STATE OF MICHIGAN

BEFORE THE MICHIGAN PUBLIC SERVICE COMMISSION

In the matter of the application and request )
of the DETROIT EDISON COMPANY seeking )
approval and authority to implement its )
proposed Advanced Metering Infrastructure )
opt out program. )

Case No U-15768

QUALIFICATIONS & DIRECT TESTIMONY OF DAVID O. CARPENTER, M.D.

1 Q Do you swear that the testimony you are about to give is the truth, the whole
2 truth, and nothing but the truth?
3 A I do.
4 Q Can you please state your name, address and contact information?
5 A David O. Carpenter, M.D. Institute for Health and the Environment, University at
6 Albany, Rensselaer, NY 12144. Phone: 518-525-2660.
7 email: dcarpenter@albany.edu
8 Q Who are you testifying for in this proceeding?
9 A Intervener David Sheldon.
10 Q Are you currently in private medical practice and, if so, could you state the name
11 of your practice and any areas of specialization within the practice?
12 A I am a public health physician and as such do not hold a license to practice
13 patient medicine. My area of specialization is environmental health and disease
14 prevention.
15 Q Are you also associated with the Institute for Health and the Environment at the
16 University at Albany, State University of New York?
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Q. Who are you testifying for in this proceeding?

A. Intervener David Sheldon.

Q. Are you currently in private medical practice and, if so, could you state the name of your practice and any areas of specialization within the practice?

A. I am a public health physician and as such do not hold a license to practice patient medicine. My area of specialization is environmental health and disease prevention.

Q. Are you also associated with the Institute for Health and the Environment at the University at Albany, State University of New York?
Q. Could you tell us briefly what is the scope of research done there and what is your own role at this institute?
A. I am the Director of the Institute for Health and the Environment, a Collaborating Centre of the World Health Organization. The Institute promotes interdisciplinary research on issues relation to both health and the environment in both domestic and international settings.

Q. Have you devoted a substantial part of your career to studying the effects of low-level non ionizing radiation upon human beings?
A. Yes.

Q. Do you understand the purpose of this administrative law case and why we have asked you to contribute your testimony?
A. Yes, I understand that the purpose is for evidence to be heard anew, on remand from the Michigan Court of Appeals, on whether the Commission should permit Detroit Edison Company to charge back the costs of AMI meters, aka “smart meters”, to its customers. I understand the Court of Appeals has directed the Commission to consider the “risks and burdens” of AMI technology, as well as its presumed benefits, before deciding to approve such a source of funding.

Q. Do you have an opinion, based on your professional knowledge and experience, as to whether the widespread deployment of radio transmitting smart meters is a safe and prudent course of action, given the present state of knowledge concerning the effects of such radio transmissions upon biological processes?
A. I do. My belief is that such widespread deployment cannot be justified at this
time based on the peer-reviewed research we have. I would say that universal
deployment of such meters throughout our urban areas amount to an experiment
on the people living in those areas, an experiment without the consent of the
experimental subjects.

Q. Can you substantiate that point?

A. Yes. Earlier this year I was asked to write my concerns about the health hazards
of smart meters. Forty five medical professionals and scientists, who together
have authored hundreds of peer-reviewed articles on the effects of
electromagnetic radiation, joined together with me in a statement expressing our
views on the effects of low level radio frequency and microwave radiation in
general and smart meter radiation in particular. That statement is attached to my
testimony as Exhibit One.

Q. And can you tell us briefly what conclusions were expressed?

A. While smart meters are too new for there to be human health studies specifically
on exposure from smart meters, there is a strong body of evidence that
demonstrates a variety of adverse human health effects, including cancer and
effects on brain and behavior, coming from exposure to radiofrequency radiation
like that generated by wireless smart meters.

Q. To the best of your knowledge, what percentage of the general public could be
called “electro-sensitive”, i.e. people who experience more or less immediate
symptoms when exposed to electromagnetic radiation, such as headaches,
mental confusion, rapid heartbeat and so on?
While the evidence is incomplete for several reasons, most reports indicate that between 5 and 10% of the population show symptoms of electrical hypersensitivity.

