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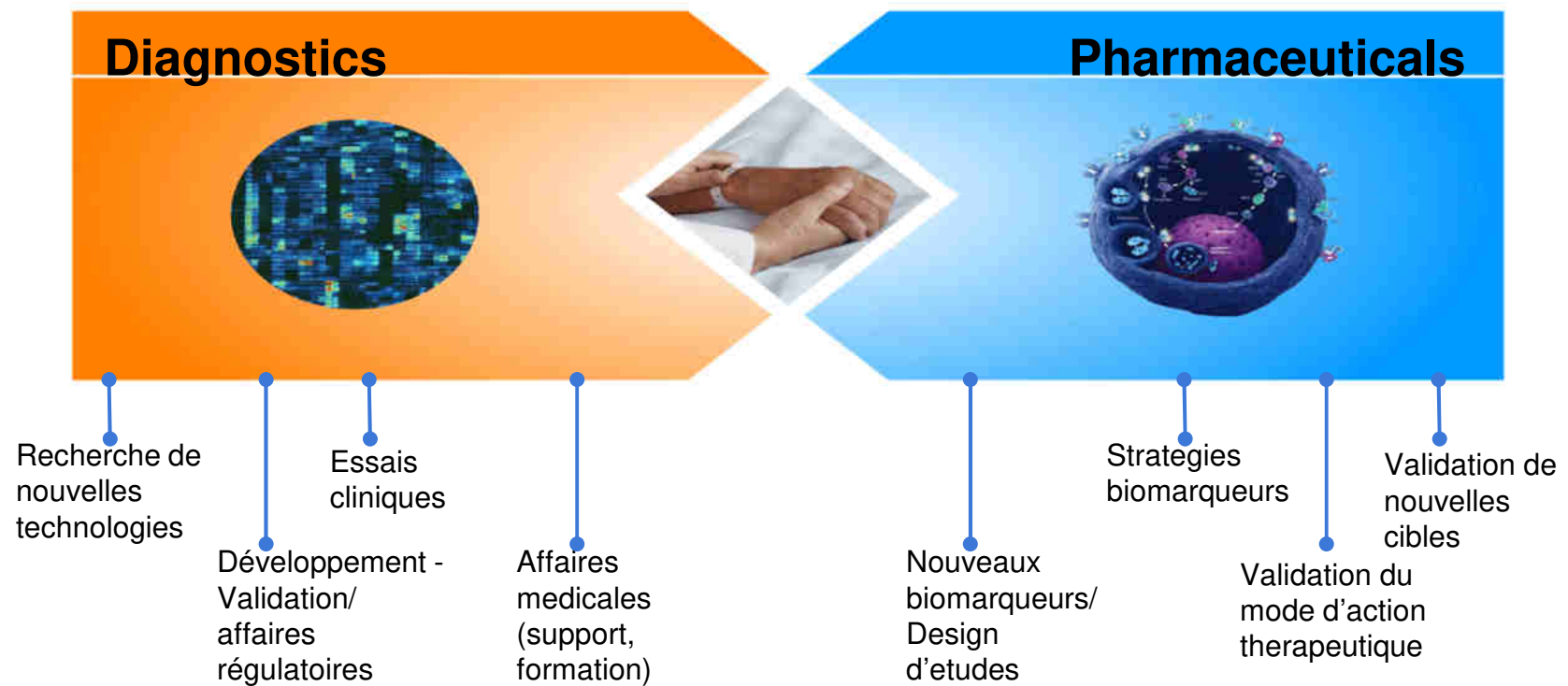
# L'apport du médecin pathologiste dans le développement de nouvelles thérapies

*Fabien Gaire, Roche pRED Research Innovation Center Munich*

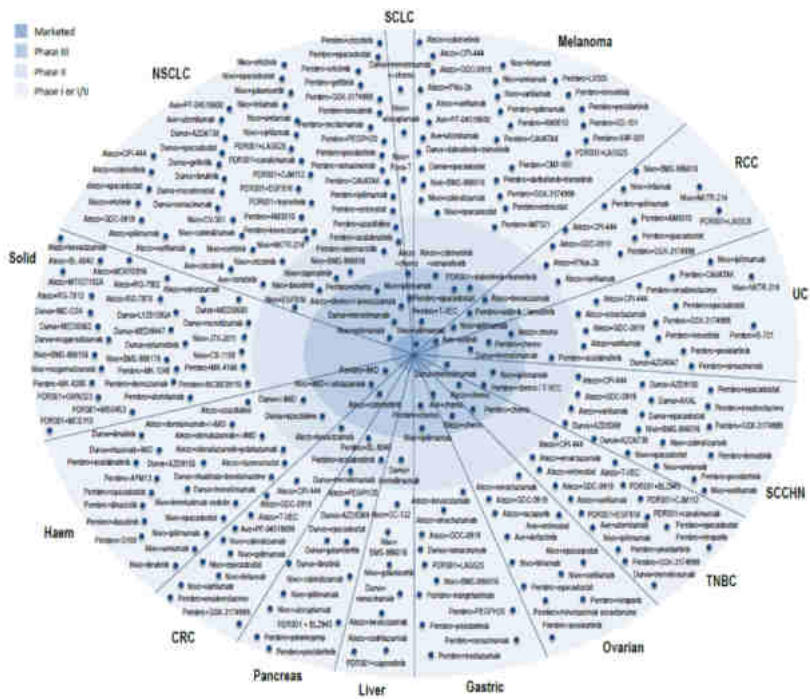
A blue rectangular banner with a white grid pattern. The text "Roche pRED" is written in white, with "Roche" in a bold, sans-serif font and "pRED" in a smaller, italicized sans-serif font.

