

colorectal cancer (mCRC) patients. However, with the use of all the three active cytotoxics upfront, some concerns may arise about the activity of second-line treatments for these patients. In this retrospective analysis, we evaluated the outcome of second-line treatments in patients treated with first-line FOLFOXIRI enrolled in two consecutive phase II and in one phase III studies.

**Material and Methods:** Overall, a total of 196 initially unresectable mCRC patients were treated with first-line FOLFOXIRI administered for a maximum of 12 cycles. Among the 185 patients so far progressed, 136 (74%) received a second-line treatment and were evaluable for response. Thirty-nine patients (26%) did not receive second line treatments mainly because of deterioration of performance status (PS) or liver function, refusal or death.

**Results:** Patients' characteristics at the time of second-line treatment included: M/F = 88/48 patients, median age 63 yrs (range 27–76), ECOG PS  $\geq 1$  = 52 patients (38%).

Three (2.2%) complete and 28 (20.6%) partial responses were observed for an overall RR of 22.8%; 35.3% of patients obtained a stable disease while 41.9% progressed.

The table reports the regimens used in second-line and the RR obtained.

	Number of patients	RR (%)
Overall	136	22.8
FOLFOXIRI	32	37.5
FOLFIRI	35	31.4
FOLFOX	14	28.6
Mitomycin plus 5-Fluorouracil/Capecitabine	19	5.3
Infusional 5-Fluorouracil/Capecitabine	14	14.3
Cetuximab-containing regimens	7	0
Bevacizumab-containing regimens	3	0
Other regimens (Irinotecan alone, Irinotecan-Oxaliplatin, Irinotecan-Gemcitabine, Raltitrexed, Oxaliplatin plus Raltitrexed or Mitomycin)	12	8.3

After a median follow up of 48 months from the start of salvage treatment, the median PFS and OS were 5.93 and 13.2 months, respectively.

At an explorative analysis, patients treated with second-line FOLFOXIRI, FOLFIRI or FOLFOX had a higher RR (33.3% vs 7.3%,  $p=0.0003$ ), PFS (6.9 vs 3.5 months,  $p=0.001$ ) and OS (15.2 vs 9.2 months,  $p=0.004$ ) compared to patients treated with other regimens.

**Conclusions:** First-line FOLFOXIRI does not impair the possibility to obtain objective responses and to delay tumour progression with second-line treatments containing the same agents used upfront.

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## POSTER

### Final results from PRECEPT: efficacy and safety of second-line treatment with panitumumab and FOLFIRI in patients with metastatic colorectal cancer (mCRC)

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**Background:** Panitumumab (pmab) is a fully human antibody against the epidermal growth factor receptor (EGFR), a therapeutic target in patients (pts) with mCRC. Response to anti-EGFR therapies can be predicted by mutation status of KRAS in tumors. This prospective analysis evaluated the effect of tumor KRAS status on efficacy of second-line pmab+FOLFIRI.

**Methods:** Pts with unresectable, measurable mCRC (ECOG status 0/1) were enrolled in this phase 2, open-label, single-arm study after failure of first-line treatment with oxaliplatin-based chemotherapy+bevacizumab (ClinicalTrials.gov ID: NCT00411450; sponsor: Amgen). Pts received pmab 6 mg/kg + FOLFIRI Q2W until disease progression or intolerability. Tumor assessments were performed at weeks 8, 16, 24, 32, and Q12W thereafter. KRAS status was determined by real-time PCR on DNA extracted from fixed tumor sections. Efficacy endpoints included objective response (per investigator), progression-free survival (PFS), and overall survival (OS). Safety endpoints included incidence of adverse events (AEs). Endpoints were evaluated by tumor KRAS status.

**Results:** 109 pts enrolled in the study and received  $\geq 1$  dose of pmab; 59% had tumors with wild-type (WT) KRAS, 41% had tumors with mutated (MT) KRAS. Efficacy outcomes (excluding 2 pts missing information at baseline) are shown (Table). Hazard ratios (95% CI) by KRAS status were 0.8 (0.5, 1.1) for PFS and 0.6 (0.4, 0.9) for OS. Pmab-related AEs were reported in 93% of pts; 94 pts (82%) had grade  $\geq 3$  AEs (related and unrelated). The most common AEs (WT/MT KRAS) were diarrhea (81%/62%), nausea

(53%/58%), fatigue (55%/47%), rash (50%/56%), and acneiform dermatitis (41%/36%). The most common serious AEs were dehydration (10% of all pts), pyrexia (5%), and deep vein thrombosis (3%).

