ORAL PRESENTATIONS 1B
COLORECTAL

O49 AWARENESS AND UPTAKE OF FAMILY SCREENING IN PATIENTS DIAGNOSED WITH COLORECTAL CANCER AT A YOUNG AGE
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Introduction
About 15-20% of people who develop colorectal cancer have a first-degree relative also affected by the disease. There is a large disparity in guidelines for screening of relatives of patients with colorectal cancer. We aimed to examine awareness and uptake of family screening amongst patients diagnosed with colorectal cancer under the age of 60 in a single institution between June 2009 and May 2012.

Methods
Patients under the age of 60 who received surgical management for colorectal cancer at UCHG between June 2009 and May 2012 were identified using pathology records and theatre log books. A telephone questionnaire was carried out.

Results
In total, 317 patients were surgically managed for colorectal cancer over the study period. 65 of these patients were under the age of 60 at diagnosis. 8 patients were deceased and 13 declined to participate, leaving a study population of 44 patients. The mean age was 51 (range 30-59). 66% had node-positive disease. 25% had a positive family history of colorectal cancer, adenomas, and/or polyps in a first-degree relative. Of 324 living first-degree relatives identified, only 40.9% had been screened as a result of patient’s diagnosis. Reasons for lack of uptake were diverse including unwillingness to undergo colonoscopy and fear of cancer diagnosis.

Conclusion
Awareness and uptake of screening in first-degree relatives of patients diagnosed with colorectal cancer at a young age is low. Increased education, uniformity of guidelines and dedicated family history clinics are needed to improve screening uptake in this high-risk population.

Take-home message
Guidelines for screening of first-degree relatives of patients with colorectal cancer are diverse. Uptake and awareness are low in this high-risk population.

O50 NEUTROPHIL-LYMPHOCYTE RATIO (NLR) AS A SIMPLE AND NOVEL BIOMARKER IN PREDICTING LOCOREGIONAL RECURRENCE AFTER CHEMOTHERAPY FOR SQUAMOUS CELL CARCINOMA (SCC) OF THE ANUS
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Introduction
NLR is a prognostic marker in several malignancies. This study assesses whether NLR can be used as a predictor of locoregional recurrence after chemoradiotherapy for anal SCC.

Methods
Patients treated with curative intent between 1st of January 2004 and 31st December 2011 were identified. Pre-treatment blood tests and radiological staging were available from multidisciplinary meeting records. NLR was calculated from pre-treatment blood tests. Relationships between NLR and clinico-pathological parameters were analysed. Receiver operating characteristic curves were constructed to determine the cut-off NLR to dichotomise the data for survival analyses. The measured cut-off NLR value was 4.75.

Results
92 patients were identified. Pre-treatment 'T' stage was T1(n=7), T2(n=36), T3(n=35) and T4(n=14). Nodal stage was node-negative(n=62) and node-positive(n=30). NLRs were significantly higher in both node-negative patients(p=0.014) and cases who developed recurrence (p=0.006). Elevated NLR[≥4.75] was predictive of recurrence at univariate level(Odds ratio[OR]=10.67, 95% Confidence interval[CI]=3.27-34.81, p<0.0001) and multivariate level(OR=9.59, CI=2.85-32.34, p<0.0001). On univariate survival analysis, an elevated NLR was associated with worse overall survival(Hazard ratio[HR]=10.49, 95% CI=2.76-39.93, p<0.0001) and cancer-specific survival(HR=12.17, CI=2.43-60.88, p<0.0001). Multivariate Cox regression analysis demonstrated that an elevated NLR is a
prognostic marker in overall survival (HR=5.74, 95% CI=1.16-28.47, p=0.032) but not in cancer-specific survival (HR=2.51, 95% CI=0.41-15.4, p=0.319).

Conclusion
Pre-treatment NLR is a simple clinical biomarker for predicting recurrence and overall survival after potentially curative treatment for anal squamous cell carcinoma.

Take-home message
Pre-treatment NLR can be a simple and novel biomarker in predicting locoregional recurrence after curative chemotherapy for squamous cell carcinoma of the anus.