**Roche** *pRED*

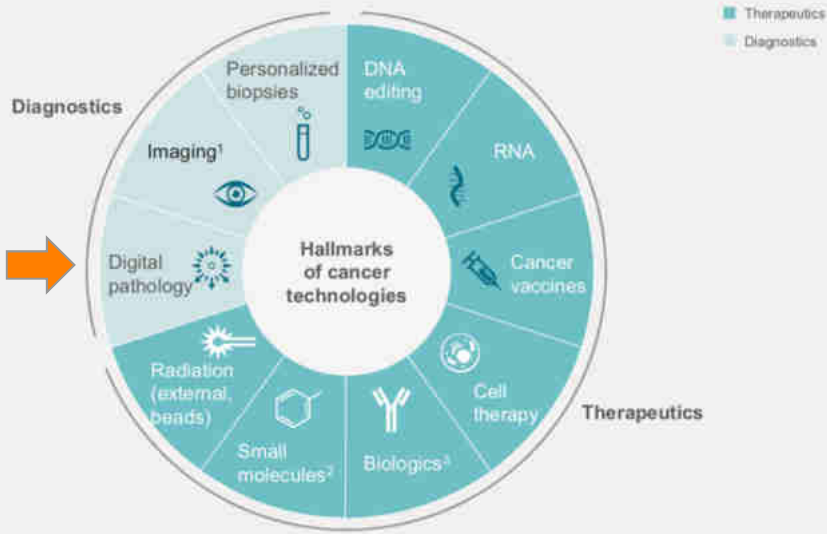
# Une grande diversité d'opportunités de carrières



# Impact des evolutions recentes en strategies therapeutiques

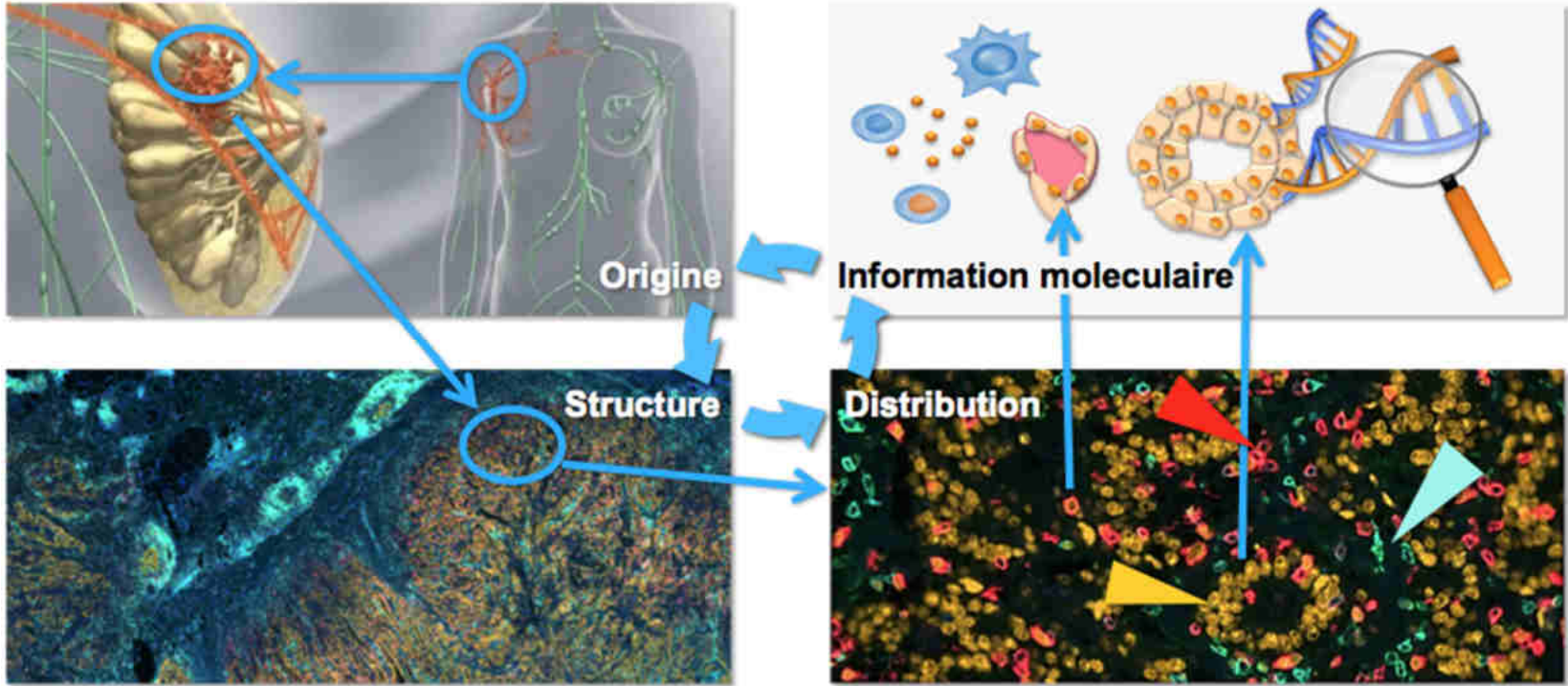


We organize new therapeutics and diagnostics by the "hallmarks of cancer technologies"

