

Surgical innovations to target tumours

SMU teams have spearheaded new technologies for cancer treatment, including gastric and liver cancers.

Spearheading strategies to optimize diagnosis and treatment, SMU professors Guoxin Li and Chihua Fang have contributed to innovations targeting gastric and liver cancers.

China accounts for 42% of all gastric cancer cases worldwide, with 80% already at an advanced stage when diagnosed, reducing the likelihood of surgical success.

For these advanced cancer patients, the usual surgical practices involve distal gastrectomy, along with the removal of lymph nodes in nearby sites. However, the advantages of laparoscopic gastrectomy (a minimally invasive option) over

conventional open gastrectomy (single incision) had not been proven.

To test the benefit of laparoscopic gastrectomy for locally advanced gastric cancer, Li led one of the first multicentre randomized controlled studies to compare the two techniques. His team published their findings in the *Journal of the American Medical Association* in 2019, based on data from September 2012 to December 2017, collected from 1,056 patients in 14 hospitals across China.

"The three-year disease-free survival rates for both options were close, which suggested that laparoscopic gastrectomy is not an inferior option when compared to conventional open gastrectomy for locally advanced

gastric cancer patients," says Li.

As the director of the general surgery department at the Nanfang Hospital, SMU's affiliated hospital, Li has introduced new standards to enhance minimally invasive surgeries for gastric cancers. "Building on our laparoscopy techniques, we have introduced new strategies from lymph node dissection to surgical reconstruction. Our hope is to improve patient well-being by reducing surgical bleeding and pain, improving wound appearance, and speeding up postoperative recovery," he says.

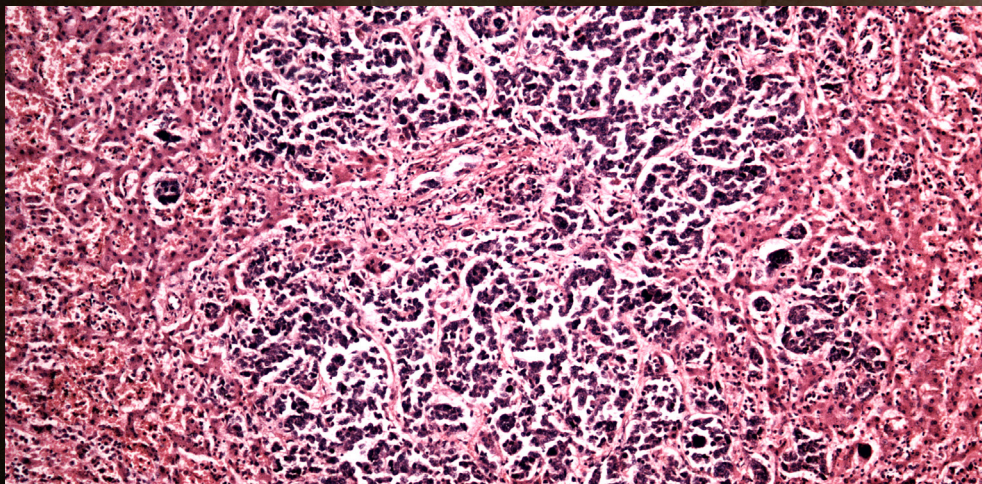
These aims are boosted by the work of Fang, the head of Hepatobiliary Division I at the Zhujiang Hospital of Southern Medical University.

Surgical techniques targeting gastric cancer have been a focus for Guoxin Li.

His 20-year research career has ushered in a new era of digital intelligence for cancer treatments with the introduction of photoacoustic imaging for target-specific molecular probes, as well as computer-assisted indocyanine green fluorescent imaging for hepatic resection. Such technologies contribute to their laparoscopic hepatectomy navigation system to achieve real-time surgical navigation.

They have shown evidence of lower intraoperative blood loss and blood transfusion rates, as well as reduced length of hospital stay, and reduced liver failure rates after operations.

"Building on our new theories, technologies and platforms down to the molecular and cellular levels, we look to visualize, personalize, and improve precision from diagnosis, surgical planning to recovery process for liver cancer patients," says Fang. ■



Chihua Fang is dedicated to improving imaging technologies for liver cancer, such as liver cancer cells.