, N., Allen, C.N., and Carpenter, D.O. Influences of trypsin and collagenase on acetylcholine responses of physically-isolated single neurons of *Aplysia californica*. Cell Molec Neurobiol, 10:193-205, 1990.
125. Büsselberg, D., Evans, M.L., Rahmann, H., and Carpenter, D.O. Lead inhibits the voltage-activated calcium current of *Aplysia* neurons. Toxicol Lett, 51:51-57, 1990.
126. Doi, N., Carpenter, D.O. and Hori, N. Differential effects of baclofen and GABA on rat piriform cortex pyramidal neurons *in vitro*. Cell Molec Neurobiol, 10: 559-564, 1991.
127. Büsselberg, D., Evans, M.L., Rahmann, H. and Carpenter, D.O. Zn²⁺ blocks the voltage activated calcium current of *Aplysia* neurons. Neurosci Letts, 117:117-122, 1990.
128. Büsselberg, D., Carpenter, D.O., Sugita, M., Araki, S., Satake, M. and Rahmann, H. Effects of exogenous lipid application on excitability of *Aplysia* neurons. Biomed Res, 11:77-86, 1990.
129. Evans, M.L., Kadan, M.J., Hartig, P.R. and Carpenter, D.O. Correlation of ¹²⁵I-LSD autoradiographic labelling with serotonin voltage clamp responses in *Aplysia* neurones. Synapse, 8:22-29, 1991.
130. S.-Rozsa, K., Stefano, G., Salanki, J. and Carpenter, D.O. Characterization of responses to enkephalins and FMRFamide on B neurons of the cerebral ganglion of *Aplysia*. Comp Biochem Physiol, 99C:403-412, 1991.
131. Büsselberg, D., Evans, M.L., Rahmann, H. and Carpenter, D.O. Lead and zinc block a voltage activated calcium channel of *Aplysia* neurons. J Neurophysiol, 65:786-795, 1991.
132. Hori, N., Doi, N., Miyahara, S., Shinoda, Y. and Carpenter, D.O. Appearance of NMDA receptors triggered by anoxia independent of voltage *in vivo* and *in vitro*. Exp Neurol, 112:304-311, 1991.
133. Büsselberg, D., Evans, M.L., Rahmann, H. and Carpenter, D.O. Effects of inorganic and triethyl lead and inorganic mercury on the voltage activated calcium channel of *Aplysia* neurons. NeuroToxicology, 12:733-744, 1991.
134. Evans, M.L., Büsselberg, D. and Carpenter, D.O. Pb²⁺ blocks calcium currents of cultured dorsal root ganglion cells. Neurosci Letts, 129:103-106, 1991.
135. Kemenes, G., S.-Rozsa, K., Stefano, G. and Carpenter, D.O. Distinct receptors for leu- and met-enkephalin on the metacerebral giant cell of *Aplysia*. Cell Molec Neurobiol, 12:107-119, 1992.
136. Ayrapetyan, S.N. and Carpenter, D.O. Very low concentrations of acetylcholine and GABA modulate transmitter responses. NeuroReport 2:563-565, 1991.
137. Carpenter, D.O. and Hori, N. Neurotransmitter and peptide receptors on medial vestibular nucleus neurons. Ann NY Acad Sci, 656:668-686, 1992.
138. Hernadi, L., S.-Rozsa, K., Jahan-Parwar, B. and Carpenter, D.O. A topography and ultrastructural characterization of *in vivo* 5,7-dihydroxytryptamine-labelled serotonin-containing neurons in the central nervous system of *Aplysia californica*. Cell Molec Neurobiol, 12:317-326, 1992.
139. Carpenter, D.O., Fejtl, M., Ayrapetyan, S., Szarowski, D. and Turner, J.N. Dynamic changes in neuronal volume resulting from osmotic and sodium transport manipulations. Acta Biologica Hungarica, 43:39-48, 1992.
140. Ayrapetyan, S.N. and Carpenter, D.O. On the modulating effect of ultralow transmitter concentrations on the functional activity of the neuron membrane. J Evol Biochem Physiol, 27:110-116, 1991.

141. Büsselberg, D., Michael, D., Evans, M.L., Carpenter, D.O. and Haas, H.L. Zinc (Zn^{2+}) blocks voltage gated calcium channels in cultured rat dorsal root ganglion cells. Brain Res., 593:77-81, 1992.
142. Matthews, M.R., Parsons, P.J. and Carpenter, D.O. Solubility of lead as lead (II) chloride in HEPES-Ringer and artificial seawater (Ca-ASW) solutions. NeuroToxicology, 14:283-290, 1993.
143. Hori, N., Büsselberg, D., Matthews, R., Parsons, P.J. and Carpenter, D.O. Lead blocks LTP by an action not at NMDA receptors. Exp. Neurol., 119: 192-197, 1993.
144. Büsselberg, D., Evans, M.L., Haas, H.L. and Carpenter, D.O. Blockade of mammalian and invertebrate calcium channels by lead. NeuroToxicology, 14:249-258, 1993.
145. Riepe, M., Hori, N., Ludolph, A.C., Carpenter, D.O., Spencer, P.S. and Allen, C.N. Inhibition of energy metabolism by 3-nitropropionic acid activates ATP-sensitive potassium channels. Brain Res., 586:61-66, 1992.
146. Hori, N., Hirotsu, I., Davis, P.J. and Carpenter, D.O. Long-term potentiation is lost in aged rats but preserved by calorie restriction. NeuroReport, 3:1085-1088, 1992.
147. Knox, A.P., Strominger, N.L., Battles, A.H. and Carpenter, D.O. Behavioral studies of emetic sensitivity in the ferret. Brain Res. Bull., 31:477-484, 1993.
148. Allen, C.N., Spencer, P.S. and Carpenter, D.O. β -N-methylamino-L-alanine in the presence of bicarbonate is an agonist at non-N-methyl-D-aspartate-type receptors. Neuroscience 54:567-574, 1993.
149. Elekes, K., Stefano, G.B. and Carpenter, D.O. Enkephalin-like immunoreactive neurons in the central nervous system of gastropods (*Helix pomatia*, *Lymnaea stagnalis*, *Aplysia californica*): A comparative immunocytochemical study. Cell Tiss. Res. 272:329-41, 1993.
150. Büsselberg, D., Platt, B., Haas, H.L. and Carpenter, D.O. Voltage gated calcium channel currents of rat dorsal root ganglion (DRG) cells are blocked by Al^{3+} . Brain Res. 622:163-168, 1993.
151. Strominger, N.L., Knox, A.P. and Carpenter, D.O. The connectivity of the area postrema in the ferret. Brain Res. Bull., 33:33-47, 1994.
152. Knox, A.P., Strominger, N.L., Battles, A.H. and Carpenter, D.O. The central connections of the vagus nerve in the ferret. Brain Res. Bull., 33:49-63, 1994.
153. Lin, Y. and Carpenter, D.O. Medial vestibular neurons are endogenous pacemakers whose discharge is modulated by neurotransmitters. Cell Molec. Neurobiol., 13:601-613, 1993.
154. Kemenes, G., S.-Rózsa, K. and Carpenter, D.O. Cyclic-AMP-mediated excitatory responses to leucine enkephalin in *Aplysia* neurones. J. Exp. Biol. 181: 321-328, 1993.
155. Büsselberg, D., Platt, B., Michael, D., Carpenter, D.O. and Haas, H.L. Mammalian voltage-activated calcium channel currents are blocked by Pb^{2+} , Zn^{2+} and Al^{3+} . J. Neurophysiol., 71:1491-1497, 1994.
156. Hori, N. and Carpenter, D.O. Transient ischemia causes a reduction of Mg^{2+} blockade of NMDA receptors. Neurosci. Letts., 173:75-78, 1994.
157. Riepe, M.W., Hori, N., Ludolph, A.C. and Carpenter, D.O. Failure of neuronal ion exchange, not potentiated excitation, causes excitotoxicity after inhibition of oxidative phosphorylation. Neuroscience, 64:91-97, 1995.
158. Hori, N. and Carpenter, D.O. Functional and morphological changes induced by transient *in vivo* ischemia. Exp. Neurol., 129:279-289, 1994.
159. Lin, Y. and Carpenter, D.O. Direct excitatory opiate effects mediated by non-synaptic actions on rat medial vestibular neurons. Eur. J. Pharmacol., 262:99-106, 1994.

