HU
HUMANITAS UNIVERSITY

RESEARCH TOPIC DASMEN6

Enhanced Endoscopic Ultrasound (EUS) imaging and Artificial Intelligence for pancreatic lesions

Curriculum DASMEN Clinical

Laboratory name and address
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Abstract
Pancreatic cancer (PC) is one of the leading cause of cancer-related deaths worldwide, and the new case burden is estimated to grow steadily for the next 20 years Favourable long-term outcomes are strictly related to early detection and surgical resection.

Endoscopic Ultrasound (EUS) enables observation of the pancreas with high spatial resolution, bousting a superior diagnostic accuracy over multidetector CT and MRI, singularly for pancreatic lesions, but a meagre specificity when differentiating pancreatic cancer from other pathologies, as well as predicting biological/histological features (i.e. grading) and clinical behaviour (i.e. IPMN evolution to cancer, PC response to chemoterapy) However, with the advent of image enhancing technologies such as Contrast Enhanced EUS (CE-EUS) and Elastography (C-EUS) coupled with Doppler and Harmonic modes (CH-EUS), we incread the quality of our diagnostic armamentarium.

In this context, the introduction of Artificial Intelligence (AI), alone or in combination with existing enhanced EUS imaging technologies, may contribute in pancreatic lesion differential diagnosis and in predicting histological and clinical features.

The general aim of this proposal is to develop an innovative model to better stratify and manage patients who refered to the endoscopy unit for undergoing an EUS for pancreatic lesion assesment.

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Scientific references

Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018; 68:394-424.

Egawa, S.; Toma, H.; Ohigashi, H.; Okusaka, T.; Nakao, A.; Hatori, T.; Maguchi, H.; Yanagisawa, A.; Tanaka, M. Japan Pancreatic Cancer Registry; 30th year anniversary: Japan Pancreas Society. Pancreas 2012, 41, 985–992

Kitano, M.; Yoshida, T.; Itonaga, M.; Tamura, T.; Hatamaru, K.; Yamashita, Y. Impact of endoscopic ultrasonography on diagnosis of pancreatic cancer. J. Gastroenterol. 2019, 54, 19–32

Tonozuka R, Mukai S, Itoi T. The Role of Artificial Intelligence in Endoscopic Ultrasound for Pancreatic Disorders. Diagnostics. 2021;11

Main technical approaches

Endoscopic Ultrasound (EUS) with enhanced imaging modalities.
- EUS-guided fine-needle aspiration and core needle biopsy.

Further the PhD candidate will learn supervised and unsupervised machine learning and advanced statistical modeling.

Particular attention will be dedicated to assessing the performance of the developed prediction tools and to validate the results.

Type of contract

Position not supported by any scholarship or equivalent contract.