



Aides intra-opératoires en Neurochirurgie

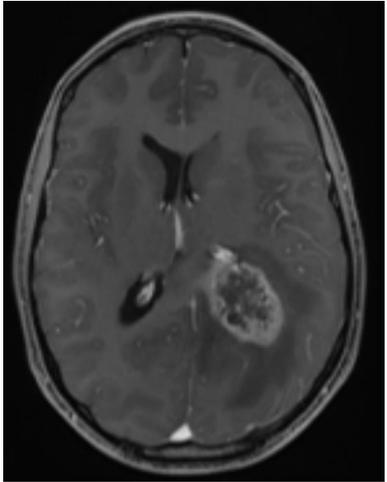
Pierre-Jean Le Reste

Service de Neurochirurgie, CHU Pontchaillou, Rennes

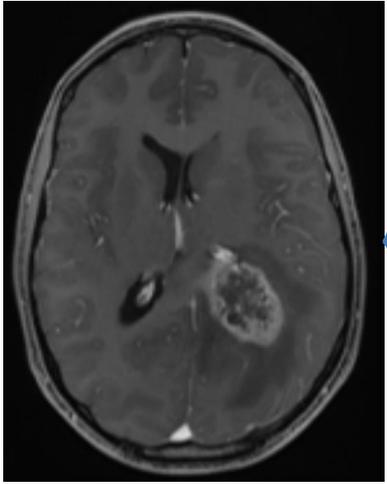
Laboratoire d'Anatomie, Université de Rennes 1

Unité OSS, INSERM U1242

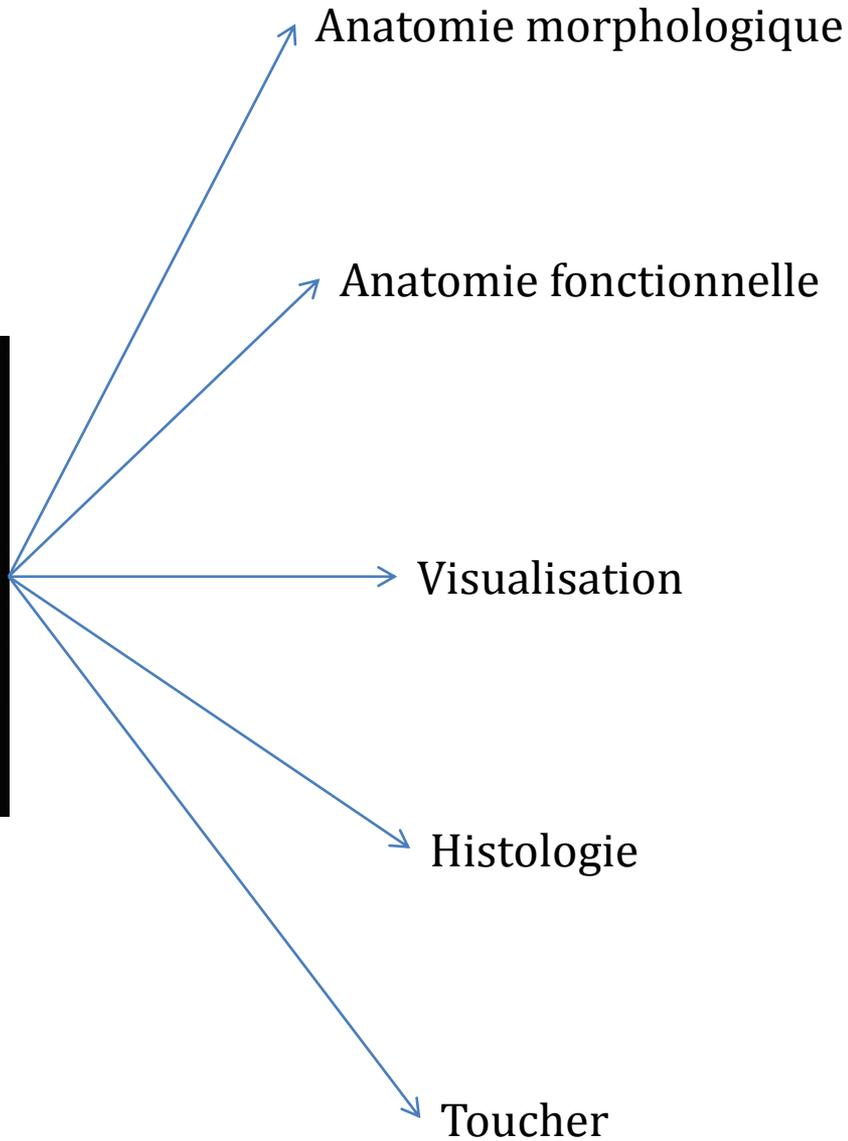


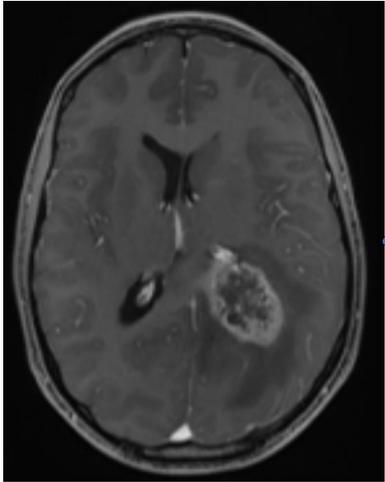


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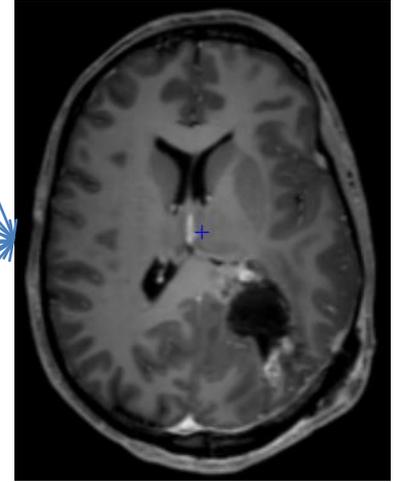
Anatomie morphologique

