

TENTACLE shapes the future of surgery with EU-funded in-situ 4D bioprinting

As the need for **minimally invasive surgeries** is rapidly increasing, the TENTACLE consortium is researching innovations—such as **in-situ 4D bioprinting**—to open new possibilities for precise and targeted treatments. This technology aims to transform colorectal diseases surgery by reducing the need for extensive **colectomies**, enhancing **patient-centered care**, and significantly improving recovery outcomes.

The **TENTACLE** project, which stands for "InnovaTivE in situ 4D biopriNTing for regenerAtion of CoLorEctal mucosa and submucosa", was launched on January 1st, 2025, with the goal of integrating 4D bioprinting directly in-situ through an endoscopic surgery procedure. By enabling the selective removal of diseased tissue, this breakthrough **reduces unnecessary surgeries** and minimizes patient trauma. The project, supported by a grant of over 7 million euros from the European Union under the Horizon Europe program, will last four years and is coordinated by *Würzburg University*, a leading institution in biomaterials research, **bioprinting technologies**, and **health-related biotechnology**.

By advancing minimally invasive techniques and prioritizing **precision medicine**, TENTACLE aims to redefine the standards of **tissue engineering** for **colorectal diseases**. The project's collaborative effort, supported by a strong international consortium, will assess the feasibility of in-situ 4D bioprinting in **endoscopic surgery** while establishing frameworks for its integration into medical practice.

While the focus is currently on **colorectal diseases**, the potential of **in-situ 4D bioprinting** could extend to other surgical fields, paving the way for broader applications in **regenerative medicine**. With **EU** backing and contributions from leading researchers and clinicians, TENTACLE is set to revolutionize **biomedical engineering**, making procedures safer, more efficient, and tailored to the patient's specific needs.

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PROJECT DETAILS:

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Project Acronym TENTACLE

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Start date of the project 1 January 2025

End date of the project 31 December 2028

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Project Website https://www.tentacle-project.eu

