

# Monsanto's Sealed Documents Reveal the Truth behind Roundup's Toxicological Dangers

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*The year 2015 hasn't been kind to Monsanto. In March, the World Health Organization declared that the company's flagship product, its herbicide glyphosate or Roundup, is a probable human carcinogen. Increasingly, national health ministries are taking a hard second look at glyphosate's health and environmental dangers and efforts are underway to ban the herbicide.[1] To protect its citizens, last year the Netherlands, Bermuda and Sri Lanka have either banned or imposed strict limits on Roundup. Last June, France banned its use in gardens. Brazil, Germany and Argentina are considering legislative bans. And this month, California's environmental protection agency launched plans to label Roundup as a carcinogen.[2]*

Glyphosate is the most widely used herbicide in the world today. Over 130 countries currently permit extensive use of the chemical. The US is the largest consumer, using approximately 20% of the world's Roundup.[3] The latest reliable figures from the US Geological Survey record 280 million pounds of Roundup were used in 2012, nearly a pound for every American.[4] In 2013, gross profit of \$371 million on crop chemicals including Roundup climbed 73% due to a 37% increase in sales. That same year Monsanto's net income rose 22% to \$1.48 billion.[5]

Over the years a large body of independent research has accumulated and now collectively provides a sound scientific rationale to confirm that glyphosate is far more toxic and poses more serious health risks to animals and humans than Monsanto and the US government admit. Among the many diseases and health conditions non-industry studies identified Alzheimer's, Parkinson's and autism since Roundup has been shown to instigate aluminum accumulation in the brain. The herbicide has been responsible for reproductive problems such as infertility, miscarriages, and neural tube and birth defects. It is a causal agent for a variety of cancers: brain, breast, prostate, lung and non-Hodgkin lymphoma. Other disorders include chronic kidney and liver diseases, diabetes, heart disease, hypothyroidism, and leaky gut syndrome. In addition to lung cancer, glyphosate may be responsible for today's growing epidemics of chronic respiratory illnesses among farm workers and their families.[6] However, these findings derive from outside the Big Agriculture industry. Private industries routinely defend themselves by positing their own research to refute independent reports. Consequently, for several decades it has been a he-said-she-said stalemate. Monsanto is content with this. It can conduct business as usual, Roundup sales increase, and the debates and media wars continue without government interference. Then who is protecting the public?

Government officials and health regulators more often than not simply ignore these studies

even if published in peer-reviewed journals. The bulk are independently funded. Most have been performed in foreign nations and therefore American bias dismisses them outright. Furthermore, Monsanto and other large chemical agricultural companies are quick to counter and discredit adverse scientific findings. The company has the financial means to retain large international PR firms, such as Burson-Marsteller and Fleishman Hillard, consultation firms and think tanks, as well as large armies of hired trolls and academic spokespersons to mobilize damage control upon notice and protect the integrity of Monsanto's products and public image. It funds and orchestrates self-serving research at universities and research laboratories to increase an arsenal of junk science. And of course it has Hillary Clinton and Bill Gates as its celebrity cheerleaders.

The EPA continues to align itself with Monsanto's safety claims and limits glyphosate's risks to kidney, reproductive and carcinogenic damage; and the warning only applies for very long-term exposure to high levels of the toxin. Anything under that is considered harmless. The EPA continues to approve small amounts of glyphosate as safe in drinking water to children. Its safety level is 0.7 ug/L. This was determined back in 1994, and after 20 years of further research into glyphosate's biomolecular activities and health risks, the level has remained the same.[7,8] A review of existing data sponsored by Moms Across America found that out of 21 drinking water samples analyzed, 13 had glyphosate levels between 0.08 and 0.3 ug/L, well below the EPA's limit, but significantly above the European Union's limit of 0.1 ug/L.[9]

While the company manages to successfully dodge scientific research outside its purview, the tables would certainly turn if it could be proven in a court of law that Monsanto has known for decades that glyphosate is one of the most toxic substances ever launched on the public, which adversely affects almost every tissue and cell in a mammal's body.

