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# Pervasive Microplastics Are Damaging Your Cells

Analysis by Dr. Joseph Mercola Fact Checked

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## STORY AT-A-GLANCE

- Plastic is a problem for the environment, wildlife and human health. Laboratory data show how microplastics at levels relevant to human consumption led to cell death and allergic reactions
- Interestingly, the data also showed that irregularly shaped particles commonly found in the environment, and not the spherical microplastics normally used in lab experiments, caused damage
- Researchers have found microplastics in the air, oceans, tap water, food supply and bottled drinking water. They have also been found on the peak of Mount Everest and the deepest parts of the ocean
- Evaluations of baby meconium, a newborn's first stool, had plastic chemicals, likely transferred through the placenta after the mother's exposure. Concentrations in infant stool was 10 times higher than in adults
- Single-use plastic medical products rose significantly during the COVID pandemic, contributing to an excessive amount of pollution. More than 8 million tons of COVID-related plastic waste was generated globally, and more than 25,000 tons has entered the oceans

Plastic is a problem. Since being developed, plastic has become a part of nearly every facet of daily life. As a result, there is a staggering amount of plastic that enters the environment as people dispose of single-use products, like water bottles, personal care products or plastic grocery bags. Researchers have discovered these microparticles damage human cells.[1]

Clothing made with synthetic plastic fibers designed to stretch and "breathe" releases microfibers into the water supply[2] and each time a plastic product is damaged, scraped or abraded it releases microparticles into the air.[3] In the U.S., for example, car tires, brakes and road surfaces contain plastics. The friction of the tires on the road and brake use causes plastic to be released into the air.

These are just a few of the ways that plastic particles may be ingested or inhaled. While you likely do not experience the direct effect every day, plastics are quite literally choking our ecosystem. Once airborne, plastics may stay in the atmosphere for up to 6.5 days and under the right conditions may travel between continents.[4]

The amount of plastic that enters the environment grows each year as manufacturers continue to produce products in disposable containers and consumers continue to demand a disposable lifestyle. At a time when advocacy groups warn that plastics are falling from the sky[5] and have become a global tragedy,[6] the COVID-19 pandemic has driven the plastic problem to even greater heights.

## Microplastics Trigger Cell Damage and Death

Scientists have been collecting data on how plastics impact the environment, wildlife and human health. However, a November 2021 paper suggests why past data on human health have not been consistent.[7] Past research has highlighted the impact that plastic pollution and microplastic has on the environment and on wildlife.[8,9,10]

Data on the implications on human health have suggested there is emerging evidence that microplastics are toxic, and increase oxidative stress and inflammation.[11] However, many studies have not drawn an association between microplastic consumption or inhalation and disease, and instead identify research gaps and recommend further study.[12]

The 2021 lab data published in the Journal of Hazardous Material[13] was the first to find microplastic damaged human cells at levels relevant to the number of particles humans ingest. The study found that microplastics trigger cell death and allergic reactions.

The study was a meta-regression analysis of the toxicological impact that microplastics have on human cells. The scientists analyzed 17 studies, comparing the level of microplastics that cause cell damage and are consumed through water, seafood and table salt. Evangelos Danopoulos from Hull York Medical School in the U.K. led the study. He commented on the results:[14]

> *"Harmful effects on cells are in many cases the initiating event for health effects. We should be concerned. Right now, there isn't really a way to protect ourselves. Once the plastic is in the environment, we can't really get it out. It [research on plastics] is exploding and for good reason. We are exposed to these particles every day: we're eating them, we're inhaling them. And we don't really know how they react with our bodies once they are in."*

The researchers looked at five biological endpoints, including cytotoxicity, immune response, oxidative stress, barrier attributes and genotoxicity. In the 17 studies evaluated, only genotoxicity did not meet the endpoint measurement.

Additionally, the researchers found that it was irregularly shaped microplastics that cause cell damage and not the spherical microplastics that are normally used in laboratory experiments.[15] This suggests that past laboratory research using spherical microplastics may not fully represent the damage microplastics can cause on human health.

