

WHAT ARE THE RISKS OF BIOHACKING ?





Biohacking is the practice of using technology to change, improve, optimise, or upgrade your body or mind. It is becoming increasingly popular as the price of devices like genetic engineering kits continues to fall (1). While there are some definite benefits to biohacking, such as increasing your strength or intelligence, there are also some serious risks involved. One of the biggest dangers is that you could end up harming yourself if you don't know what you're doing.

This is a brief overview of the risks involved in some aspects of biohacking.

One of the major biohacking risks is the use of implanted devices. People with diabetes have to constantly monitor their blood sugar levels to ensure that they stay within a safe range. For many years, this meant taking a small amount of blood, and then inserting a test strip (with the blood on it) into a glucose meter. However, advances in technology have led to the development of implantable glucose monitors. These devices are placed under the skin, where they constantly measure the level of sugar in the interstitial fluid (2). This allows people with diabetes to closely monitor their blood sugar levels without having to repeatedly prick their fingers.

However, implantable glucose monitors and other implantable biohacking devices, can also cause problems if they're not inserted correctly.

While these devices offer many benefits, there is also a risk of infection (3). The most common type of infection is caused by bacteria, which can enter the body through the incision site or through the bloodstream. Fungi and viruses can also cause infections, though these are less common.



Symptoms to watch out for are redness, swelling and pain at the site of the implant. Treatment usually involves antibiotics, but in some cases, the device may need to be removed. To reduce the risk of infection, it is important to carefully follow the instructions regarding hygiene and aftercare. Ideally, it is better to have the implant inserted by a professional.

Implanted devices and monitors that measure vital signs such as heart rate, temperature, blood pressure, hydration and stress can be incredibly helpful. However, they also come with a risk of rejection by the body's immune system. The body views implanted monitors as foreign objects and could try to break them down. In some cases, this can lead to inflammation and tissue damage. There are a few ways to reduce the risk of rejection. These include using inert materials and coating the devices with anti-rejection drugs. However, even with these precautions, there is still a chance that the body will reject an implanted monitor, which can be painful.

Implanted devices can also cause scar tissue to form around the site of implantation. In some cases, this scar tissue can become thick and hard, making it difficult to remove the device if it needs to be replaced. In other cases, the scar tissue can interfere with the functioning of the implanted device, causing it to produce inaccurate readings (4). For these reasons, it is important to discuss the risks of implantation with your doctor before making the decision to have a monitor implanted.

Another risk linked to implanted monitors is privacy (5). These devices convey real-time data on a person's health, and while this information can be incredibly valuable for people with chronic health conditions, it also raises significant privacy concerns. It is important to research the security of these



bio hacks, as many do not have encryption. This leaves data open to hacking, and if this data were to fall into the wrong hands, it could be used to exploit vulnerabilities or blackmail individuals (6).

Genetic biohacking refers to the process of manipulating genes in order to change the way the body functions. This can be done for a variety of reasons, including improving physical performance, increasing intelligence, or altering appearance. While there are potential benefits to genetic biohacking, there are also risks that should be considered.

Over the past few years, the gene-editing tool CRISPR has become increasingly accessible thanks to the availability of DIY kits (7). However, the risks associated with using these kits are that they can be used to create harmful mutations. In addition, it is difficult to control where the CRISPR edits will take place, which could lead to unintended consequences. For example, someone who is trying to edit a specific gene might inadvertently end up editing a nearby gene as well. This could potentially have dangerous consequences, as it could lead to the development of new diseases or disorders. It also brings into question the ethics of editing genes and DNA (8). Consequently, it is important to be aware of the risks associated with DIY CRISPR kits before considering using one.

If you attempt to modify your own DNA without fully understanding the process, you could end up causing irreversible damage to your long-term health. That being said, it is illegal to use CRISPR kits to edit human genes (9).

There is a risk of breaking the law when carrying out genetic biohacking. This is because some authorities have laws that prohibit or restrict the use of



certain technologies, including those that may be used for gene editing. For example, in the United States, it is illegal to create heritable modifications to the human genome. This means that any attempt to modify the DNA of future generations would be in violation of federal law. There are also laws that regulate the use of genetically modified organisms (GMOs), and it is possible that modifying an organism's DNA could fall under this category. It is also against the law to edit your own DNA (10). As such, it is important to be aware of the relevant laws before undertaking any genetic biohacking project. Failure to do so could result in legal penalties, fines or even imprisonment.

Some nootropics are unlicensed and as such you may be at risk of being prosecuted if you use them. For example, Modafinil is not licensed when used for the treatment of ADHD (11).

Another popular health body hack is the taking of supplements. Vitamins, minerals and supplements are an important part of a healthy diet. However, it is possible to take too much of these nutrients, which can lead to an overdose. Symptoms of an overdose may vary depending on the nutrient involved, but can include nausea, vomiting, diarrhoea, headaches, dizziness and blurred vision (12). In severe cases, an overdose can cause organ damage and even death. To avoid these risks, it is important to only take the recommended amount of each supplemental nutrient. Many people assume that more is better when it comes to vitamins and minerals, but this is not always the case. Too much of a good thing can be dangerous, so it is important to be informed about the risks before taking any supplements.

For example, curcumin, the active ingredient in the spice turmeric, is known to have blood-thinning effects (13). Other supplements often taken by



biohackers that can interfere with blood clotting are ginger, vitamin E, ginkgo biloba and ginseng (14). For this reason, these supplements should not be eaten in large amounts, not with each other, and definitely not if you already take blood thinning medication, such as warfarin. There is also a risk of liver damage if too much curcumin is ingested, on a long-term basis (15). Do not fall into the trap of thinking that more of a supplement will increase the benefit. Often, a small amount is all that is necessary to improve health.

The final risk of bio hacking, is that there is a lot of misinformation out there. There are charlatans and quacks hoping to make a quick buck from promoting supplements. While biohacking can benefit health, performance, the mind and body, it is vital that you do plenty of research, from unbiased, qualified sources. Then weigh up the pros and cons, risks and benefits, carefully. If possible, it is always best to seek the advice of an experienced medical professional.

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