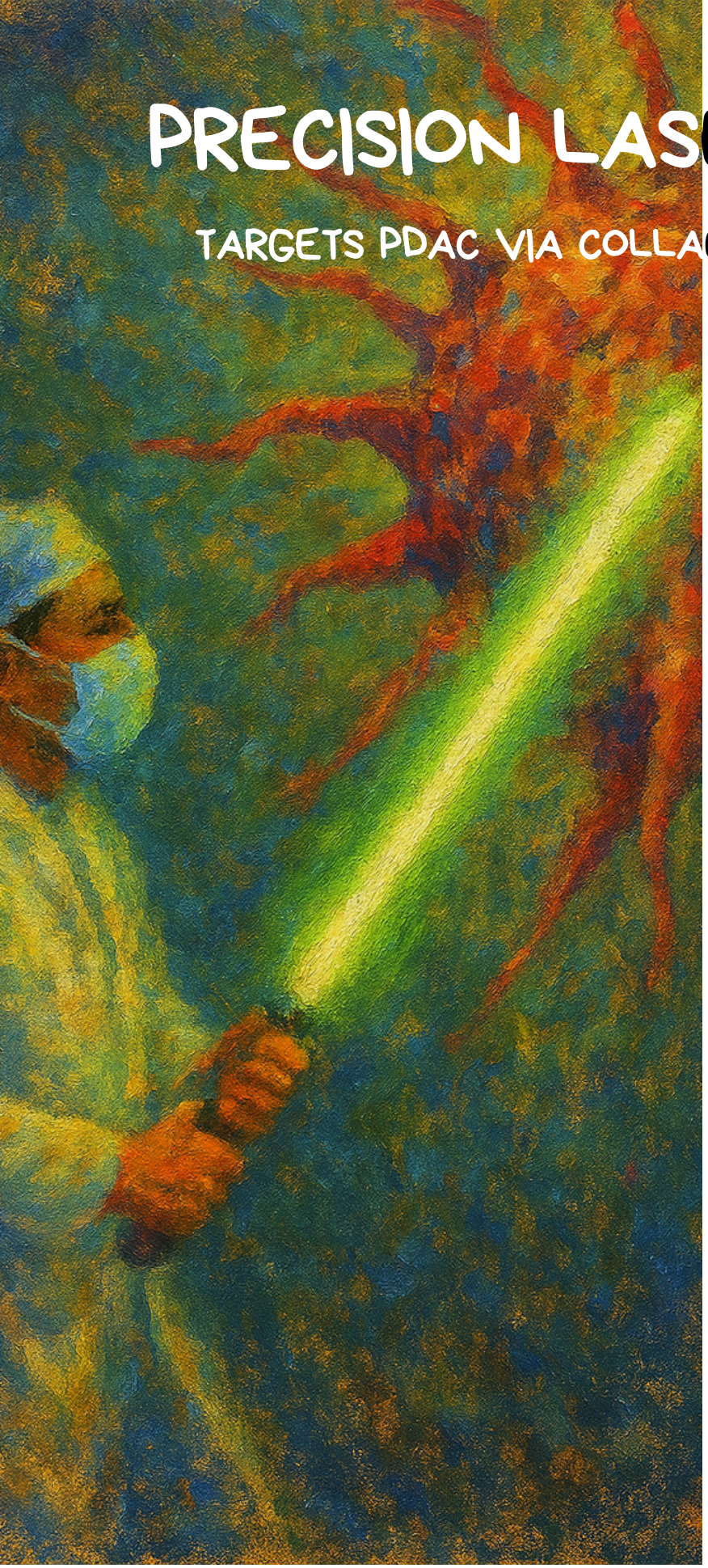


# PRECISION LASER ABLATION

## TARGETS PDAC VIA COLLAGEN FINGERPRINTING

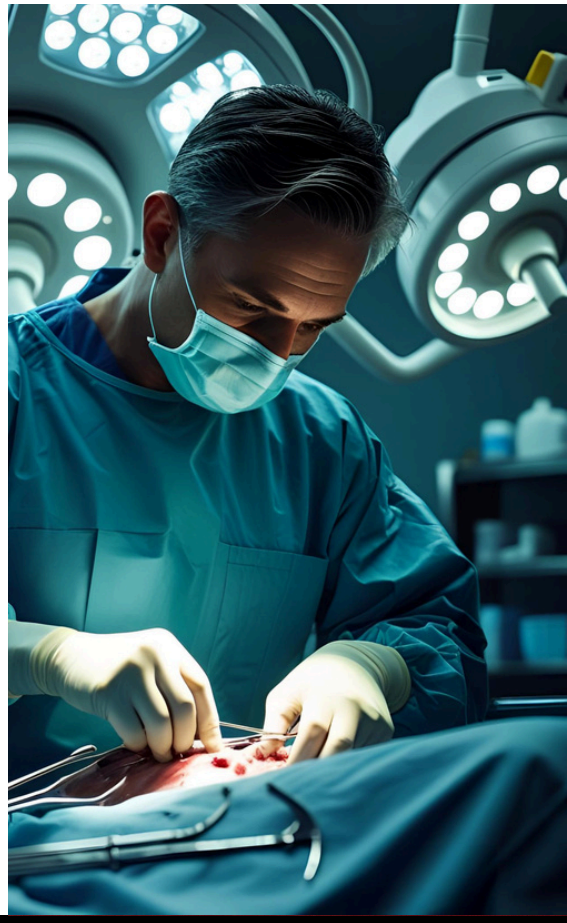
by Cliff Dominy PhD

**Researchers at Sichuan University in China have developed a laser therapy that selectively kills pancreatic ductal adenocarcinoma (PDAC) tumours whilst preserving the surrounding healthy tissue. The technology, built around a 6.1 micron laser, takes advantage of the characteristic collagen fingerprint of PDAC tumours to focus the laser energy where it is needed the most.**

"OUR TECHNOLOGY, FOR THE FIRST TIME, UTILIZES THE TUMOR'S MOLECULAR FINGERPRINT TO ACHIEVE SELECTIVE ABLATION." - DR HOUKUN LIANG

The technology has received full approval from the Chinese National Medical Products Administration and will be developed by Hymson Laser Intelligent Equipment. The therapy has been authorized for adults with advanced PDAC who are no longer eligible for surgery because of the advanced nature of their disease. Corresponding author of the study, Dr Houkun Liang noted, "Our technology, for the first time, utilizes the tumor's molecular fingerprint to achieve selective ablation."

## The results



The preclinical trials conducted on human tissue and animal models showed promising results. A single laser ablation treatment reduced tumour growth to 18% of the control samples, with minimal damage observed to the adjacent healthy tissue. Preliminary human trials conducted on 13 patients showed similar tissue selectivity; ablation was consistently 2-3 times more targeted to malignant tissue. No adverse events were observed.

The laser recognizes the tumour by the collagen fibres present in the growth. Collagen absorbs the most light, and laser energy, at the 6.1-micron wavelength. The laser was programmed to emit a short femtosecond burst of energy when it detected the signature wavelength in the tumour tissue.

