

Fluorescence for response evaluation ?

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Why fluorescence imaging?



Why near-infrared fluorescence imaging?

Fast: acquisition in milliseconds

- Real-time and intraoperatively

Invisible for the naked eye

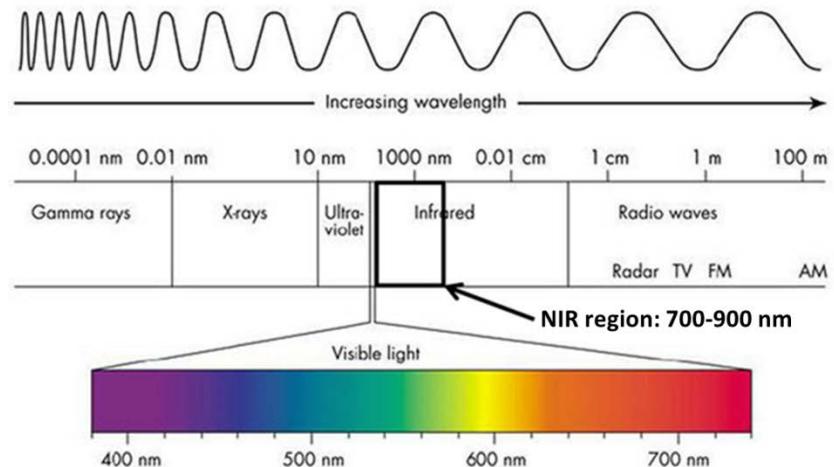
- No alteration of surgical field

Relatively high tissue penetration