160. Carpenter, D.O. Epidemiological evidence for an association between exposure to 50 and 60 Hz magnetic fields and cancer. James Bay Publication Series, Hydro-Electric Development: Environmental Impacts - Paper No. 6, pp. 2-31, 1994.
161. Carpenter, D.O. Communicating with the public on issues of science and public health. Environ. Health Perspect. 103:127-130, 1995.
162. Fejtl, M., Gyori, J. and Carpenter, D.O. Hg²⁺ increases the open probability of carbachol-activated Cl⁻ channels in *Aplysia* neurons. NeuroReport, 5:2317-2320, 1994.
163. Carpenter, D.O. The public health significance of metal neurotoxicity. Cell Molec. Neurobiol., 14:591-597, 1994.
164. Gyori, J., Fejtl, M. and Carpenter, D.O. Effect of HgCl₂ on acetylcholine, carbachol and glutamate currents of *Aplysia* neurons. Cell Molec. Neurobiol., 14:653-664, 1994.
165. Fejtl, M., Gyori, J. and Carpenter, D.O. Mercuric (II) chloride modulates single channel properties of carbachol activated Cl⁻ channels in cultured neurons of *Aplysia californica*. Cell Molec. Neurobiol., 14:665-674, 1994.
166. Carpenter, D.O., Matthews, M.R., Parsons, P.J. and Hori, N. Long-term potentiation in piriform cortex is blocked by lead. Cell Molec. Neurobiol., 14:723-733, 1994.
167. Salanki, J., Gyori, J. and Carpenter, D.O. Action of lead on glutamate-activated chloride currents in *Helix Pomatia L.* neurons. Cell Molec. Neurobiol., 14:755-768, 1994.
168. Carpenter, D.O. How hazardous wastes affect human health. Cent. Eur. J. Publ. Hlth. 2:6-9, 1994.
169. Oyama, Y., Carpenter, D.O., Ueno, S., Hayashi, H. and Tomiyoshi, F. Methylmercury induces Ca²⁺-dependent hyperpolarization of mouse thymocytes: A flow-cytometric study using fluorescent dyes. Eur. J. Pharmacol., 293:101-107, 1995.
170. Fejtl, M., Szarowski, D.H., Decker, D., Buttle, K., Carpenter, D.O. and Turner, J.N. Three-dimensional imaging and electrophysiology of live *Aplysia* neurons during volume perturbation: confocal light and high-voltage electron microscopy. JMSA 1(2):75-85, 1995.
171. Carpenter, D.O., Kemenes, G., Elekes, K., Leung, M., Stefano, G., S.-Rozsa, K. and Salanki, J. Opioid peptides in the nervous system of *Aplysia*: A combined biochemical immunocytochemical, and electrophysiological study. Cell Molec. Neurobiol. 15:239-256, 1995.
172. Riepe, M. and Carpenter, D.O. Delayed increase of cell volume of single pyramidal cells in live hippocampal slices upon kainate application. Neurosci. Letts. 191:35-38, 1995.
173. Son, H. And Carpenter, D.O. Protein kinase C activation is necessary but not sufficient for induction of LTP at the synapse of mossy fiber-CA3 in the rat hippocampus. Neuroscience 72:1-13, 1996.
174. Iwase, T., Hori, N., Morioka, T. and Carpenter, D.O. Low power laser irradiation reduces ischemic damage in hippocampal slices *in vitro*. Lasers Surg. Med., 19:465-450, 1996.
175. Carpenter, D.O., King, W.M. and McCreery, M.J. The role of glutamate reuptake in regulation of glutamate responses in *Aplysia* neurons. Acta Biologica Hungaria 46:363-373, 1995.
176. Saghian, A.A., Ayrapetyan, S.N. and Carpenter, D.O. Low concentrations of ouabain stimulate Na/Ca exchange in neurons. Cell Molec. Neurobiol., 16:489-498, 1996.
177. Platt, B., Carpenter, D.O., Büsselberg, D., Reymann, K.G. and Riedel, G. Aluminum impairs hippocampal long-term potentiation in rats *in vitro* and *in vivo*. Exp. Neurol., 134:73-86, 1995.

178. Rubakhin, S.S., Gyori, J., Carpenter, D.O. and Salanki, J. HgCl₂ potentiates GABA activated currents in *Lymnaea stagnalis* L. neurons. Acta Biologica Hungaria, 46:431-444, 1995.
 179. Fejtl, M. and Carpenter, D.O. Neurite outgrowth is enhanced by conditioning factor(s) released from central ganglia of *Aplysia californica*. Neurosci Letts., 199:33-36, 1995.
 180. Riepe, M.W., Niemi, W.N., Megow, D., Ludolph, A.C. and Carpenter, D.O. Mitochondrial oxidation in rat hippocampus can be preconditioned by selective chemical inhibition of SDH. Exp Neurol, 138:15-21, 1996.
 181. Son, H. and Carpenter, D.O. Interactions among paired-pulse facilitation and post-tetanic and long-term potentiation in the mossy fiber-CA3 pathway in rat hippocampus. Synapse, 23:302-311, 1996.
 182. Carpenter, D.O., Suk, W.A., Blaha, K. and Cikrt, M. Hazardous wastes in Eastern and Central Europe. Environ Health Perspect., 104:244-248, 1996.
 183. Son, H., Davis, P.J. and Carpenter, D.O. Time course and involvement of protein kinase C-mediated phosphorylation of F1/GAP-43 in area CA3 after the mossy fiber stimulation. Cell Molec Neurobiol, 17:171-194, 1997.
 184. Dyatlov, V.A., Platoshin, A.V., Lawrence, D.A. and Carpenter, D.O. Mercury (Hg²⁺) enhances the depressant effect of kainate on Ca-inactivated potassium current in telencephalic cells derived from chick embryos. Toxicol Appl Pharmacol, 138:285-297, 1996.
 185. Carpenter, D.O. and Conway, J.B. Optimizing professional education in public health. J Public Health Management Practice, 2:66-72, 1996.
 186. Carpenter, D.O. Great Lakes contaminants: A shift in human health outcomes. Health and Environment Digest, 10:17-19, 1996.
 187. Boldyrev, A.A., Stvolinsky, S.L., Tyulina, O.V., Koshelev, V.B., Hori, N. and Carpenter, D.O. Biochemical and physiological evidence that carnosine is an endogenous neuroprotector against free radicals. Cell Molec Neurobiol, 17:259-271, 1997.
 188. Szücs, A., Angiello, C., Salánki, J. and Carpenter, D.O. Effects of inorganic mercury and methylmercury on the ionic currents of cultured rat hippocampal neurons. Cell Molec Neurobiol, 17:273-288, 1997.
 189. Niemi, W.D., Slivinski, K., Audi, J., Rej, R. and Carpenter, D.O. Propylthiouracil treatment reduces long-term potentiation in area CA1 of neonatal rat hippocampus. Neurosci Letts, 210:127-129, 1996.
 190. Son, H., Madelian, V. and Carpenter, D.O. The translocation and involvement of protein kinase C in mossy fiber-CA3 long-term potentiation in hippocampus of the rat brain. Brain Res, 739:282-292, 1997.
 191. Oyama, Y., Carpenter, D.O., Chikahisa, L. and Okazaki, E. Flow-cytometric estimation on glutamate- and kainate-induced increases in intracellular Ca²⁺ of brain neurons. Brain Research, 728:121-124, 1996.
 192. Carpenter, D.O., Stoner, C.R.T. and Lawrence, D.A. Flow cytometric measurements of neuronal death triggered by PCBs. NeuroToxicology, 18:507-514, 1997.
 193. Azatian, K.V., Ayrapetyan, S.N. and Carpenter, D.O. Metabotropic GABA receptors regulate acetylcholine responses on snail neurons. Gen Pharmacol, 29:67-72, 1997.
- Carpenter, D.O., Stoner, C.T., Lawrence, D.A., Niemi, W.D., Shain, W. and Seegal, R. Multiple mechanisms of PCB neurotoxicity. Proceedings of the 1996 Pacific Basin Conference on Hazardous Waste, Kuala Lumpur, Malaysia, CONF-9611157, pp. 404-918.

- Carpenter, D.O. New Dimensions in our understanding of the human health effects of environmental pollutants. Proceedings of the 1996 Pacific Basin Conference on Hazardous Waste, Kuala Lumpur, Malaysia, CONF-9611157, pp. 37-53.
196. Carpenter, D.O. Possible effects of electromagnetic fields on the nervous system and development. Men Retard Dev Dis Res Rev 3:270-274, 1997.
 197. Chiarenzelli, J., Scudato, R., Bush, B., Carpenter, D. and Bushart, S. Do large-scale remedial and dredging events have the potential to release significant amounts of semi-volatile compounds to the atmosphere? Environ Hlth Perspect., 106:47-49, 1998.
 198. Dyatlov, V.A., Dytlova O.M., Parsons, P.H., Lawrence, D.A. and Carpenter, D.O. Lipopolysaccharide and interleukin-6 enhance lead entry into cerebellar neurons: Application of a new and sensitive flow cytometric technique to measure intracellular lead and calcium concentrations. NeuroToxicology, 19:293-302, 1998.
 199. Dyatlov, V.A., Platoshin, A.V., Lawrence, D.A. and Carpenter, D.O. Lead potentiates cytokine- and glutamate-mediated increases in permeability of the blood-brain barrier. NeuroToxicology, 19:283-292, 1998.
 200. Niemi, W.D., Audi, J., Bush, B. and Carpenter, D.O. PCBs reduce long-term potentiation in the CA1 region of rat hippocampus. Exper Neurol, 151:26-34, 1998.
 201. Carpenter, D.O. Health effects of metals. Cent. Eur. J. Publ. Hlth., 6:160-163, 1998.
 202. Carpenter, D.O., Bláha, K., Buekens, A., Cikrt, M., Damstra, T., Dellinger, B., Sarofim, A., Suk, W.A., Wyes, H. and Zejda, J. Remediation of hazardous wastes in Central and Eastern Europe: Technology and health effects. Cent. Eur. J. Publ. Hlth., 6:77-78, 1998.
 203. Carpenter, D.O. Human health effects of environmental pollutants: New Insights. Environ Monitor Assess. J., 53:245-258, 1998.
 204. Dyatlov, V.A., Makovetskaia, V.V., Leonhardt, R., Lawrence, D.A. and Carpenter, D.O. Vitamin E enhances Ca²⁺-mediated vulnerability of immature cerebellar granule cells to ischemia. Free Rad Biol Med., 25: 793-802, 1998.
 205. Fitzgerald, E.F., Schell, L.M., Marshall, E.G., Carpenter, D.O., Suk, W.A. and Zejda, J.E. Environmental pollution and child health in Central and Eastern Europe. Environ. Health Persp., 106:307-311, 1998.
 206. Carpenter, D.O., Arcaro, K.F., Bush, B., Niemi, W.D., Pang, S. and Vakharia, D.D. Human health and chemical mixtures: An overview. Environ Health Perspect., 106: 1263-1270, 1998.
 207. Carpenter, D.O., Cikrt, M. and Suk, W.A. Hazardous wastes in Eastern and Central Europe: Technology and health effects. Environ Health Perspect., 107: 3-4, 1999.
 194. Carpenter, D.O. Polychlorinated biphenyls and human health. Int. J. Occup. Med. Environ. Hlth. 11: 291-303, 1998.
 195. Boldyrev, A.A., Johnson, P., Yanzhang, W., Tan, Y. and Carpenter, D.O. Carnosine and taurine protect rat cerebellar granular cells from free radical damage. Neurosci Letts., 263: 169-172, 1999.
 196. Boldyrev, A.A., Carpenter, D.O., Huentelman, M.J., Peters, C.M. and Johnson, P. Sources of reactive oxygen species production in excitotoxin-stimulated neurons. Biophys. Biochem Res Commun., 256: 320-324, 1999.
 197. Ayrapetyan, S.N., Ayrapetyan, G. and Carpenter, D.O. The electrogenic sodium pump activity in *Aplysia* neurons is not potential dependent. Acta Biologica Hungarica, 50: 27-34, 1999.

