

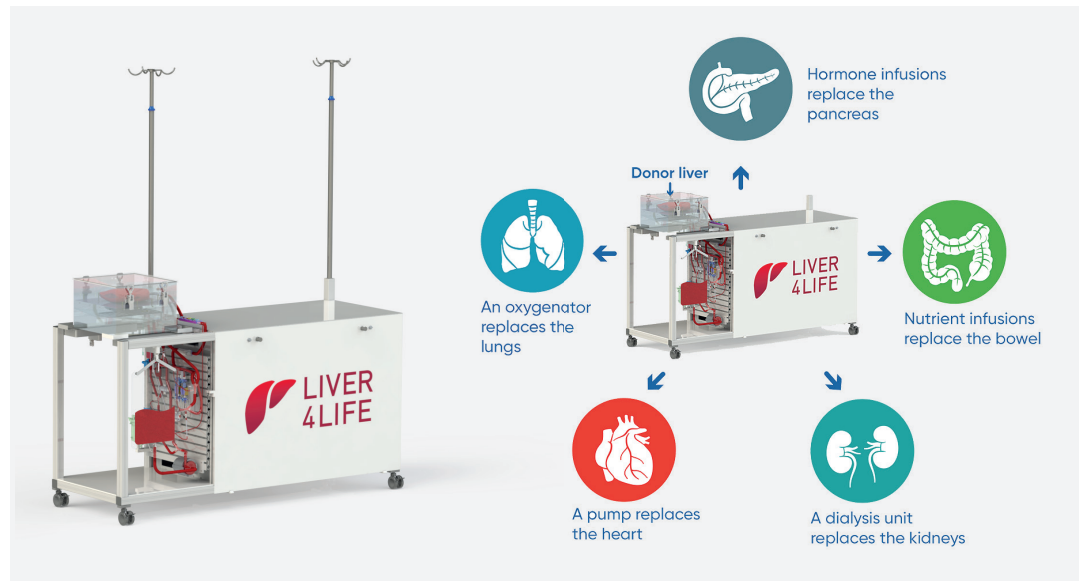
Liver4Life

Regeneration of
the human liver
outside of the body



Wyss Zurich
Translating
Science into Life

Liver4Life



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Regeneration of the human liver outside of the body

It is well known that the liver has the ability to regenerate. Liver resection (surgical removal of the diseased part of the liver) for the treatment of liver cancer has been carried out for a few decades, but many tumors are inoperable, notably because the removal of a too large piece of liver is fatal.

The Wyss Zurich project will develop a novel therapeutic strategy for liver regeneration consisting of: i) surgical resection of a small healthy piece of the liver from the patient; ii) growth of this piece outside of the body in a perfusion machine until a sufficient size is reached; iii) retransplantation of the regenerated liver to the original patient while removing the remaining diseased part. Current perfusion systems are not able to keep a liver alive outside of the body for a sufficient time to allow growth and regeneration to occur. The challenging aim of the project is to extend the viability of liver tissue outside of the body up to five days and allow its growth. To this end, a perfusion machine will be developed, which will provide necessary nutrients and oxygen supply, and be equipped to monitor growth, as well as assess the functional capacity of the liver.

This technological advance will allow patients with formerly inoperable liver cancers to gain access to surgical resection. Additionally, performing autologous transplantation (patients receive liver tissue from their own body) will avoid the need for life-long immunosuppression and its associated severe side effects. This novel regeneration strategy could also be used in allogenic liver transplantation (patients receive liver tissue from a donor) for end-stage chronic liver diseases, where an organ transplant is the only treatment option. In this second approach, a healthy donor liver will be split into a couple of parts that will be grown in the perfusion machine, yielding more than one transplantable organ. With this approach, the organ donor pool would be increased, which would help to alleviate current donor organ shortage.



Liver4Life
is a Wyss Zurich project
www.wysszurich.uzh.ch