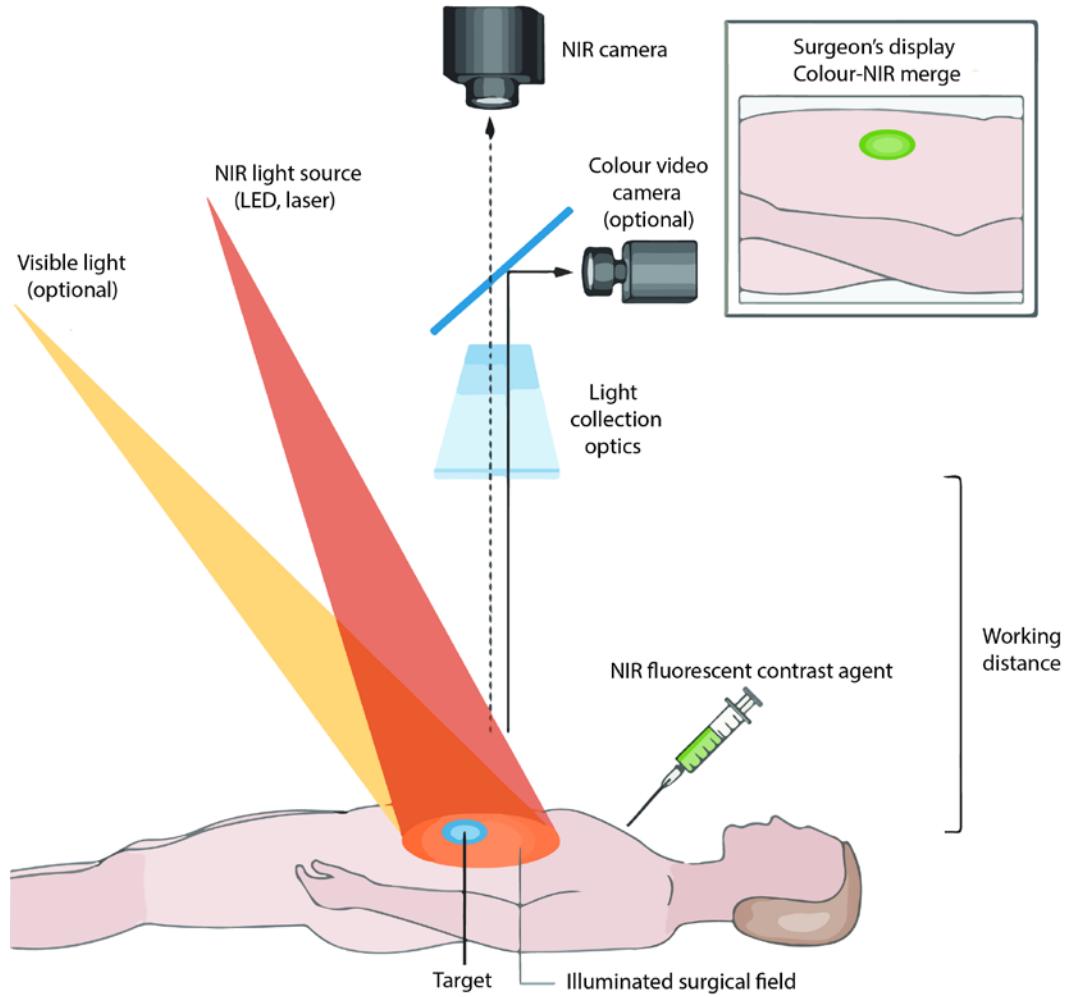
- Up to 8 mm

Easy:

- Imaging system
- Fluorescent tracer

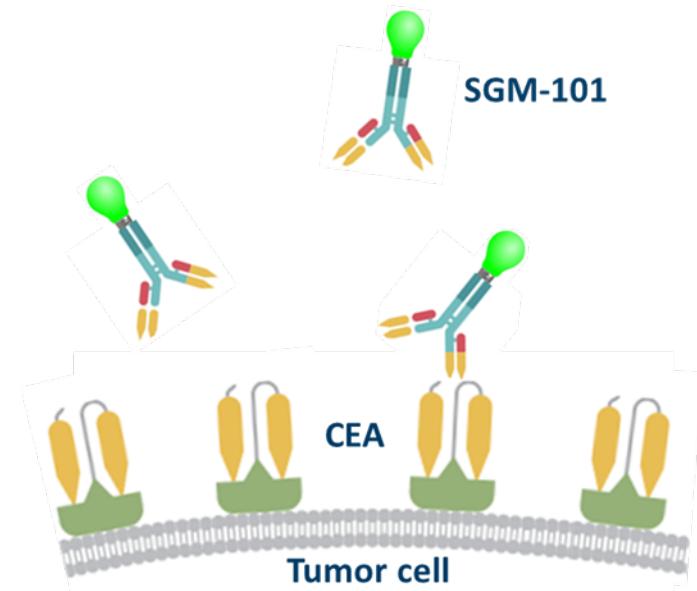
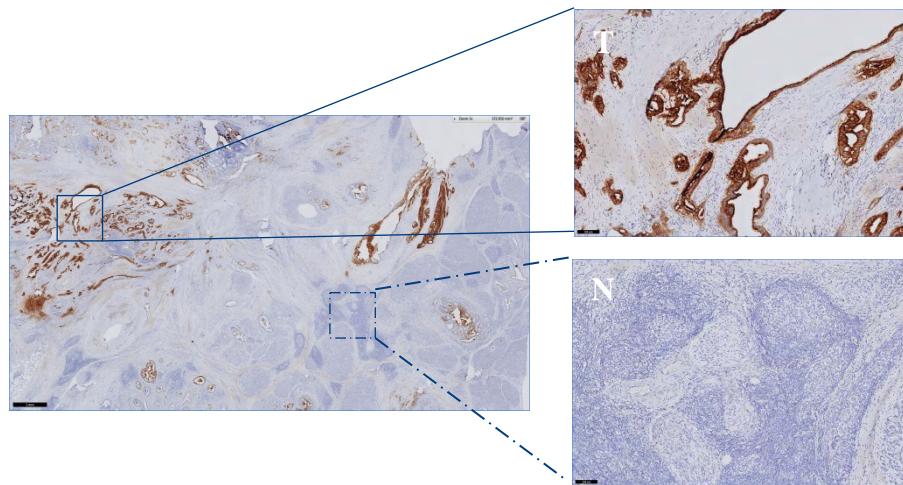


Fluorescence imaging



Targeting CEA

- Carcino-embryonal antigen
- Glycoprotein involved in cell adhesion
- 80-90% overexpression in rectal cancer
- Expression not affected by RT or CRT
- No expression normal acini