198. Boldyrev, A., Song, R., Lawrence, D. and Carpenter, D.O. Carnosine protects against excitotoxic cell death independently of effects on reactive oxygen species. Neuroscience, 94: 571-577, 1999.
199. Boldyrev, A., Song, R., Dyatlov, V.A., Lawrence, D.A. and Carpenter, D.O. Neuronal cell death and reactive oxygen species. Cell Molec Neurobiol., 20:433-450, 2000.
200. Gyori, J., Platoshyn, O., Carpenter, D.O. and Salanki, J. Effect of inorganic- and organic tin compounds on ACh- and voltage-activated Na currents. Cell Molec Neurobiol. 20:591-604, 2000.
215. Hussain, R.J., Gyori, J., DeCaprio, A.P. and Carpenter, D.O. *In vivo* and *in vitro* exposure to PCB 153 reduces long-term potentiation. Environ. Hlth. Perspect., 108 :827-831, 2000.
216. Negoita, S., Swamp, L., Kelley, B. and Carpenter, D.O. Chronic diseases surveillance of St. Regis Mohawk health service patients. J. Public Health Management Practice, 7:84-91, 2001.
217. Hussain, R.J., Parsons, P.J., Carpenter, D.O. Effects of lead on long-term potentiation in hippocampal CA3 vary with age. Dev. Brain Res., 121: 243-252, 2000.
218. Tanji, M., Katz, B.H., Spink, B.C. and Carpenter, D.O. Growth inhibition of MCF-7 cells by estrogen is dependent upon a serum factor. Anticancer Res., 20: 2779-2784, 2000.
219. Tanji, M. and Carpenter, D.O. A steroid-binding protein mediates estrogen-dependent inhibition of growth of MCF-7 breast cancer cells. Anticancer Res., 20:2785-2790, 2000.
220. Gyori, J., Hussain, R., Carpenter, D.O. Long-term potentiation in CA1 region of rat brain slices is blocked by PCB 153. Cent. Europ. J. Publ. Hlth., 8: 21-22, 2000.
221. Carpenter, D.O. Human health effects of polychlorinated biphenyls. Cent. Eur. J. Public Health, 8: 23-24, 2000.
- 221a. Sukdolova, V., Negoita, S., Hubicki, L., DeCaprio, A., and Carpenter, D.O. The assessment of risk to acquired hypothyroidism from exposure to PCBs: a study among Akwesasne Mohawk women. Cent. Eur. J. Public Health, 8: 167-168, 2000.
222. Carpenter, D.O., Chew, F.T., Damstra, T., Lam, L.H., Landrigan, P.J., Makalinao, I., Peralta, G.L. and Suk, W.A. Environmental threats to the health of children: The Asian perspective. Environ. Hlth. Perspect., 108: 989-992, 2000.
223. Boldyrev, A.A., Carpenter, D.O. and Johnson, P. Natural mechanisms of protection of neurons against oxidative stress. Recent Res. Devel. Comparative Biochem. & Physiol. 1: 91-103, 2000.
224. Strominger, N.L., Hori, N., Carpenter, D.O., Tan, Y. and Folger W.H. Effects of acetylcholine and GABA on neurons in the area postrema of *Suncus murinus* brainstem slices. Neurosci. Letts. 309: 77-80, 2001.
225. Strominger, N.L., Brady, R., Gullikson, G. and Carpenter, D.O. Imiquimod-elicited emesis is mediated by the area postrema, but not by direct neuronal activation. Brain Res. Bull. 55: 445-451, 2001.
226. Hori, N., Tan, Y., Strominger, N.L. and Carpenter, D.O. Intracellular activity of rat spinal cord motoneurons in slices. J. Neurosci. Meth. 112: 185-191, 2001.
227. Sukocheva, O.A., Abramov, A.Y., Levitskaya, J.O., Gagelgans, A.I. and Carpenter, D.O. Modulation of intracellular Ca concentration by vitamin B12 in rat thymocytes. Blood Cells. Mol. Dis. 27: 812-824, 2001.
228. Gilbertson, M., Carpenter, D. and Upshur, R. Methodology for assessing community health in Areas of Concern: Measuring the adverse effects on human health. Environ. Health Perspect. 109 (Suppl 6): 811-812, 2001.

229. Carpenter, D.O., Shen, Y., Nguyen, T., Le, L. and Lininger, L.L. Incidence of endocrine disease among residents of New York Areas of Concern. Environ. Health Perspect. 109: (Suppl 6) 845-851, 2001.
230. Suk, W.A., Carpenter, D.O., Cirkt, M. and Smerhovsky, Z. Metals in Eastern and Central Europe: Health effects, sources of contamination and methods of remediation. Internat. J. Occup. Med. Environ. Health 14, 151-156, 2001.
231. Carpenter, D.O. Effects of metals on the nervous system of humans and animals. Internat. J. Occup. Med. Environ. Health 14: 209-218, 2001.
232. Carpenter, D.O., Arcaro, K. and Spink, D.C. Understanding the human health effects of chemical mixtures. Environ. Health Perspect. 110 (Suppl 1), 25-42, 2002.
233. Carpenter, D.O., Nguyen, T., Le, L., Kudyakov, R. and Lininger, L. Human disease in relation to residence near hazardous waste sites. Proceedings of The 10th Pacific Basin Conference on Hazardous Waste, Okayama, Japan, December 5-7, 2001.
234. Carpenter, D.O., Tarbell, A., Fitzgerald, E., Kadlec, M.J., O'Hehir, D.O. and Bush, B. University-community partnership for the study of environmental contamination at Akwesasne. In: Biomarkers of Environmentally Associated Disease, S.H. Wilson and W.A. Suk, editors, CRC Press/Lewis Publishers, 507-523, 2002.
235. Carpenter, D.O., Hussain, R.J., Berger, D.F., Lombardo, J.P., Park, H-Y. Electrophysiological and behavioral effects of perinatal and acute exposure of rats to lead and polychlorinated biphenyls. Environ. Health Perspect., 110: 377-386, 2002.
236. Hori, N., Tan, Y. King, M., Strominger, N.L. and Carpenter, D.O. Differential actions and excitotoxicity of glutamate agonists on motoneurons in adult mouse cervical spinal cord slices. Brain Res., 958: 434-438, 2002.
237. Laemle, L.K., Hori, N., Strominger, N.L., Tan, Y. and Carpenter, D.O. Physiological and anatomical properties of the suprachiasmatic nucleus of an anophthalmic mouse. Brain Res., 953: 73-81, 2002.
238. Hori, N., Tan, Y., Strominger, N.L. and Carpenter, D.O. Rat motoneuron cell death in development correlates with loss of N-methyl-D-aspartate receptors. Neurosci. Letts., 330:131-134, 2002.
239. Carpenter, D.O., Morris, D.L. and Legator, M. Initial attempts to profile health effects with types of exposure in Anniston, Alabama. EEB, 12: 191-195, 2003.
240. Carpenter, D.O., Nguyen, T., Le, L., Baibergenova, A. and Kudyakov, R. Profile of health effects related to proximity to PCB-contaminated hazardous waste sites in New York. EEB, 12: 173-180, 2003.
241. Hori, N., Carp, J.S., Carpenter, D.O. and Akaike, N. Corticospinal transmission to motoneurons in cervical spinal slices from adult rats. Life Sci., 72: 389-396, 2002.
242. Carpenter, D.O. and Hussain, R.J. Cell-to-cell communication of neurons is impaired by metals. Mat.-wiss. U. Werkstofftech. 34: 1-8, 2003.
243. Tan, Y., Hori, N. and Carpenter, D.O. The mechanism of presynaptic long-lasting-depression mediated by group 1 metabotropic glutamate receptors. Cell Molec. Neurobiol., 23: 187-203, 2003.
244. Baibergenova, A., Kudyakov, R., Zdeb, M., and Carpenter, D.O. Low birth weight and residential proximity to PCB-contaminated waste sites. Environ. Health Perspect., 111: 1352-1357, 2003.
245. Nishizaki, Y., Oyama, Y., Sakai, Y., Hirama, S., Tomita, K., Nakao, H., Umebayashi, C., Ishida, S., Okano, Y. and Carpenter, D.O. PbCl₂-induced hyperpolarization of rat

