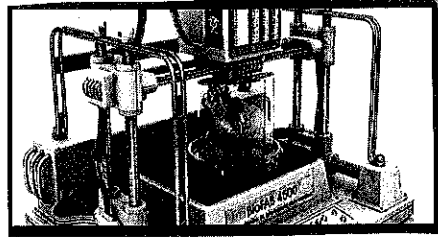


inspired from the article
www.technologymagazine.com/news/technology
2158322-bioprinting-building-living-tissue-3d-printer-business

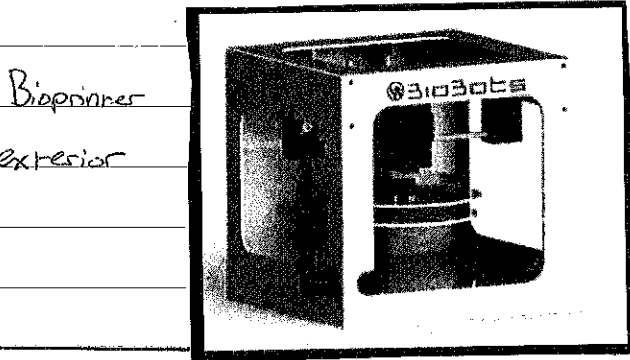
Bioprinting essay by Luke Timmins

Bioprinting and bioprinters - Bioprinting is the process of generating spatially - controlled cell patterns using 3D printed technologies. There are many types of bioprinters. Firstly, there is an original bioprinter that has two robotic printing heads, one places human cells and the other places hydrogel as a Scaffold. Hydrogel is a self-repairing specialised type of polymer gel. Secondly, there are inkjet printers and within this printer the cells are placed into inkjet cartridges and the printer is programmed to place the cells in a particular order. Finally, there are six axis printers which create the centre of the object and place the cells around the object.



Bioprinter interior

The Bioprinting Process - The Bioprinting process is a step by step process. The first step is to establish a tissue design that will be constructed in a bioprinter. The second step is to develop multi-cellular building blocks. These are then dispensed into the bioprinter using a layer-by-layer approach. Whilst this is happening the bioprinter applies the hydrogel and this is built vertically with the artificial tissue.



Bioprinter exterior

Alternate Materials - Other than hydrogels and cells scientists are looking into using strong flexible plastic. They have done this once on a baby because they had been born with a collapsed trachea so they made a replacement to keep it from collapsing.

phosphoric acid.
My opinion - In my opinion I think this is a good idea because anyone who has a major disease in one of their organs could have a quicker and easier replacement and not get a worse disease or die. Also, I think this is a good idea because people who have a heart transplant don't have to die or wait for donors. There will be no need for donors if hospitals get a bioprinter and this will cause less people having to wait for an organ replacement.

3D Bones - The 3D bones that are printed are made from gelatine, agarose, alginate, calcium and phosphate. Agarose is a polysaccharide polymer material. Alginate are cells from a cell wall of a brown alga. Phosphate is an inorganic chemical and a salt from

This article is written by Christopher Navarro because E-cigarettes has become more common as the year goes on, and yet we do not really know if this tool is safe for regular use and a "safe" alternative way for smoking.

The article only applies for smokers or people who want to quit but want an alternative.

Smoking has been a common trend ever since 1612. The Native Americans smoked tobacco for special religious and medical purposes. Although it's different from the current era. In our era people smoke about 10-12 cigars everyday, and that's only an average smoker. These are some of the common issues we face in the modern era. Smokers are well known to face major health problems such as the risk of getting cancer, heart disease, stroke and more. Smoking is harmful because there are many ingredients in tobacco smoke that can harm your body. The main health risks from smoking are lung cancer, heart disease and stroke. Smoking causes almost 90% of deaths from lung cancer, around 80% of deaths from COPD (chronic obstructive pulmonary disease), and around 17% of deaths from heart diseases. As well as nicotine, there are more than 4000 chemicals in tobacco smoke, of which many are poisons. At least 60 of these chemicals cause cancer.

To avoid these issues, E-cigarettes replace cigars as this is apparently safer than the normal cigar. It simulates the feeling of smoking, but without burning tobacco, the electronic cigarette has no smell, no second hand smoke and none of the 4,000+ chemicals you find in a tobacco cigarette. It won't stain your teeth, the cost after initial purchase can be much lower than traditional cigarettes and they can usually be used in non-smoking areas. E-liquids come in various nicotine strengths from zero to high this gives you more control of your nicotine intake.

E-cigars may seem quite pricey at first glance, but in the long run it can actually save money, as consumers only purchase refills which is also eco friendly as these refills seem like they won't affect our planet in a negative way. It would eliminate the risk of accidental fire, endanger lives and destroy properties, and pollute the environment. E-cigarettes are also powered by rechargeable batteries and e-liquids that are not harmful to the atmosphere. E-cigars also eliminate second hand smoke as others cannot inhale the harmful vapours that normal cigarettes distribute.

Many smokers have also claimed that they started smoking from peer pressure. As they were pressured to smoke, later on became smokers as the nicotine has affected their brain and made them addicted to it.

In my opinion it is good that our society is finding ways to improve itself. E-cigarettes are now the most popular quitting aid in England. There is some good quality evidence that E-cigarettes can be very effective in helping people to quit smoking. E-cigars have been used by middle school and high school students tripled by 2013-14. This means these students who have smoked conventional cigarettes which can risk their health, have stopped using that and have moved on to a much safer alternative.