Study design

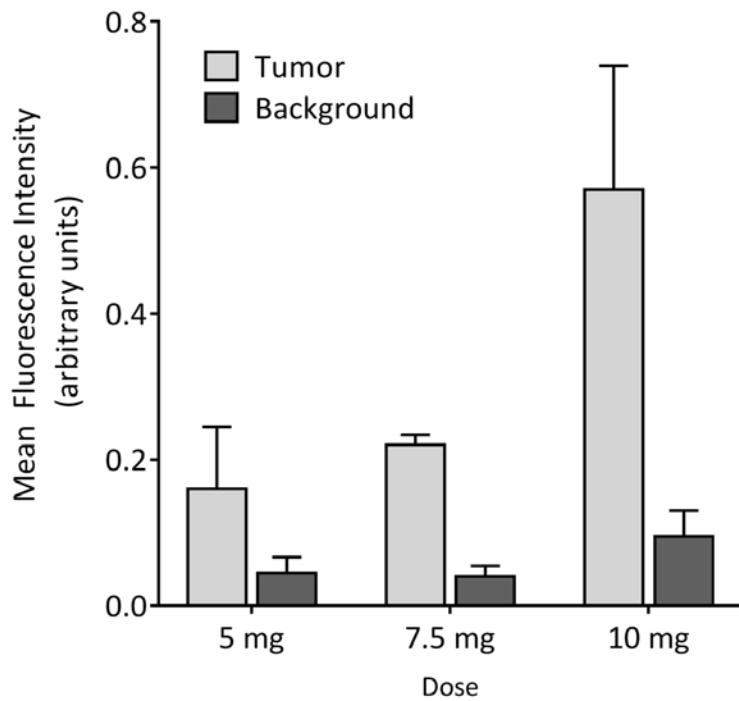
Cohort 1 = Dose escalation study

- Primary CRC ($n=9$) and elevated serum CEA ($>3\text{ng/mL}$) since diagnose
 - 5.0, 7.5, 10 mg SGM-101
 - IV administration 2-4 days prior to surgery