**Conclusions:** Numerical differences in PFS and OS in favor of pts with WT KRAS were observed. Pmab had a safety profile consistent with other pmab+FOLFIRI trials in pts of the same study population.

Best Objective Response <sup>a</sup> , n (%)	WT KRAS (N = 64)	MT KRAS (N = 43)
Complete response <sup>b</sup>	2 (3)	1 (2)
Partial response <sup>b</sup>	13 (20)	6 (14)
Stable disease	26 (41)	18 (42)
Disease progression	13 (20)	11 (26)
Unable to evaluate/not done	10 (16)	7 (17)
Objective response rate, n responders	15	7
Response rate, % (95% CI)	23 (13, 34)	16 (5, 27)
PFS, n events	54	43
Median weeks (95% CI)	26 (19, 33)	19 (12, 25)
OS, n deaths	34	36
Median weeks (95% CI)	50 (39, 76)	31 (23, 47)

<sup>a</sup>Primary analysis set (N = 107); <sup>b</sup>Confirmed at next assessment.

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## POSTER

### Efficacy and safety of bevacizumab-based combination regimens in patients with metastatic colorectal cancer: final results from a randomised phase II study of bevacizumab + FOLFIRI vs. bevacizumab + XELIRI (FNCLCC ACCORD 13/0503 study)

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**Background:** The combination of bevacizumab (bev) and chemotherapy improves overall survival and/or progression-free survival (PFS) compared with chemotherapy alone in patients (pts) with metastatic colorectal cancer (mCRC). This randomised non-comparative phase II trial evaluated the efficacy and safety of bev in combination with either XELIRI or FOLFIRI as first-line therapy for mCRC.

**Materials and Methods:** Pts were eligible for inclusion in this study if they had histologically proven measurable mCRC, were 18–75 years of age, and had an Eastern Cooperative Oncology Group performance status of 0–2. Pts were treated with either 8 cycles of XELIRI (irinotecan 200 mg/m<sup>2</sup> on Day 1 and capecitabine 1000 mg/m<sup>2</sup> bid on Days 1–14) + bev 7.5 mg/kg on Day 1, every 3 weeks or 12 cycles of FOLFIRI (irinotecan 200 mg/m<sup>2</sup> on Day 1 + 5-fluorouracil [5-FU] 400 mg/m<sup>2</sup> + folinic acid 400 mg/m<sup>2</sup> on Day 1 followed by 5-FU 2400 mg/m<sup>2</sup> via 46-h infusion) + bev 5 mg/kg on Day 1, every 2 weeks. Bev was continued until disease progression. Pts  $\geq 65$  years of age received a lower daily dose of capecitabine (800 mg/m<sup>2</sup> bid). The primary endpoint was crude PFS at 6 months.

Table. Efficacy and tolerability of bev + XELIRI and bev + FOLFIRI in pts with mCRC

Outcome	Bev + XELIRI (n = 72)	Bev + FOLFIRI (n = 73)
Efficacy, % (95% CI)		
Objective response rate <sup>a</sup>	58 (47–70)	58 (46–69)
Crude 6-month PFS	79 (70–88)	84 (75–92)
Safety, %		
$\geq 1$ grade 3/4 AE (grade 4)	58 (8)	59 (12)
Grade 3/4 neutropenia (grade 4)	17 (3)	26 (4)
Grade 3/4 diarrhoea (grade 4)	12 (1)	5 (0)
Grade 3/4 cardiovascular (grade 4)	13 (3)	11 (1)

<sup>a</sup>Evaluated by Response Evaluation Criteria in Solid Tumours. AE, adverse event; CI, confidence interval; PFS, progression-free survival.

**Results:** In total, 145 pts were entered into the study between March 2006 and January 2008; 72 pts received bev + XELIRI and 73 pts received bev + FOLFIRI (male 64%/48%; median age 61/61 years; 35%/36% >65 years of age, respectively). Preliminary results from the first 6 months of follow-up are reported here. A total of 491/783 cycles were administered, with 63%/67% of pts receiving at least the planned number of cycles (8 cycles for bev + XELIRI and 12 for bev + FOLFIRI). The main efficacy and safety results are shown in the table.