Anatomie fonctionnelle

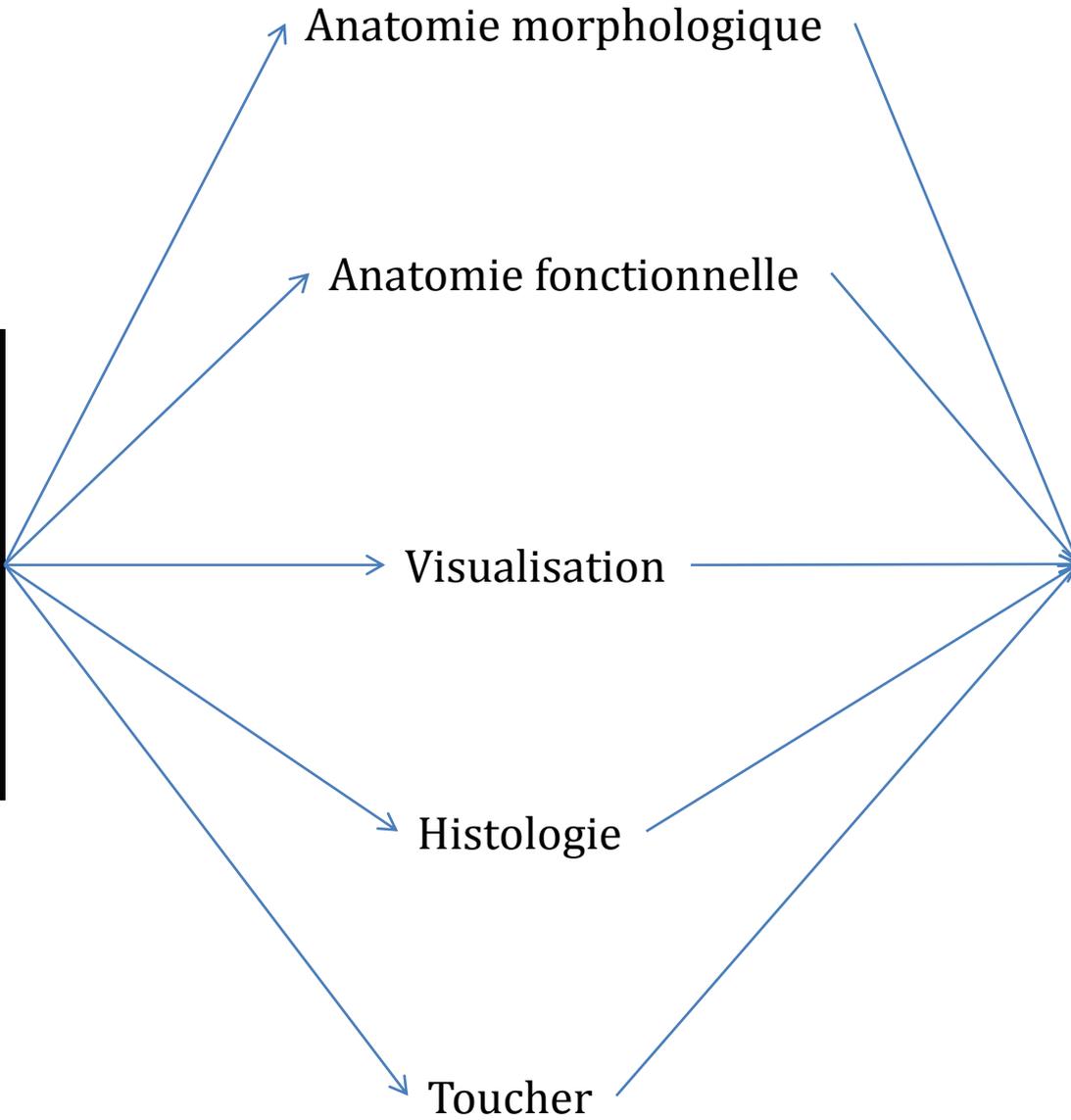
Visualisation

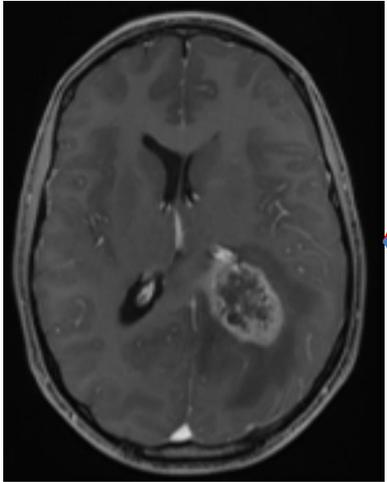
Histologie

Toucher

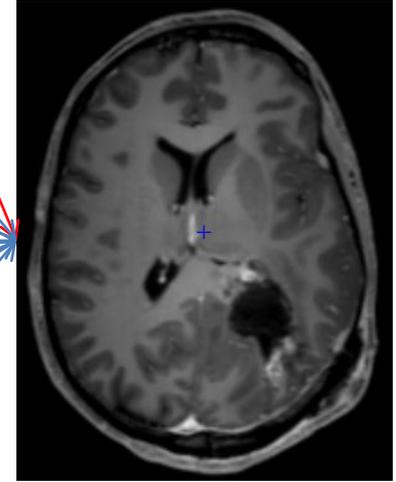


TROU





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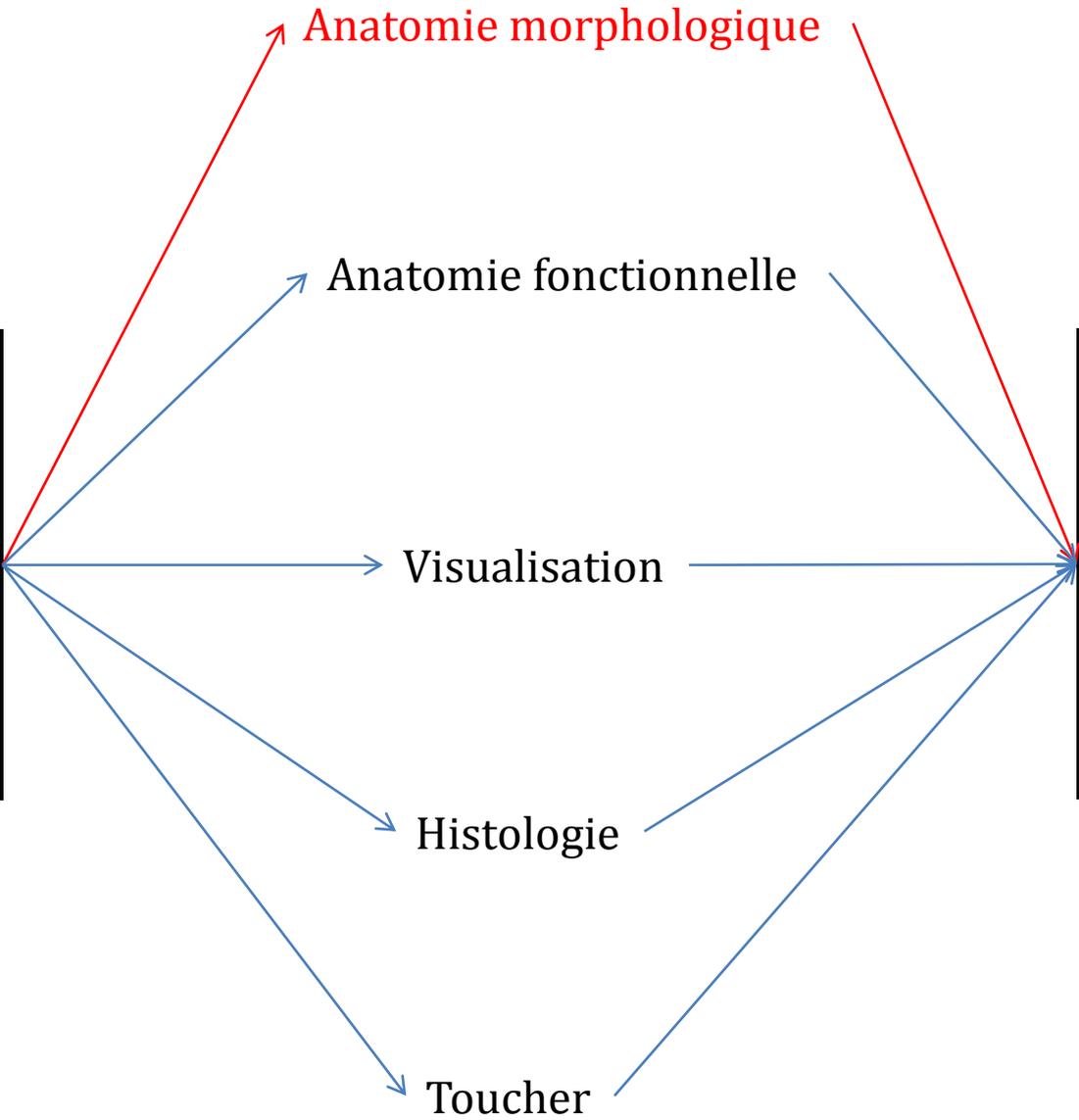
Anatomie morphologique

Anatomie fonctionnelle

Visualisation

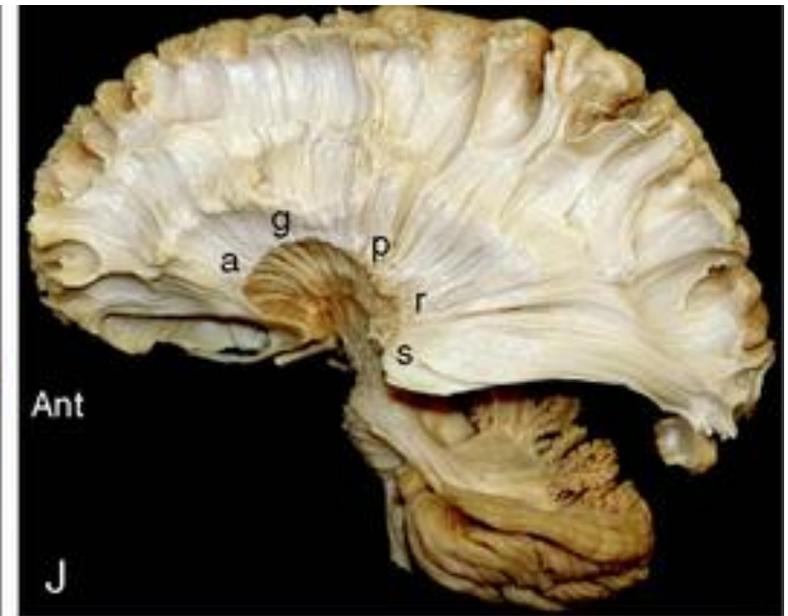
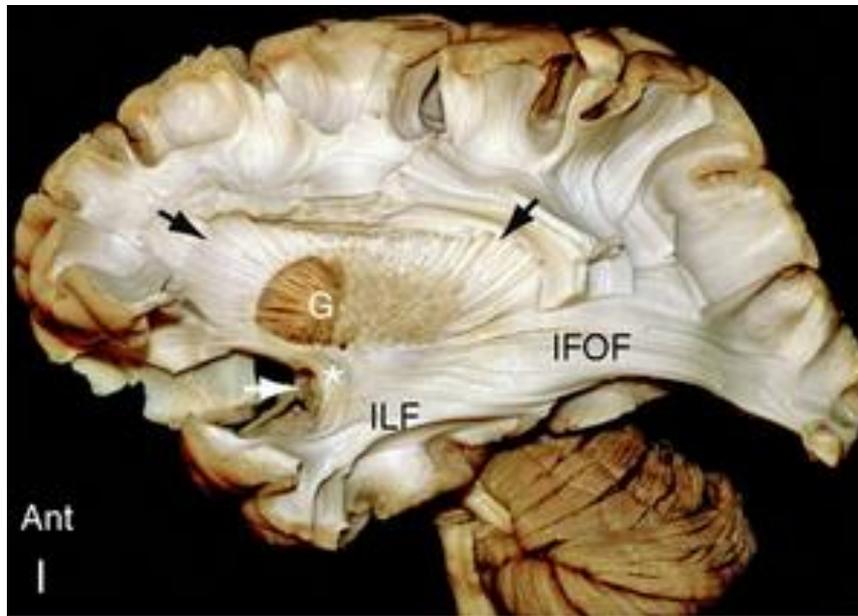
Histologie

