

# **Intraoperative Immunophotodetection : a new imaging technique to improve peritoneal surface malignancy diagnosis and treatment**

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# Intra-operative Immunophotodetection (IPD) of cancers

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- Develop a **new medical imaging** technique that allows surgeons to **visualize in real-time** the tumor nodules during surgery, with high levels of sensitivity and specificity

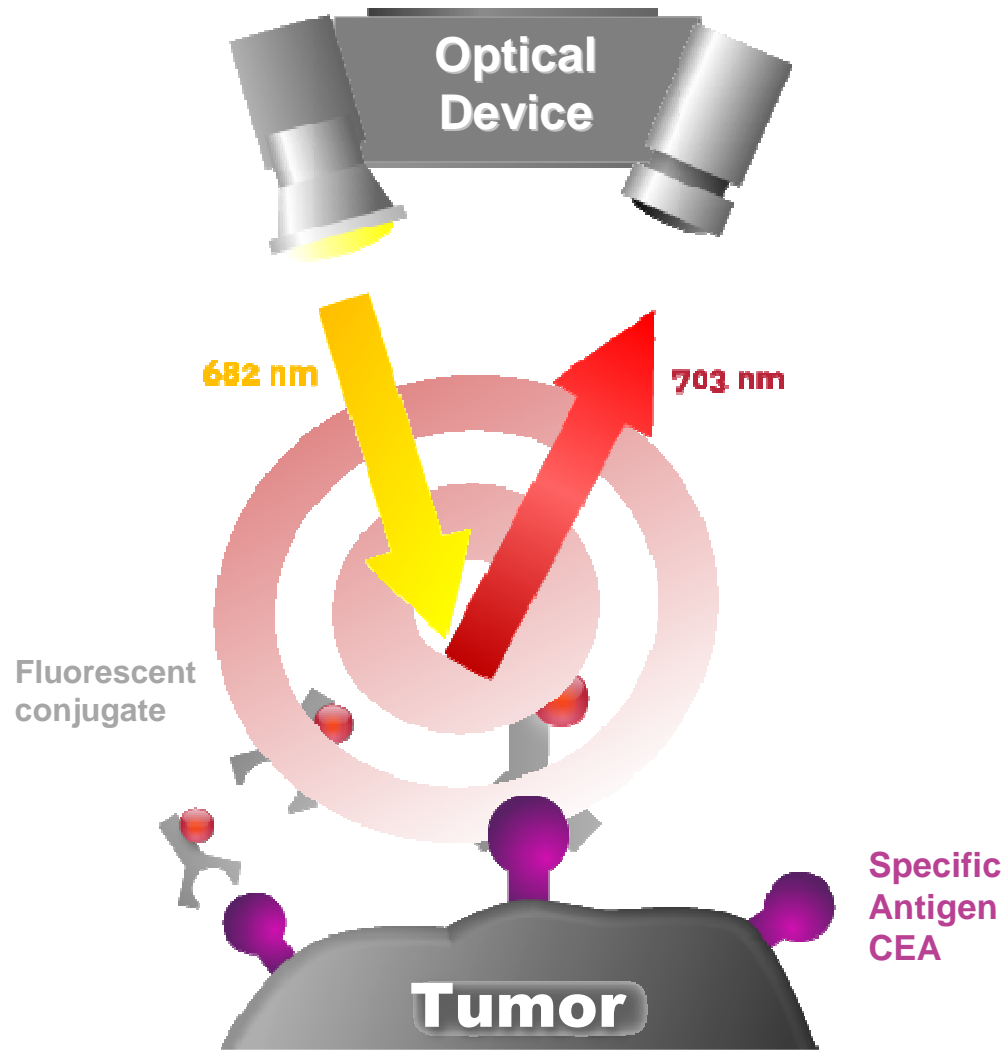
Objectives :

- Help for **complete resection** of disease
- Improve **staging** of the disease
  - to give to the surgeon informations which would change surgical strategy
  - to orient the post-surgery therapeutic protocol in the best possible way for each patient.