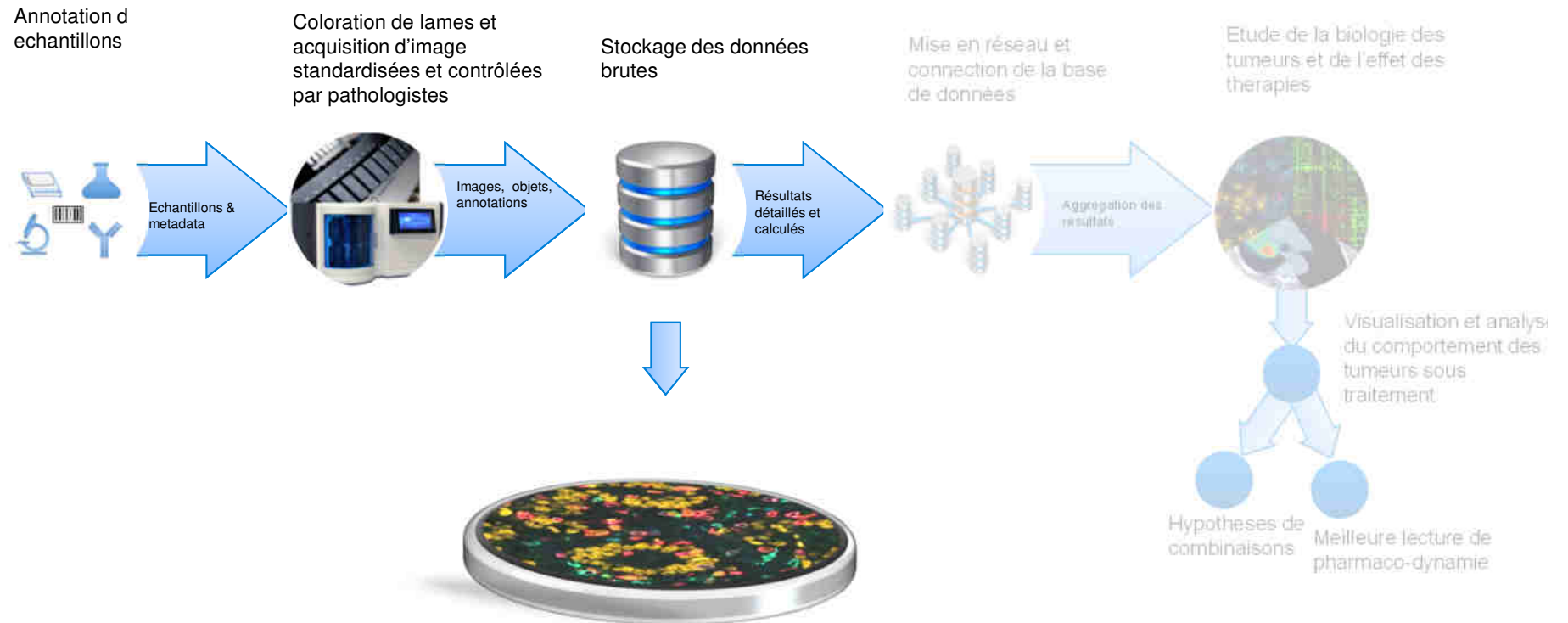


1 Conventional and molecular imaging  
 2 Including radioactive chemical entities and nanoparticle-encapsulated small molecules  
 3 Includes antibody-drug conjugates with cytotoxic and radio-isotope payloads  
 Source: McKinsey analysis

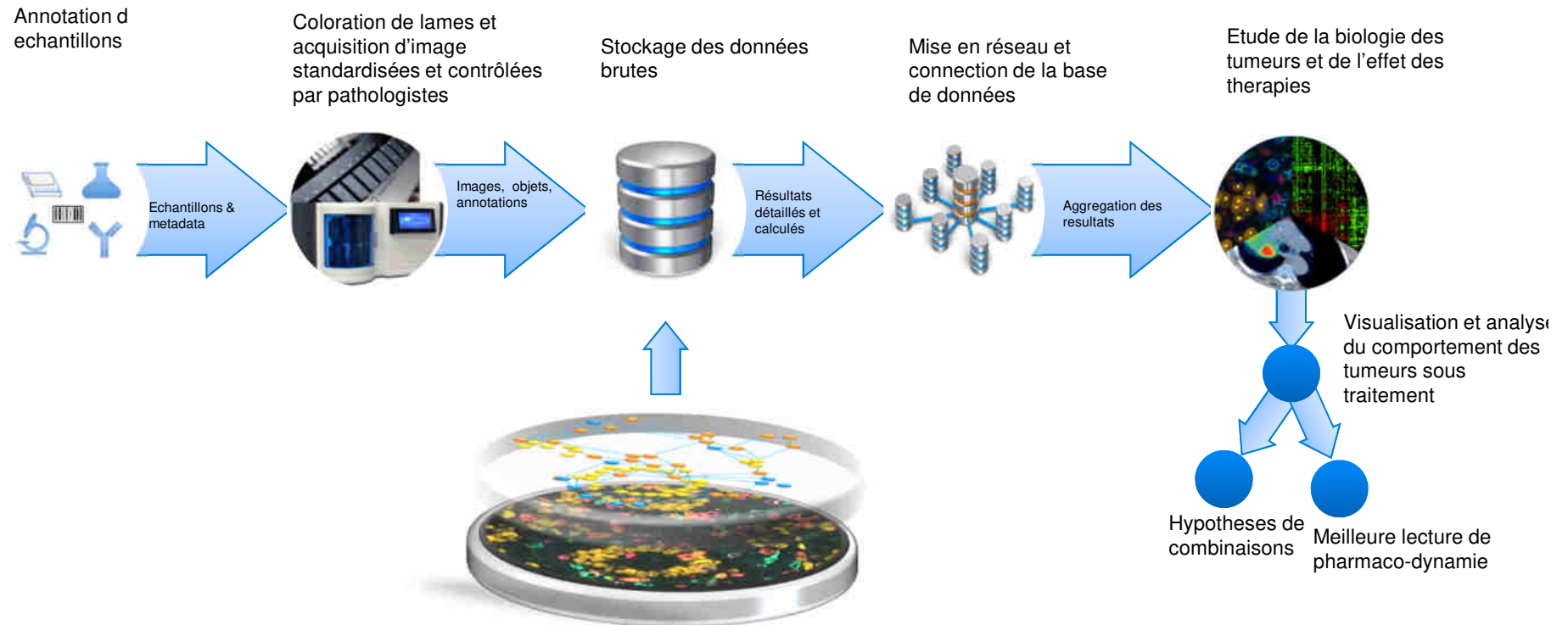
# La compréhension moléculaire du micro- environnement de la tumeur est au coeur de la recherche pharmaceutique