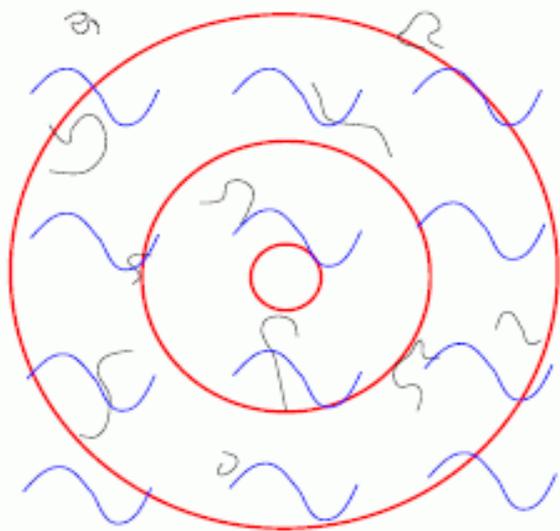
Toucher



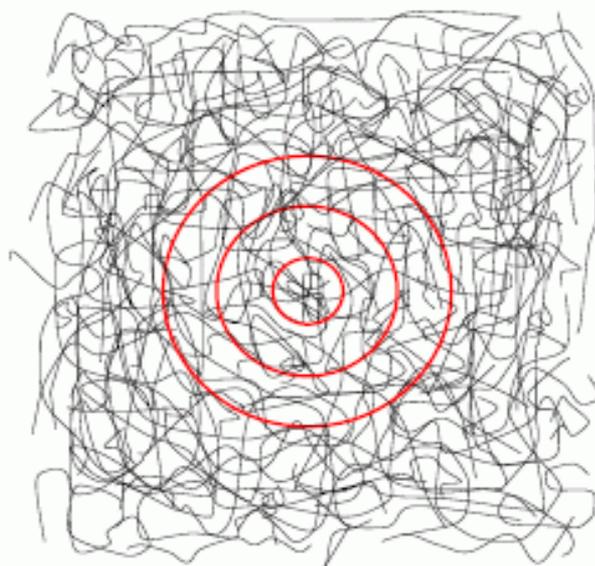
Anatomie morphologique

- Tractographie

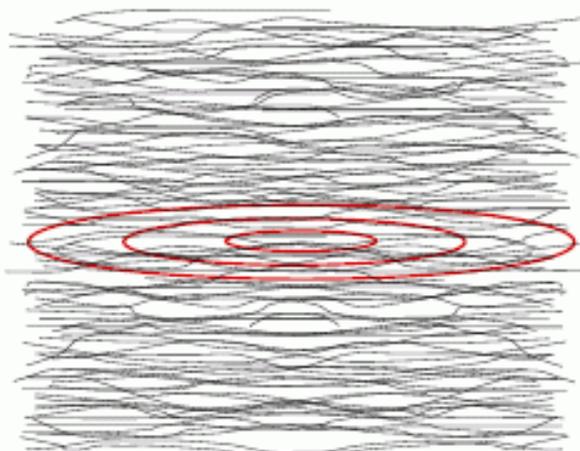




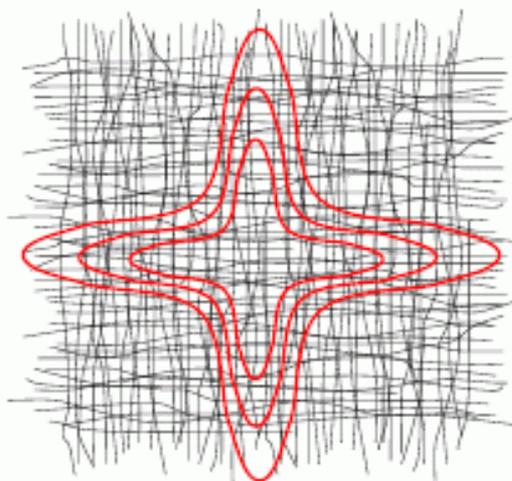
(a)



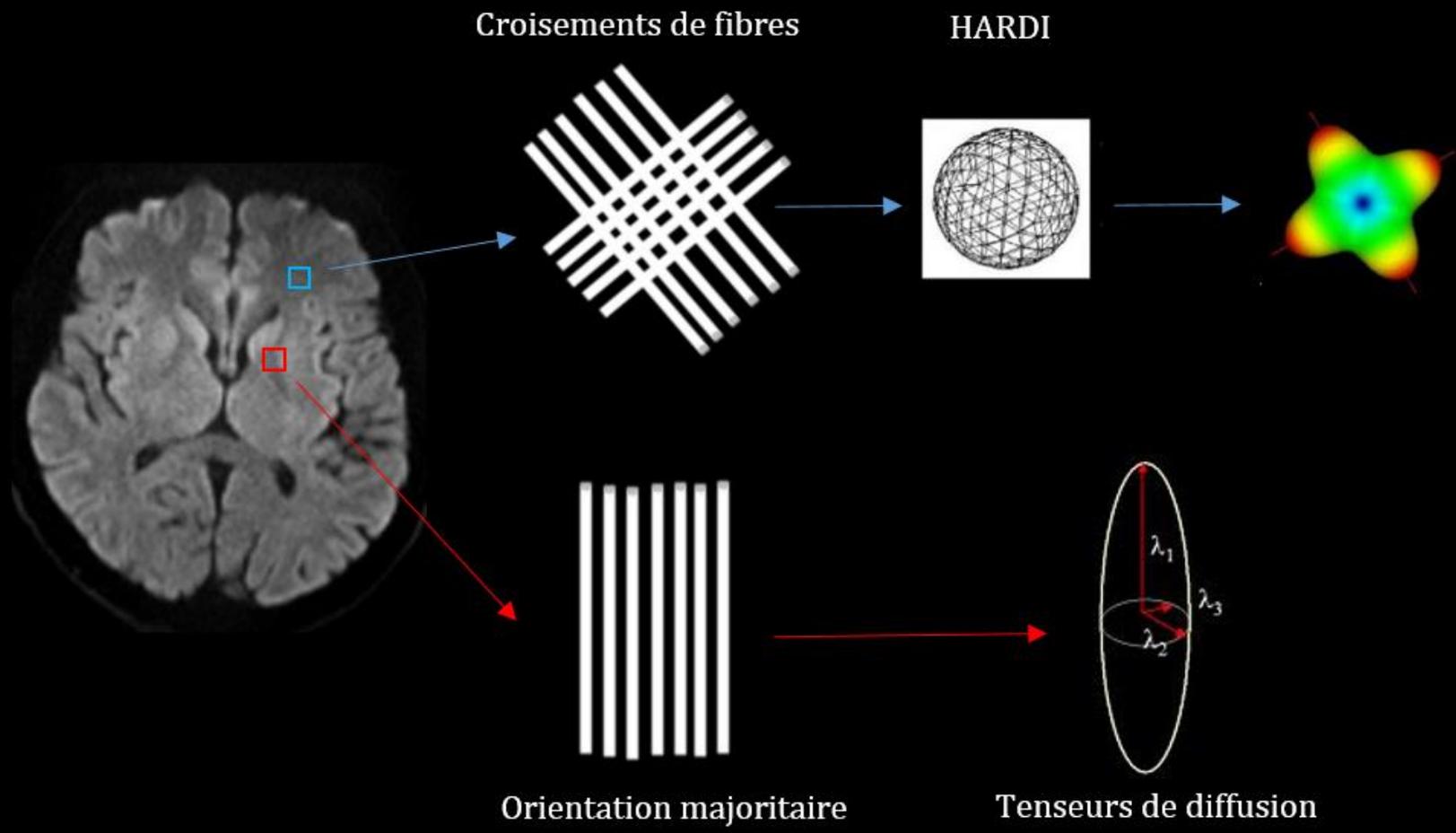
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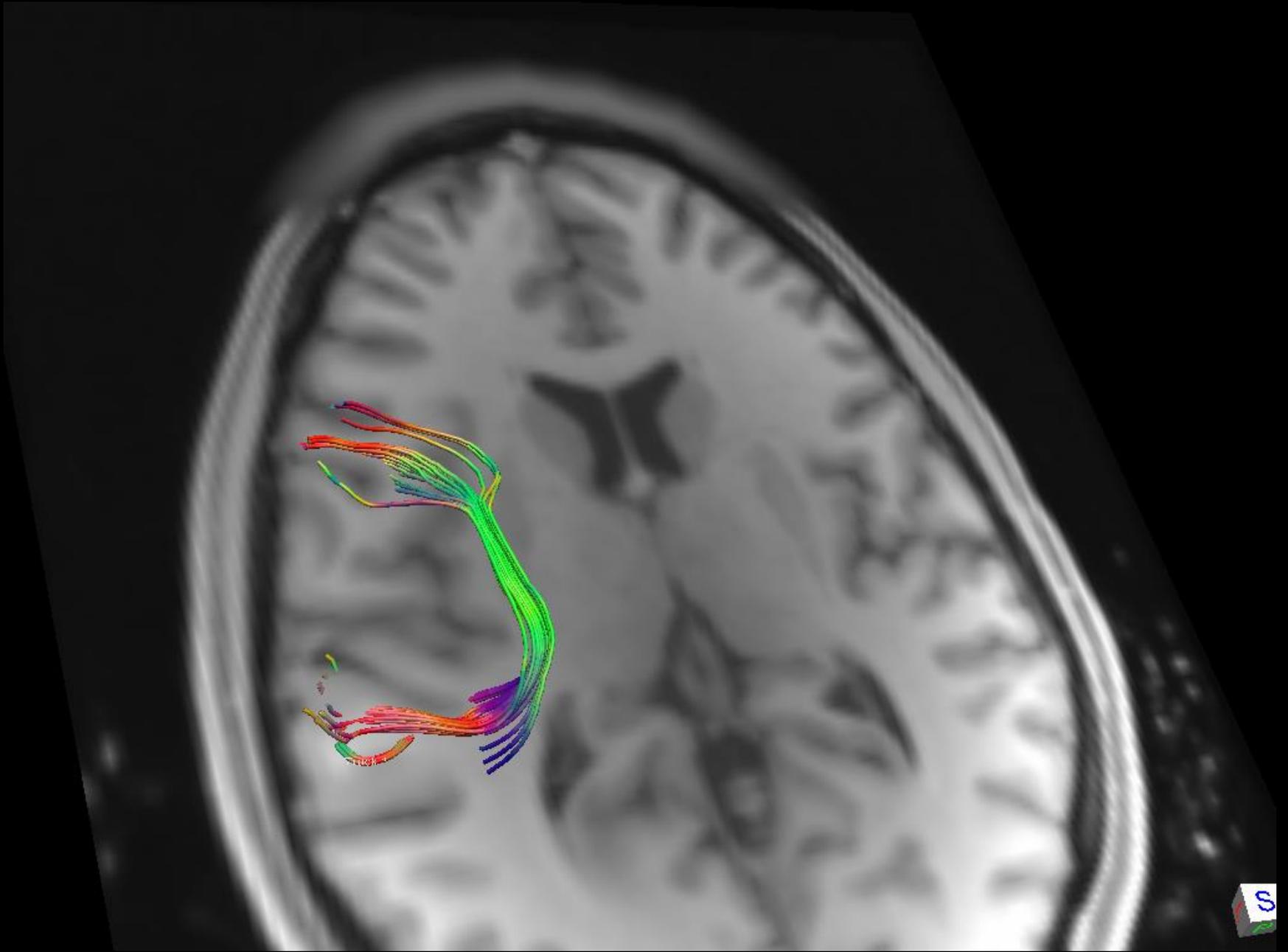