Imagine for a minute that evidence emerged to implicate Monsanto on a massive cover-up and manipulation of scientific data from hundreds of research trials. If it were Monsanto's data indicting itself about glyphosate's toxicity, and if it can be shown the company falsified, masked or fudged its data to win regulatory approval, it may likely be the largest corporate scandal in history. The question could Monsanto be charged with crimes of omission and more deservingly crimes against humanity?

This scenario may not be fantasy or the wishful thinking of GMO's opponents. The case has a precedent and has been played out in the courts before. In November 1998, the US government won a judgment against the four largest US tobacco companies: Philip Morris, RJ Reynolds, Brown & Williamson, and Lorillard. The case came to trial after a former vice president of research and development at Brown & Williamson, Jeffrey Wigand, turned whistleblower and revealed that his company concealed the tobacco's health risks and was making concerted efforts to addict people to smoking. High ranking executives were found to have approved the inclusion of known addictive and carcinogenic chemicals, such as coumarin, in its cigarettes to increase smoking, sales and profits.

Before the trial there had never been a lawsuit lost by a tobacco company because no one could prove with absolute medical certainty that smoking had ever caused lung cancer or emphysema. During Congressional hearings, all seven CEOs representing the four tobacco giants lied under oath stating they had no knowledge about an association between nicotine and brain addiction. Their rationale was that they believed their research data and marketing strategies were protected under propriety secrecy claims and therefore they could avoid conviction. Although FDA scientists possessed all the necessary information that

could condemn Big Tobacco's false claims, the industry relied upon proprietary rules in order to hide behind legal protection. The FDA was silenced and powerless to make the industry's information public. Consequently it is estimated that millions of people died from a risk that could have been prevented or at least reduced substantially. Instead, the FDA honored the tobacco industry above all human life.

The guilty verdict, which resulted in the Tobacco Master Settlement Agreement against the tobacco companies, enforced a minimum \$206 billion settlement over a 25 year period. While the majority of payments were to settle 46 states' Medicaid lawsuits to recover smoking related health costs, the settlement unfortunately exempted the industry from private tort claims. Many critics of the Agreement state that the settlement was too merciful. No tobacco executive went to prison and evidence indicates the industry emerged stronger and consolidated the companies into an ever more powerful cartel.[10]

What busted the tobacco companies was not the scientific evidence piling up outside the industry. Rather it was its crimes of omission about cigarettes' health risks within the industry. The industry's own research prosecuted itself. And this is demanded today in order to bring down Monsanto's chemical regime and to protect populations and children throughout the world.

Perhaps we might want to consider the atmosphere Monsanto faced after it first developed glyphosate in 1973 and prepare for EPA approval for the remainder of the decade.

During the latter half of the 1970s, Monsanto's leading products were under federal inquiry and public assault regarding safety. Dioxin had been banned. Safety concerns arose over its sweetener saccharin, and cyclamate was removed from the market. The company's attempts to get its new artificial sweetener aspartame confronted obstacles during FDA scientific review. Independent research had shown that aspartame caused brain tumors in mammals. And its best selling herbicide at the time, Lasso, was showing signs of carcinogenicity. Today Lasso is a restricted-use pesticide due to its oncogenicity. With sales falling and future growth under threat, Monsanto faced a desperate need to launch a new and novel flagship product. Monsanto found itself banking its future on its new herbicide glyphosate. As we recently discovered, enormous amounts of research, analysis and hundreds of trials were conducted to learn as much as possible about the compound's bioactivity in mammals and its potential health risks. All of this research data, studies and reports were subsequently sealed as trade secrets upon submission to the EPA. For over thirty years it has sat in the EPA vaults.