**Conclusions:** This randomised non-comparative study has shown that bev + XELIRI and bev + FOLFIRI are similarly effective treatments for pts with mCRC, with manageable toxicity profiles. Final results will be presented at the meeting.

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POSTER

**FOLFOXIRI (irinotecan, oxaliplatin, infusional 5FU/LV) vs FOLFIRI as first-line treatment of metastatic colorectal cancer (mCRC): updated results after 5 years follow up and risk-stratified analysis**

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**Background:** As we previously reported the GONO-FOLFOXIRI regimen compared to FOLFIRI demonstrated significant improvements in responses (60% vs 34%,  $p < 0.001$ ), secondary radical (R0) resection of metastases (15% vs 6%,  $p = 0.03$ ), progression-free survival (9.8 vs 6.9 months,  $p = 0.006$ ) and overall survival (22.6 vs 16.7 months,  $p = 0.03$ ) after a median follow up of 18.4 months.

**Methods:** We updated overall survival (OS) and progression-free survival (PFS) data of the 244 randomized patients after a median follow up of 60.6 months (mos) and we used a risk-stratified analysis according to the Kohn prognostic model to determine if treatment outcomes differ in specific patient subgroups.

**Results:** The updated results confirm a significant improvement for FOLFOXIRI in terms of PFS (median 9.8 vs 6.8 mos, HR = 0.59,  $p < 0.0001$ ) and OS (median 23.4 vs 16.7 mos, HR = 0.74,  $p = 0.026$  and 5-years survival rate 15% vs 8%). There is a PFS and OS benefit from FOLFOXIRI also excluding from the analysis the R0 patients (median PFS 9.5 vs 6.6 mos,  $p = 0.0001$  and median OS 20.2 vs 15.9 months,  $p = 0.12$ ). With regard to the risk-stratified analysis, FOLFOXIRI results in longer PFS and OS than FOLFIRI in all risk subgroups with Hazard Ratios for low, intermediate and high risk groups respectively of 0.68, 0.56 and 0.44 for PFS and of 0.90, 0.58 and 0.78 for OS.

**Conclusions:** These results demonstrate that the GONO-FOLFOXIRI regimen is associated also with a better long term outcome compared to FOLFIRI (with an absolute benefit in survival at 5 years of 7%) and that the superiority of FOLFOXIRI is not only related to the increased rate of R0 surgery of metastases, but also to a better palliative effect which does not seem to be limited to some specific subgroup.

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POSTER

**Induction of resectability of colorectal liver metastases (CLM) with cetuximab (Cmab) plus CPT-11/5-FU/oxaliplatin (5-FU)/leucovorin (FA)/oxaliplatin (L-OHP) (CPT-11-FFL) (POCHER trial)**

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**Background:** CML pts K-RAS wild type seem to benefit from the addition of Cmab to standard chemotherapy (Crystal and Opus trials). Triplet combination of CPT-11/5-FU/FA/L-OHP (Falcone 2007) is more effective than doublets. Aim of the study was to evaluate Cmab+CPT-11-FFL in unresectable CLM pts, with primary endpoint resectability.

**Methods:** Unresectability criteria: (a) size >5 cm; (b) multinodular; (c) iliac location; (d) extrahepatic disease. Aim was to have at least 30% resection rate (power 80%,  $p_0 = 10\%$  and  $p_1 = 25\%$ ). Pts received weekly Cmab plus CPT-11 130 mg/m<sup>2</sup>/d1 6 h infusion (peak at 13:00), and 12 h, days 2–5, infusion of L-OHP 20 mg/m<sup>2</sup>/d (peak at 16:00), FA 150 mg/m<sup>2</sup>/d plus 5-FU

600 mg/m<sup>2</sup>/d (peak at 4:00), q2 weeks; after first 17 pts L-OHP and 5-FU were reduced to 15 and 550 mg/m<sup>2</sup>/d respectively due to toxicity. Trial was designed in 2006, thus we retrospectively evaluated EGFR and K-RAS

