

Artificially Cultured Biological Cybernetic Components

A new concept design breakthrough in cybernetics. To negate the effects from EMP the R&D labs at Claymere Cybernetics Unlimited have developed artificially cultured biological components. These components take the place of the delicate wires and circuitry that are sensitive to EMP bursts. The whole purpose for this design is to render EMP ineffective against cybernetics. Since EMP only affects the wiring and circuitry of cybernetics, having them replaced with the biological equivalent makes the components more survivable. There is no need for shielding anything. Full conversion cyborgs especially have no need to be concerned and can lighten their loads substantially. Because the nanomachinery maintains the biological components there is no need for a biological body. Occasional maintenance is all that is needed in those cases which consists of adding fluid to the system, much like an oil change.

Using nanotechnology to create artificially generate biological components that replace the original susceptible ones, the cybernetic implant is made immune to the effects of EMP. Nanomachinery is programmed to generate biological replicas of such items. The extra effect caused by this is a reduction in weight by rendering current shielding techniques unnecessary. The reduced mass allows the cybernetic component to become more versatile. The biological components create a nervous system which act like the wires of the unit. Circuits are replaced by neurons which process information and help direct the signals for coordination. Miniature secondary brain clusters are created that help improve limb coordination according to the user's movements. When the system is injured it can be repaired by drawing from the biological body much like natural healing. On fully converted subjects they can repair by applying a nutrient rich solution which has cultured 'building blocks' into the unit via access port. These building blocks consist of natural fibers much like the fluid that the nanomachines originally travelled in and used to create the system when it was first installed. This is the same substance used for periodic maintenance as mentioned above. The nanomachinery can then restore damaged systems slowly over time. If the cybernetic component itself is undamaged then this process allows it to return to full functionality without further need for repairs. Varying degrees of damage will determine if further repairs may be necessary.

The nanomachinery itself is shielded on a microscopic level and is thus unaffected by EMP. The machinery is able to replicate itself and continues to follow its programming of maintaining the biological components it creates.

Storage

Generic stasis unit, available in any hospital unit. All it has to do is keep the nanomachines inert or on standby. The shape of these containers can be cylindrical or cube like depending on the brand, make, and model.

Administration

Surgical, typically when the cybernetic implant is being installed. Due to the complexity of cybernetic components removal of wiring and circuitry in an already existing unit is more complicated than replacing it with a new one. The new component is 'hollowed out' and set for acceptance of the biological replacement. During the surgery the part is grafted and the biological supplement inserted. It grows along with the grafting process. The growth is accelerated and stabilized within a few hours of the surgery. Afterwards it heals along with regular recovery time typical of cybernetic surgery. Designers can use the subject's biological sample to program into the nanomachinery to allow for greater ease of synchronization to the synthetic biomatter. This helps to prevent rejection by the body.

Laws

Normal laws and procedures according to regular cybernetics. Licensing not typical except for the facilities that perform the procedure in accordance to standard medical laws.

Creation

The biological component is generated via a template that is programmed into the nanomachinery. Adjustments are added after a sample is taken from the subject about to receive the cybernetic component. Medical trials have been completed with no side effects outside of the ones typical with cybernetic usage such as phantom limbs, misfired signals, and unresponsive appendages. Those are usually fixed with further synchronization and recovery time. It is to be considered ready for public use.

Safety

Typical safeties used on most cybernetics apply. Emergency shut offs in case of power overload, pain mechanism disabling, safety overrides, etc. Usually determined by the type of component.

Transportation

Unformed and uncoded nanomachinery can be moved safely via storage modes mentioned above. Fully formed components cannot be removed without damaging the system unless performed in a surgical facility.

Application

Limbs Arms and legs will have wires and circuits replaced with a cultured nervous system, self-improving synapses, and small neural clusters. The nervous system takes the place of the wires original purpose which was to send power and command signals to the limbs' mechanisms. The self-improving synapses help the limb to learn how to move like the original and even increase motor skill as time goes by. The neural clusters coordinate signals for better efficiency and are also self-improving to further reduce

reaction time for the limb. Over time this 'secondary brain' can learn how the user reacts in a given situation and even do so before the user knows to do it. This automatic reaction can be curtailed with a shut down signal that is sent from the brain, much like the safety protocols typical to cybernetic limbs.

Organs Organs that have been replaced with a cybernetic equivalent have a greater chance for rejection by the natural body. Using a sample from the original organ, if available, the replacement can more closely bond during the healing process and reduce the chances of rejection. Otherwise the typical sample is used and can still reduce the chances of rejection.

Components Cybernetic components that enhance natural abilities can have their wiring replaced with organic substitutes. The circuits that hold software for the component are replaced with synapses that simulate miniature brain clusters. They are like secondary brains that learn and improve while remaining coded with their primary purpose. Much like a clone's brain has preencoded memories, these clusters have the program of the software preencoded. This helps to regulate and control the component much like the original software did through signals from the brain. Because the components no longer have to translate from brain signal code to computer code the signals now move slightly faster.

This design is mainly for the purpose of defeating EMP waves that could be used against cybernetic users. The cost for the procedure only adds five hundred more Nepleslian credits to the regular cost of the cybernetic component, mostly for labor and nanomachinery culture. This is taking into consideration the reduction of cost caused by not using the shielding, wires, circuits, and software originally created for these components. As a result, cybernetics employing this design also create less electrical signature and weight. Some components may not even be detectable outside of x-rays.

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Last update: **2023/12/27 08:08**