- thymocytes: Involvement of charybdotoxin-sensitive K⁺ channels. Environ Toxicol., 18(5): 321-326, 2003.
246. Hussain, R.J. and Carpenter, D.O. The effects of protein kinase C activity on synaptic transmission in two areas of rat hippocampus. Brain Res., 990: 28-37, 2003.
 247. Suk, W.A., Ruchirawat, K., Balakrishnan, K., Berger, M., Carpenter, D., Damstra, T., Pronczuk de Garbino, J., Koh, D., Landrigan, P.J., Makalinao, I., Sly, P.D., Xu, Y. and Zheng, B.S. Environmental threats to children's health in Southeast Asia and the Western Pacific. Environ Health Perspect. 111: 1340, 2003.
 248. Carpenter, D.O. The need for global environmental health policy. New Solutions, 13(1): 53-59, 2003.
 249. Tan, Y., Li, D., Song, R., Lawrence, D. and Carpenter, D.O. Ortho-substituted PCBs kill thymocytes. Toxicol Sci., 76: 328-337, 2003.
 250. Boldyrev, A., Bulygina, E., Carpenter, D.O. and Schoner, W. Glutamate receptors communicate with Na⁺/K⁺-ATPase in rat cerebellum granule cells: Demonstration of differences in the action of several metabotropic and ionotropic glutamate agonists on intracellular reactive oxygen species and the sodium pump. J Molec Neurosci., 21:213-222, 2003.
 251. Hites, R.A., Foran, J.A., Carpenter, D.O., Hamilton, M.C., Knuth, B.A. and Schwager, S.J. Global assessment of organic contaminants in farmed salmon. Science 303: 226-229, 2004.
 252. Sandal, S., Yilmaz, B., Chen, C-H and Carpenter, D.O. Comparative effects of technical toxaphene, 2,5-dichloro-3-biphenylol and octabromodiphenylether on cell viability, [Ca²⁺]_i levels and membrane fluidity in mouse thymocytes. Toxicol Letts., 151: 417-428, 2004.
 253. Tan, Y., Chen, C-H., Lawrence, D. and Carpenter, D.O. Ortho-substituted PCBs kill cells by altering membrane structure. Toxicol Sci., 80: 54-59, 2004.
 254. Tan, Y., Song, R., Lawrence, D. and Carpenter, D.O. Ortho-substituted but not coplanar PCBs rapidly kill cerebellular granule cells. Toxicol Sci., 79: 147-156, 2004.
 255. Ozcan, M., Yilmaz, B., King, W.M. and Carpenter, D.O. Hippocampal long-term potentiation (LTP) is reduced by a coplanar PCB congener. NeuroToxicology, 25: 981-988, 2004.
 256. Ssempebwa, J.C., Carpenter, D.O., Yilmaz, B., DeCaprio, A.P., O=Hehir, D.J. and Arcaro, K.F. Waste crankcase oil: an environmental contaminant with potential to modulate estrogenic responses. J Toxicol Environ Hlth, Part A, 67: 1081-1094, 2004.
 257. Foran, J.A., Hites, R.A., Carpenter, D.O., Hamilton, M.C., Mathews-Amos, A. and Schwager, S.J. A survey of metals in tissues of farmed Atlantic and wild Pacific salmon. Environ Toxicol Chem., 23: 2108-2110, 2004.
 258. Oenga, G.N., Spink, D.C. and Carpenter, D.O. TCDD and PCBs inhibit breast cancer cell proliferation in vitro. Toxicol In Vitro, 18: 811-819, 2004.
 259. Hussain, R.J. and Carpenter, D.O. A comparison of the roles of protein kinase C in long-term potentiation in rat hippocampal areas CA1 and CA3. Cell Molec Neurobiol., 25: 649-661, 2005.
 260. Hites, R.A., Foran, J.A., Schwager, S.J., Knuth, B.A., Hamilton, M.C. and Carpenter, D.O. Global assessment of polybrominated diphenyl ethers in farmed and wild salmon. Organohalogen Compounds, 66: 3826-3829, 2004.

261. Kudyakov, R., Baibergenova, A., Zdeb, M. and Carpenter, D.O. Respiratory disease in relation to patient residence near to hazardous waste sites. Environ. Toxicol. Pharmacol., 18: 249-257, 2004.
262. Gilbertson, M. and Carpenter, D.O. An ecosystem approach to the health effects of mercury in the Great Lakes basin ecosystem. Environ. Res. 95: 240-246, 2004.
263. Hites, R.A., Foran, J.A., Schwager, S.J., Knuth, B.A., Hamilton, M.C. and Carpenter, D.O. Global assessment of polybrominated diphenyl ethers in farmed and wild salmon. Environ. Sci. Technol., 38: 4945-4949, 2004.
264. DeCaprio, A.P., Johnson, G.W., Tarbell, A.M., Carpenter, D.O. Chiarenzelli, J.R., Morse, G.S., Santiago-Rivera, A.L., Schymura, M.J., and the Akwesasne Task Force on the Environment. PCB exposure assessment by multivariate statistical analysis of serum congener profiles in an adult Native American population. Environ. Res., 98: 284-302, 2005.
265. Boldyrev, A.A., Kazey, V.I., Leinsoo, T.A., Mashkina, A.P., Tyulina O.V., Tuneva, J.O., Chittur, S. and Carpenter, D.O. Rodent lymphocytes express functionally active glutamate receptors. Biochem. Biophys. Res. Comm., 324: 133-139, 2004.
266. Boldyrev, A.A., Koudinov, A., Berezov, T. and Carpenter, D.O. Amyloid- β induced cell death is independent of free radicals. J. Alzheimer's Dis., 6: 633-638, 2004.
267. Neagu, B., Strominger, N.L. and Carpenter, D.O. Use of bipolar parallel electrodes for well-controlled microstimulation in a mouse hippocampal brain slice. J. Neurosci. Meth., 144: 153-163, 2005.
268. Suk, W.A., Avakian, M.D., Carpenter, D., Groopman, J.D., Scammell, M. and Wild, C.P. Human exposure monitoring and evaluation in the Arctic: The importance of understanding exposures to the development of public health policy. Environ. Health Perspect. 112: 113-120, 2004.
269. Neagu, B., Neagu, E.R., Strominger, N.L. and Carpenter, D.O. A new fast electrophysiological response measured extracellularly in a mouse hippocampal brain slice. Neurosci. Letts., 381: 179-184, 2005.
270. Sergeev, A.V. and Carpenter, D.O. Hospitalization rates for coronary heart disease in relation to residence near areas contaminated with POPs and other pollutants. Environ. Health Perspect., 113: 756-761, 2005.
271. Foran, J.A., Carpenter, D.O., Hamilton, M.C., Knuth, B.A. and Schwager, S.J. Risk-based consumption advice for farmed Atlantic and wild Pacific salmon contaminated with dioxins and dioxin-like compounds. Environ. Health Perspect. 113: 552-556, 2005.
272. Shaw, S.D., Bourakovsky, A., Brenner, D., Carpenter, D.O., Tao, L., Kannan, K. and Hong, C-S. Polybrominated diphenyl ethers (PBDEs) in farmed salmon from Maine and Eastern Canada. In: Proceedings of 25th International Symposium on Halogenated Environmental Organic Pollutants and POPs (DIOXIN 2005), August 21-26, 2005, Toronto, Canada.
273. Carpenter, D.O., DeCaprio, A.P., O=Hehir, D., Akhtar, F., Johnson, G., Scudato, R.J., Apatiki, L., Kava, J., Gologergen, J., Miller, P.K. and Eckstein, L. Polychlorinated biphenyls in serum of the Siberian Yupik people from St. Lawrence Island, Alaska. Int. J. Circumpolar Health, 64(4): 322-335, 2005.
274. Foran, J.A., Good, D.H., Carpenter, D.O., Hamilton, M.C., Knuth, B.A. and Schwager, S.J. Quantitative analysis of the benefits and risks of consuming farmed and wild salmon. J. Nutr 135: 2639-2643, 2005.

