

Revolutionising tissue reconstruction with bioprinting



Bioprinting technology for medical research

This EU-funded project is pioneering advancements in medical research through **cutting-edge bioprinting technology**, which enables the creation of tissue constructs with precise cell composition, structure, and mechanical properties.

The STRONG-UR bioprinting solution represents a unique combination of **novel manufacturing technologies and biomaterials for regenerative medicine**.

With specifically designed 3D bioprinter components and biomaterials, STRONG-UR seeks to make **personalised**, **engineered tissue available for medical use**.

Focus on male urethra



A stricture is a narrowing in a tube-like passage in tubular organs such as the esophagus, trachea, intestine, or the urethra.

A significant healthcare challenge

Approximately 0.6% of the male population experiences **urethral strictures**, obstructing urine flow. This condition often leads to debilitating physical and psychological effects and, in severe cases, can result in sexual dysfunction, bladder damage, or kidney failure.

The male urethra has a delicate and unique anatomy surrounded by highly vascularised spongious tissue.

Therefore, achieving successful results in reconstructive surgery of urethral strictures continues to be challenging.

Current approaches to male urethral repair have limitations, including:

- **shortage of tissue** that can be safely taken from the patient's own body
- complications at the donor site
- lack of standardisation
- high treatment costs.



A new horizon for tissue engineering

At the core of STRONG-UR's innovation lies dynamic **hydrogel-based biomaterials**.

These hydrogels provide unparalleled control over the mechanical and biological properties of tissue constructs.

This biomaterial combined with living cells forms **bioinks** which are transformed into intricate biological structures using advanced 3D printing.



We are conducting a comprehensive study on the structure of the human urethra to better understand it and its functional relationships.

Based on this information, we will develop bioprinting strategies to **personalise the architecture and composition of the tissue structures**.

Afterwards, we will validate the technology with in vivo models.



Pablo Pennisi Associate Professor at Aalborg University and Project Coordinator

Learn more





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The team

Backed by a consortium of 12 partners, STRONG-UR combines expertise from academic institutions, hospitals, and industry.

The team includes specialists in cell biology, biomaterials, 3D printing, and urology from leading organisations across Europe.