Cohort 2 = Expansion cohort

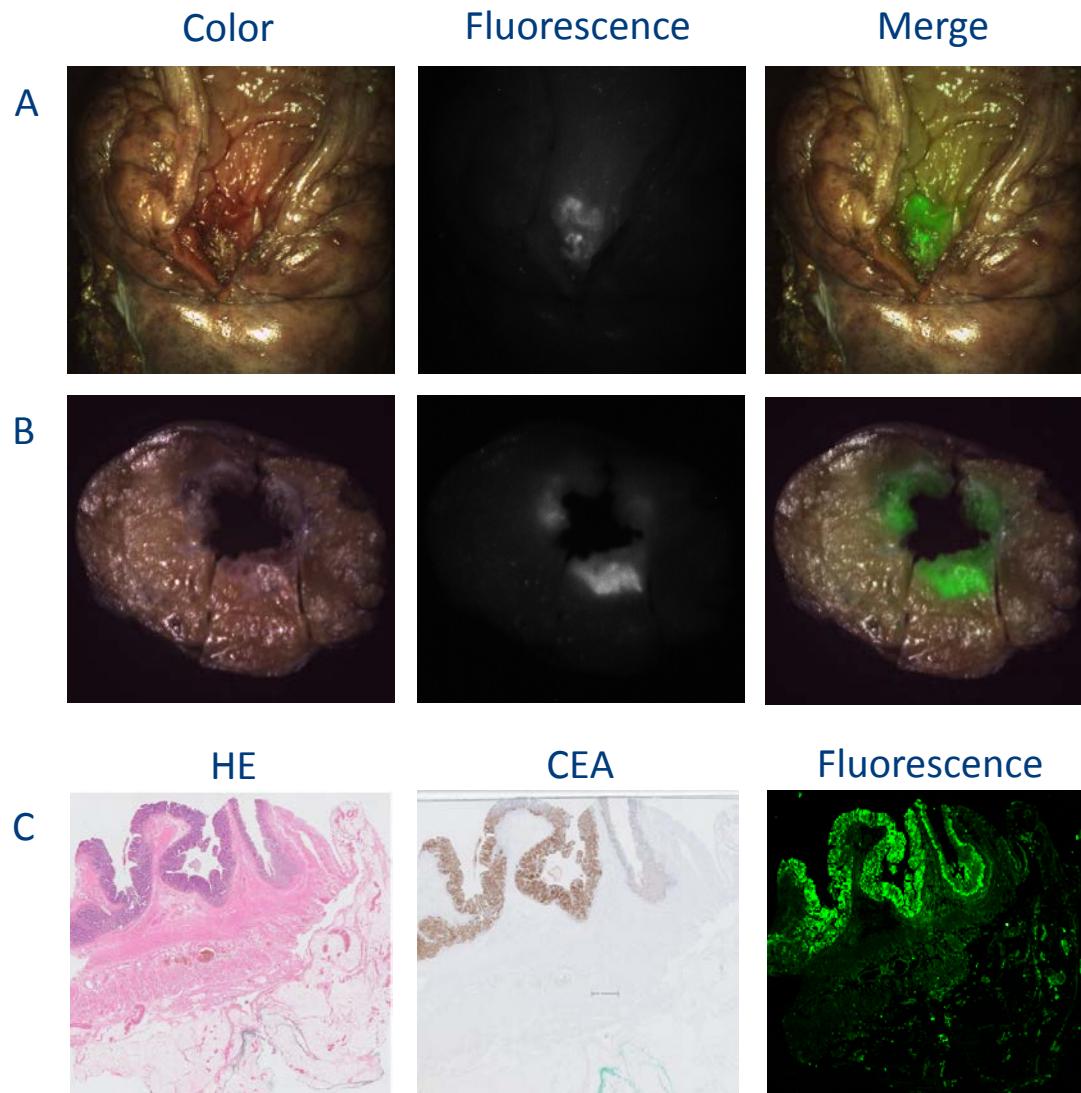
- Recurrent or peritoneal metastases of CRC ($n=17$), rising serum CEA since diagnosis
 - Optimal dose SGM-101
 - IV administration 4 days prior to surgery

Results – Cohort I

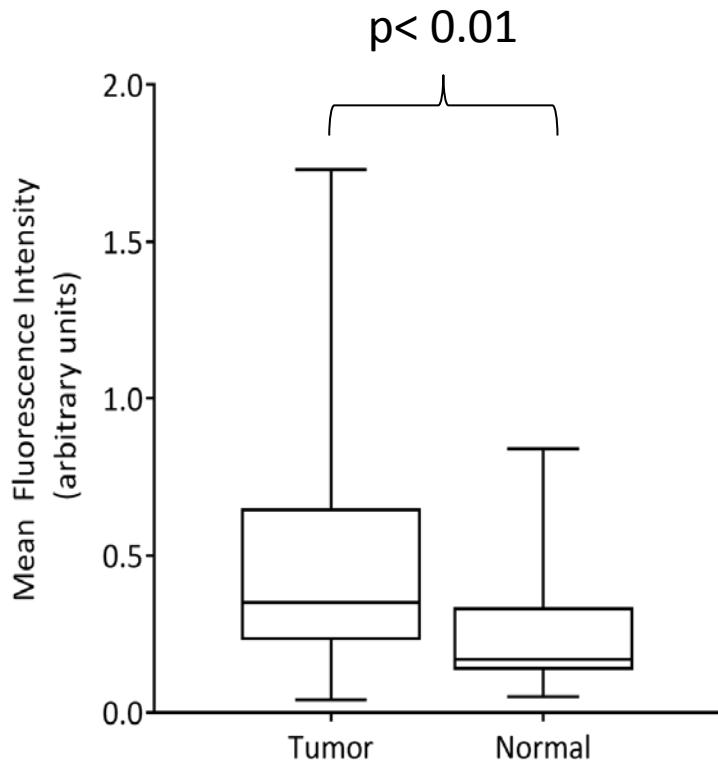


	In vivo fluorescence	Ex vivo fluorescence
Primary CRC pCR	57% (4/7) None (2/2)	100% (7/7) None (2/2)
Metastases	57% (4/7)	89% (6/7)