275. Huang, X., Hites, R.A., Foran, J.A., Hamilton, C., Knuth, B.A., Schwager, S.J. and Carpenter, D.O. Consumption advisories for salmon based on risk of cancer and non-cancer health effects. *Environ. Res.*, 101: 263-274, 2006.
276. Shcherbatykh, I., Huang, X., Lessner, L. and Carpenter, D.O. Hazardous waste sites and stroke in New York State. *Environ. Health*, 4:18, 2005.
277. Hamilton, M.C., Hites, R.A., Schwager, S.J., Foran, J.A., Knuth, B.A. and Carpenter, D.O. Lipid composition and contaminants in farmed and wild salmon. *Environ. Sci. Tech.*, 39: 8622-8629, 2005.
278. Yilmaz, B., Sandal, S., Chen, C-H. and Carpenter, D.O. Effects of PCB 52 and PCB 77 on cell viability, $[Ca^{2+}]_i$ levels and membrane fluidity in mouse thymocytes. *Toxicology*, 217: 184-193, 2006.
279. Tan, Y., Hori, N., and Carpenter, D.O. Electrophysiological effects of three groups of glutamate metabotropic receptors in rat piriform cortex. *Cell Molec. Neurobiol.*, 26: 915-924, 2006.
280. Boldyrev, A.A., Carpenter, D.O. and Johnson, P.A., Emerging evidence for a similar role of glutamate receptors in the nervous and immune systems. *J. Neurochem.*, 95: 913-918, 2005.
281. Sandal, S., Yilmaz, B., Godekmerdan, A., Kelestimur, H. and Carpenter, D.O. Effects of PCBs 52 and 77 on Th1/Th2 balance in mouse thymocyte cell cultures. *Immunopharmacol. Immunotoxicol.* 27: 601-613, 2005.
282. Carpenter, D.O. Environmental contaminants and learning and memory. *International Congress Series*, 1287: 185-189, 2006.
283. Carpenter, D.O. Polychlorinated biphenyls (PCBs): Routes of exposure and effects on human health. *Rev. Environ. Health*, 21: 1-23, 2006.
284. Huang, X., Lessner, L. and Carpenter, D.O. Exposure to persistent organic pollutants and hypertensive disease. *Environ. Res.*, 102: 101-106, 2006.
285. Carpenter, D.O., El-Qaderi, S., Fayzieva, D., Gilani, A., Hambartsumyan, A., Herz, K., Isobaev, M., Kasymov, O., Kudyakov, R., Majitova, Z., Mamadov, E., Nemer, L., Revich, B., Stege, P., Suk, W., Upshur, R., Yilmaz, B. and Zaineh K. Children's environmental health in Central Asia and the Middle East. *Int. J. Occup. Environ. Health*, 12: 362-368, 2006.
286. King, W.M., Sarup, V., Sauve, Y., Moreland, C.M., Carpenter, D.O. and Sharma, S.C. Expansion of visual receptive fields in experimental glaucoma. *Visual Neurosci* 23: 137-142, 2006.
287. Tuneva, J., Chittur, S., Boldyrev, A.A., Birman, I. and Carpenter, D.O. Cerebellar granule cell death induced by aluminum. *Neurotox. Res.*, 9: 297-304, 2006.
288. Trasande, L., Boscarino, J., Graber, N., Falk, R., Schechter, C., Dunkel, G., Geslani, J., Moline, J., Kaplan-Liss, E., Miller, R.K., Korfmacher, K., Carpenter, D., Balk, S.J., Laraque, D., Frumkin, H. and Landrigan, P.J. The environment in pediatric practice: A study of New York pediatricians' attitudes, beliefs, and practices towards children's environmental health. *J. Urban Health*, 2006, DOI: 10.1007/s11524-006-9071-4.
289. Surdu, S., Montoya, L.D., Tarbell, A. and Carpenter, D.O. Childhood asthma and indoor allergens in Native Americans in New York. *Environ. Health: A Global Access Science Source*, 5:22, 2006. DOI: 10.1186/1476-069X-5-22.
290. Ozcan M., Yilmaz, B. and Carpenter, D.O. Effects of melatonin on synaptic transmission and long term potentiation in two areas of mouse hippocampus. *Brain Res.*, 1111: 90-94, 2006.

291. Shaw, S.D., Brenner, D., Berger, M.L., Pulser, E.L., Carpenter, D.O., Hong, C-W and Kannan K. PCBs, dioxin-like PCBs, dioxins, and organochlorine pesticides in farmed salmon (*Salmo salar*) from Maine and Eastern Canada. Environ. Sci. Technol. 40: 5347-5354, 2006.
292. Yilmaz, B., Ssempebwa J., Mackerer, C.R., Arcaro, K.F. and Carpenter, D.O. Effects of polycyclic aromatic hydrocarbon-containing oil mixtures on generation of reactive oxygen species and cell viability in MCF-7 breast cancer cells. J. Toxicol. Environ. Health, Part A: 70: 1-8, 2007.
293. Kouznetsova, M., Huang, X., Ma, J., Lessner, L. and Carpenter, D.O. Increased rate of hospitalization for diabetes and residential proximity of hazardous waste sites. Environ. Health Perspect., 115:75-79, 2007.
294. Yilmaz, Y., Seyran, A.D., Sandal, S., Aydin, M., Colakoglu, N., Kocer, M. and Carpenter, D.O. Modulatory effects of Aroclors 1221 and 1254 on bone turnover and vertebral histology in intact and ovariectomized rats. Toxicology Letts., 166: 276-294, 2006.
295. Shcherbatykh, I. and Carpenter, D.O. The role of metals in the etiology of Alzheimer's disease. J. Alzheimer's Dis., 11: 191-205, 2007.
296. Surdu S, Neamtiu I, Gurzau E, Kasler I and Carpenter D. Blood lead levels and hand lead contamination in children ages 4-6 in Copsa Mica, Romania. In: *Environmental Health in Central and Eastern Europe*. KC Donnelly and LH Cizmas, Eds. Springer Netherlands. pp. 123-134, 2007.
297. Carpenter D.O. The importance of the Great Lakes Water Quality Agreement. J. Public Health Policy 28: 216-220, 2007.
298. Codru N, Schymura MJ, Negoita S, the Akwesasne Task Force on the Environment, Rej R and Carpenter DO. Diabetes in relation to serum levels of polychlorinated biphenyls (PCBs) and chlorinated pesticides in adult Native Americans. Environ Health Perspect. 115: 1442-1447, 2007.
299. Carpenter DO. Biomarcadores de efectos neuroconductuales. Acta Toxicol Argent 14 (Suplemento): 11-12, 2006.
300. Hennig B, Ormsbee L, Bachas L, Silverstone A, Milner J, Carpenter D, Thompson C and Suk WA . Introductory comments: nutrition, environmental toxins and implications in prevention and intervention of human diseases. J. Nutrit Biochem 189: 161-163, 2007.
301. Arnold R, Armour MA, Barich J, Cebrian M, Cifuentes L, Kirk D, Koh D, Lewis ND, Ling B, Makalinao I, Maiden T, Paz-y-Mino C, Peralta G, Singh K, Sly P, Suk W, Woodward A, Zheng B and Carpenter DO. Threats to human health and environmental sustainability in the Pacific Basin: The 11th International Conference of the Pacific Basin Consortium. Environ Health Perspect. 115: 1770-1775, 2007.
302. Parrish RR, Horstwood M, Arnason JG, Chenery S, Brewer T, Lloyd NS and Carpenter DO (2008) Depleted uranium contamination by inhalation exposure and its detection after approximately 25 years: Implications for health assessment. Sci Total Environ 390: 58-68.
303. Goncharov A, Haase RF, Santiago-Rivera A, Morse G, Akwesasne Task Force on the Environment, McCaffrey RJ, Rej R and Carpenter DO. (2008) High serum PCBs are associated with elevation of serum lipids and cardiovascular disease in a Native American population. Environ Res. 106: 226-239.
304. Ma J, Kouznetsova M, Lessner L and Carpenter DO. Asthma and infectious respiratory disease in children – correlation to residence near hazardous waste sites. Paediatr Respir Rev 8: 292-298, 2007.

305. Schell LM, Gallo MV, Denham M, Ravenscroft J, DeCaprio AP and Carpenter DO (2008) Relationship of thyroid hormone levels of polychlorinated biphenyls, lead, p,p'-DDE and other toxicants in Akwesasne Mohawk youth. *Environ Health Perspect.* 116: 806-813.
306. Ssempebwa J and Carpenter DO (2009) The generation, use and disposal of waste crankcase oil in developing countries: A case for Kampala District, Uganda. *J Hazard Materials* 161: 835-841.
307. Carpenter DO (2008) Environmental contaminants as risk factors for developing diabetes. *Rev Environ Health* 23: 59-74.
308. Shaw SD, Berger ML, Brenner D, Carpenter DO, Lao L, Hong CS and Kannan K (2008) Polybrominated diphenyl ethers (PBDEs) in farmed and wild salmon marketed in the Northeastern United States. *Chemosphere* 71: 1422-1431.
309. Sandel S, Yilmaz B and Carpenter DO (2008) Genotoxic effects of PCB 52 and PCB 77 on cultured human peripheral lymphocytes. *Mutation Res.* 654: 88-92.
310. Carpenter DO and Sage C (2008) Setting prudent public health policy for electromagnetic field exposures. *Rev Environ Health* 23: 91-117.
311. Neagu B, Strominger NL and Carpenter DO (2008) Contribution of NMDA receptor-mediated component to the EPSP in mouse Schaffer collateral synapses under single pulse stimulation protocol. *Brain Res.* 1240: 54-61.
312. Holdren J, Tao S and Carpenter DO (2008) Environment and health in the 21st Century: Challenges and solutions. *Ann NY Acad Sci.* 1140:1-21.
313. Carpenter DO, Ma J and Lessner L (2008) Asthma and infectious respiratory disease in relation to residence near hazardous waste sites. *Ann NY Acad Sci.* 1140: 201-208.
314. Sandal S, Tuneva J, Yilmaz B and Carpenter DO (2009) Effects of cholesterol and docosahexaenoic acid on cell viability and (Ca²⁺)_i levels in acutely isolated mouse thymocytes. *Cell Biochem Funct* 27: 155-161.
315. Steele RE, de Leeuw, E and Carpenter DO (2009) A novel and effective treatment modality for medically unexplained symptoms. *J Pain Management* 1: 402-412
316. Sage C and Carpenter DO (2009) Public health implications of wireless technologies. *Pathophysiology* 16: 233-246.
317. Sly PD, Eskenazi B, Pronczuk J, Sram R, Diaz-Barriga F, Machin DG, Carpenter DO, Surdu S and Meslin EM (2009) Ethical issues in measuring biomarkers in children's environmental health. *Environ Health Perspect.* 117: 1185-1190.
318. Goncharov A, Rej R, Negoita S, Schymura M, Santiago-Rivera A, Morse G, Akwesasne Task Force on the Environment and Carpenter DO (2009) Lower serum testosterone associated with elevated polychlorinated biphenyl concentrations in Native American men. *Environ Health Perspect.* 117:1454-1460.
319. Tuneva JO, Karpova LV, Shittur SV, Carpenter DO, Johnson P and Boldyrev AA (2009) Amyloid- β and aluminum ions enhance neuronal damage mediated by NMDA-activated glutamate receptors. *Biochemistry (Moscow) Supplement Series A: Membrane and Cell Biology* 4: 466-471.
320. Carpenter DO and Nevin R (2009) Environmental causes of violence. *Physiol Behavior* 99: 260-268.
321. Goncharov A, Bloom MS, Pavuk M, Carpenter DO for the Anniston Environmental Health Research Consortium. (2009) Exposure to PCBs and hypertension in the Anniston Community Health Survey. *Organohal Comp* 71: 0-136.
322. Sergeev AV and Carpenter DO (2010) Residential proximity to environmental sources of persistent organic pollutants and first-time hospitalizations for myocardial infarction with

