LIVER IN TISSUE ENGINEERING: MECHANICAL PROPERTIES INFLUENCING CELL BEHAVIOUR IN LIVER FIBROSIS MODEL

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Liver is the largest organ of our body, and it plays a crucial role in many biological processes e.g. blood detoxification, protein metabolism, and nutrients balance. Liver diseases are the 11th leading cause of death worldwide. A characteristic feature of these diseases is the gradual stiffening of liver tissue in a process called fibrosis, which can eventually lead to liver failure (cirrhosis).

Before cirrhosis develops, the fibrosis process is thought to be reversible by anti-fibrotic drugs. However, these drugs need to be tested in a laboratory disease model before they can be used on patients. Our project aimed to create such a model by designing a gelatine-based scaffold that mimics the stiffness of early-stage fibrosis. When liver cells were grown on this scaffold, they began to show typical signs of fibrosis: more blood vessel structures, higher levels of fibrosis-related molecules, and lower levels of those associated with normal liver function.

This platform could help researchers better study the early stages of liver disease and test potential treatments before they reach clinical trials.