Q. Is it possible that electro-sensitive people are like the canary in the mine? Or, more precisely, is it possible that the kind of electromagnetic fields that cause electro-sensitive people to experience immediate symptoms of distress, are also the kind of fields that are likely to cause long term illness to a much larger group of individuals who do not experience immediate symptoms?

A. Yes, this is not only possible but likely.

Q. So would it be fair to say that from a public health standpoint, protecting the most vulnerable among us might well be viewed not only as an act of compassion toward them but also have the effect of protecting the majority of the population from long term diseases like cancer or neurological diseases like Alzheimer’s Disease?

A. This is true.

Q. Is there data on smart meters going back far enough to trace the long term effects of such meters on people?

A. No, but until more data becomes available we have to make inferences based on longer term data that we do have concerning use of cell phones and people living near to radio transmission towers. These studies show that increased radiofrequency exposure increases risk of cancer, and that the most vulnerable parts of the population are children and teenagers.

Q. Have you had occasion to testify previously about such effects?
A. Yes, in January, 2012, I testified concerning the effects of WiFi radiation on school children in the Oregon Public Schools. My legal testimony in that case is attached here as Exhibit Two.

Q. Can you give us a very brief summation in a few sentences as to your conclusions about the Wi-Fi study?

A. As with wireless smart meters, WiFi in schools exposes children constantly to radiofrequency radiation. As with smart meters, the specific health effects from exposure to WiFi have not been determined, but WiFi is radiofrequency radiation. Because children are more vulnerable than adults to radiofrequency radiation, as documented by studies from cell phone use and people living near to radio transmission towers, it is unwise to use WiFi in schools when a wired connection to the Internet does not increase exposure.

Q. Does an opt-out plan really solve the exposure risk you have been describing here and in your exhibits?

A. Not entirely. Not having a smart meter on one’s own home will reduce the potentially harmful exposure, but the customer opting out is still going to be exposed to a whole blanket of electromagnetic radiation from the smart meters of immediate neighbors and from all the transmitting and receiving devices and repeaters the utility must install to allow all these meters to report their data, as well as other sources of radiofrequency radiation.

Q. If a smarter grid is necessary, what would be the best way to implement the necessary metering technology?
A. A properly designed system of wired smart meters using internet cable or fiber optics need not result in any elevated exposure to radio frequencies, but would still provide the utility with information about daily use.

Q. Detroit Edison is currently offering an opt-out meter that they call a “digital meter” which is the Itron smart meter with the radios turned off. We understand that it will store detailed usage information that a meter reader can download through a plug-in connection or through an optical port. Do you believe that this meter entirely solves the problem of RF exposure?

A. I am not familiar with the details of this meter and so cannot comment on whether or not it would be an entirely safe alternative. But, in principle, it should be possible to devise a safe digital meter that could communicate through a plug-in connection, or through hard-wired means.

Q. Is there anything else you would like to add to your testimony today?

A. Exposure to radiofrequency radiation has been shown to result in human disease, and we should take every step within reason to avoid increased exposure. All the benefits of a smart grid technology could be obtained with wired smart meters without increasing the risk of exposure and human disease. But at the very least everyone should have the opportunity to opt-out of having wireless smart meters placed on their home.
EXHIBIT ONE

2012 statement of David O. Carpenter, M.D. and 45 other scientists and health professionals concerning hazards of radiation from 'smart meters'

Institute for Health and the Environment
State University of New York at Albany
We, the undersigned are a group of scientists and health professionals who together have coauthored hundreds of peer-reviewed studies on the health effects of electromagnetic fields (EMFs). We wish to correct some of the gross misinformation found in the letter regarding wireless “smart” meters that was published in the Montreal daily *Le Devoir* on May 24. Submitted by a group Quebec engineers, physicists and chemists, the letter in question reflects an obvious lack of understanding of the science behind the health impacts of the radiofrequency (RF)/microwave EMFs emitted by these meters.

The statement that “Thousands of studies, both epidemiological and experimental in humans, show no increase in cancer cases as a result of exposure to radio waves of low intensity...” is false (1). In fact, only a few such studies, case-control studies of mobile phone use, certainly not thousands, have reported no elevations of cancer, and most were funded by the wireless industry. In addition, these reassuring studies contained significant experimental design flaws, mainly the fact that the populations followed were too small, were followed for a too short a period of time and had used mobile phones for too short a period of time.