- comorbid diabetes mellitus: A 12-year population-based study. *Int J Occup Med Environ Health* 23: 5-13.
323. Carpenter DO (2010) Electromagnetic fields and cancer: The cost of doing nothing. *Rev Environ Health* 25: 75-80.
 324. Sergeev AV and Carpenter DO (2010) Exposure to persistent organic pollutants increases hospitalization rates for myocardial infarction with comorbid hypertension. *Primary Prevention Insights*. 2: 1-9.
 325. Hori N, Kadota MT, Watanabe M, Ito Y, Akaike N and Carpenter DO (2010) Neurotoxic effects of methamphetamine on rat hippocampus pyramidal neurons. *Cell Mol Neurobiol*.30: 849-856.
 326. Hardell, S, Tilander H, Welfinger-Smith G and Carpenter DO (2010) Levels of polychlorinated biphenyls (PCBs) and three organochlorine pesticides in fishes from the Aleutian Islands of Alaska. *PLoS ONE*, 5:e12396.
 327. Carpenter, DO. (2010) Human health effects of EMFs: The cost of doing nothing. *IOP Conf. Series: Earth and Environmental Science* 10: 012004. doi:10.1088/1755-1315/10/1/10/012004.
 328. Goncharov A, Bloom M, Pavuk M, Birman I and Carpenter DO for the Anniston Environmental Health Research Consortium. Blood pressure and hypertension in relation to levels of serum polychlorinated biphenyls in residents of Anniston, Alabama. *J Hypertension*. 28: 2053-2060..
 329. Prasad A, Ahs M, Goncharov A and Carpenter DO (2010) Omega-3 and omega-6 fatty acids kill thymocytes and increase membrane fluidity. *The Open Cell Development & Biology Journal* 3: 1-8
 330. Sergeev AV and Carpenter DO (2010) Increased hospitalizations for ischemic stroke with comorbid diabetes and residential proximity to source of organic pollutants: A 12-year population-based study. *Neuroepidemiology* 35:196-201.
 331. Prasad A, Bloom M and Carpenter DO (2010) Role of calcium and ROS in cell death induced by polyunsaturated fatty acids in murine thymocytes. *J Cell Physiol*. 225: 829-836.
 332. Sergeev AV and Carpenter DO (2010) Geospatial patterns of hospitalization rates for stroke with comorbid hypertension in relation to environmental sources of persistent organic pollutants: Results from a 12-year population-based study. *Environ Sci Pollut Res Int* 18: 576-585.
 333. Brown D, Goncharov A, Paul E, Simonin H and Carpenter DO. (2010) The relationships between Adirondack lake pH and levels of mercury in yellow perch. *J Aquat Animal Health*. 22:280-290.
 334. Gavidia T, Brune M-N, McCarty KM, Pronczuk J, Etzel R, Neira M, Carpenter DO, Suk WA, Arnold RG, Ha EH, and Sly PD (2010) Children's environmental health – from knowledge to action. *Lancet* 377:1134-1136.
 335. Bushkin-Bedient S and Carpenter DO (2010) Benefits versus risks associated with consumption of fish and other seafood. *Rev Environ Health* 25: 161-191.
 336. Goncharov A, Pavuk M, Foushee HR and Carpenter DO for the Anniston Environmental Health Consortium (2010) Blood pressure in relation to concentrations of PCB congeners and chlorinated pesticides. *Environ Health Perspect*. 119:319-325.
 337. Yilmaz B, Sandal S and Carpenter DO (2010) PCB 9 exposure induces endothelial cell death while increasing intracellular calcium and ROS levels. *Environ Toxicol*. In press. doi: 10.1002/tox.20676.

338. Sly PD, Arnold RG and Carpenter DO (2011) Environmental exposures in the era of climate change. *Rev Environ Health* 26: 1-4.
339. Carpenter DO (2011) Health effects of persistent organic pollutants: The challenge for the Pacific Basin and for the World. *Rev Environ Health* 26: 61-69.
340. Sergeev AV and Carpenter DO (2011) Increase in metabolic syndrome-related hospitalizations in relation to environmental sources of persistent organic pollutants. *Int J Environ Res Public Health* 8:762-776.
341. Carpenter DO, Miller PK, Waghiyi, Welfinger-Smith G (2011) Environmental contamination of the Yupik people of St. Lawrence Island, Alaska. *J Indigenous Res In Press*.
342. Carpenter DO (2010) Human health effects of EMFs: The cost of doing nothing. *IOP C Ser Earth Env* 10:1-6.
343. Kamalov J, Carpenter DO, Birman I (2011) Cytotoxicity of environmentally relevant concentrations of aluminum in murine thymocytes and lymphocytes. *J Toxicol*. Doi:10.1155/2011/796719.
344. Silbernagel S, Carpenter DO, Gilbert SG, Gochfeld M, Groth E, Hightower JM, Schiavone FM. (2011) Recognizing and preventing over exposure to methylmercury from fish and seafood consumption: Information for physicians. *J Toxicol*, 2011; doi:10.1155/2011/983072
345. Welfinger-Smith G, Minholz JL, Byrne S, Waghiyi V, Goloderggen J, Kava J, Apatiki M, Ungott E, Miller PK, Arnason J and Carpenter DO. (2011) Organochlorine and metal contaminants in traditional foods from St. Lawrence Island, Alaska. *J Toxicol Environ Health A*. 74: 1-20.
346. Åhs M, Prasad A, Aminov Z and Carpenter DO (2011) Mechanisms of cell death of thymocytes induced by polyunsaturated, monounsaturated and trans-fatty acids. *J Cell Biochem*. In press.
347. Boberg E, Lessner L and Carpenter DO. The role of residence near hazardous waste sites containing benzene in the development of hematologic cancers in upstate New York. *Int J Occup Med Environ Health*. In press.
348. Turyk ME, Bhazsar SP, Bowerman W, Boysen E, Clark M, Diamond M, Mergler D, Pantazopoulos P, Schantz S and Carpenter DO (2011) Risks and benefits of consumption of Great Lakes fish. *Environ Health Perspect*. In press.
349. Ma J, Lessner L, Schreiber J and Carpenter DO (2009) Association between residential proximity to PERC dry cleaning establishments and kidney cancer in New York city. *J Environ Public Health* doi:10.1155/2009/183920.

Books:

1. Cellular Pacemakers I: Mechanisms of Pacemaker Generation, David O. Carpenter, editor; John Wiley & Sons, New York, 1982.
2. Cellular Pacemakers II: Function in Normal and Disease States, David O. Carpenter, editor; John Wiley & Sons, New York 1982.
3. Biologic Effects of Electric and Magnetic Fields, Volume I: Sources and Mechanisms of Biologic Effects, David O. Carpenter and Sinerik Ayrapetyan, editors; Academic Press, California, 1994.

4. Biologic Effects of Electric and Magnetic Fields, Volume II: Beneficial and Harmful Effects, David O. Carpenter and Sinerik Ayrapetyan, editors; Academic Press, California, 1994.
5. Environmental Challenges in the Pacific Basin, David O. Carpenter, ed. New York Academy of Sciences, Vol 1140, 457 pp, 2008.