Monsanto has yet to be caught and charged for falsifying scientific data on glyphosate. However on earlier occasions two laboratories Monsanto outsourced research to were caught and indicted. In 1978, the EPA busted Industrial Biotest Laboratories for rigging laboratory results; the company's executives were found guilty for submitting fabricated data supporting glyphosate positively to the government. In 1991, another firm, Craven Labs, was found guilty on similar charges with 20 felony counts.[11]

To this day, Monsanto continues to assert that Roundup is environmentally friendly. We are told it biodegrades rapidly and therefore poses no long-term risks after repeated usage. We are told that the herbicide is ideal for weed control. Throughout the US, it is liberally sprayed on our public parks, school playgrounds, sporting fields, and throughout our lawns and gardens. We are told it doesn't bio-accumulate in the body's cells and tissues and is excreted rapidly. We are also told that glyphosate toxicity is dose specific. Only exceedingly

high levels of the pesticide pose any serious health risks.[12]

How factual are these claims or are they mere propaganda to obscure scientific truths far more deceptive and sinister? To answer that we would have to know for certain whether or not Monsanto conducted long-term studies on glyphosate that revealed devastating toxic effects on mammal health. We would need evidence that their own data clearly negates their scientific declarations, and that the company intentionally, and with forethought, either distorted or concealed data from federal regulatory officials and the public.

There is now an enormous cache of evidence on both scientific and legal grounds that Monsanto in fact conducted numerous studies in the 1970s and 1980s on glyphosate's toxicity and health risks and intentionally sealed this research from independent and public review and scrutiny. As with Big Tobacco's proprietary claims that prevented the FDA from publicly warning Americans about the dangers of smoking, the EPA has sat on Monsanto's own deleterious data for decades.

Anthony Samsel is an independent research scientist working internationally in the interest of public health and the environment. He is a member of the Union of Concerned Scientists, and a former scientist and consultant at Arthur D. Little, one of the world's leading management consulting firms. Now retired, Samsel has devoted much of his independent research on Roundup's toxicological characteristics and bioactivity. Unable to gain access to research reports and data Monsanto submitted to the EPA through FOIAs, he turned to his senator's office, who assisted in the procurement of studies and reports he sought. Months later he received a hoard of scientific documents, over 15,000 pages worth, covering Monsanto's complete glyphosate research.

With his co-investigator Dr. Stephanie Seneff at MIT the two have been reviewing Monsanto's data. Their conclusion is Monsanto's claims about glyphosate's safety are patently false. The company has known for almost four decades that glyphosate is responsible for a large variety of cancers and organ failures. Clearly it was for this reason that Monsanto demanded the data and reports to be sealed and hidden from public scrutiny as proprietary trade secrets.

During an exclusive interview on the Progressive Radio Network on September 4, Samsel stated that Monsanto used an industry trick to dismiss evidence about glyphosate's risks in its own research. "Monsanto misrepresented the data," says Samsel, "and deliberately covered up data to bring the product [glyphosate] to market." [13]

In order to minimize and cancel out its adverse findings, Samsel explained that Monsanto had relied upon earlier historical animal control data, toxicological research with lab animals afflicted with cancer and organ failures, and completely unrelated to glyphosate. In some cases the control animals displayed kidney, liver and pancreatic diseases. Many of Monsanto's own studies required the inclusion of extraneous studies in order to cancel out damaging results. This is not an uncommon industry habit, particularly in toxicological science. It enables corporations to mask undesirable outcomes and make claims that observable illnesses and disease are spontaneous occurrences without known causal factors. Frequently, Monsanto would have to rely on three external control studies to negate the adverse effects of a single one of its own. Samsel found other incidences in Monsanto's data where 5, 7 and in one case 11 unrelated studies were necessary to diminish the severity of its own findings. In effect, glyphosate received licensure based upon a platform

of junk tobacco science. By ignoring cause and effect relationships behind the onset of multiple cancers and other life-threatening diseases throughout many of its research trials, Monsanto engaged in a radical scientific denialism that has since raked in tens of billions of dollars.

But the cache of Monsanto documents, after Samsel's and Seneff's review, reveals much more that we should be worried about.