The result is intense localized heating and “explosive vaporisation” of the tumour tissue.

Dr Liang noted, “Selective ablation for PDAC represents a major technological leap. By minimizing harm to healthy tissue, we hope to improve patient comfort, speed up recovery, and expand access to effective care for those faced with this devastating cancer.”

## Next steps

Clinical trials are expected to begin in China in early 2026, with submissions to international regulatory bodies possible in 2027. The laser treatment, guided by ultrasound, will be delivered through a minimally invasive hollow-core fibre needle, allowing for precision delivery in an anatomically challenging region.

Several technical challenges will need to be resolved before clinical trials can determine the safety and efficacy of this approach in large human populations. The authors want to test a more powerful version of their technology to assess its feasibility in the clinic. They noted that an improved hollow fibre delivery system is in development to refine the technique. Specifically, PDAC tumours can be notoriously irregular, and a more refined tumour detection procedure must be developed to ensure the whole growth is removed in a single treatment.

All things being equal, it might be possible to extend this technology to other collagen-rich tumours such as breast, colon, kidney, skin and brain tumours. As it is, pancreatic ductal adenocarcinoma is an aggressive disease capable of silently spreading beyond the pancreas- it has a 10% five-year survival rate. Development of an effective and highly selective intervention like femtosecond laser technology could represent an important step forward in treating these cancers.

Human tumours have developed several mechanisms by which they flourish within us - but it is going to be hard to argue with a laser.

## Reference

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