Reviews and Book Chapters:

1. Carpenter, D.O. Ionic mechanisms and models of endogenous discharge of Aplysia neurons. Proceedings of the Symposium on Neurobiology of Invertebrates: Mechanisms of Rhythm Regulation. Tihany, Hungary, August 2-5, 1971, Hungarian Academy of Sciences, pp. 35-58, 1973.
2. Carpenter, D.O., Hovey, M.M. and Bak, A.F. Measurements of intracellular conductivity in Aplysia neurons: Evidence for organization of water and ions. Ann. NY Acad. Sci., 204:502-533, 1973.
3. Carpenter, D.O., Hubbard, J.H., Humphrey, D.R., Thompson, H.K. and Marshall, W.H. CO₂ effects on nerve cell function. In: Topics in Environmental Physiology and Medicine: Carbon Dioxide and Metabolic Regulation. (Eds.: G. Nahas and K.A. Schaefer), Springer-Verlag, New York, pp. 49-62, 1974.
4. Parmentier, J. and Carpenter, D.O. Blocking action of snake venom neurotoxins at receptor sites to putative central nervous system transmitters. In: Animal, Plant and Microbial Toxins (Eds.: A. Ohaska, K. Hayashi, and Y. Sawai), Plenum Press, London, Vol. 2, pp. 179-191, 1976.
5. Pierau, Fr.-K. and Carpenter, D.O. Metabolic control of peripheral temperature receptors in the scrotal skin of the rat. Israel J. Med. Sci., 12:1044-1046, 1976.
6. Carpenter, D.O. Membrane Excitability: In: Mammalian Cell Membranes Vol. 4, Membranes and Cellular Functions, (Eds.: G.A. Jamieson and D.M. Robinson), Butterworth & Co., London, pp. 184-206, 1977.
7. Carpenter, D.O., Myers, P.R., Shain, W., Sinback, C.N. and Swann, J.W. Interchangeable association of neurotransmitter receptors and ionophores in vertebrate and invertebrate cells. Proc. Symposium: "Iontophoresis and Transmitter Mechanisms in the Mammalian Central Nervous System", Cambridge, England, Raven Press, pp. 203-205, 1978.
8. Carpenter, D.O., McCreery, M.J., Woodbury, C.M. and Yarowsky, P.J. Modulation of endogenous discharge in neuron R-15 through specific receptors for several neurotransmitters. In: Abnormal Neuronal Discharges, (Eds: N. Chalazonitis and M. Boisson), Raven Press, New York, pp. 189-203, 1978.
9. Tsien, R.W. and Carpenter, D.O. Ionic mechanisms of pacemaker activity in cardiac purkinje fibers. Fed. Proc., 37:2127-2131, 1978.
10. Keabian, P.R., Keabian, J.W. and Carpenter, D.O. Serotonin causes accumulation of cyclic AMP in Aplysia hear. The Proceedings of the Fourth International Catecholamine Symposium, (Eds: E. Usdin and I. Kopin), Pergamon Press, New York, pp. 1167-1169.
11. Braitman, D.J., Aufer, C.R. and Carpenter, D.O. Direct and modulatory actions of thyrotropin-releasing hormone (TRH) in sensorimotor cortex. Proc. EMBO Workshop on Drug Receptors in the Central Nervous System, Weizman Institute of Science, Rehovot, Israel, February 10-14, 1980.

12. Carpenter, D.O. Ionic and metabolic bases of neuronal thermosensitivity. Fed. Proc., 40:2808-2813, 1981.
13. Carpenter, D.O. and Reese, T.S. Chemistry and Physiology of Synaptic Transmissions. In: Basic Neurochemistry, 3rd Edition, (Eds.: Siegel, Albers, Agranoff and Katzman), Little, Brown and Company, pp. 161-168, 1981.
14. Shain, W. and Carpenter, D.O. Mechanisms of synaptic modulation. Intl. Rev. Neurobiol., 22:205-247, 1981.
15. Wiederhold, M.L. and Carpenter, D.O. Possible Role of Pacemaker Mechanisms in Sensory Systems. In: Cellular Pacemakers II: Function in Normal and Disease States, (Ed.: D.O. Carpenter), John Wiley & Sons, New York, pp. 27-58, 1982.
16. Carpenter, D.O. The generator potential mechanism in cold afferents may be an electrogenic sodium pump. Workshop on Mechanisms of Thermal Regulations. J. Therm. Biol., 387-390, 1983.
17. Carpenter, D.O. and Gregg, R.A. Functional significance of electrogenic pumps in neurons. In: Electrogenic transport: Fundamental Principles and Physiological Implications, (Eds.: M. Blaustein and M. Liebermann), Raven Press, pp. 253-270, 1984.
18. Carpenter, D.O., Briggs, D.B. and Strominger, N. Behavioral and electrophysiological studies of peptide-induced emesis in dogs. Fed. Proc., 43:16-18, 1984.
19. Coyle, J.T., Blakeley, R.D., Zaczeck, R., Ory-Lavollee, L., Koller, K., ffrench-Mullen, J.M.H. and Carpenter, D.O. Acidic peptides in brain: Do they act at putative glutamatergic synapses. In: Excitatory Amino Acids and Epilepsy, (Eds.: Y. Ben-Ari and R. Schwarcz), Plenum Press, New York, pp. 375-384.
20. Carpenter, D.O., ffrench-Mullen, J.M.H., Hori, N., Sinback, C.N. and Shain, W. Segregation of synaptic function on excitable cells. In: Neural Mechanisms of Conditioning, (Eds.: D. Alkon and C.D. Woody), Plenum Press, NY, pp. 355-369, 1985.
21. Carpenter, D.O. and Hall, A.F. Responses of *Aplysia* cerebral ganglion neurons to leucine enkephalin. In: Comparative Aspects of Opioid and Related Neuropeptide Mechanisms, (Eds.: M. Leung and G. Stefano), CRC Press, pp. 49-57.
22. Zaczeck, R., Koller, K., Carpenter, D.O., Fisher, R., ffrench-Mullen, J.M.H. and Coyle, J.T. Interactions of acidic peptides: Excitatory amino acid receptors. In: Excitatory Amino Acids, (Ed.: P.J. Roberts), Macmillan, London, 1987.
23. Carpenter, D.O. Central nervous system mechanisms in deglutition and emesis. In: Handbook of Physiology, Section 6: The Gastrointestinal System. Vol. I, Motility and Circulation, (Ed.: J.D. Wood), American Physiological Society, Chapter 18, pp. 685-714, 1989.
24. Carpenter, D.O., Briggs, D.B. and Strominger, N. Mechanisms of radiation-induced emesis in the dog. Pharmacol. Ther., 39:367-371, 1988.
25. Carpenter, D.O. Comparative biology of neurotransmitter functions. Biology International, 15:2-9, 1987.
26. Carpenter, D.O. Electromagnetic Fields: Do We Know Enough to Act? In: Health and Environmental Digest, Vol. 2, pp. 3-4, 1988.
27. Carpenter, D.O. The New York State Power Lines Project: Summary and Conclusions. In: 20th Annual National Conference on Radiation Control, CRCPD Publication 88-6, Nashville, Tennessee, May 15-19, 1988, pp. 399-409.
28. S.-Rozsa, K., Carpenter, D.O., Stefano, G.B. and Salanki, J. Distinct responses to opiate peptides and FMRFamide on B-neurons of the *Aplysia* cerebral ganglia. In: Comparative

- Aspects of Neuropeptide Function, (Eds. E. Florey and G.B. Stefano), Manchester University Press, Chapter 6, pp. 73-86, 1991.
29. Carpenter, D.O. A common mechanism of excitation of area postrema neurons by several neuropeptides, hormones and monoamines. In: Comparative Aspects of Neuropeptide Function, (Eds. E. Florey and G.B. Stefano) Manchester University Press, Chapter 21, pp. 260-270, 1991.
 30. Carpenter, D. O., Hirotsu, I., Katsuda, N. and Hori, N. The effects of acetylcholine and aging on electrical excitability of the central nervous system. In: Neuroregulatory Mechanisms in Aging, Pergamon Press LTD, pp. 5-23, 1993.
 31. Turner, J.N., Swann, J.W., Szarowski, D.H., Smith, K.L., Shain, W., Carpenter, D.O. and Fejtl, M. Three-dimensional confocal light and electron microscopy of neurons: fluorescent and reflection stains. Methods in Cell Biology, 38:345-366, 1993.
 32. Deno, D. and Carpenter, D.O. Sources and characteristics of electric and magnetic fields in the environment. In: Biologic Effects of Electric and Magnetic Fields, Volume I: Sources and Mechanisms of Biologic Effects, David O. Carpenter and Sinerik Ayrapetyan, editors, Academic Press, California, pp. 3-59, 1994.
 33. Carpenter, D.O. The public health implications of magnetic field effects on biological systems. In: Biologic Effects of Electric and Magnetic Fields, Volume II: Beneficial and Harmful Effects, David O. Carpenter and Sinerik Ayrapetyan, editors, Academic Press, California, pp. 321-329, 1994.
 34. Carpenter, D.O. Multidisciplinary study of hazardous wastes at a Great Lakes Superfund Site. Great Lakes Research Review, 1: 37-39, 1994.
 35. Fejtl, M. and Carpenter, D.O. Single-channel studies in molluscan neurons. In: Ion Channels, Vol. 4, Toshio Narahashi, ed., Plenum Press, New York, pp. 333-376, 1996.
 36. Turner, J.N., Swann, J.W., Szarowski, D.H., Smith, K.L., Shain, W., Carpenter, D.O. and Fejtl, M. Three-dimensional confocal light and electron microscopy of central nervous system tissue, and neurons and glia in culture. In: International Review of Experimental Pathology, V.J. Savin and T.B. Wiegmann, editors, Volume 36, Academic Press, pp. 53-72, 1996.
 37. Boldyrev, A., Lawrence, D. and Carpenter, D. Effect of carnosine and its natural derivatives on apoptosis of neurons induced by excitotoxic compounds. In: Peptide Science-Present and Future, Y. Shimonishi, editor, Kluwer Academic Publishers, Great Britain, pp. 424-426, 1998.
 38. Carpenter, D.O., Hussain, R., Tan, Y., Niemi, W. and Hori, N. Long-term potentiation and long-term depression: Relevance to learning and memory. In: Modern Problems of Cellular and Molecular Biophysics. S.N. Ayrapetyan and A.C.T. North, editors, Nayan Tapan, pp. 83-94, 2001.
 1. Carpenter, D.O. NMDA receptors and molecular mechanisms of excitotoxicity. In: Oxidative Stress at Molecular, Cellular and Organ Levels, A. Boldyrev and P. Johnson, editors, Research Signpost, pp. 77-88, 2002.
 2. Carpenter, D.O. Clearing the air: Asthma an indoor exposure. INMA 96: 1-2, 2004.
 41. Carpenter DO. Environmental contaminants and human health: The health effects of persistent toxic substances. Firat Tip Dergisi 10: ____: 2005.
 42. Hermanson MH, Johnson GW and Carpenter DO. Routes of human exposure to PCBs in Anniston, Alabama. ACS Division of Environmental Chemistry, 232rd National Meeting, 46: 1117-1122, 2006