In addition, Monsanto's studies included doses from low to high range. Samsel observed that low glyphosate doses were equally if not more toxic than higher doses. The company later discontinued low dose trials, relying only on higher levels because it is customarily assumed to have greater toxicological risks. Samsel's observation has recently been confirmed by a study published in the August issue of the Environmental Health Journal by scientists at Kings College London and the University of Caen in France. The two year study found that glyphosate administered at an ultra low dose of 0.1 ppb (the EU's safety limit) in drinking water altered over 4000 gene clusters in the livers and kidneys of rats. These alterations, the study reports, "were consistent with fibrosis, necrosis, phospholipidosis, mitochondria membrane dysfunction and ischemia." [14] Consequently low doses of Roundup are far more toxic than US EPA limits.

During its years investigating glyphosate's bioactivity, Monsanto conducted hundreds of trials on mice, rats, beagle dogs, rabbits and other life. Among the many cancers and diseases Monsanto's own research found associated with glyphosate are:

- Adenoma cancer in the pituitary gland
- Glioma tumors in the brain
- Reticular cell sarcomas in the heart
- Malignant tumors in the lungs
- Salivary mandibular reticular cell carcinoma
- Metastatic sarcomas of the lymph gland
- Prostate carcinoma
- Cancer of the bladder
- Thyroid carcinoma
- Adrenal reticulum cell sarcomas
- Cortical adenomas
- Basal cell squamous skin tumors

In female mammals there were cancers of the lung, liver, thymus, stomach, bladder adrenal glands, ovaries, colon, uterus, parathyroid and mammary glands.

Samsel and Seneff also noticed that Monsanto had conducted many long-term studies, as much as two years, on mice and rats. When Gilles-Eric Seralini and his French team reproduced and extended the length of Monsanto's 3-month GMO maize rat-fed study for the life of the animals, they observed profuse cancer and tumor development started after the 4th month of the study. Monsanto continues to stand by its 3-month study as sufficient proof of GM maize's safety. Yet the thoroughness and variety of Monsanto's research operations should give strong reason to suspect that Monsanto has likewise conducted long term studies and knows all too well the deleterious effects of its pesticides, herbicides and genetically modified crops.

One of Monsanto's claims is that glyphosate doesn't bio-accumulate in tissues, rapidly bio-degrades and is excreted from the body readily. Contrary to this claim, Monsanto carried out



meticulous studies to determine levels of accumulation and the organs, tissues and cells glyphosate reaches. Glyphosate was radio labeled with carbon 14 and given in 10 mg doses to seven groups of animals, male and female. After only 24 hours, the toxic chemical was found in the lungs and all body fluids: lymph, blood, urine and cerebral spinal fluid. Glyphosate also accumulated in the bone by 30 ppm and in the bone marrow by 4 ppm. Monsanto's studies were comprehensive. It found an accumulation of the chemical in red cells, thyroid, uterus, colon, testes and ovaries, shoulder muscle, nasal mucosa, heart, lung, small intestine, abdominal muscle and the eyes.

Samsel and Seneff noted that the bioaccumulation in the pancreas was not reported. Why would such meticulous efforts be made to measure radio labeled carbon 14 laced glyphosate levels in all the other organs, tissues and bodily fluids and then ignore the pancreas? The scientists believe this was deliberate.

Samsel notes that glyphosate does a "particular number on the lungs." According to a 2014 report by the National Cancer Institute, lung cancer rates have been declining. The decline is largely due to the national decrease in smoking. However, other lung cancers such as adenocarcinomas are on the rise. The NCI is unable to account for this anomaly.[15] Yet the Institute is not considering that Americans are increasingly being exposed to glyphosate in their food, water and environment?

During the PRN interview, Dr. Seneff stated that the pancreas may be driving glyphosate to gather in the lungs. The pancreas is responsible for the release of the enzyme trypsin, which in turn infiltrates the lungs. A study published by Brazil's Universidade Federal de Santa Maria in the medical journal *Ciencia Rural* measured glyphosate's reactivity with digestive enzymes including trypsin. Trypsin activity was found to increase in parallel to higher glyphosate concentrations.[16] Seneff suggests that this may be contributing to the increase of glyphosate in the lungs that is contributing to the dramatic rise in COPD and asthma conditions, as well as lung cancers.