Results – cohort I



Results – cohort II



	Malignant	Benign
Fluorescent	43	10
Not fluorescent	1	16

- Sensitivity 98%
- Specificity 62%
- Positive predictive value 81%
- Negative predictive value 94%

In vivo fluorescence imaging

Color



Fluorescence



Merge

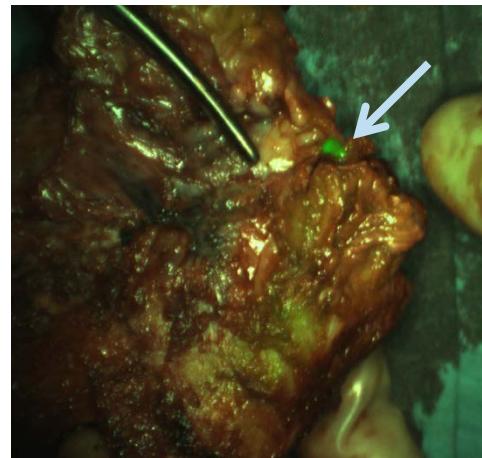


Tumor-positive resection margin

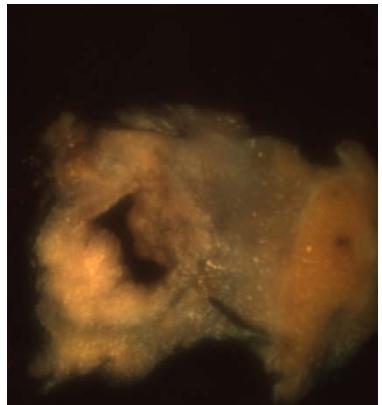
Macroscopy



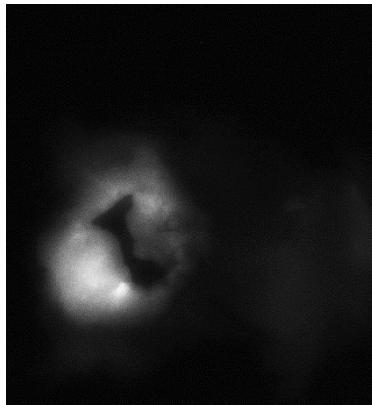
Color-NIR Merge



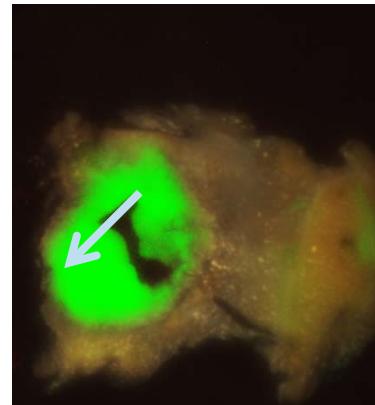
Color



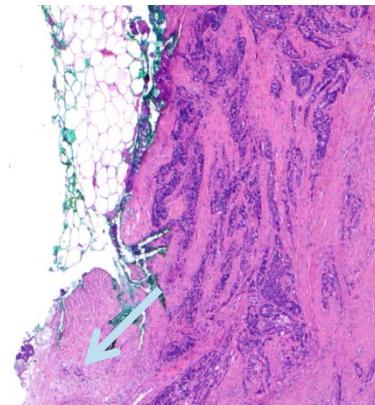
NIR Fluorescence



Color-NIR Merge



HE



In vivo fluorescence imaging



Results - Cohort II

- 19/43 additional malignancies detected with fluorescence imaging
- In 6/17 patients this changed the treatment strategy

Discussion and conclusion

- False-positive lesions
- Limited depth penetration
- Small subgroup analysis

SGM-101 leads to:

- Intraoperative detection of additional tumor spots
- Adaptation of original treatment strategy
- Response evaluation W&W strategies
 - Fluorescent endoscope (Olympus – Quest)
 - Collaboration with Wouter Nagelgast en Go van Dam UMCG (Cetuximab / Avastin)

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Thank you for your attention!



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