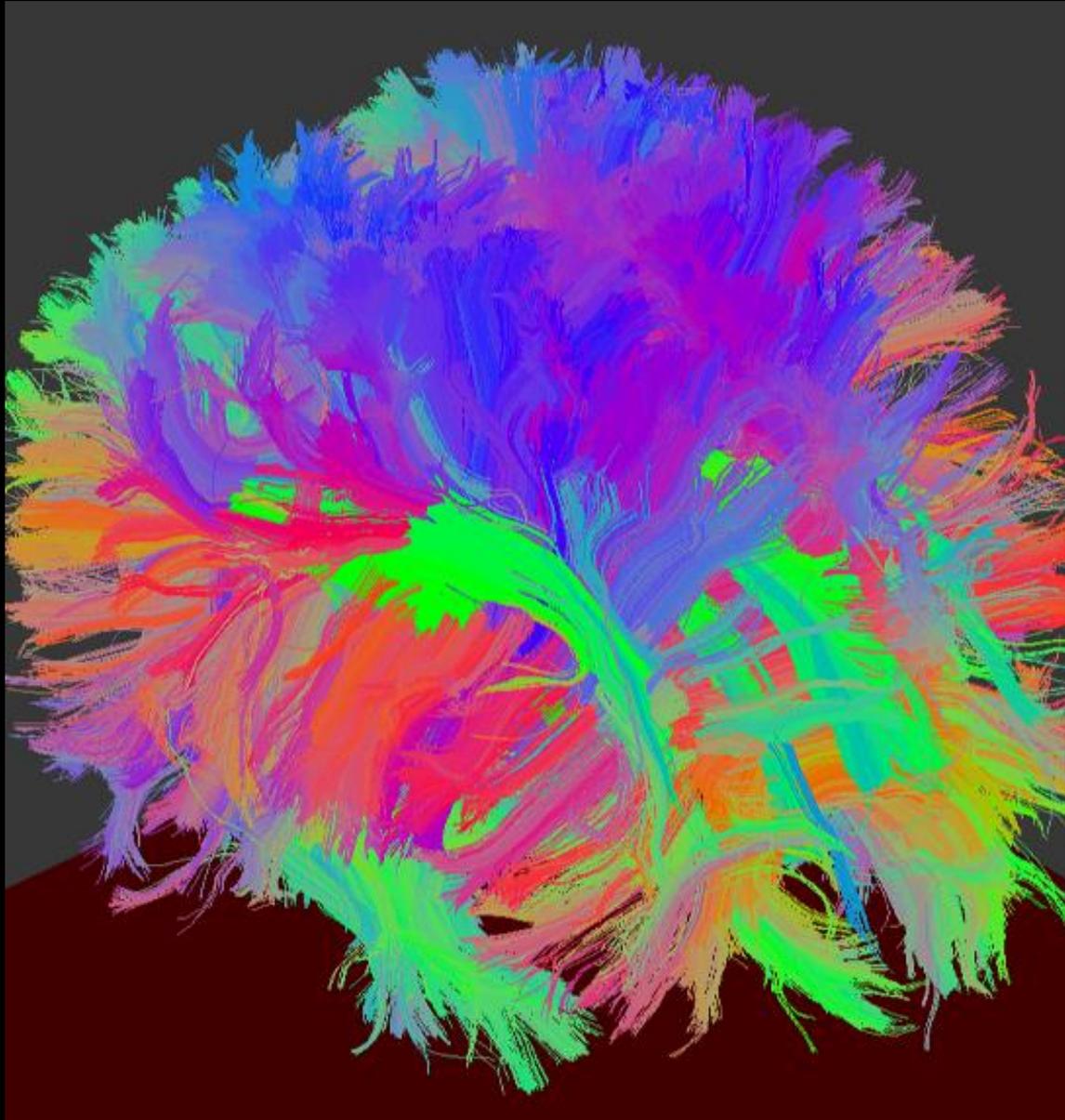
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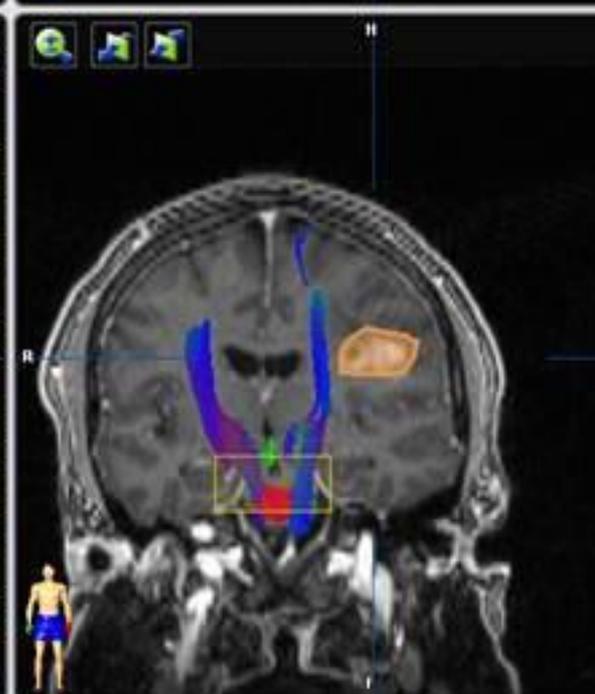
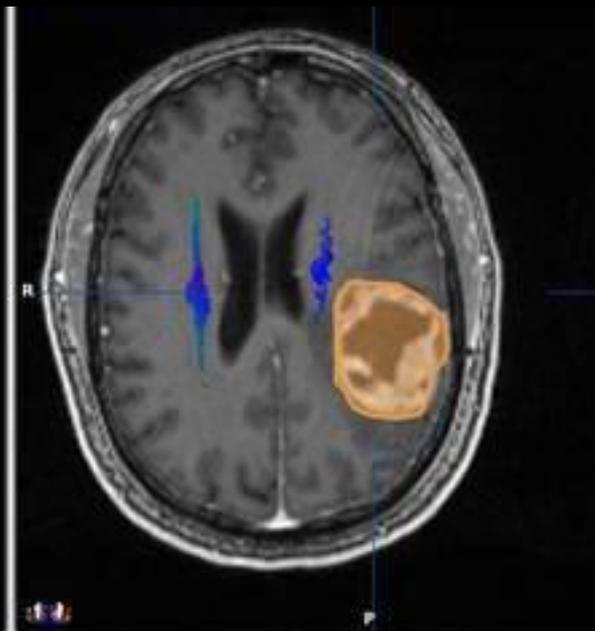
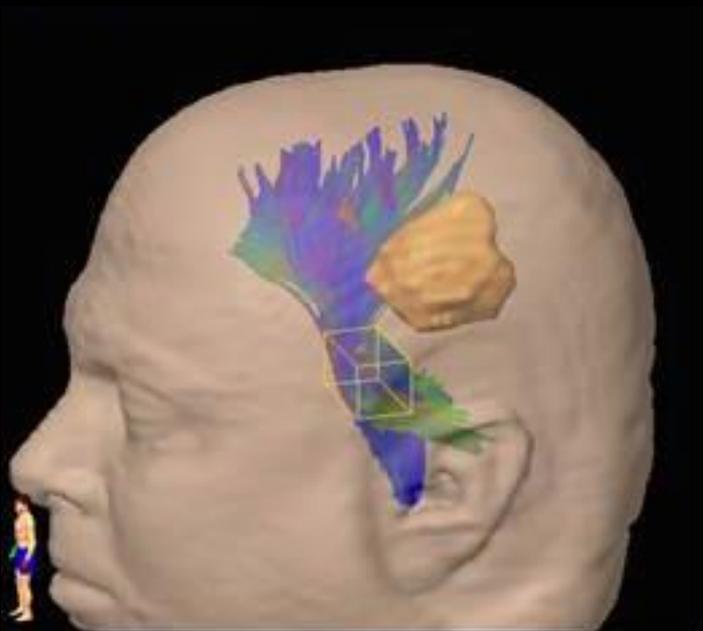