The occurrence of cataracts is rising rapidly, particularly in Mid-Western states such as ND, SD, NB, IA, KS, and MO. According to Prevent Blindness America's statistics, 17% of adults over 40 years have cataract problems. The NIH projects the rate will reach nearly 40% by 2030.[17] Monsanto's study showing glyphosate activity in the eye may be contributing to this epidemic. Dr. Seneff stated that the eye's exposure to sunlight reacts with glyphosate residue thereby potentially making the chemical more toxic. Farmers often apply glyphosate on crops when it is warm, moist and when there is plenty of sunlight in order for the chemical to activate more effectively. These are similar conditions to our eyes during the day.

Monsanto's research was not limited solely to the Roundup compound. It also performed extensive research on glyphosate's individual metabolites, the intermediate molecules that result after Roundup's breakdown through metabolic reactions. Many of these metabolites are every bit as toxic as glyphosate. All the glyphosate metabolites in solutions fed to rats were measured before and after feeding. One of Samsel's more disturbing discoveries was that levels of the metabolite N-Nitrosoglyphosate (NNG) were found in higher concentrations in the rats' feces and urine excretions than the original amount in the feeding solutions. NNG is a known carcinogen and endocrine disruptor. Samsel postulates that our own body's natural nitrous acid reacts immediately with glyphosate, without requiring a catalyst, to produce NNG. Both the EPA and the World Health Organization acknowledge that NNG is present in glyphosate during the manufacturing process. The agencies therefore have

established safety limits for NNG. However, for any endocrine disruptor, there is no realistic safety limit because such chemical disruptors destroy cells on a molecule to molecule basis.

Nitrous acid naturally occurs in the colon, urinary tract and skin tissue. According to the CDC, skin cancer is the most common form of cancer in the US, and affects more men than women. The Skin Cancer Foundation estimates that “each year there are more new cases of skin cancer than the combined incidence of cancers of the breast, prostate, lung and colon.”[18,19] Basal cell and squamous cell carcinomas are the two most common forms, both which have been identified by Monsanto with glyphosate exposure, particularly in males. When glyphosate reacts in the skin along with nitrous acid the metabolites NNG contributes to skin melanomas. Other chemicals are added to Monsanto’s Roundup to increase its effectiveness such as the surfactant POEA (polyethoxylated tallow amine), which also increases its toxicity.

We don’t pay enough attention to these other ingredients, Samsel states, because the EPA permits Monsanto to add anything it wants to enhance Roundup’s potency while identifying these substances innocuously as “inert.” When Monsanto convinces the public that glyphosate breaks down quickly, we are not told that the compound’s metabolic byproducts are equally toxic.

Therefore Anthony Samsel’s unprecedented discovery and review of Monsanto’s actual scientific and toxicological data of Roundup has provided us with information that warrants a thoughtful pause. Samsel and Seneff cover the subject in more detail in a new peer-reviewed paper titled “Glyphosate Pathways to Modern Diseases IV: Cancer and Related Pathologies.” The paper has been approved for publication in October.

During recent years dozens of states are submitting bills to label GMO foods. These food crops are heavily laced with glyphosate residue. Not only GM crops, but even non-GM produce are sprayed with Roundup. According to the Organic Consumers Association, non-organic and non-GM foods such as wheat, barley, oats, flax, peas, lentils, beans and sugar cane are also being sold to farmers “as a dessicant, to dry out all their crops so they could harvest them faster.”[20] Monsanto, Dupont, Syngenta, Grocery Manufacturers of America and other agro-chemical companies are aggressively combating labeling efforts. The Big Ag lobby is today pushing for a national bill to prevent GMO labeling that would supersede individual state’s rights. We can only wonder what the voting outcome in California, Colorado, Washington and Oregon may have been had Monsanto’s own research been made available to the media and public. Is it therefore not time for full Congressional hearings to learn the truth once for all and make the disclosure of Monsanto’s Roundup research public for all?

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