

## AB011. 175. Selective colorectal cancer fluorescence by calibrated dose and timing of indocyanine green with standard near-infrared endoscopic illumination alone

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**Abstract:** Confident, optical discrimination of malignant from benign tissue within the colorectum could be useful during colonoscopy for the easy identification of live cancer cell deposits within neoplastic sites. We show how the enhanced permeability retention (EPR) phenomenon, a hallmark characteristic of cancer, can be reliably exploited by intelligent dose-delay utilization of near infrared (NIR) with indocyanine green (ICG) providing for endoscopic visualization of colorectal cancer tissue with high selectivity versus background, adjacent non-neoplastic tissue. NIR viewing was achieved using the PINPOINT Endoscopic System (Novadaq) for NIR illumination. ICG was administered as a systemic aliquot via peripheral cannula at

a dose of 0.25 mg/kg and the region of interest visualized 15 minutes afterwards. Careful dose/interval combination induces primary tumour fluorescence in a variety of settings including direct serosal visualisation of colonic cancers in both open and laparoscopic surgery and identification of out-of field metastatic relapse in the retroperitoneum in a patient after prior radical D3 resection of a right colon cancer. Prior dose-related work has shown that earlier administration (40–180 minutes before examination) gives no useful tumour fluorescence. Targeting the tumour microenvironment as a package obviates the issue of variable expression cellular phenotypes while use of a safe and approved agent avoids toxicity concerns and allows clinicians focus on determination of clinical usefulness including indicative cost-economic profiling ahead of new agent commercialisation. In this way, NIR-ICG offers itself as a similar oncologic diagnostic modality as FDG-PET while remaining the benchmark fluorescent agent for intraoperative tissue evaluation.

**Keywords:** Colorectal cancer; fluorescence; metabolomics; near infrared; indocyanine green

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