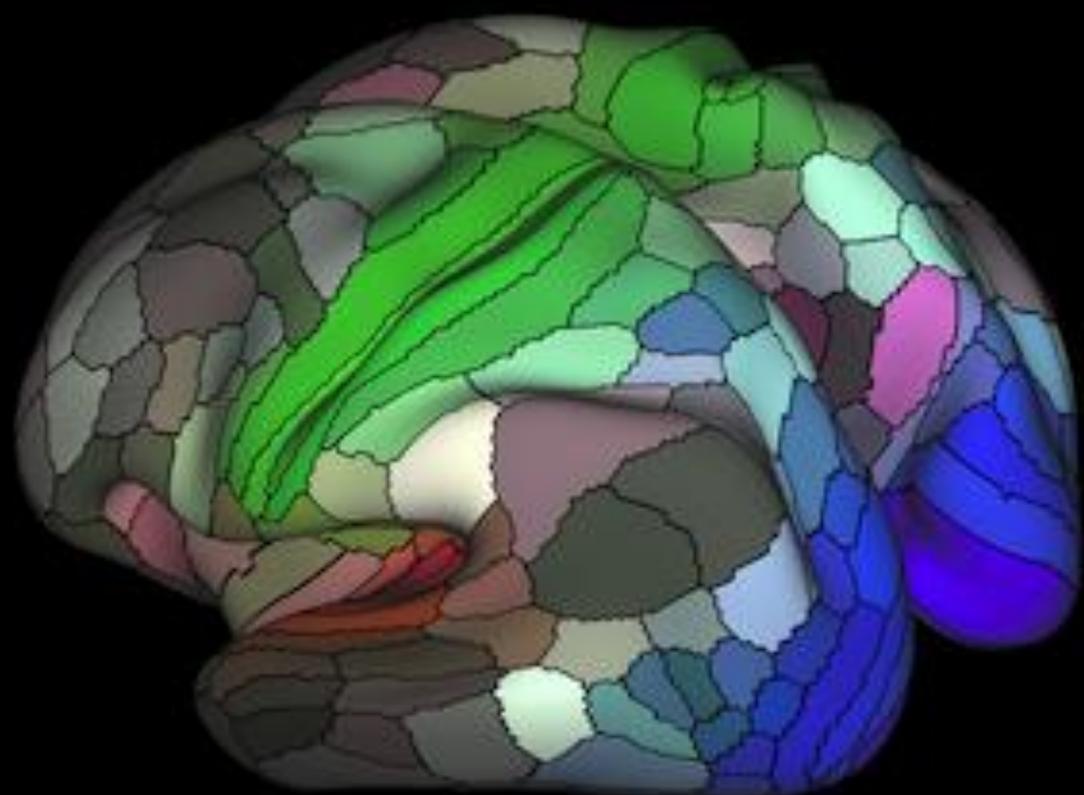
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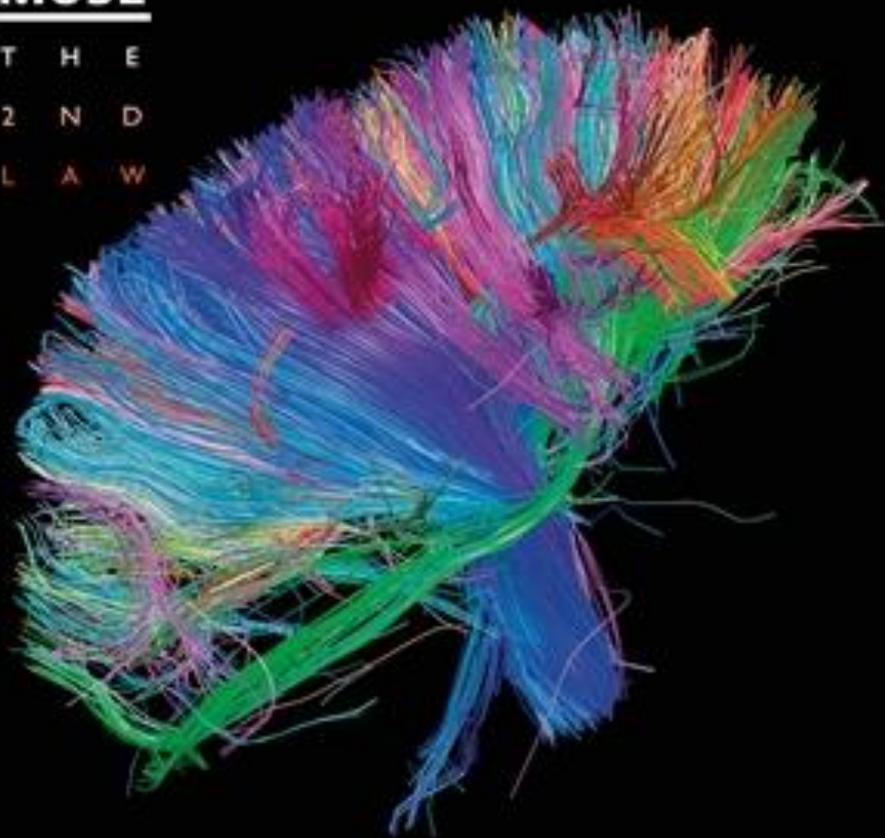