Non industry-funded studies have clearly demonstrated a significant increase in cancer cases among individuals who have suffered from prolonged exposure to low-level microwaves, transmitted notably by radio antennas. The effects were best documented in meta-analyses that have been published and that include grouped results from several different studies: these analyses consistently showed an increased risk of brain cancer among regular users of a cell phone who have been exposed to microwaves for at least ten years.

**Brain Cancer Rates**

Furthermore, the argument that brain cancer rates do not indicate an overall increase in incidence is not evidence that cell phones are safe: the latency for brain cancer in adults after environmental exposure can be long, up to 20-30 years. Most North Americans haven’t used cell phones extensively for that long. The evidence of the link between long-term cell phone use and brain cancer comes primarily from Northern Europe, where cell phones have been commonly used since the 1990s.

Children are especially at risk. In May 2012, the U.K.’s Office of National Statistics reported a 50 percent increase in incidence of frontal and temporal lobe tumors in children between 1999 and 2009. This statistic is especially disturbing since in May 2011, after reviewing the published scientific literature regarding cancers affecting cell phone users, the International Agency for Research on Cancer (IARC) classified radiofrequency radiation as a 2B, possible human carcinogen. Despite the absence of scientific consensus, the evidence is sufficiently compelling for any cautious parent to want to reduce their loved one’s exposure to RF/microwave emissions as much as possible, as recommended by various countries such as Austria, Belgium, Germany, Russia and the United Kingdom.
Electrosensitivity
Public fears about wireless smart meters are well-founded. They are backed by various medical authorities such as those of the Santa Cruz County (California) Public Health Department. These authorities are worried about the growing number of citizens who say they have developed electrohypersensitivity (EHS), especially since for many of them, the symptoms developed after the installation of such meters (it takes some time for most people to link the two events).

Since the turn of the millennium, people are increasingly affected by ambient microwaves due to the growing popularity of wireless devices such as cell phones and Wi-Fi Internet. Therefore, the mass deployment of smart grids could expose large chunks of the general population to alarming risk scenarios without their consent. According to seven surveys done in six European countries between 2002 and 2004, about 10% of Europeans have become electrosensitive, and experts fear that percentage could reach 50% by 2017. The most famous person to publicly reveal her electrosensitivity is Gro Harlem Brundtland, formerly Prime Minister of Norway and retired Director of the World Health Organization (WHO).

While there is no consensus on the origins and mechanisms of EHS, many physicians and other specialists around the world have become aware that EHS symptoms (neurological, dermatological, acoustical, etc.) seem to be triggered by exposure to EMF levels well below current international exposure limits, which are established solely on short-term thermal effects (2). Organizations such as the Austrian Medical Association and the American Academy of Environmental Medicine have recognized that the ideal way to treat EHS is to reduce EMF exposure.

Therefore, caution is warranted because the growing variety of RF/microwave emissions produced by many wireless devices such as smart meters have never been tested for their potential biological effects.

Well-known bioeffects
While the specific pathways to cancer are not fully understood, it is scientifically unacceptable to deny the weight of the evidence regarding the increase in cancer cases in humans that are exposed to high levels of RF/microwave radiation.

The statement that “there is no established mechanism by which a radio wave could induce an adverse effect on human tissue other than by heating” is incorrect, and reflects a lack of awareness and understanding of the scientific literature on the subject. In fact, more than a thousand studies done on low intensity, high frequency, non-ionizing radiation, going back at least fifty years, show that some biological mechanisms of effect do not involve heat. This radiation sends signals to living tissue that stimulate biochemical changes, which can generate various symptoms and may lead to diseases such as cancer.

Even though RF/microwaves don’t have the energy to directly break chemical bonds, unlike ionizing radiation such as X-rays, there is scientific evidence that this energy can cause DNA damage indirectly leading to cancer by a combination of biological effects. Recent publications have documented the generation of free radicals, increased permeability of the blood brain barrier allowing potentially toxic chemicals to enter the brain, induction of genes, as well as altered electrical and metabolic activity in human brains upon application of cell phone RF/microwaves similar to those produced by smart meters.