O51 INTERACTIONS BETWEEN MESENCHYMAL STEM CELLS (MSCS) AND COLORECTAL CANCER CELLS ARE MEDIATED BY PLASMINOGEN ACTIVATOR INHIBITOR TYPE 1 (PAI-1)
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Introduction
MSCs are known to home to and engrat at the site of colorectal tumours. Despite this, their functional effect at this site has yet to be elucidated. Bidirectional crosstalk between stromal and epithelial populations is thought to be mediated by secreted proteins such as PAI-1. Although high circulating PAI-1 in CRC patients has been associated with poor prognosis, the specific source remains unknown. The aim of this study was to investigate interactions between MSCs and colorectal cancer cells and the factors mediating them.

Methods
Cell-conditioned media containing all secreted factors was harvested from CRC cell lines (HT-29 and HCT-116) and MSCs. Absolute levels of PAI-1 were quantified using ELISA. Migration of CRC cells was quantified in response to PAI-1 recombinant standards and MSC conditioned media with or without an antibody to PAI-1. Proliferation in the presence of these factors was also quantified using an MTS assay.

Results
The highest levels of PAI-1 protein were secreted by stromal populations (range: 1.53-18.21ng/mL). CRC migrated towards PAI-1 protein standards (5-20ng/mL) and migrated in highest number towards MSC conditioned media containing all secreted factors. In the presence of an antibody to PAI-1, this migration was significantly decreased. Both HT-29 and HCT-116 proliferated to a greater degree, however PAI-1 had an anti-proliferative effect on HT 29 cells.

Conclusion
This is the first study to report on the functional effects of MSCs on CRC cells. The pro-migratory and anti-proliferative effects of MSC-secreted PAI-1 reported here, suggests that MSCs have a significant impact on tumour biology.

Take-home message
Mesenchymal Stem Cells are present in colorectal tumours and are having a distinct effect on proliferation and migration, mediated by PAI-1. These remarkable cells may represent novel therapeutic targets.

O52 KRAS MUTATION AND ITS EFFECT ON OUTCOME AFTER NEOADJUVANT CHEMORADIOThERAPY IN RECTAL CANCER: A META-ANALYSIS
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Introduction
Currently the gold standard of treatment for locally advanced rectal cancer is neoadjuvant chemoradiotherapy (CRT) followed by total mesorectal excision. Some patients achieve a pathological complete response after neoadjuvant CRT whilst others have minimal response. Identification of biomarkers predicting poor responders may avoid considerable morbidity in some patients. KRAS mutation, which is widely recognised as a key step in the adenoma-carcinoma sequence, has been investigated as a potential predictive biomarker in several studies however it has not been validated or incorporated into practice.

Methods
A comprehensive search for published studies examining the effect of KRAS mutation and clinical outcomes after neoadjuvant chemoradiotherapy was performed. All chemoradiotherapy types and duration were recorded and interval to surgery was established. Random effects methods were used to combine data.
Results
Data was retrieved from 9 studies describing 804 patients. KRAS mutation does not shorten disease free survival (odds ratio (OR): 1.239, 95% CI: 0.607-2.531, P=0.555). It is not associated with decreased levels of pathological complete response (OR: 0.778, 95% CI: 0.424-1.428, P=0.418) and does not decrease the likelihood of downstaging (OR: 0.846, 95% CI: 0.331-2.162, P=0.728)

Conclusions
The presence of KRAS mutation in rectal cancer is not predictive of poor response to neoadjuvant CRT and does not decrease disease free survival or likelihood of downstaging.

Take-home message
KRAS mutation does not confer additional resistance to neoadjuvant chemoradiotherapy in rectal cancer.

O53 CROHN'S DISEASE: A POPULATION ANALYSIS OF CHANGING TRENDS IN HOSPITAL ADMISSION AND SURGICAL INTERVENTION 1995-2009
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Introduction
The incidence of inflammatory bowel disease (IBD) is rising internationally. In addition, biological therapy has led to a paradigm shift in treatment strategies. Knowledge of changing trends in IBD is crucial in planning future acute hospital services. In this context, this study aims to evaluate trends in hospital admission and surgery for Crohn's Disease in Ireland over 14 years from 1995 to 2009.

Methods
Population-based analysis of national admissions and surgical intervention for Crohn's Disease in Ireland using HIPE (Hospital Inpatient Enquiry) database and population data from the Central Statistics Office (CSO). Data was exported into Excel and analyzed using PAWS 18.0 SPSS.