**Enhanced reality  
optical biopsy  
Resection  
Staging**

## Colorectal cancer :

- 945 000 new cases / year in the world
- 492 000 deaths
- Surgery in 80 % of patients
- Peritoneal carcinomatosis

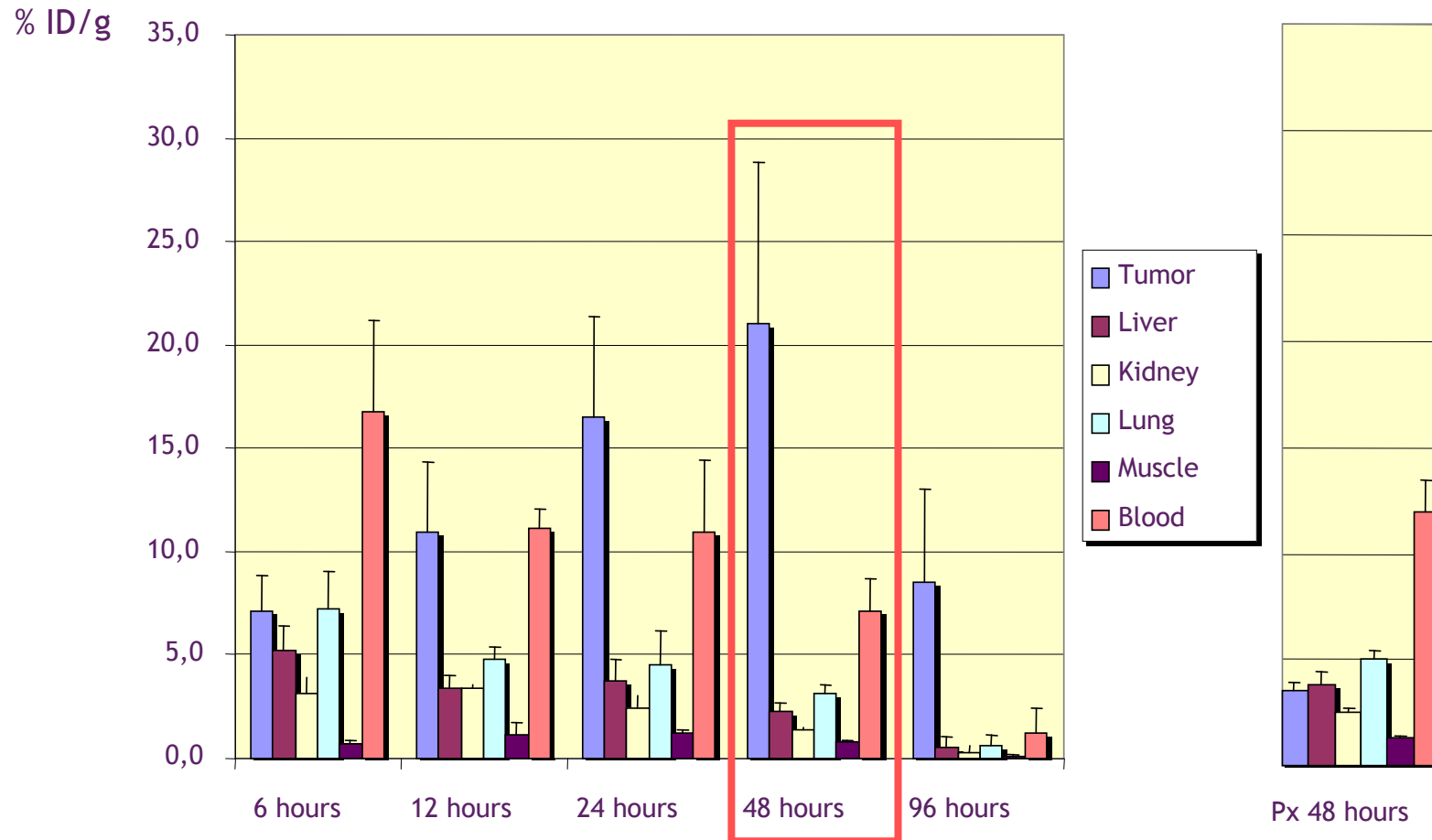


### General concept :

- **Target :** antigen
  - Cell surface
  - High density
  - Low expression in normal tissues
  - Available MAb
  - Physiology
  - No cross-reaction with other treatments
  - Low circulating fraction
- **Bullet :** MAb + dye = conjugate
- **Optical Device :** laser excitation, filters, camera, software

# IPD

## Conjugate biodistribution



# IPD

## Prestigious partnership

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### Partnership for Device :

**CEA - Leti (Grenoble) - EURORAD**

- Hand-held device
- No operating room heavy works
- No darkness required
- Easy-to-use
- Real-Time imaging
- Fluorescence and natural light signal merging
- No laser beam hazard for patient and surgeon / team (glasses)