These effects are cumulative and depend on many factors including RF/microwave levels, frequency, waveform, exposure time, bioavailability between individuals and combination with other toxic agents.
Clear evidence that these microwaves are indeed bioactive has been shown by the fact that low-intensity EMFs have proven clinically useful in some circumstances. Pulsed EMFs have long been used to successfully treat bone fractures that are resistant to other forms of therapy. More recently, frequency-specific, amplitude-modulated EMFs have been found useful to treat advanced carcinoma and chronic pain.

High frequency EMFs such as the microwaves used in cell phones, smart meters, Wi-Fi and cordless “DECT” phones, appear to be the most damaging when used commonly. Most of their biological effects, including symptoms of electrohypersensitivity, can be seen in the damage done to cellular membranes by the loss of structurally-important calcium ions. Prolonged exposure to these high frequencies may eventually lead to cellular malfunction and death.

Furthermore, malfunction of the parathyroid gland, located in the neck just inches from where one holds a cell phone, may actually cause electrohypersensitivity in some people by reducing the background level of calcium ions in the blood. RF/microwave radiation is also known to decrease the production of melatonin, which protects against cancer, and to promote the growth of existing cancer cells.

**Early warning scientists attacked**

In recommending that the Precautionary Principle be applied in EMF matters, the European Environment Agency’s Director Jacqueline McGlade wrote in 2009: “We have noted from previous health hazard histories such as that of lead in petrol, and methyl mercury, that ‘early warning’ scientists frequently suffer from discrimination, from loss of research funds, and from unduly personal attacks on their scientific integrity. It would be surprising if this is not already a feature of the present EMF controversy…” Such unfortunate consequences have indeed occurred.

The statement in the *Le Devoir* letter, “if we consider that a debate should take place, it should focus exclusively on the effects of cell phones on health”, is basically an acknowledgement that there is at least some reason to be concerned about cell phones. However, while the immediate exposure from a cell phone is of much greater intensity than the exposure from smart meters, cell phone use is temporary.

**Smart meters**

Wireless smart meters typically produce atypical, relatively potent and very short pulsed RF/microwaves whose biological effects have never been fully tested. They emit these millisecond-long RF bursts on average 9,600 times a day with a maximum of 190,000 daily transmissions and a peak level emission two and a half times higher than the stated safety signal, as the California utility Pacific Gas & Electric recognized before that State’s Public Utilities Commission. Thus people in proximity to a smart meter are at risk of significantly greater aggregate exposure than with a cell phone, not to mention the cumulative levels of RF/microwaves that people living near several meters are exposed to.

People are exposed to cell phone microwaves primarily in the head and neck, and only when they use their device. With smart meters, the entire body is exposed to the microwaves, which increases the risk of overexposure to many organs.
In addition to these erratic bursts of modulated microwaves coming from smart meters that are transferring usage data to electric, gas and water utilities, wireless and wired smart (powerline communication) meters are also a major source of "dirty electricity" (electrical interference of high frequency voltage transients typically of kilohertz frequencies). Indeed, some scientists, such as American epidemiologist Sam Milham, believe that many of the health complaints about smart meters may also be caused by dirty electricity generated by the "switching" power supply activating all smart meters. Since the installation of filters to reduce dirty electricity circulating on house wiring has been found to relieve symptoms of EHS in some people, this method should be considered among the priorities aimed at reducing potential adverse impacts. Indeed, the Salzburg State (Austria) Public Health Department confirms its concern about the potential public health risk when in coming years almost every electric wire and device will emit such transient electric fields in the kilohertz-range due to wired smart meters.

**Rather be safe than sorry**

The apparent adverse health effects noted with smart meter exposure are likely to be further exacerbated if smart appliances that use wireless communications become the norm and further increase unwarranted exposure.

To date, there have been few independent studies of the health effects of such sources of more continuous but lower intensity microwaves. However, we know after decades of studies of hazardous chemical substances, that chronic exposure to low concentrations of microwaves can cause equal or even greater harm than an acute exposure to high concentrations of the same microwaves.

This is why so many scientists and medical experts urgently recommend that measures following the Precautionary Principle be applied immediately — such as using wired meters — to reduce biologically inappropriate microwave exposure. We are not advocating the abolishment of RF technologies, only the use of common sense and the development and implementation of best practices in using these technologies in order to reduce exposure and risk of health hazards.

