

Bioethics of the Engineered Heart: Where Biochemistry Meets Cardiac Enhancement

When we think of the heart, we think of it as much more than just an organ - a symbol of love and joy, as well as pain and suffering. However, in the eyes of a biochemist, this can look completely different. A giant clump of muscle, not just twitching, but a 3-D printed copy behaving almost exactly like the organ in our chest. An engineered heart. Nowadays, biochemists in the lab don't just fix hearts - they improve them. This sounds like fun for a scientist, like how children mold play-dough, but although this revolutionary new development has benefits, several ethical concerns rise too.

What exactly is the engineered heart? Most people think of some sort of metallic contraption shoved in someones chest, but developing a lab-grown heart goes far beyond this. The most important aspect of this process is the use of iPCS, or induced pluripotent stem cells. Specialized cells, or iPCS (like skin cells or red blood cells) are reprogrammed to become a sort of stem cell that help develop any part of the body. By growing these cells as 'functional cardiac tissue' in the lab, scientists are essentially 'engineering' another heart. The engineered heart that results from this process actually behaves like a normal heart, having synchronized contractions and even undergoing circulation. In fact, they are now being studied for heart disease and future tests, revealing the unbelievable level of development obtained by today's biochemists.

Every medical phenomenon has two kinds of people commenting on it - the people backing the process, and the people opposed. But in terms of science and medicine, the engineered heart can help save countless lives and propel our population numbers, but it also makes us ponder on what one's identity truly is. The idea of the engineered heart helps us tread on the thin line between biotechnological advancement, and natural genetic growth of the human species. We could replace a failing heart with a better, healthy one to save somebody's life, but what if we go beyond that? Imagine designing a heart in the future that could be disease resistant, or even prevent heart attacks. How far could humans' natural biology allow them to stretch.

If humans can make lab grown hearts, who is first on the list - the dying patient or the billionaires eager to try out the latest model? Medical innovation tends to reflect society's imbalances, and the engineered heart could do no less. Fairness is one of the main concerns supporting the argument of the engineered heart. The wealthy sectors of society would have a greater access to this life-inducing piece of technology, almost as if they were cheating death, while the poorer sections of society would be forced to suffer more while the rich literally have 'bigger hearts' than them. Questions like these don't just expose the inequalities in healthcare - they reshape societal dynamics.

Then comes the next key issue - identity. Our heart controls our entire body, it is the core of who we are. It doesn't just pump blood, but also transmits messages to our brain to help us feel diverse emotions - love, safety and security, happiness and even heartbreak and pure suffering. If somebody walks around with an artificial heart pumping in their chest, could that alter the way in which they view themselves? Would it make them feel either less than human, like a robot, or almost superhuman? And most importantly, will it still be connected to our brains? The answer is yes. The brain is the seat of emotion, so that is the organ mainly involved in processing feelings. However, these two organs are intricately connected by bundles of nerves, and replacing a physical heart with an engineered one would not change the brain's function of generating emotions. However, it must also be noted that this could potentially change the way these emotions are perceived and experienced by the brain, although scientists are yet to discover the complexities of this.

The lab-grown heart reflects the extent of modernization of biochemistry in the 21st century environment, proving to be medicine's latest eureka, with the potential to help save multiple lives and reverse diseases. However, this engineered heart is still in its early exploration stages. Biochemistry is powerful yet unpredictable, and increased tweaks to this 'heart' could someday create even more risks that we don't even understand. As a population, we must consider the effects of this development on our society, as well as individuals' identities, keeping in mind the moral dilemmas posed by this new invention. Biology never fails to find ways to completely blow our minds, does it?