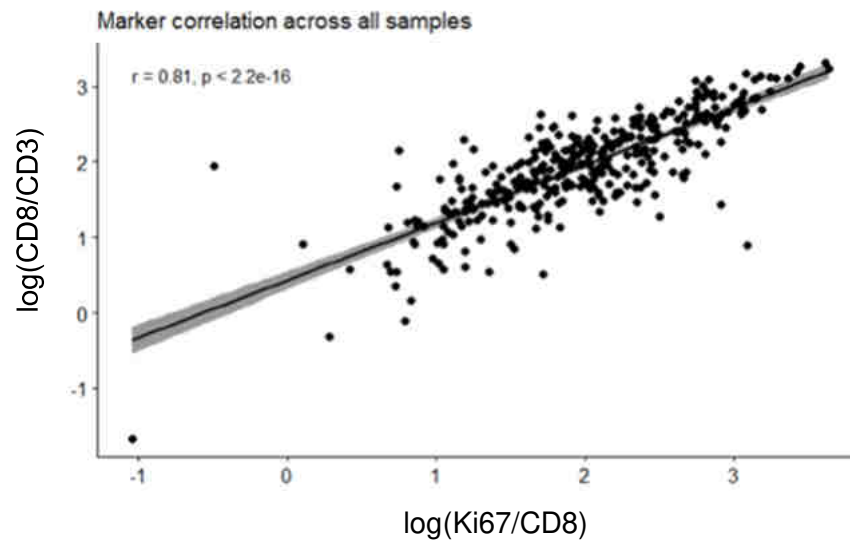
# Nouvelle infrastructure IRIS pour la recherche chez Roche



# Nouvelle infrastructure IRIS pour la recherche chez Roche

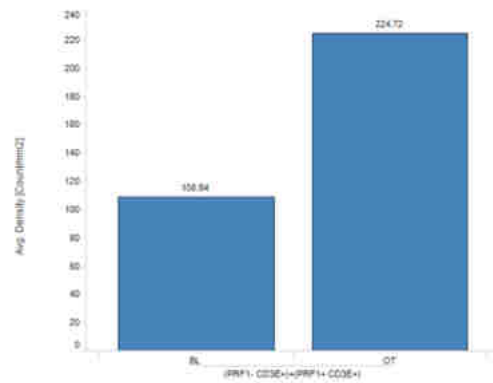


# Mesures de standardization des analyses dans la chaîne analytique

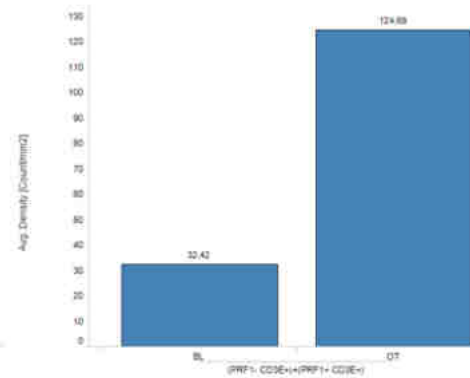




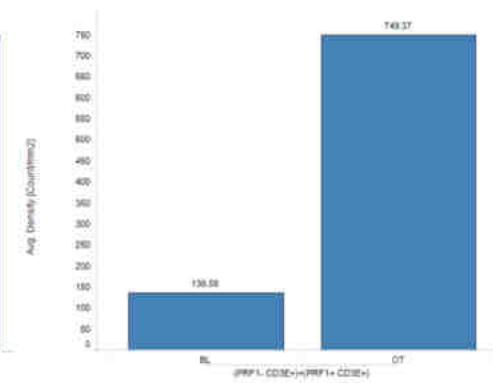
# Exemple de l'analyse de patients en phase I