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1. **Scientific papers on EMF health effects**
2. **Explanation and studies on electrosensitivity**
3. **Governments and organizations that ban or warn against wireless technology**

- David O. Carpenter, MD, Director, Institute for Health & the Environment, University at Albany, USA
- Jennifer Armstrong, MD, Past President, Canadian Society of Environmental Medicine, Founder, Ottawa Environmental Health Clinic, Ontario, Canada
- Pierre L. Auger, M. D., FRCPC, Occupational medicine, Multiclinique des accidentés 1464, Montreal, Quebec, Canada
- Fiorella Belpoggi, Director Cesare Maltoni Cancer Research Center, Ramazzini Institute, Bologna, Italy
- Martin Blank, PhD, former President, Bioelectromagnetics Society, Special Lecturer, Department of Physiology and Cellular Biophysics, Columbia University Medical Center, New York, USA
- Barry Breger, MD, Centre d’intégration somatosophique (orthomolecular medicine), Montreal, Quebec
- John Cline, MD, Professor, Institute for Functional Medicine, Federal Way, WA, USA, Medical Director, Cline Medical Centre, Nanaimo, BC, Canada
- Alvaro Augusto de Salles, PhD, Professor of Electrical Engineering, Federal University of Rio Grande do Sul, Porto Alegre, Brazil
- Christos Georgiou, Prof. Biochemistry, Biology Department, University of Patras, Greece
- Andrew Goldsworthy, PhD, Honorary lecturer in Biology, Imperial College, London, UK
- Claudio Gómez-Perretta, MD, PhD, Director, Centro de Investigación, Hospital Universitario LA Fe, Valencia, Spain
- Livio Giuliani, PhD, Senior Researcher, National Insurance Institute (INAIL), Chief of Radiation and Ultrasound Research Unit, Rome, Italy
- Yury Grigoriev, PhD, Chair Russian National Committee on Non-Ionizing Radiation Protection, Moscow, Russia
- Settimio Grimaldi, PhD, Director, Institute of Translational Pharmacology (Neurobiology and molecular medicine), National Research Council, Rome, Italy
- Magda Havas, PhD, Centre for Health Studies, Trent University, Canada
- Lennart Hardell, MD, Professor of Oncology, University Hospital, Örebro, Sweden
- Denis L. Henshaw, PhD, Professor of Physics, Head of The Human Radiation Effects Group, University of Bristol, UK
- Ronald B. Herberman, MD, Chairman of Board, Environmental Health Trust, and Founding Director emeritus, University of Pittsburgh Cancer Institute, USA
- Donald Hillman, PhD, Dairy Science, Professor Emeritus, Department of Animal Science, Michigan State University, USA
- Isaac Jamieson, PhD, Environmental Science (electromagnetic phenomena in the built environment), independent architect, scientist and environmental consultant, Hertfordshire, UK
- Olle Johansson, PhD, Professor of Neuroscience (Experimental Dermatology Unit), Karolinska Institute, Stockholm, Sweden
- Yury Kron, PhD, Soviet authority on physics of nonlinear vibrations and high frequency electromagnetic vibrations, founder of Energy Tools International, Oregon, USA
- Henry Lai, PhD, Professor of Bioengineering, University of Washington School of Medicine, Seattle, WA, USA
- Abraham R. Liboff, PhD, Professor Emeritus, Department of Physics, Oakland University, Rochester, Michigan, USA
- Don Maisch, PhD, Researcher on radiation exposure standards for telecommunications frequency, EMFacts Consultancy, Tasmania, Australia
- Erica Mallery-Blythe, MD, Emergency Medicine Physician, England
- Andrew A. Marino, MD, PhD, JD, Professor of Neurology, LSU Health Sciences Center, Shreveport, LA, USA
- Karl Maret, MD, M.Eng., President, Dove Health Alliance, Adept, CA, USA
- Andrew Michrowski, PhD, Director, Planetary Association for Clean Energy, Ottawa, Canada
- Sam Milham, MD, former chief epidemiologist, Washington State Department of Health, USA
- Joel M. Moskowitz, PhD, Director, Center for Family and Community Health, School of Public Health, University of California, Berkeley
- Gerd Oberfeld, MD, Public Health Department, Salzburg State Government, Austria
- Mike O’Carroll, PhD, Professor Emeritus (Applied Mathematics), University of Sunderland, UK
- Jerry L. Phillips, PhD, Director, Center for Excellence in Science, Department of Chemistry and Biochemistry, University of Colorado, USA
- John Podd, PhD, Professor of Psychology (experimental neuropsychology), Massey University, New-Zealand
- William J. Rea, MD, thoracic and cardiovascular surgeon, founder of the Environmental Health Center, Dallas, Tx, USA
- Elihu D. Richter, MD, Professor, Hebrew University-Hadassah School of Public Health and Community Medicine, Jerusalem, Israel
- Leif G. Salford, MD, Senior Professor of Neurosurgery, Lund University, Sweden
- Nesrin Seyhan, MD, Founder and Chair of Biophysics, Medical Faculty of Gazi University, Turkey
- Cyril W. Smith, PhD, lead author of “Electromagnetic Man”, retired from Electronic and Electrical Engineering, University of Salford, UK
- Morando Soffritti, MD, Scientific Director of the European Foundation for Oncology and Environmental Sciences “B. Ramazzini” in Bologna, Italy
- Antoinette “Toni” Stein, PhD, Collaborative on Health and the Environment (CHE-EMF Working Group), Co-Coordinator, Berkeley, CA, USA
- Stanislaw Szmigielski, MD, PhD Professor of Pathophysiology, Consulting Expert, former director of Microwave Safety, Military Institute of Hygiene and Epidemiology, Warsaw, Poland
- Bradford S. Weeks, MD, Director, The Weeks Clinic, Clinton, WA, USA
- Stelios A. Zinelis, MD, Vice-President, Hellenic Cancer Society, Cefallonia, Greece
EXHIBIT TWO