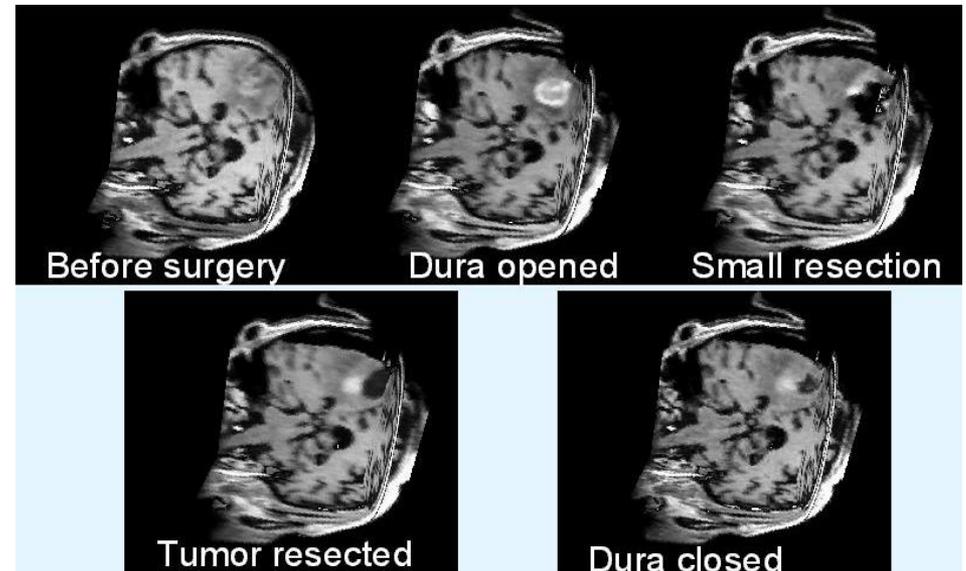
MUSE

T H E
2 N D
L A W



Anatomie morphologique

- Tractographie
- Neuronavigation



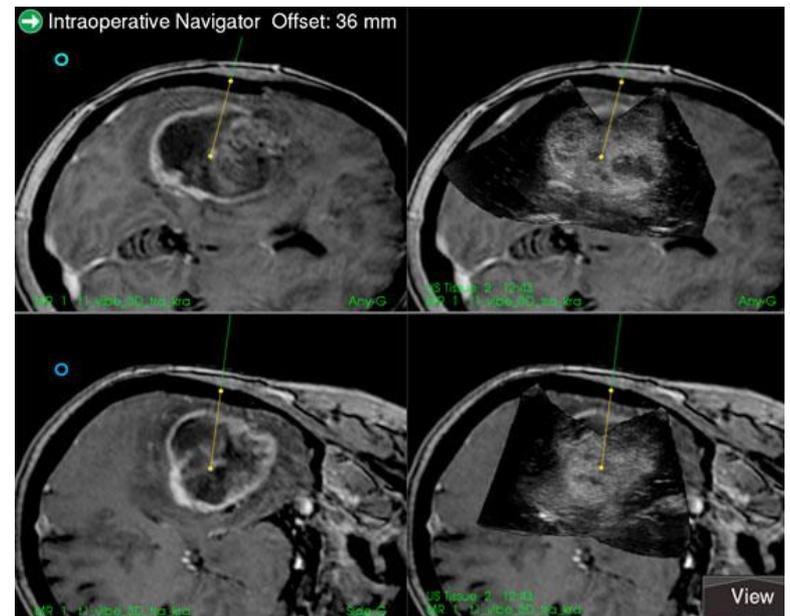
Anatomie morphologique

- Tractographie
- Neuronavigation



Anatomie morphologique

- Tractographie
- Neuronavigation
- Echographie peropératoire



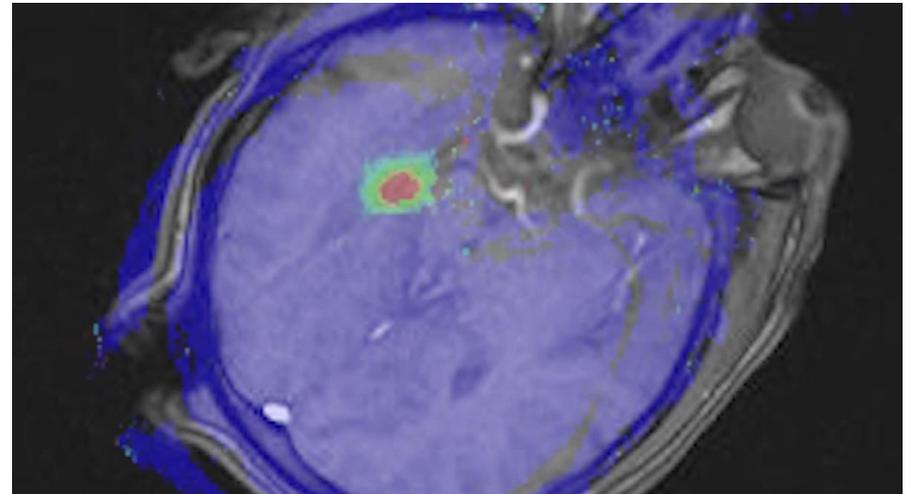
Anatomie morphologique

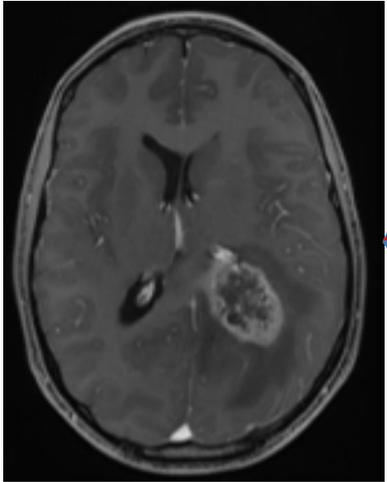
- Tractographie
- Neuronavigation
- Echographie peropératoire
- IRM peropératoire



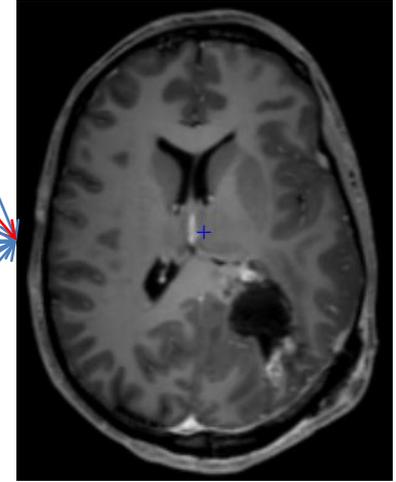
Anatomie morphologique

- Tractographie
- Neuronavigation
- Echographie peropératoire
- IRM peropératoire

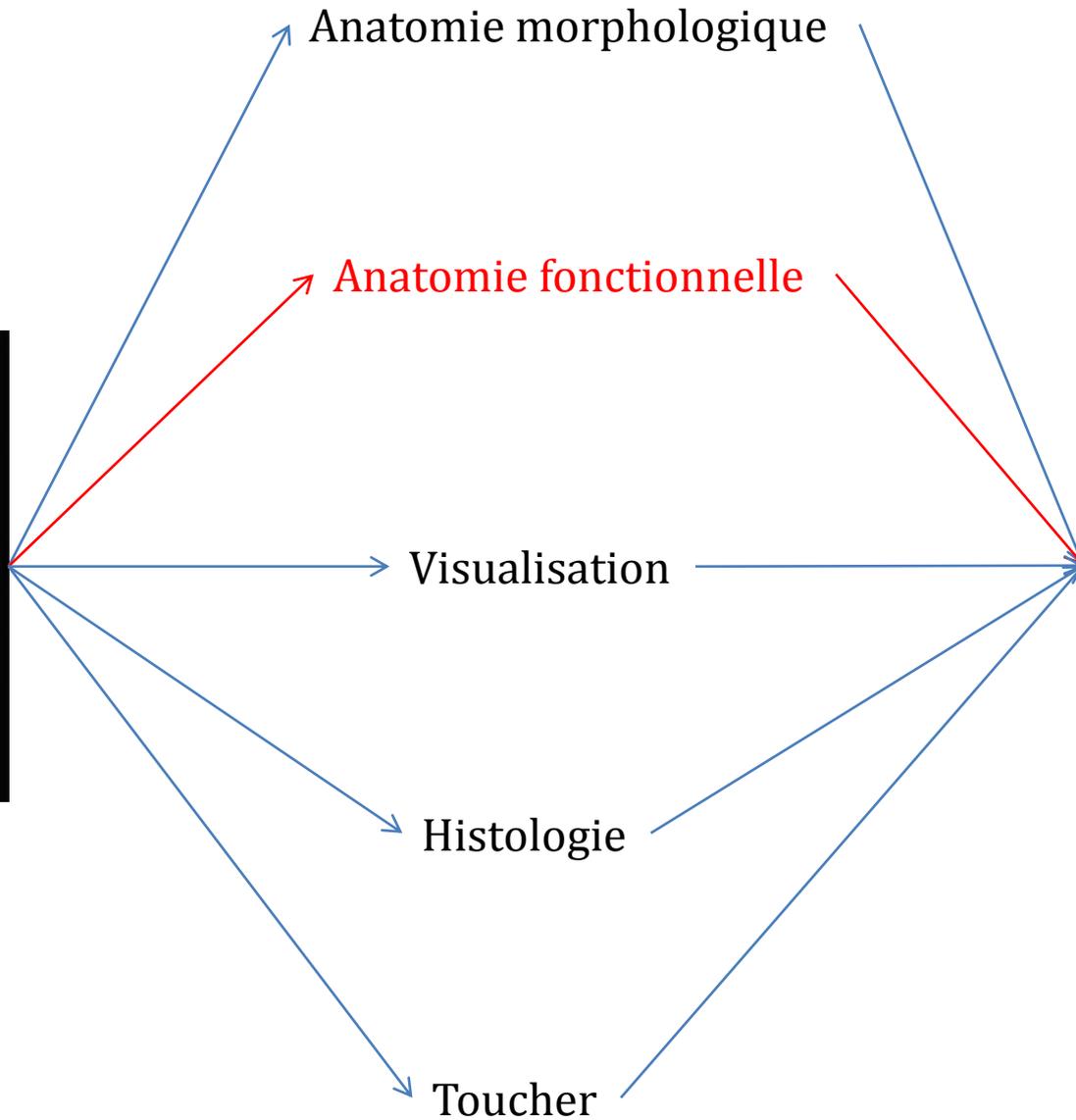




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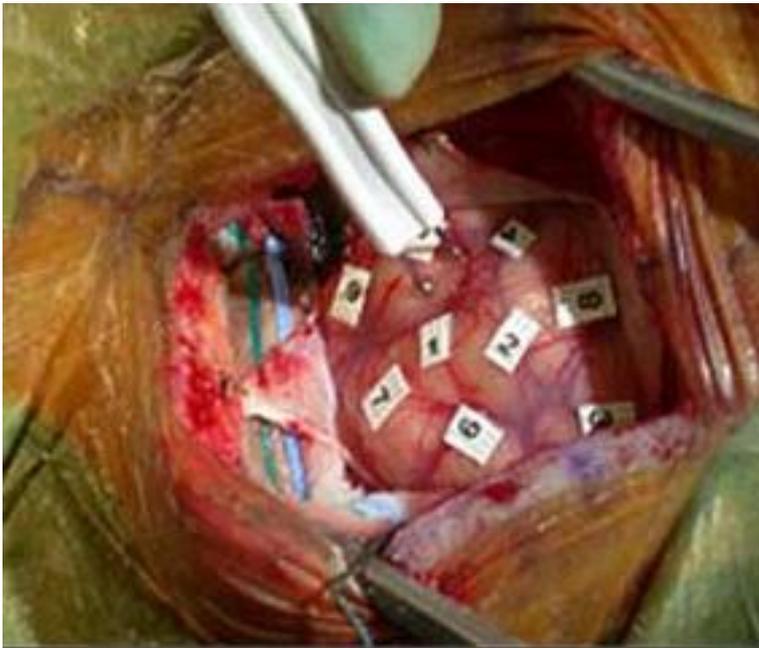