Patient 8



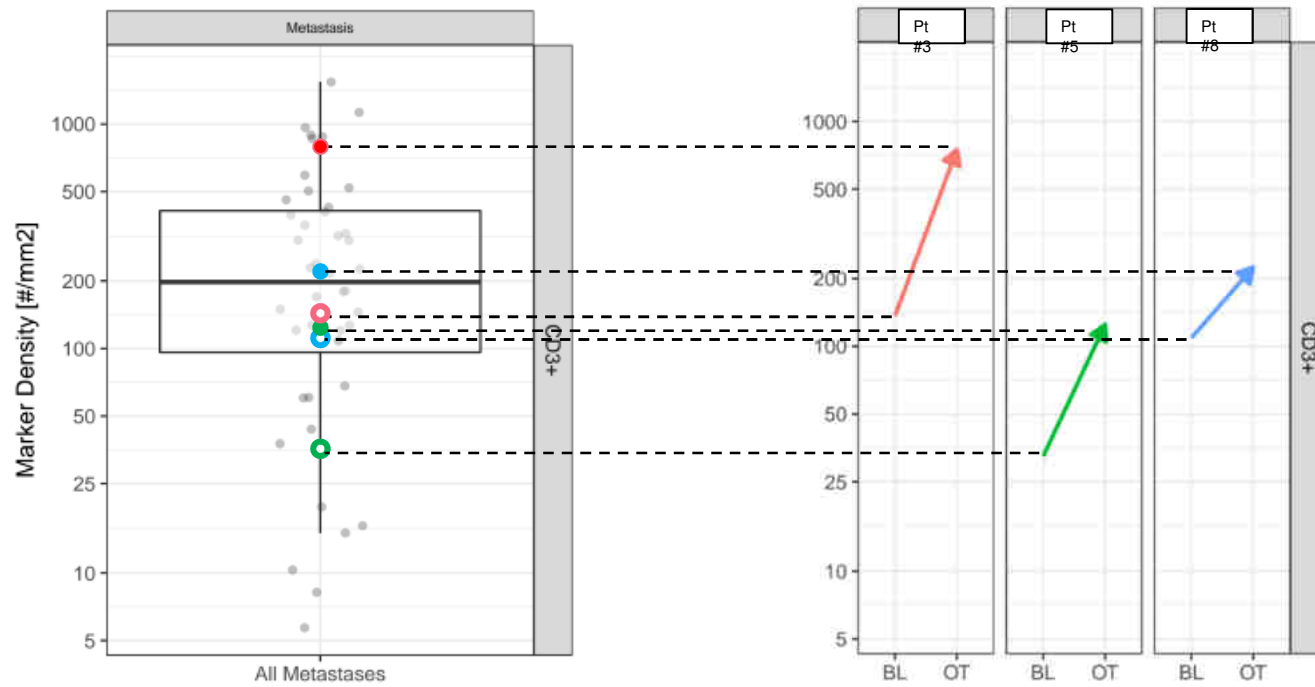
Patient 5



Patient 3

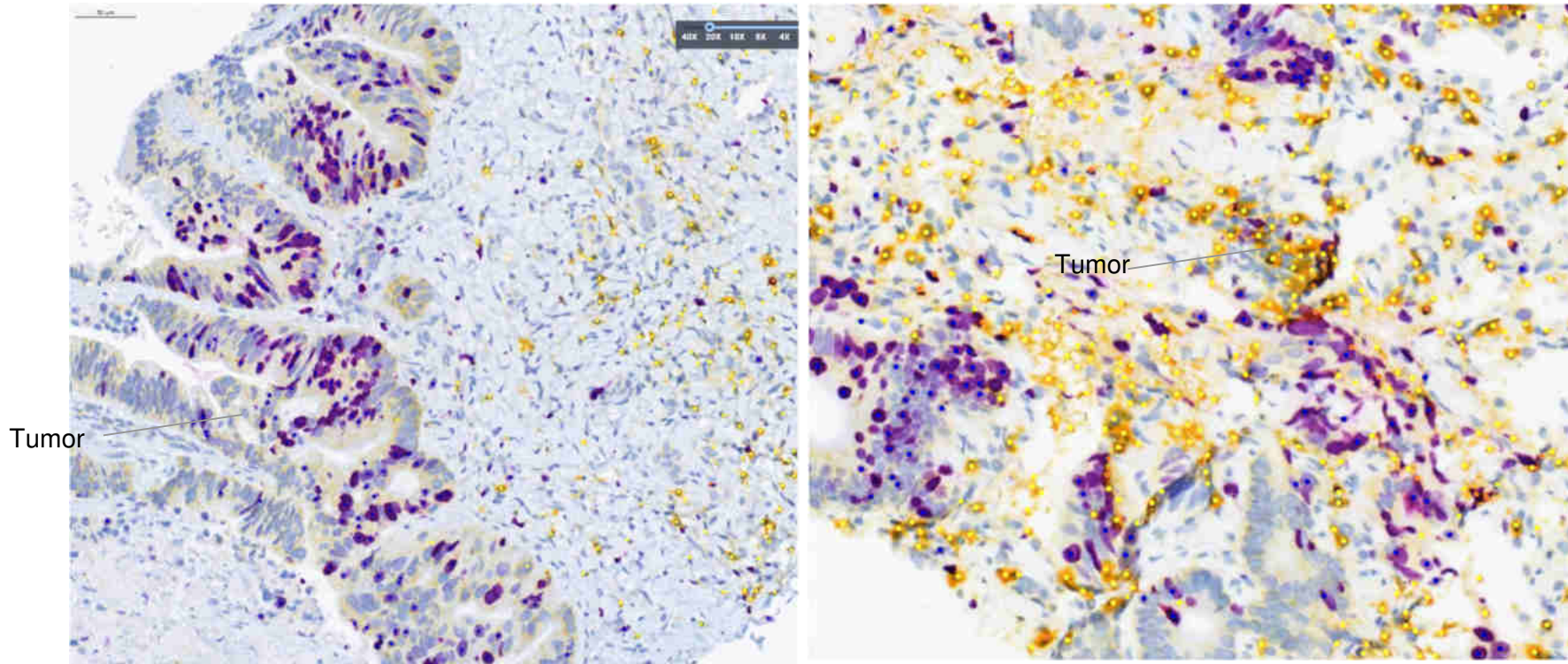


# La base de données procure une référence pour l'analyse de patients individuels

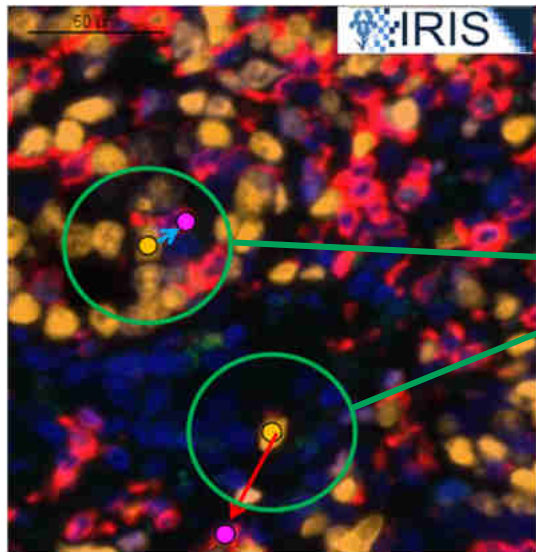


# L'observation des images indique des changements migratoires de cellules LT

● CD8    ● Ki67