On the other hand it is too early to categorise that E-cigarettes are actually safe as they have not been tested to find long term results therefore making it 95% safer. It may help the chronic

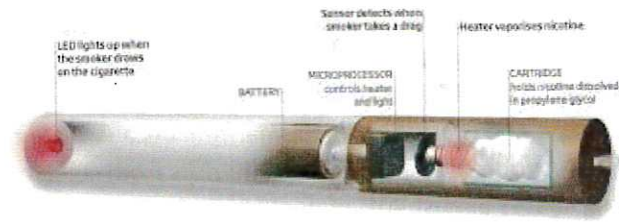
smoker to quit but, may not benefit the next generation as the long term result of the use of electronic cigarettes may be harmful to the users' health.

In conclusion it would be a very efficient tool for smokers who want to quit but I would not recommend it to smokers who have already quit, or even people who are planning to start smoking

in a 'safer' way as we do not have enough good quality evidences that proves thus alternate way is a safer way to smoke. In other words just cut smoking completely.

Smoke without fire

Suck on an e-cigarette and it produces a cloud of nicotine-carrying vapour with some of the toxic by-products of burning tobacco.



This is the diagram of an e-cigarette, it shows the functionality of the device. Even though it does prevent a high risk of fire, it is still possible as it's electrical circuit can bust if over used or even over charged.

This is one of the example of numerous hazards of using e-cigarettes. According to one of The Telegraph's article "Man left with hole in lung after e-cigarette spits out burning nicotine" Richard Courtney a 35 year old man who purchased this "pricy" item which is meant to turn the fluid into vapour - with the aim to give up smoking. Has put him to hospital.

According to him he tasted fluid which is most likely the burning nicotine and he started coughing. He said "Then it felt like I'd got a trapped nerve in my shoulder. In the morning I had a really tight chest and couldn't breathe properly.

To conclude this I would like to state that these kinds of problems are easily preventable if we just restrict the use of E-cigarettes. These companies do not care about their consumers and would just continue if their product is making them big profits. So why should we give them our money for a device that can effect our bodies critically?

Link to websites used: <http://www.theguardian.com/society/e-cigarettes> and <http://www.telegraph.co.uk/news/health/news/11945417/Man-left-with-hole-in-lung-after-e-cigarette-spits-out-burning-nicotine.html>

British couple overjoyed at birth of second cloned puppy

Laura Jacques and Richard Remde payed 67,000 to a south Korean cloning firm to clone their deceased boxer, Dylan who died from a brain tumour. They provided tissue samples containing Dylan's DNA to the firm, and testing started straight away, and were thrilled when they received the news last month that two pregnancies had been established in surrogate dogs. The couple have named the second dog Shadow and named the first one chance.

Both puppies are healthy and are bonding with their mothers who are feeding and caring for them. Both puppies bear markings that are identical to those Dylan had. Remde and Jacques said they were so happy to be the proud owners of two healthy cloned puppies.

The boxer puppies have made scientific history – they were cloned from the couple's dead dog almost two weeks after it died. The previous limit for dog cloning was five days after death.

"The whole thing just feels surreal," she said. "I lost all sense of time. I have no idea how long everything took, the whole thing made me feel very disoriented. I was just clinging on to Richard for about an hour and a half after Chance was born.

There are no regulations on the cloning of pets, although the cloning of human beings is illegal, and in August the European parliament voted to outlaw the cloning of farm animals.

The RSPCA expressed concern about dog cloning. A spokesperson said: "There are serious ethical and welfare concerns relating to the application of cloning technology to animals."

I decided to choose cloning because I found it very interesting also, if we are able to do something against the law of nature, the future is endless of possibility's.

By cloning you can make medical breakthroughs, such as cure cancer because we will have better understanding of cell differentiation. Plus, if people need transplants, their clone has the same DNA so they can give it to them.

Endangered species could be saved because we could just clone many of the endangered species to prevent them becoming extinct. Also, animals and plants could be cloned for medical we should discover how to clone animals and plants to produce life-saving medications.

The downside of cloning is there will be a series impact on economy because it is a very expensive process, it requires technically sophisticated resources for which one may have to shell out a lot of money. Plus, there are lot of risks involved in cloning and with more people in the world, less money people with have, also the world will become over populated.

There will be a lack of genetic diversity in the world because every individual is born with a different set of genes which are

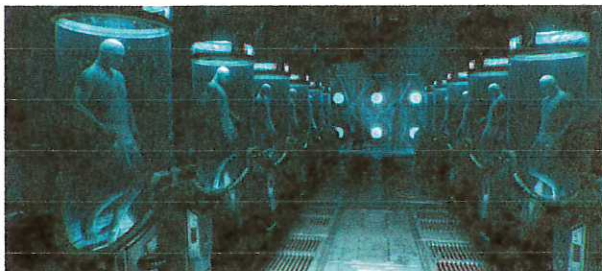
inherited from the parents. Cloning will mean bringing in identical genes, which will naturally weaken our power to adapt to different circumstances. This may put us in a threat of getting infected with a serious disease. Moreover, beauty of humanity lies in the differences we see in one another. Cloning shall eliminate this surprise factor from the entire human race.

Do clones have different personalities?

No because clones don't have the same brains and are brought up differently therefore clones are different. For example, if one clone was brought up in a rich family, they could turn out snobby and take for granted, on the other hand if the other clone was brought up in a poor environment, they could turn out a very nice person and take nothing for granted.

Do clones have the same fingerprints?

No, two cloned humans would not have the same fingerprints. Fingerprints are not genetically determined so even with identical DNA, two people would have different sets of fingerprints, exactly the same as identical twins do.



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