**Results:** From 07/20/2006 to 09/01/2008 we enrolled 43 pts: M/F 27/16; median age 60.7 y (33–76), median PS 0. Primary tumor colon/rectum 34/9; primary tumor resected 39 pts (79%); synchronous metastases 35 pts (81%); liver involvement <25%/>25% 9/34 (21/79%), pre-treatment median CEA/Ca19–9 55 ng/ml (1–6600)/91.8 U/l (2–66440); unresectability (a) 9 (21%), (b) 29 (68%), (c) 1, (d) 4 (9%). EGFR and K-RAS status was evaluated in 70% of pts (liver biopsy). EGFR staining: neg 18%, + 7%, ++ 57%, +++ 18%. K-RAS wt 75% and mut 25%. We had 34 partial response (79%, CI 79.1–87), 5 stable disease and 4 pts not evaluable for toxicity. Complete CLM resection in 25 pts (58%), 2 pts still to be resected. Median number (n) of courses (c) per pt was 10 (2–18) with median n of c before surgery (s) = 5 (3–10) and after s = 6 (1–6); median time from last c to s was 2 wks (2–4), from s to recovery chemotherapy was 10 wks (2–16). Median follow-up was 14 months (range 1–34), median PFS 13 months (CI95% 6–20), median OS not reached with 2 y survival of 63%; 14 pts alive without recurrence (32%) and 13 deaths (30%).

Major limiting toxicity was diarrhea: G2 6%, G3 81% and G4 12.5%, significantly reduced after dose modification: G2 26%, G3 35% ( $p = 0.005$ ), G4 1% ( $p = 0.006$ ). Abdominal pain also resulted significantly reduced: G2 31/25%, G3 31/7% ( $p = 0.05$ ). No significant differences pre/after dose modification for other toxicities. Toxicity did not affect time to surgery ( $p = 0.23$ ).

**Conclusions:** A triplet combination of Cmab+CPT-11-FFL seems able to obtain tumor shrinkage in 79% of unresectable CLM pts with 58% of complete liver resection. Major limiting toxicity was diarrhea improved with dose modification. Definitive results on molecular analysis and prognostic factors are in progress.

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POSTER

**Prospective comparative study on pre-operative diagnostic accuracy of different imaging techniques in colorectal cancer patients with liver metastases candidates to surgical resection (Italian PROMETEO Study)**

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**Background:** The aim of the study was to compare different available imaging techniques in patients (pts) with colorectal cancer liver metastasis (CLMs) in order to define the best diagnostic accuracy before liver surgery.

**Materials and Methods:** Consecutive pts with potentially resectable CLMs afferent to the Multidisciplinary Liver Team of S. Orsola Malpighi Hospital in Bologna were studied, with computed tomography scan (CT), magnetic resonance diffusion-weighted (MR-DW), 18F-FDG-PET and liver contrast-enhanced ultrasonography (CEUS1) in the 3 weeks prior to liver surgery. CEUS was also performed intra-operatively (CEUS2). All the imaging exams were performed according to the standard operative procedures.

**Results:** From December 2007 to March 2009, thirty-eight out of 65 pts enrolled in the PROMETEO study underwent liver resection. The pt characteristics were: 23 (60.5%) males, 15 (39.5%) females; 25 (65.8%) synchronous metastasis, 13 (34.2%) metachronous metastasis; 19 (50%) neoadjuvant chemotherapy; 8 (21.1%) previous liver surgery; 4 (10.5%) previous loco-regional treatment. One-hundred and twenty-nine liver lesions were resected; the median number lesions per patient was 2 (range 1–15). All the lesions were studied with CT, 109 (84.5%) with MR-DW, 119 (92.2%) with PET, 116 (89.9%) with CEUS1, and 126 (97.7%) with CEUS2. Five lesions (4%) at pathological examination were non-metastasis (1 hamartoma, 1 steatosis, 1 giant-cell reaction, 2 necrosis). The table reports diagnostic values of different imaging techniques:

	CT	%	MR-DW	%	PET	%	CEUS1	%	CEUS2	%
Accuracy	102/129	79	105/109	96	69/119	58	87/116	75	117/126	93
Sensitivity	101/124	81.5	104/116	90	68/116	59	86/111	77.5	114/121	94
PPV	101/105	96	104/106	98	68/70	97	86/90	95.5	114/116	98
Specificity	1/5	20	1/3	33	1/3	33	1/5	20	3/5	60
NPV	1/24	4	1/13	8	1/49	2	1/26	4	3/10	30

PPV, positive predictive value; NPV, negative predictive value.

**Conclusions:** According to this preliminary data, MR-DW and CEUS2 imaging appear to be very accurate imaging techniques in the detection of liver metastasis in patients who are candidates for resection.