# Mise en place d'une analyse systématique de localisation cellulaire



representative sample from internal CRC pilot study

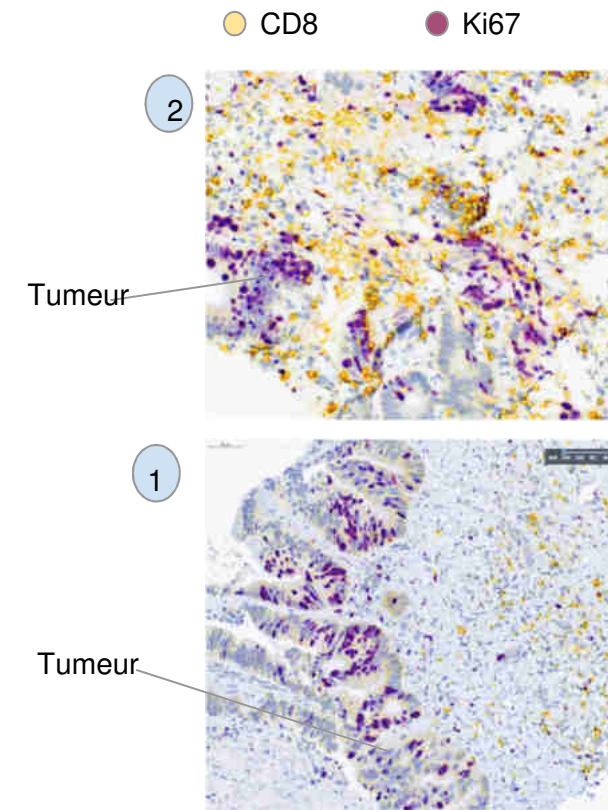
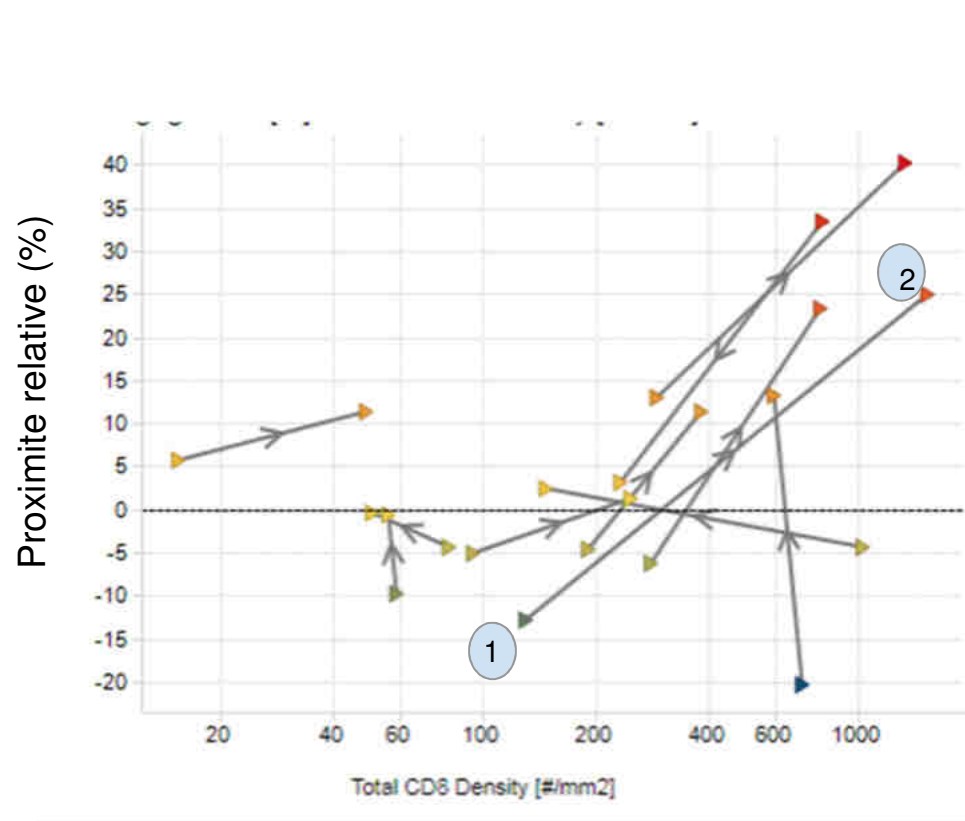
-  Ki67 tumor cell
-  CD8 T-cell
-  <radius
-  >radius
-  Radius

Densités et distances inter-objets, e.g. cellules LT, cellules tumorales

Relations entre cellules, compartiments, structures.