Results
Overall, Crohn's Disease accounted for 48,142 admissions and 279,933 bed days during the 14-year study period. There was a significant increase in population adjusted admission rates over time for Crohn's Disease (CD: 29.5/100000 in 1995, versus 43.6/100000 in 2009, p<0.05) Population-adjusted admission rates of for major surgery rose significantly for Crohn's Disease from 4.4/100000 in 1995 to 6.4/100000 in 2009. The mean age of major surgery did not change significantly over the study period (1995: 38.2 years, 2009: 40 years). Population adjusted day-case admissions for perianal surgery increased significantly (CD 1995: 0.1/10000, 2009: 1.5/100000).

Conclusions
The number of admissions for surgery in Crohn's Disease have not decreased; this may be due in part to the rising incidence of IBD. Although the total number of inpatient bed days remains high, there is a shift towards ambulatory care with increasing day case admissions.

Take-home message
Population adjusted overall admissions and admissions for major surgical intervention in Crohn's Disease have not decreased between 1995 and 2009.

O54 INCREASED DERMAL ELASTIC FIBRES IN PATIENTS WITH RECTAL PROLAPSE
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Introduction
The aetiology of rectal prolapse is not well understood. A number of studies have suggested that there may be an underlying connective tissue disorder contributing to the condition. The skin is a "window" into connective tissue disorders. We aimed to determine whether dermal elastic fibres are altered in patients with rectal prolapse.

Methods
Dermal punch biopsies were taken from prolapse and control patients. The samples were histologically processed to identify elastic fibres. Image analysis software was used to quantify the percentage surface area occupied by elastic fibres. Control patients underwent resections for rectal cancer.

Results
(Data presented as median, range +/-SD): Controls had lower levels of elastic fibres (4.0%) (3.88-5.56 +/-0.80) than nulliparous women (7.8%) (5.67-11.72 +/-2.21) p 0.02, multiparous women (7.4%) (2.32-22.11 +/-3.95)p 0.01 and men (8.3%) (6.83-13.22+/- 2.5) p0.01. In multiparous women,
those with external prolapse had more elastic fibres (8.0%) (6.57-22.11 +/- 5.65) than those with internal prolapse (7.2%) (2.32-13.22 +/- 2.52) p 0.04.

Conclusion
Patients with rectal prolapse have higher amount of dermal elastic fibres compared to controls. This may be indicative of further biological evidence of a generalised connective predisposition to developing the disorder.

Take-home message
Development in characterising the pathophysiology of rectal prolapse.

O55 ANALYSIS OF COLON DAMAGE AND RECOVERY FOLLOWING APPLICATION OF A MECHANICAL STRESS
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Introduction
Laparoscopic colorectal surgery involves instrumented grasping of the colon with the risk of iatrogenic injury. We aimed to quantify colonic tissue recovery after mechanical stress application and correlate this with histological tissue damage.

Methods
A 50kPA indentation was applied to fresh, ex vivo porcine colon using a modular universal surface tester (MUST) and held for 5, 30 or 60s on either the serosal or mucosal surface. Indentations were repeated 20 times. The difference between the highest and lowest force over the tissue relaxation period (ΔF) was calculated. H&E staining was performed to grade colonic damage and compared to normal colon. The depth of each histological layer was compared to a control region.

Results
The mean ΔF was higher with indentations at the serosal as compared to mucosal surface at 5 and 30s time-points. This was reversed at 60s where ΔF was higher at the mucosal surface. Histological analysis showed a significant decrease in muscle thickness at 5 (p=0.03) and 30s (p=0.001), irrespective of whether the force was applied to the mucosal or serosal surface. The submucosal depth was decreased in the 60s indentations only (p=0.001). A positive correlation was observed between indentation duration and grade of mucosal injury.

Conclusions
We have shown for the first time that mechanical stresses, equivalent to those in laparoscopic tissue grasping, result in microscopic damage to the colon. The extent of irreversible damage is dependent on the duration of applied stress. Further analysis is being undertaken to determine safe thresholds for tissue handling.

Take-home message
Mechanical stresses, equivalent to those in laparoscopic tissue grasping, result in microscopic damage to the colon in ex vivo experiments.

O56 A POTENTIAL PATHWAY LINKING INFLAMMATION TO MIR-21 ACTIVATION AND PDCD4 DOWNREGULATION IN COLORECTAL CANCER
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Introduction
Aspirin is effective in chemoprevention of colorectal cancer (CRC). The mechanisms underlying this effect are unclear but may partly rely on its ability to inhibit cyclooxygenase (COX) enzymes. COX-2 is an important player in tumour development and alters the expression of the tumour suppressor gene Programmed Cell Death 4 (PDCD4). As PDCD4 is also a direct target of the oncogene microRNA-21 (miR-21), we aimed to investigate a potential pathway involving COX-2, miR-21 and PDCD4.

