

# Researchers manage transplantation of adrenal cells encapsulated in a bioreactor

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If a person is under stress his body tips out stress regulators. These are Cortisol, Adrenalin and Noradrenalin - hormones and messenger substances - which intervene adjusting in the metabolism and help thus the organism to master the unusual load.

Cortisol has an essential meaning for the coal hydrate household, the [fat metabolism](#) as well as the protein turnover. These hormones and messenger material are produced in the adrenal glands as central stress organs. By a sub-function of the [adrenal gland](#), the so-called adrenal insufficiency, the production of the stress regulator decreases and the normal balance in the metabolism is disturbed. A state which has serious results for the health and can be even life-threatening. Innate dysfunction of [hormone](#) production clearly affects the quality of life. An example is the so-called 21-hydroxylase deficiency, the most frequent form of the congenital syndrome there the adrenal glands produce excess androgens, which are [male hormones](#).

The determining of the next step led to success: before the transplant the researchers gave the cells in a small capsule, an artificial adrenal [system](#) which they implanted-. The advantage: The artificial system — developed by an Israeli enterprise — makes an immunosuppression in the recipient superfluous. The capsule protects the donator's cells against attacks of the immune system but , passes the hormones by semi-permeable walls into the body of the receiver.

For Professor Bornstein an important step forward to the artificial

adrenal system in humans has been taken: "Our vision is that people get even adrenal cells of another kind transplanted, as for example from pigs, in future. The capsule creates the biotechnical condition for it, because it separates the donator's cells from the body of the receiver and transfers the hormones which are important for the [metabolism](#) exclusively." In the eyes of Dresden scientists this kind of transplantation will be suitable for patients with adrenal insufficiency but also with congenital diseases such as the lack of 21-hydroxylase.

**More information:** "Transplantation of bovine adrenocortical cells encapsulated in alginate." *Proceedings of the National Academy of Sciences*, doi:10.1073 / pnas.1500242112

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