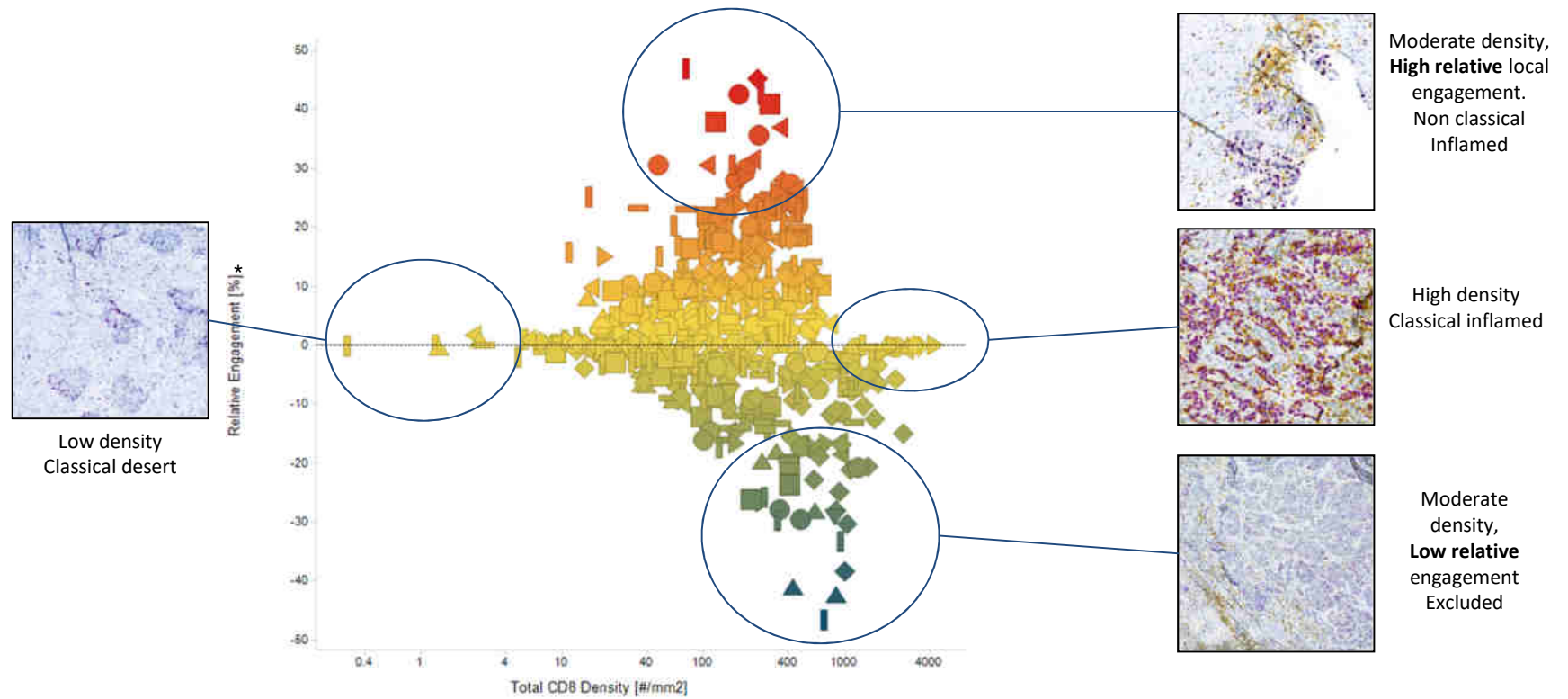


# Application de la méthode à la caractérisation du mode d'action d'un traitement



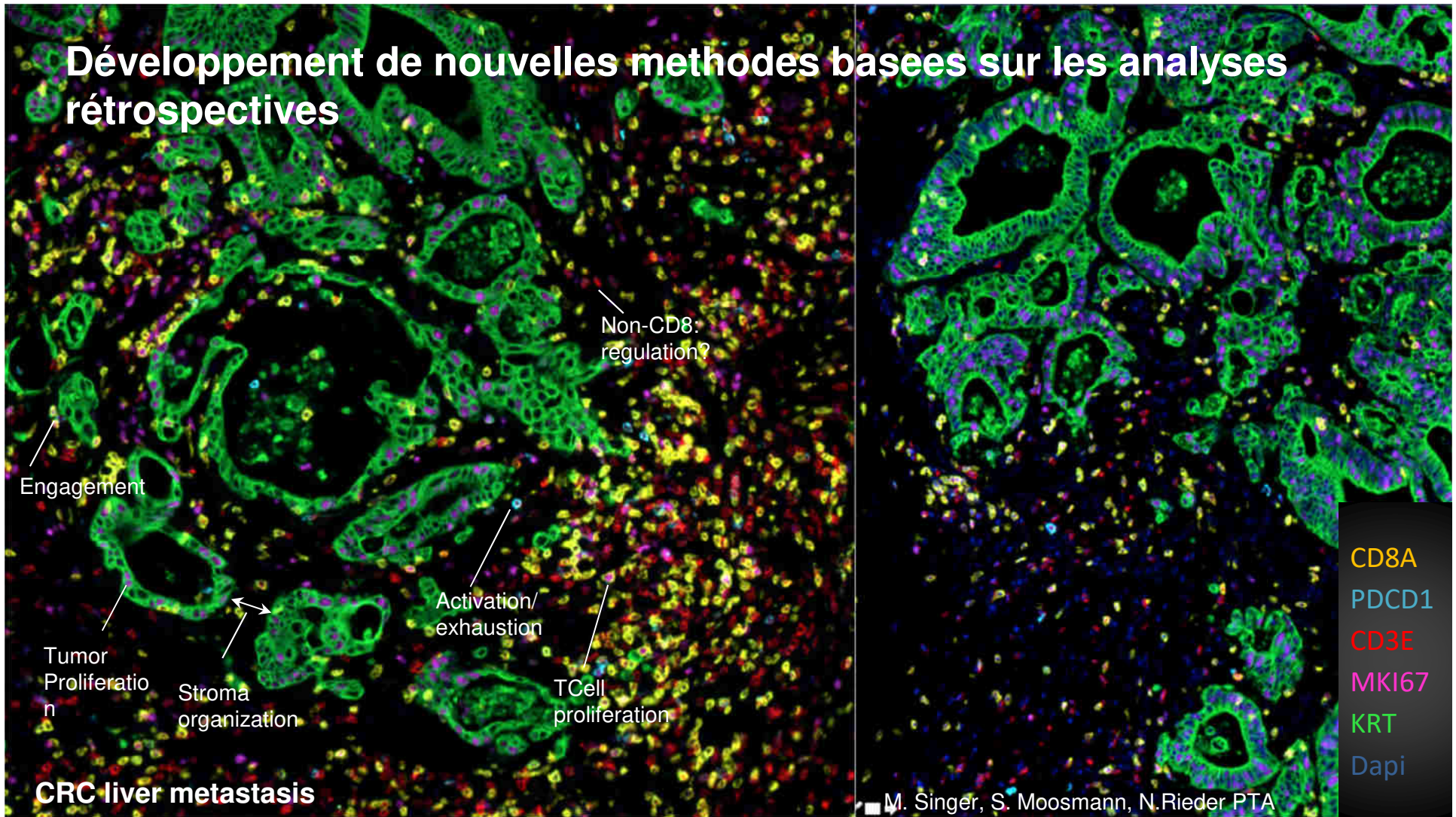
# Analyse retrospective de la base de données

(N=354 patients)

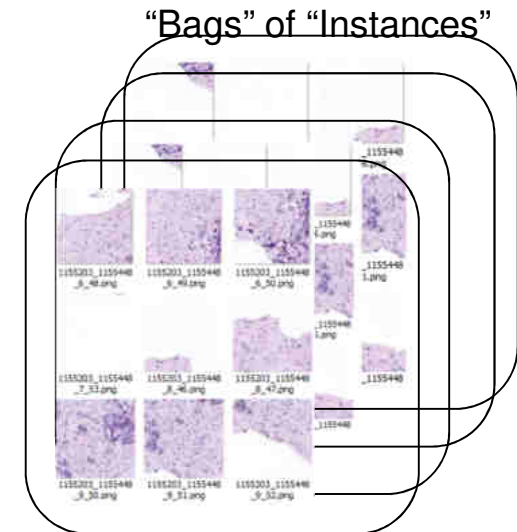
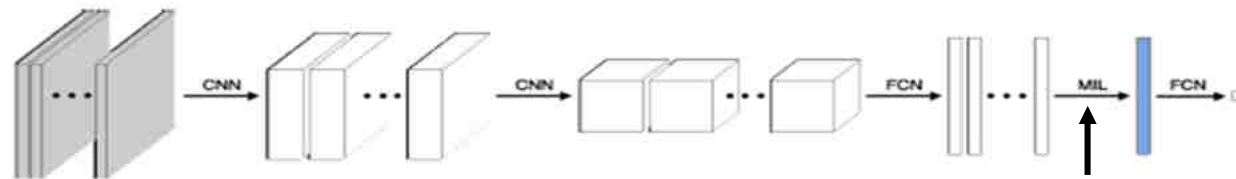