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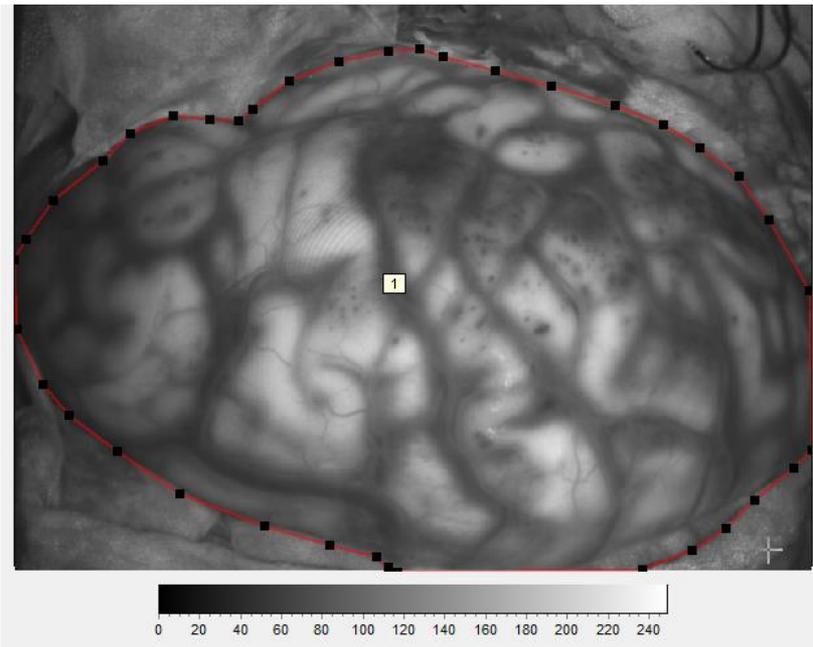
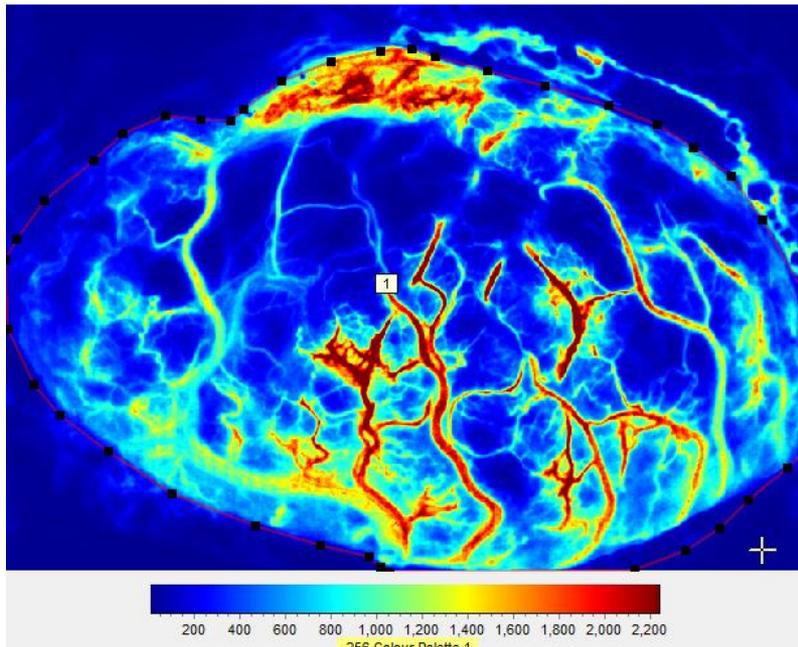
Anatomie fonctionnelle

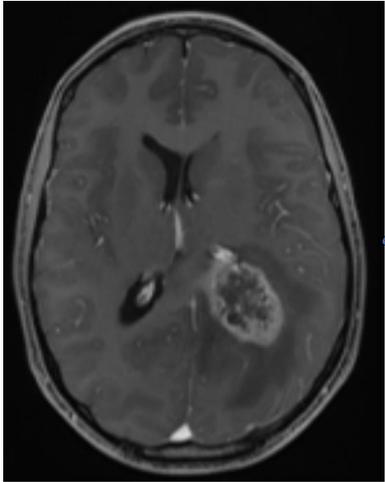
- Chirurgie éveillée & mapping cortical



Anatomie fonctionnelle

- Chirurgie éveillée & mapping cortical
- Speckle-laser





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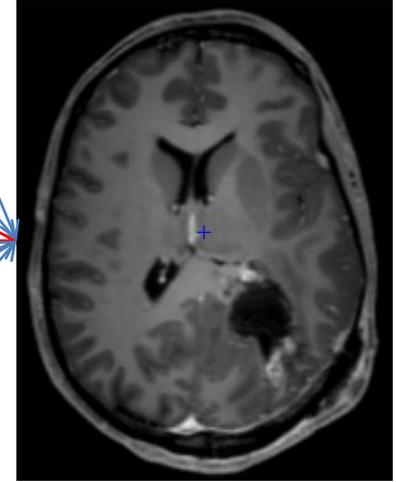
Anatomie morphologique