Methods
miR-21, PDCD4 and COX-2 expression were measured using quantitative RT-PCR in tumour and paired normal mucosa tissues from 45 CRC patients and correlated to tumour stage. Expression analysis of miR-21, PDCD4 and COX-2 was also performed on HCA-7 CRC cells before or after treatment with anti-miR-21, or a selective COX-2 inhibitor (NS398), or Prostaglandin E2 (PGE2).

Results
Upregulation of miR-21 (p<0.0001) and COX-2 (p<0.0001) mRNA and downregulation of PDCD4 mRNA (p<0.0001) in CRC tissue relative to paired normal mucosa was demonstrated, correlating with
worse Duke’s stage (p<0.0001). In HCA-7 cells, knockdown of miR-21 and treatment with NS398 significantly increased PDCD4 protein levels (p<0.01 and p<0.001 respectively). NS398 had no effect on miR-21 expression whilst PGE2 upregulated miR-21 expression and downregulated PDCD4 protein (p=0.02).

**Conclusion**

Significant changes of miR-21, PDCD4 and COX-2 RNA levels in CRC correlate with worsening stage and appear functionally related. COX-2 induced downregulation of PDCD4 in CRC may be achieved via PGE2 and miR-21 dependent and independent pathways which are worthy of further investigation as potential therapeutic targets.

**Take-home message**

This is the first study to demonstrate a potential pathway linking inflammation with miR-21 activation and downregulation of the tumour suppression gene PDCD4 in colorectal cancer.

**O57 COMPARISON OF ANAL EVOKED POTENTIALS ELICITED BY MECHANICAL AND ELECTRICAL STIMULI IN ANAESTHESISED RATS**

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**Introduction**

Evoked potentials (EPs) can be used to interrogate sensory pathways fundamental to control of defaecation, but are usually elicited using electrical stimuli known to activate multiple neuronal subtypes. Use of a physiological stimulus would provide a more accurate assessment of those pathways. This study compared mechanical and electrical EPs of the rat anal canal.

**Methods**

Eight anaesthetised female Wistar rats (body mass 180-270g) were used to record EPs using a 32 channel multi-electrode array overlying the right primary somatosensory cortex. Electrical EPs were elicited using a 2mm anal plug electrode (1Hz, 1ms, 10V) and mechanical EPs using an inter-dental brush placed on a rotating stepper motor (1Hz, 1ms, 15o rotation). Response latency, amplitude and spatial extent, expressed as an index, were measured. Statistical significance was assumed if P<0.05.

**Results**

Mechanical and electrical EPs were successfully recorded in all animals. Mean maximal response amplitude (electrical 30.8±1V (SD 27.8) vs. mechanical 17.5 (11.5)) and onset latency (electrical 14.1ms (3.5) vs. mechanical 13.7 (1.5)) were similar (Student’s t-test P=0.17 and P=0.83). Cortical location and waveform profile were also comparable. The spatial extent index was lower for mechanical stimulation (2.5 (1.7) vs. (4.1 (2.5)), but did not reach statistical significance (P=0.06).

**Conclusions**

To the authors’ knowledge these are the first mechanically elicited anal EPs recorded in animals. Characteristics appear similar to those elicited electrically. Mechanical EPs may prove useful in the further exploration of treatments that modulate the neuronal control of defaecation such as sacral nerve stimulation.

**Take-home message**

Characteristics of mechanically and electrically evoked anal potentials are similar. As mechanical stimulation provides a more physiologic stimulus, these may be useful in the exploration of anal sensation.

**O58 CARCINOEMBRYONIC ANTIGEN (CEA) IS A HIGHLY SPECIFIC AND SENSITIVE MARKER FOR COLORECTAL CANCER IN VIVO IMAGING OR TARGETED DELIVERY APPLICATIONS AND OUTPERFORMS OTHER CANDIDATE MARKERS**

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**Introduction**

Colorectal cancer-specific biomarkers have been used as targets for fluorescent intra-operative imaging, targeted PET/MRI and selective cytotoxic drug delivery. Each of these applications is reliant upon tumour-specific markers, yet marker selection is rarely evidence-based. We evaluated the
sensitivity and specificity of potential markers for colorectal cancer detection to inform these choices.