Equal contribution O. Grimm, F. Schmich, K. Korski, E. Andersson, F. Gaire RICM

# Développement de nouvelles méthodes basées sur les analyses rétrospectives



# L'apport de l'intelligence artificielle pour accélérer la compréhension de la morphologie



arXiv.org > cs > arXiv:1802.04712

Computer Science > Machine Learning

## Attention-based Deep Multiple Instance Learning

Maximilian Ilse, Jakob M. Tomczak, Max Welling

(Submitted on 12 Feb 2018 (v1), last revised [18 Oct 2018](#) (this version, v4))

Multiple instance learning (MIL) is a variation of supervised learning where a single id instance. In this paper, we state the MIL problem as learning the Bernoulli distribution label probability is fully parameterized by neural networks. Furthermore, we propose a permutation-invariant aggregation operator that corresponds to the attention mechanism proposed attention-based operator provides insight into the contribution of each instance empirically that our approach achieves comparable performance to the best MIL method and it outperforms other methods on a MIST-based MIL dataset and has real-life histomorphology interpretability.

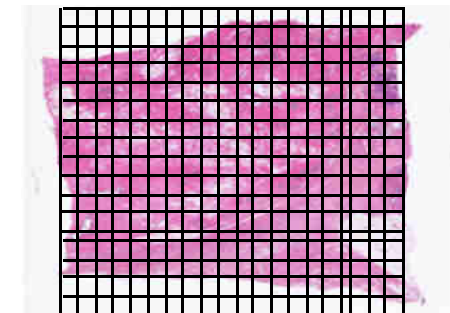
Comments: ICML 2018 paper, code source: <https://github.com/mililse>

Subjects: Machine Learning (cs.LG); Machine Learning (stat.ML)

Cite as: arXiv:1802.04712 [cs.LG]

or [arXiv:1802.04712v4](https://arxiv.org/abs/1802.04712v4) [cs.LG] for this version

Image ID	Protocol Name	Site Code	Stain	Study Date	Tissue	Tumor Diagnosis	Analysis QC	Image Quality QC	Region Annotation QC	Tissue QC	Analysis Results Count	Image Arrangements Count	Project Title	Image Status	Date
1155203_1155448_3_48.png															
1155203_1155448_3_49.png															
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1155203_1155448_3_51.png															
1155203_1155448_3_52.png															

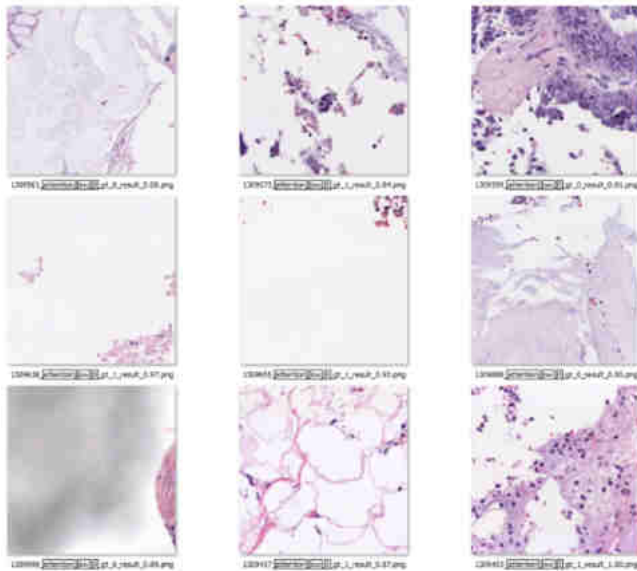




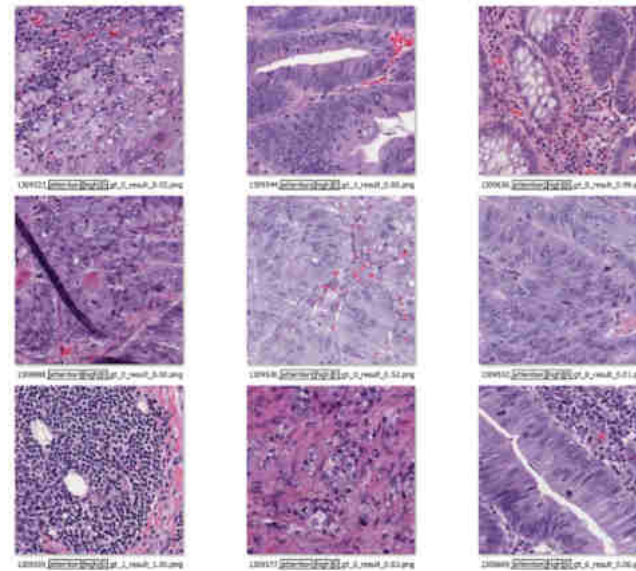
# Exemple d'application pour détecter les changements caractéristiques a l'IMS



Champs visuels de faible valeur



Champs visuels de forte valeur



## L'apport du pathologiste en recherche thérapeutique moderne

- Rôle d'intégrateur liant les résultats d'analyse biologique des tissus et l'effet thérapeutique
- Le pathologiste est un acteur clé pour le développement de nouvelles technologies d'analyse
- La pathologie digitale, les techniques avancées d'analyse de données et d'image révolutionnent la pratique en industrie
- Le rôle du pathologiste médical évolue rapidement





***Doing now what patients need  
next***