### Partnership for conjugate:

**INSERM, SynthInnove**



Prototype of the second generation device

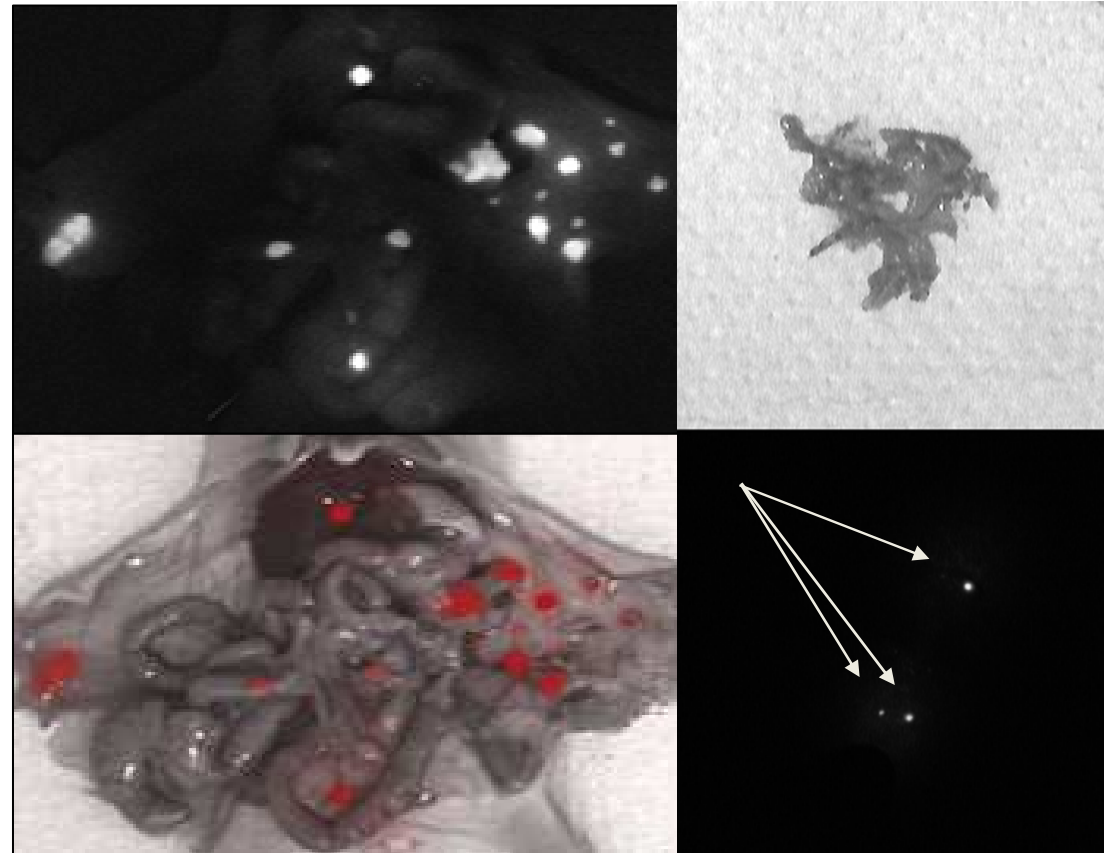
# IPD

## Technical data (First generation device)

Biopsy Weight	Tumor		Positive Predictive Value
	Yes	No	
> 10 mg	38	0	100 %
>1 mg et ≤ 10 mg	32	1	96,9 %
≤ 1 mg	38	5	88,4 %

**Smallest nodules detected:**  
 < 1 mm, < 1 mg  
 < 1 ng of Cy5

**Classification of Fluorescent Biopsies, as a function of their weight.**



Gutowski *et al.*, 2001, Clin. Cancer Research.

# IPD

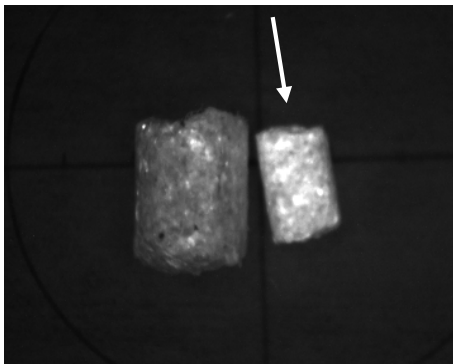
## Second generation device

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Peritoneal  
carcinomatosis  
LS174T

10 $\mu$ g conjugate  
injected IV 48H

Mouse food can be  
fluorescent !



# IPD

## Present developpement

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- Two new MAb : CEA overexpressing tumors, ovarian cancer
- Dye specially designed for IPD
- Toxicity study of conjugate in progress
- Device design for operating room and sterilization
- Preparation of clinical studies : peritoneal carcinomatosis of overexpressing CEA tumors
- Setting up of SurgiMAb





# IPD

## Summary

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- Easy-to-use new intraoperative diagnosis tool
  - MAb - Dye conjugate
  - Hand Device
- Project and company both integrated within a cancer institute
- Multidisciplinary team with experience - complementarity of the members of the team - Surgeon involved from the early beginning
- Advanced R&D with prestigious partners
- High level of sensitivity and specificity (animal)
- Ready to go for clinical studies
- Listening to your opinion !



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