Testimony of Dr. David O. Carpenter
Concerning health effects of WiFi System
In Portland, Oregon Public Schools

Testimony given under oath
December 20th, 2011
In United States District Court
District of Oregon
Portland Division
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 WiFi:

Page 1 – Amended Declaration of Dr. David O. Carpenter, M.D.
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.


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 Unite 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 \( \sim 12.2 \text{ cm or } \sim 4.8 \text{ inches} \), 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 without limitation that PM MW radiation with chronic duration is quite harmful to humans, particularly children, as well as to animals and plants.

Page 7 – Amended Declaration of Dr. David O. Carpenter, M.D.
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.

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.


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. Al 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. 165:601-605. 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.


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:

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.


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.

g. Eliyahu I, Luria R, Hareuveny R, Margaliot 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 Scie 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.

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 is 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 ate 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.


b. Cell membrane reaction is lipid peroxidation.


c. Free-Radical Damage:


d. mRNA:


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*


f. Micronuclei formation:


g. DNA repair disruption:


h. Immune response suppression:


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 retrigged 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.

[Signature]

DR. DAVID O. CARPENTER, M.D.
Director, Institute for Health and the Environment
University at Albany

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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/Centers, Albany, New York

Editor-in-Chief: Cellular and Molecular Neurobiology, 1981 - 1987
Editorial Advisor: Cellular and Molecular Neurobiology, 1987 - Present
International Journal of Occupational Medicine & Environmental Health 1996 – Present

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Journal of Alzheimer's Disease – Associate Editor, 2007-2009
Reviews in Environmental Health; 2008-present
International Archives of Occupational and Environmental 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
1986-1987 Member, Neurophysiology Peer Panel for the National Aeronautics and Space Administration
1987-1989 Member, Science Advisory Council of the American Paralysis Association
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
1994-1997 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
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.
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:

1964       Elected to Phi Beta Kappa and to Sigma Xi
           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

Page 26 – Amended Declaration of Dr. David O. Carpenter. M.D.
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) 

           $76,847 total direct costs. 
           $464,786 total direct costs. 
           $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. 
           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. ACentral/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, AIndoor 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, 
           ACooperative 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. AMultidisciplinary 
           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.


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:


Major Peer-Reviewed Publications:


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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.


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322. Sergeev AV and Carpenter DO (2010) Residential proximity to environmental sources of persistent organic pollutants and first-time hospitalizations for myocardial infarction with

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Books:


Reviews and Book Chapters:


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...*


Other Publications:

PREVIOUS DEPOSITIONS AND TESTIMONY (past seven years):


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.


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

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