Methods
Carcinoembryonic antigen (CEA), tumour-associated glycoprotein-72 (TAG-72), folate receptor alpha (FRα) and endothelial growth factor receptor (EGFR) were identified as the markers most commonly used in published work. Their expression was evaluated by immunohistochemistry in matched normal and tumour tissue from 280 patients using Histoscores of 0-15. Matched positive and negative lymph nodes from 18 patients were also examined and scored.

Results
Markers were more highly expressed in tumour tissue than in matched normal tissue in 98.8%, 79.0%, 37.1% and 32.8% of cases for CEA, TAG-72, FRα and EGFR respectively. CEA showed the greatest differential expression, with tumours scoring a mean of 10.8 points higher than normal tissues (95% CI 10.31-11.21), compared to the next best marker, TAG-72 (mean 5.1, 95% CI 4.35-5.77). FRα and EGFR showed only small increases in expression within tumours. Similarly, CEA showed the greatest differential expression between positive and negative lymph nodes. The sensitivity and specificity of each marker for detecting tumour tissue were determined following receiver operating characteristic analyses; CEA gave the best combination of 93.7% and 96.1% respectively.

Conclusion
CEA has the greatest potential to allow highly specific tumour imaging and drug delivery; future translational research should aim to exploit this.

Take-home message
EGFR, TAG-72, CEA and Folate Receptor alpha have all been used as colorectal cancer-specific targets for intra-operative imaging, targeted-PET/MRI and selective cytotoxic drug delivery. CEA has the greatest potential as a highly sensitive and specific target for these applications.

O59 DOES TUMOUR TATTOOING IN COLORECTAL SURGERY AFFECT LYMPH NODE YIELD?
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Introduction
It is common practice to routinely tattoo colorectal neoplastic lesions to facilitate detection at laparoscopic resection. It is frequently observed that mesocolic lymph nodes avidly uptake the blue dye which may facilitate subsequent detection by the pathologist. The aim of this study was to determine if total lymph node harvest in resected cases is higher in those patients with tattooed tumours.

Methods
Patients having laparoscopic resection between 2004-2010 were identified from a prospective database. Presence of tattoo, diagnosis, operative procedure and lymph node yield (total and involved) were collected. Statistical analysis was by one-way ANOVA.

Results
One hundred and forty one patients were studied including 84 malignant cases (60%). 89 cases (63%) were tattooed. Mean total node yield was 15.4 in anterior resection, 11.9 left hemicolecctomy and 16.3 for right hemicolecctomy (p=0.06). Mean total node yield was lower in benign cases compared with malignant (9.9 vs. 17.3)(p=0.0001). Overall there was no significant difference in total mean lymph node yield in tattooed cases (14.4) compared with non-tattooed cases (15.3, p=0.513). Separate analysis of malignant cases in the series showed no significant difference in total node yield (16.06 tattooed vs. 18.09 non-tattooed, p=0.27) or involved node yield (1.97 tattooed vs. 1.6 tattooed, p=0.577).

Conclusions
High rates of lymph node harvest were observed in this series of laparoscopic colorectal resections. Preoperative tumour tattooing did not correlate with increased total or involved lymph node yield. The utility of this technique in improving node harvest in centres with low nodal yield warrants investment.

O60 REPORTING OF LONG-TERM SURVIVAL AND ONCOLOGICAL OUTCOMES OF COLORECTAL CANCER SURGERY: A SYSTEMATIC REVIEW
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Introduction
Assessment of survival rates and disease recurrence is important to inform treatment decisions in patients with colorectal cancer (CRC). There is currently no consensus, however, on how these outcomes should be measured. This study aimed to consider the verbatim terms and definitions of long-term survival and oncological outcomes reported in studies of CRC surgery.

Methods
This systematic review identified prospective studies of CRC surgery between 2009-2010. Excluded were studies of non-biomedical interventions; non-curative, non-surgical treatments; screening; and treatment of colorectal metastases. Data extraction included the verbatim terms and definitions of survival and long-term oncological outcomes.

Results
Some 5644 abstracts were identified of which 194 articles (34 randomised and 160 non-randomised studies) were included. 766 different clinical outcomes were extracted from publications of which 42 pertained to long-term survival and 66 to oncological outcomes. The most frequently reported survival outcomes were ‘overall survival’ (recorded in 60, defined in 20 in 6 different ways) and ‘disease-free survival’ (recorded in 43, defined in 27 in 16 different ways). The most frequently reported oncological outcomes were ‘local recurrence’ (recorded in 44, defined in 19 in 15 different ways) and ‘distant recurrence’ (recorded in 23, defined in 4 in 4 different ways).