## Plastics: We Breathe Them, Drink Them and Eat Them

Danopoulos said the team's next step is an animal study to evaluate health damage, as a human study would not be ethical. Microplastics researcher Steve Allen spoke with a reporter from The Guardian. He was encouraged by the results, commenting:[16]

> *"This work helps inform where research should be looking to find real-world effects. It was interesting that shape was so important to toxicity, as it confirms what many plastic pollution researchers believed would be happening — that pristine spheres used in lab experiments may not be showing the real-world effects."*

Unfortunately, the ubiquitous nature of plastics in the environment has meant that globally most, if not all, people have been exposed to, and have ingested or inhaled, microplastic particles. A study published in late 2020 found microplastics in the snow and water samples on Mount Everest.[17]

An analysis of the lowest place on the planet — water samples from the Mariana Trench in the Western Pacific Ocean — revealed the highest levels of microplastics found in the open ocean.[18] Every ocean beach that has been tested has contained tiny plastic fibers[19] and researchers have identified microplastics in the sediment from the Amazon River in Brazil.[20]

In 2017, The Guardian[21] published results of an investigation by Orb Media, which revealed 83% of the samples of tap water collected from more than one dozen nations contained plastic fibers. The U.S. had the highest rate of contamination in this study.

Bottled water has a similar rate of microplastic contamination. Researchers[22] with the department of chemistry at the State University of New York Fredonia purchased 11 brands of bottled water from 19 locations in nine different countries. They found microplastic contamination in 93% of them.

The researchers wrote,[23] "Plastics become microplastics become nanoplastics, but they are all plastics, just of increasingly smaller size, allowing them to be more easily ingested and perhaps even cross the gastrointestinal tract to be transported throughout a living organism," referring to the increasingly smaller size that plastics break down to in the environment.

## Plastics in Your Clothing Are Absorbable Through Your Skin

Sherri Mason, Ph.D., professor of chemistry in the department of geology and environmental sciences at State University New York Fredonia, has spent years studying microplastics in the water supply. In an article in American Scientist, she explains the relationship between airborne microplastic fibers and water contamination.[24]

> *"In 2017 we examined 159 samples of tap water collected from 14 different countries. Eighty-eight percent of these samples showed evidence of microplastic contamination, with an average of 5.5 particles per liter. Almost all (98 percent) of these particles were microfibers, which suggests that air is the primary source of contamination."*

One study reported in National Geographic found 90% of table salt contained microplastics[25] and The Guardian[26] reported that research by Mason found Americans could be ingesting 660 particles of plastic every year if they consume[27] 2,300 milligrams of salt each day.

Takeout food containers are another source of ingesting microplastics. One study[28] published in 2020 found microplastics in different types of takeout containers, with the highest level found in those made of polystyrene. As you can see, when you consider that you likely use tap water when you cook, many of the foods and beverages you eat and drink could contain microplastics.

BPA is a plastic additive used to reinforce products.[29] In an article in the San Franscico Chronicle,[30] the Center for Environmental Health reported months of testing revealed even small clothing items for babies, children and adults could contain BPA at levels 31 times higher than the limit placed by California environmental law.

BPA is an endocrine disruptor that mimics human hormones and can be absorbed through the skin. Early life exposure can increase the risk of developing disease. When the CEH tested socks, they found BPA only in those that were made with polyester and spandex. They initiated litigation against Adidas, Champion, GAP, Hanes, New Balance and Reebok with the intent of forcing the apparel sector to remove the toxic substance from socks.[31]

## Plastic Ingestion Starts at an Early Age

Our addiction to plastic has meant that even newborns are exposed to microplastics. A market report[32] in 2021 showed the baby bottle market would reach $3.5 billion by 2026 and plastic bottles would account for $1.7 billion, or 48.5% of the market share. One study[33] published in 2020 analyzed the release of microplastics from plastic baby bottles to which infants may be exposed while consuming formula.

The team was led by John Boland, Ph.D., from Trinity College Dublin.[34] The analysis showed the bottles leaked a wide range of particles, from an average of 4 million up to 16 million plastic particles per liter. Boland commented on the study:[35]

> *"We were surprised by the quantity. Based on research that has been done previously looking at the degradation of plastics in the environment, we had a suspicion that the quantities would be substantial, but I don't think anyone expected the very high levels that we found."*

The researchers predicted[36] that, globally, infants up to 12 months old may be exposed to 14,600 to 4.55 million microplastic particles a day, depending on region, which is higher than previously recognized due to the widespread usage of polypropylene baby bottles.

Not surprisingly, then, another study[37] in late 2021 showed a disturbing amount of plastic in baby poop. The researchers found polyethylene-terephthalate (PET) in meconium samples, which is a baby's first stool.

The concentration in infant stool was 10 times higher than what was found in adult samples.[38] The plastic particles found in meconium samples suggests microplastics are passing from mother to baby through the placenta.

## COVID-Related Medical Waste Intensifies Plastic Problem

Plastic use and pollution are the driving forces behind the growing challenge with microplastics in the environment and our food and water supply. During the pandemic, the problem grew at a far faster rate than it has in recent years. This is due in part to the waste from discarded masks, gloves and other personal protective items.

