

PORTABLE STEM-CELL BANK

ABSTRACT:

People are taking too many medications because of the rise in health issues, which has several negative repercussions. It has been discovered that stem cells may be utilized to treat several dangerous disorders, including cancer. Modern problems require modern answers. However, the procedure of keeping them in blood banks is expensive and beyond the means of the average person. We can save costs and raise survival rates by making the stem cell preservation equipment portable. The package includes two cylinders and two boxes that can hold two people's cord tissues and cord blood cells. The entire structure of the portable stem cell banking system is based on 3-D printing. The cylindrical chamber and cylinders are made of PEEK (Poly Ether Ether Ketone) material, which can withstand temperatures as low as -197 degrees. The box is made of PLA or ABS material, which is less expensive and can withstand temperatures as high as -2 degrees. Because of their ability to withstand extremely low temperatures, these materials are known as cryogenic materials. Liquid nitrogen, which continuously circulates through the cylinder's perforations, is used by this apparatus to sustain such low temperatures. Additionally, there is a 5 mm space beneath the cylinder, and liquid nitrogen is even applied there. Then, if needed, tiny motors continue to pump the liquid nitrogen that has been stored. The box has heat sensors, and as the temperature rises, liquid nitrogen is automatically injected to keep the temperature low. Extra liquid nitrogen is kept in a free area under the cylinder and rectangular box, and it may be changed every ten to fifteen years by a qualified technician. and the package is entirely enclosed inside a 3-D printed, airtight container. and confirm that the cord tissue and blood are kept in separate cryogenic bags and bottles, respectively.

Keywords: PEEK, PLA, ABS, Cord blood, Cord tissue, Cryogenic materials, Liquid nitrogen.