Conclusions
Long-term survival and oncological outcomes of CRC surgery are inconsistently reported and poorly defined. Standardisation of outcome reporting is necessary to improve data synthesis, allow comparisons between studies and to better inform clinical practice. We recommend the development of a core outcomes set (a minimally reported set of endpoints for all studies of CRC surgery).

Take-home message
Standardisation of outcome reporting is necessary to improve data synthesis, allow comparisons between studies and to better inform clinical practice. We recommend the development of a core outcomes set (a minimally reported set of endpoints for all studies of CRC surgery).

O61 SYSTEMIC INFLAMMATORY RESPONSE IS PREDICTIVE OF OUTCOME IN PATIENTS UNDERGOING SURGERY FOR LOCALLY RECURRENT RECTAL CANCER
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Introduction
Systemic inflammatory response is associated with outcomes in a number of malignancies. We investigate the predictive value of markers of SIRS as potential biomarkers of outcome in patients with locally recurrent rectal cancer (LRRC).

Methods
Patients undergoing surgery between January 2005 and December 2011 were identified. Data on pre-operative neutrophil-lymphocyte ratio (NLR), platelet-lymphocyte ratio (PLR), C-reactive protein, albumin and haemoglobin (Hb) were collected.

Results
One hundred and thirty patients were identified. At ROC analysis, NLR of 4.81, PLR of 233, Hb of 13.1, Albumin of 26, and CRP of 8.1 had the highest sensitivity and specificity. Elevated NLR, PLR and CRP were associated with poor overall survival (p<0.05). NLR and margin status were the only prognostically significant factors at multivariate analysis (p<0.05).

Conclusions
This study has highlighted the importance of NLR, PLR and CRP in influencing post-operative outcomes in patients with LRRC. Pre-operative inflammatory markers are important clinical biomarkers associated with tumour biology and prognosis in patients with locally recurrent rectal cancer.

Take-home message
The inflammatory response is important in predicting outcomes in patients with locally recurrent rectal cancer.
GENETIC AND EPGENETIC FACTORS IN PREDICTION OF RESPONSE OF RECTAL ADENOCARCINOMA TO NEOADJUVANT CHEMORADIATION
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Introduction
Genetic and epigenetic factors are implicated in the pathogenesis of colorectal cancer and may predict the response to treatment. This pilot work aims to implicate which of these factors determine the response of rectal cancer to neoadjuvant chemoradiotherapy.

Methods
Patients undergoing neoadjuvant chemoradiotherapy and subsequent resection for rectal adenocarcinoma were identified. Pretreatment biopsies were analysed by immunohistochemistry for DNA (cytosine-5)-methyltransferase (DNMT1) and 5 Methyl Cytosine (5MC). KRAS mutations (codon 12,13,61) were detected using pyrosequencing. CpG island methylator phenotype (CIMP) status was determined by methylation specific PCR using a two panel approach. Tumour regression grade (TRG) was analysed by two independent histopathologists.

Results
24 patients were analysed initially. 6/24 (25%) were CIMP-High, 5/24 (21%) CIMP-Intermediate and 13/24 (54%) CIMP-Low. 4/6 (66%) CIMP H tumours had KRAS mutations, compared with 3/13 (23%) CIMP L. Tumour regression was less marked in CIMP H tumours (mean TRG 2.83/5) compared with CIMP I (mean TRG 3/5) and CIMP L (mean TRG 3.45/5). DNMT1 staining scores were similar between groups but 5MC staining scores were higher (mean score 7.4/8) in CIMP H tumours compared with CIMP L tumours (mean score 6/8), which approached statistical significance (p=0.08). Extra mural vascular invasion was seen in 3/24 tumours, all of which were CIMP-H. CIMP H tumours were associated with advanced T and N stage.

Conclusions
High levels of tumour methylation correlate with adverse pathological features. CIMP status as a marker of aberrant DNA methylation demonstrates potential as a predictive marker for patients response to neoadjuvant chemoradiotherapy and may have utility in guiding neoadjuvant treatment.

Take-home message
Preliminary data from this study suggest that characterisation of DNA methylation status and KRAS mutational analysis in pretreatment biopsy specimens may offer a useful tool in predicting patients response to neoadjuvant chemoradiotherapy.