43. Carpenter DO and Welfinger-Smith G. The Hudson River: A case study of PCB contamination. In: *Water and Sanitation-Related diseases and the Environment: Challenges, Interventions, and Preventative Measures*. Janine M.H. Selendy, Ed., Wiley & Sons, Inc. 2011, pp 303-327.
44. Welfinger-Smith G and Carpenter DO. Addressing sources of PCBs and other chemical pollutants in water. In: *Water and Sanitation-Related diseases and the Environment: Challenges, Interventions, and Preventative Measures*. Janine M.H. Selendy, Ed., Wiley & Sons, Inc. 2011, pp 359-384.

Other Publications:

1. Barker, J.L. and Carpenter, D.O. Neuronal thermosensitivity. *Science*, 172:1361-1362, 1971.
2. Carpenter, D.O. Cellular Pacemakers. *Fed. Proc.*, 37:2125-2126, 1978.
3. Carpenter, D.O. Membrane biophysics and general neurobiology in Japan. *ONR Tokyo Scientific Bulletin*, 3:23-27, 1978.
4. Carpenter, D.O. Research on the primate nervous system in Japan. *ONR Tokyo Scientific Bulletin*, 3:28-32, 1978.
5. Carpenter, D.O. Report on the Sixth International Biophysics Congress, Kyoto, Japan. *ONR Tokyo Scientific Bulletin*, 3:38-40, 1978.
6. Carpenter, D.O. Interchangeable association of neurotransmitter receptors with several ionophores. *Brain Research Bulletin*, 4:149-152, 1978.
7. Carpenter, D.O. and Ahlbom, A. Power lines and cancer: Public health and policy implications. *Forum*, 3:96-101, 1988.
8. Carpenter, D.O. Setting Health Policy When the Science and the Risk are Uncertain. In: *The Scientific Basis of Health Policy in the 1990s*, Proceedings of the School of Public Health's Fifth Anniversary Symposium, 54-63, 1990.
9. Carpenter, D.O. Integrating public health in professional education. *Optometry and Vision Science*, 70: 699-702, 1993.
10. Bowerman, W.W., Carey, J., Carpenter, D.O., Colborn, T., DeRosa, C., Fournier, M., Fox, G.A., Gibson, B.L., Gilbertson, M., Henshel, D., McMaster, S. and Upshur, R. Is it time for a Great Lakes Ecosystem Agreement separate from the Great Lakes Water Quality Agreement? *J. Great Lakes Res.* 25:237-238, 1999.
11. Carpenter, D.O. Editorial Comment of "Primary hypoxic tolerance and chemical preconditioning during estrus cycle". *Stroke*, 30:1262, 1999.
12. Carpenter, D.O. Bring environmental health back into public Health. *J. Pub. Health Mgmt. Pract.*, 5:vii-viii, 1999.
13. Carpenter, D.O. Should children and women of childbearing age eat Great Lakes fish? *Great Lakes Commission Advisor*, 13: 8, 2000.
14. Hites, R.A., Foran, J.A., Schwager, S.J., Knuth, B.A., Hamilton, M.C. and Carpenter, D.O. Response to comment on "Global Assessment of Polybrominated Diphenyl Ethers in Farmed and Wild Salmon". *Environ. Sci. Technol.* 39: 379-380.
15. Carpenter, D.O. Blood lead and IQ in older children. Letter to the editor. *Environ. Health Perspect.*, 113: A581-A582, 2005.

16. Foran, J.A., Carpenter, D.O., Good, D.H., Hamilton, M.C., Hites, R.A., Knuth, B.A. and Schwager, S.J. Risks and benefits of seafood consumption. Letter to the editor. Am J Prev Med. 30: 438-439, 2006.

PREVIOUS DEPOSITIONS AND TESTIMONY (past seven years):

Antonia Tolbert et al. vs. Monsanto Company, Pharmacia Corp., and Solutia Inc.,
deposed for the plaintiffs, 21-22 January 2003. Mark Englehart, Attorney 334-269-2343.

Aaron et al. vs. Chicago Housing Authority et al., deposed for the plaintiffs, 5-6 March
2003.

Kellum et al., vs. Kuhlman Corporation, deposed for the plaintiffs, 4 September 2004.
Douglas Mercier, Attorney, 601-914-2882.

Allgood et al. vs. General Motors Corporation, deposed for the plaintiffs, 8-10 December
2004. Brian J. Leinbach, Attorney. 310-552-3800.

Maggie T. Williams et al. vs. Kuhlman Corporation, deposed for the plaintiffs, 1
February and 25 February 2005. Douglas Mercier, Attorney, 601-914-2882.

Solutia Inc. et al., Debtors, vs. Monsanto Company and Pharmacia Corporation; deposed
for the plaintiffs, 12 September 2006. Samuel E. Stubbs, Attorney; 713-425-7345.

Charles W. Adams, et al., vs. Cooper Industries, Inc. et al., deposed for the plaintiffs, 28-
29 September 2006. Donna Keene Holt, Attorney. 865-212-3294.

Arthur D. Dyer et al. vs. Waste Management et al., deposed for the plaintiffs, 2
November 2006. Mark L. Thomsen, Attorney. Cannon & Dunply, Brookfield, WI 53008.

Clopten et al. vs. Monsanto, deposed for the plaintiffs, 31 January 2007. Robert Roden,
Attorney. 406-525-2665.

Marty Paulson et al. vs. Monsanto, deposed for the plaintiffs, 7 August 2007. Torger
Oaas, Attorney. 406-525-2665.

John Edward Martinez and Gladys Yolanda Martinez vs. Entergy Corporation et al.,
deposed for the plaintiffs, 16 April 2008. Julie Jacobs, Attorney. 504-566-1704.

Fannie Wayne et al. vs. Pharmacia Corporation, et al., deposed for the plaintiffs, 29
October 2008. John E. Norris, Attorney. 205-541-7759.

Fannie Wayne et al. vs. Pharmacia Corporation et al., testified for the plaintiffs, 31
March-1 April, 2009. John E. Norris, Attorney. 205-541-7759.

Clement Passariello, et al., vs. CL&P, et al.; William Korzon, et al., vs. CL&P, et al.;
Louis Gherlone et al., vs. CL&P, et al.; and William Ho, et al., vs. CL&P et al., deposed for the
plaintiffs, 13 April 2009. Benson A. Snaider, Attorney. 203-777-6426.

Before the Pennsylvania Public Utility Commission, docket No A-2009-2082652, et al.
Testified on behalf of the Saw Creek Estates Community Association, 2 September 2009. Paul
M. Schmidt, Attorney. 215-569-2800 x161.

James Alford et al. v. Kuhlman Corporation, et al., pending in the USDC, Southern
District of Mississippi, Deposed for plaintiffs, 20 August 2009. Shiela Bossier, Attorney. 601-
352-5450

Fannie Wayne et al. v. Pharmacia Corporation. Deposed for plaintiffs, 23 September
2009, Timothy C. Davis, Attorney. 205-327-9115.

Before the Minnesota Public Utilities Commission in the matter of the route permit
application by Great river energy and Xcel Energy for a 345 kV transmission line from
Brookings County, South Dakota to Hampton, Minnesota. Testified for plaintiffs, 16 December

2009. Paula Maccabee, Attorney. 651-775-7128.

Highland Lakes Estates et al.v. Republic Services of Florida et al., Deposed for the plaintiffs, 23 April 2010. John W. Frost II, Attorney. 863-533-8985.

Zina G. Bibb, et al. v Monsanto Company et al. Deposed for plaintiffs, 28 April 2010. W. Stuart Calwell, Attorney, 304-343-4323.

Highland Lakes Estates et al., v. Republic Services of Florida et al., Testified for the plaintiffs, 13 May 2010.

Nora Williams, et al., v. City of Jacksonville, et al. Deposed for the plaintiffs.15 July 2010. Samuel W. Wethern, Attorney.

Ronald Cybart et al., Michael Campanelli, and Donald and Theresa Shea, et al.v. CL&P. Deposed for the plaintiffs. 15 July 2011. Benson A. Snaider, Attorney.

Maria Snoops vs. Lyon Associates, Inc. and Insurance Co of the state of Pennsylvania. Deposed for the plaintiff, 1 November 2011. Matthew J. Witteman, Attorney. 415-363-3106.

John Edward Martinez and Gladys Yolanda Martinez v. Entergy Corporation, et al., Deposed for the plaintiff, 19 December 2011. J. Patrick Connick, Attorney. 504-347-4535.