The single-use medical plastic items have intensified the "pressure on an already out of control problem," finds a recent study.[39] The result of this analysis shows that more than 8 million tons of plastic waste associated with the pandemic were generated and more than 25,000 tons have entered the oceans. Roughly three-quarters of the waste was produced by hospitals,[40] which poses a long-lasting problem.

The paper calls for better medical waste management to protect the oceans[41] and ultimately our food supply. The study categorized the amount of waste for different areas of the world. They found that only 30% of all COVID cases were detected in Asia, yet the region was responsible for 72% of the plastic waste discharge.[42]

In addition to medical waste and personal protective equipment, the researchers also found larger quantities of packing material[43] in the ocean and waterways, likely from the increase in online shopping during lockdowns. This made up 4.7% of the waste that entered the environment since the start of the pandemic.

Researchers predict that 70.5% of the waste deposited during the pandemic will end up on beaches by the end of the century. One crowdsourced project[44] is tracking instances and observations of wildlife interacting with plastics and PPE litter, as well as noting cases where animals are trapped, tangled or ingesting the COVID-19 trash.

## DARPA Wants Military Plastic Waste Transformed to Food

Apparently, there is not enough plastic pollution in the food supply, so the Defense Advanced Research Projects Agency (DARPA) awarded Iowa State University and partners a $2.7 million grant to create a process that would make food from plastic and paper waste.[45]

The intention is to use the product to feed the military men and women who have dedicated their lives to defending this country. They believe the ability to turn the paper and plastic waste products into a consumable could help with short-term "nourishment" and improve military logistics for extended missions. They estimate the total award could reach $7.8 million before the project ends.[46]

The system seeks to convert plastic waste into fatty alcohols and fatty acids and paper into sugar that would then be bioprocessed by single cell organisms into an edible mass rich in protein and vitamins. In other words, the hope is that microorganisms can convert the endocrine-disrupting chemicals found in plastic to vitamins and proteins.

DARPA also awarded Michigan Tech[47] researchers $7.2 million to turn plastic waste into protein powder and lubricants. Battelle, a large research firm, announced in February 2021 that DARPA had awarded an undisclosed amount to create a process that "quickly convert[s] energy-dense waste into a useful substance to support expeditionary operations and stabilization missions."[48]

DARPA wants to turn plastics that leach hazardous chemicals, which researchers have found threaten human health,[49] into food stuff for the U.S. military. However, in an era where fake meat is valued over regeneratively and biodynamically grown real meat,[50,51] it doesn't take much to imagine that the next step could be plastic food for all.


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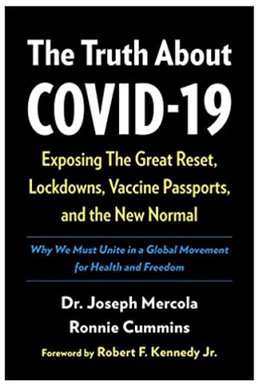


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**juststeve**

Joined On 1/5/2012 11:13:54 AM

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* "DARPA Wants Military Plastic Waste Transformed to Food"* Wow! Now Predator Bill Gate's Impossible burgher can have a whole menu you can choke yourself to death with. Bark eaters would get more nutrition.

Reply | Mark as Spam | Posted On 12/22/2021 7:05:22 AM

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**cat86887**

Joined On 11/9/2017 5:28:11 AM

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Further illustrating the lack of critical thinking ability: saw a restaurant with a "Plastic straws suck" posted next to an assurance their employees use PPE at work. My head wanted to explode.

Reply | Mark as Spam | Posted On 12/22/2021 5:51:41 AM

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**Randyfast**

Joined On 5/6/2010 8:42:42 PM

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"This is due in part to the waste from discarded masks, gloves and other personal protective items." Thank you for mentioning that "elephant in the room". I was beginning to think that I was the only one noticing. Everywhere I go, I see those items littering the landscape. Those masks (especially from China), are full of microplastics, heavy metals and other toxins. There have been at least, hundreds of millions of them manufactured (all under the guise of covid) and there hasn't been a peep about this massive pollution problem from the talking heads who "claim" to care about the environment. Let's never forget the BILLIONS of $$$ that the already rich and greedy are making - from every aspect of this Covid Con.

Reply | Mark as Spam | Posted On 12/22/2021 5:49:26 AM

Like Dislike

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**Pete.Smith**

Joined On 10/11/2013 8:19:55 AM

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New study: People With IBD Have More Microplastics in Their Feces Dec. 22, 2021 — Microplastics -- tiny pieces of plastic less than 5 mm in length -- are everywhere, from bottled water to food to air. According to recent estimates, people consume tens of thousands of these particles each year, with unknown health consequences. www.sciencedaily.com/.../211222084024.htm ~ If you leave a clean plate for only half an hour it will collect hundreds of plastic microfibers that fall from the indoor air, a study found. So they fall on your food also.

On tv there was a demonstration of this. They had a clean fish, then a women in a red dress prepared the fish for frying. It took only a minute. Then they looked closed-up at the fish again. It had collected a few red microfibers, clearly coming from the dress. They found those microfibers in beer, bottled water in Europe and USA. Globally, we are ingesting an average of 5 grams of plastic every week, the

equivalent of a credit card, a new study suggests. d2ouvy59p0dg6k.cloudfront.net/downloads/plastic_ingestion_web_spreads... So imaging a stack of 52 plastic credit cards that you consume each year. And how many fibers you breathe in, that will stay in your lungs? Biggest source of plastics are clothes fibers, then microbeads like found in some toothpastes.

Reply | Mark as Spam | Posted On 12/22/2021 2:07:05 AM

Like Dislike

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**Healthbuf**

Joined On 11/28/2018 1:55:15 AM

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I recently need water and drank some bottled water. I really can't believe it doesn't bother anyone else. I felt this burning sensation in my mouth and throat. It was *terrible*. Years ago when Odwalla was here, I started to take a swig. and it smelled like I as in the middle of an automotive paint booth.

Reply | Mark as Spam | Posted On 12/23/2021 12:05:22 AM

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**MaryRN**

Joined On 11/23/2009 11:22:14 AM

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Sounds like Fahrenheit 451, where you don't eat food, but take a bunch of pills daily, and don't get them confused or they can kill you.

Reply | Mark as Spam | Posted On 12/22/2021 6:28:48 PM

Like Dislike

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**Bitcopper**

Joined On 12/16/2021 1:21:12 PM

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I suspect if you grind everything small enough, it starts to look like a 'piece of plastic'. Solution: burn it, turn it into CO2 and let the plants recycle it into 'new plastic'. The whole notion of landfills is an atrocity. It is like a plastic debt clock ticking tonnage into the future. Nobody said that garbage disposal had to be cheap, did they? How to get cooperation: you want to buy something new? Turn in X tons of clean and sorted waste, or you don't qualify!

Reply | Mark as Spam | Posted On 12/22/2021 7:13:57 AM

Like Dislike

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**Catplat**

Joined On 3/8/2010 7:06:02 AM

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For each Covid test made, one pair of plastic gloves are used and thrown out every time. I'm sorry to say, but humans are the worst invention Mother Earth made. We are killing her nature...

Reply | Mark as Spam | Posted On 12/22/2021 7:04:07 AM

Like Dislike

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**Almond**

Joined On 2/26/2008 4:23:33 PM

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How much baby formula and baby food is packaged in plastic?

Reply | Mark as Spam | Posted On 12/22/2021 2:45:51 AM

Like Dislike

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**mrrobb**

Joined On 6/15/2011 2:41:18 PM

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hypo, shots ,injection devised are made from plastic ....and rammed into a muscle or vein or artery....instant plastic 'rush'

Mark as Spam | Posted On 12/22/2021 3:45:26 AM

Like Dislike

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**Randyfast**

Joined On 5/6/2010 8:42:42 PM

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Most; if not all?

Mark as Spam | Posted On 12/22/2021 5:50:34 AM

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**grulla**

Joined On 1/17/2012 8:03:55 AM

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And whatever happened to paper straws: www.ecoproductsstore.com/paper-straws.html

Mark as Spam | Posted On 12/22/2021 8:13:37 AM

Like Dislike

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**Flamingo123**

Joined On 9/21/2011 9:19:06 PM

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I would love for you to do an article on GeoEngineering and the amount of aluminum and other nano particles, including plastics, that are being sprayed into our atmosphere everyday. I recently moved to the mountains and scaled back work. Now I have a front row seat at watching dozens of jets fly by my house everyday leaving unnatural contrails. I literally watch them changing the weather drastically in a matter of hours. If you have not already explored this topic please go to www.GeoEngineeringWatch.org and watch their movie 'Dimming'. Thank you for all the work you do, I feel privileged to share you emails everyday.

Reply | Mark as Spam | Posted On 12/22/2021 7:50:41 AM

Like Dislike

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**der2417**

Joined On 1/2/2018 6:09:10 PM

Why are microplastics found atop Mt Everest and in Antarctica, of nano particulate size? Sure, some may be due the breakdown of manmade materials in the environment. But I believe like Flamingo123 that the bulk are due to the polymer materials that are engineered to hold aloft the nano particulate heavy metals that are being sprayed globally into the stratosphere, as part of "solar radiation management" and sundry other harmful agendas.Materials smaller than 6 microns pass straight through into the bloodstream. The EPA tracks combustion air pollution, typically 10 microns or greater in size, while 98% of the particles in the air are smaller than 1 micron. You won't find what you are paid not to look for.

Mark as Spam | Delete | Edit | Posted On 12/22/2021 10:20:17 AM

Like | Dislike

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**mrrobb**

Joined On 6/15/2011 2:41:18 PM

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And if the plastic don't kill ya , than maybe the Jab will , or the Hospital , than this will >> 5G - DEW >>>>> sgp.fas.org/.../R45098.pdf and its now worldwide and 95% completed .....Its in every hospital on earth....and its in every police station and Directed Energy will eliminate billions within a couple years.... Proven , KNOWN FACTS!!!!!!

Reply | Mark as Spam | Posted On 12/22/2021 2:47:24 AM

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**mrrobb**

Joined On 6/15/2011 2:41:18 PM

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Up Dated.....nearly a $ trillion spent in DOD most dealing with 5G weaponized via 'Public Business and companies' to cover DOD assets we will be virtually "Fryed alive" .....thyis will be the final culling tool...its fast, clean and doesn't destroy in infrastructures.....just removed the living anything.... You , your family..pets gold fick and cattle and birds and ever living thing in the area 5G towers AND the Mini 5G irradiaters on chimneys and buildings and streetlight poles etc....
sgp.fas.org/.../R45098.pdf

this is not Doom&gloom.....this is well known and you are watching it being built and operated in your neighbourhoods in the name of better games and cell phone ...and while your busy chatting and gaming...you also being slowly being 'cooked' ....Oh you will slowly start to have headaches and body pains..and feel like bugs are crawling on ya....but you will be gaming n watching TV and think nothing of the pain.until they will blind ya or go into seizures ....

and by then its too late..and when the Ambulance come to get ya...you will is diagnoses with "Covid" and run off to the Giant Microwave Oven Known as "Hospital"..and finished off with a ventilator jamming you lungs full and rupturing them .and you will have cost thousands$ off your family.....and you will die under 5G.....another Covid19 death... here dig down the rabbit hole of Directed energy weapons and see more facts you don't wanna see..
crsreports.congress.gov/search/#/?termsToSearch=directed%20energy%20we..

Mark as Spam | Posted On 12/22/2021 3:18:43 AM

Like | Dislike

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**mrrobb**

Joined On 6/15/2011 2:41:18 PM

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Use and Applications of Artificial Intelligence (AI)58 DOD is researching cognitive electronic warfare systems that use artificial intelligence to identify novel electronic emissions, determine whether the emission originates from a hostile source, and develop an effective jamming signal. According to former DOD electronic warfare official William Conley, “a future battlespace will contain threat signals not previously observed, [so] it will be essential for many platforms to be executing real time dec ision algorithms.”59

DOD is also researching options for using advances in computing power to improve electronic deception, or “spoofing,” capabilities. For example, Digital Radio Frequency Memory could be used to generate false radar returns that complicate adversary targeting.60 Similarly, DOD is exploring AI-enabled dynamic spectrum sharing. Because spectrum is currently allocated in set segments, allocation cannot be responsive to changes in the volume of traffic across segments (i.e., some segments may be overwhelmed while others are underutilized), leading to inefficiencies.

DARPA has sponsored the Spectrum Collaboration Challenge (SC2), which “aims to ensure that the exponentially growing number of military and civilian wireless devices will have full access to the increasingly crowded electromagnetic spectrum.”61 Teams competing in SC2—the final competition was held in October 2019—leveraged AI and machine learning algorithms to develop options for dynamic spectrum sharing, in which radios autonomously coordinate to optimize spectrum use. Directed-Energy (DE) TechnologiesA number of directed energy technologies, including laser communications and directed-energy weapons, make use of the electromagnetic spectrum. crsreports.congress.gov/.../R46564

Mark as Spam | Posted On 12/22/2021 3:41:19 AM

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**Randyfast**

Joined On 5/6/2010 8:42:42 PM

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Mrrobb; If they try to put up a tower on your mountain - you know what to do! "Silent Weapons For Silent Wars". BTW: the military is also one of the main players in this covid psyops! The last time I looked; the military was not in the business of "Health Care"!

Mark as Spam | Posted On 12/22/2021 5:53:34 AM

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