Anatomie fonctionnelle

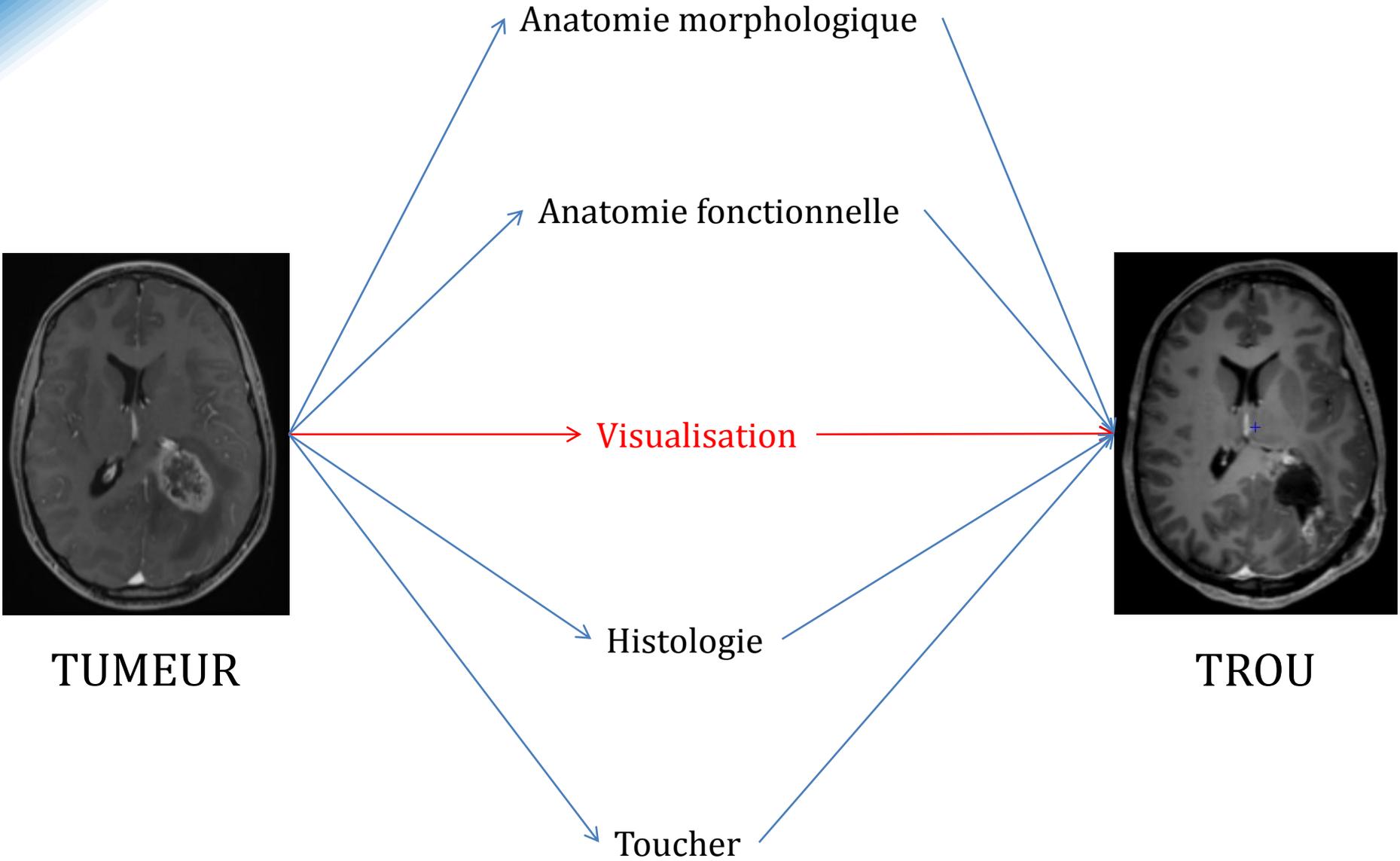
→ Visualisation

Histologie

Toucher

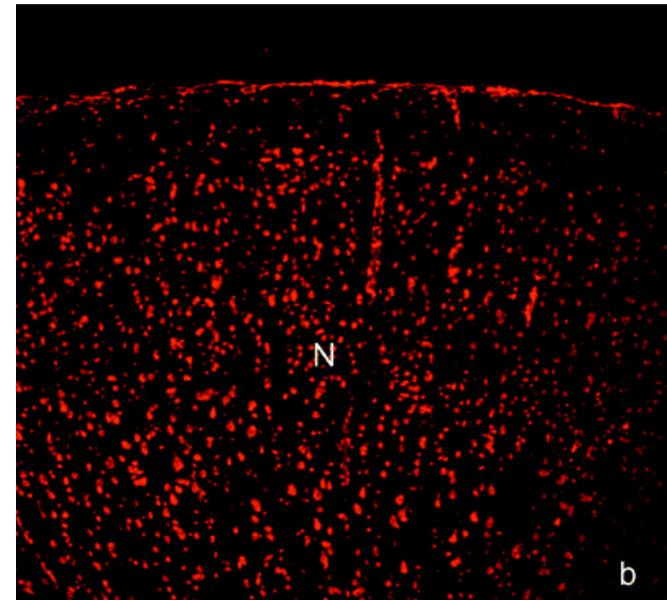
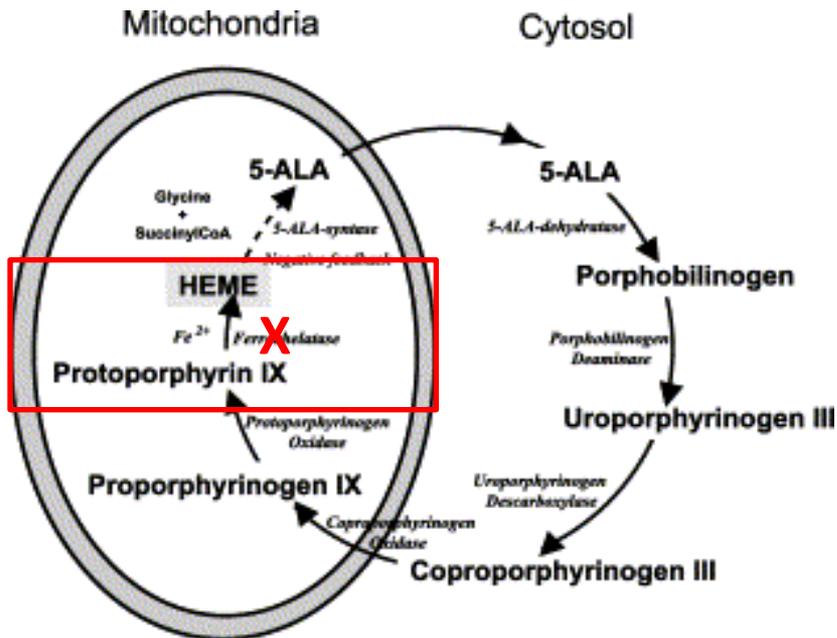


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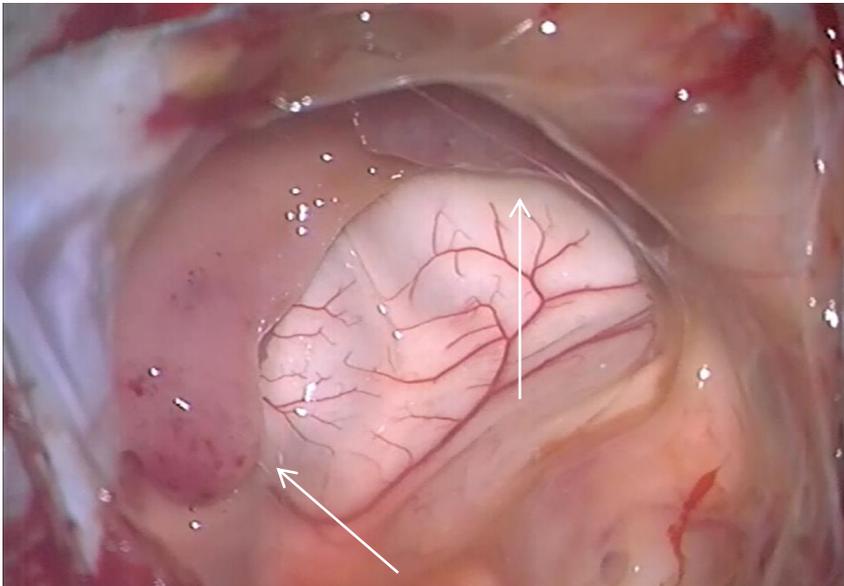
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique



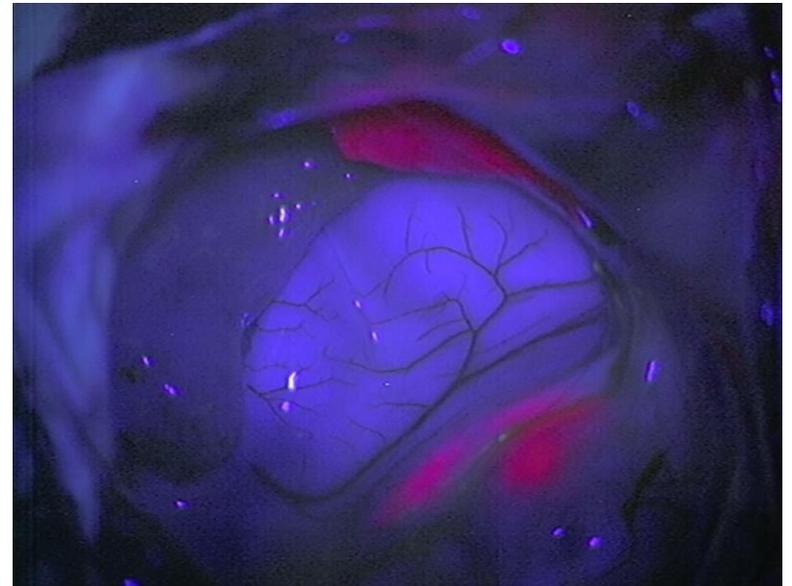
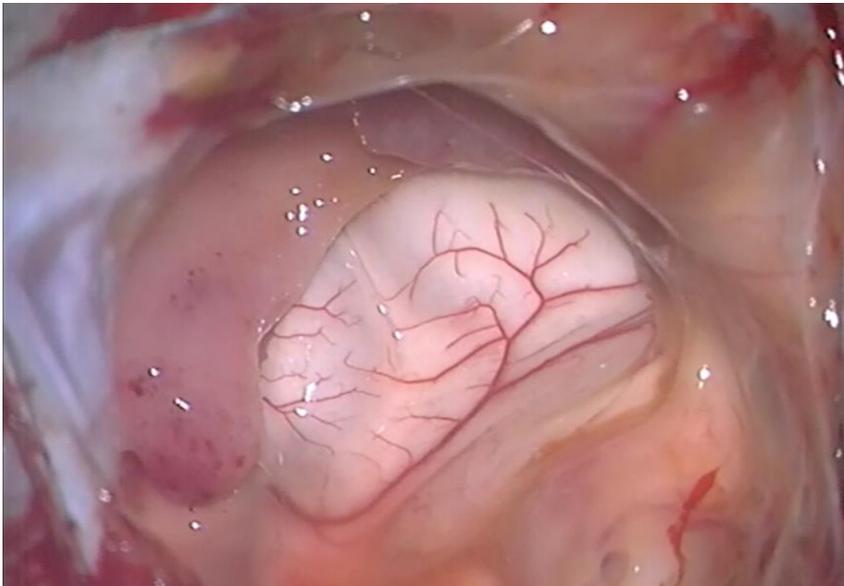
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique



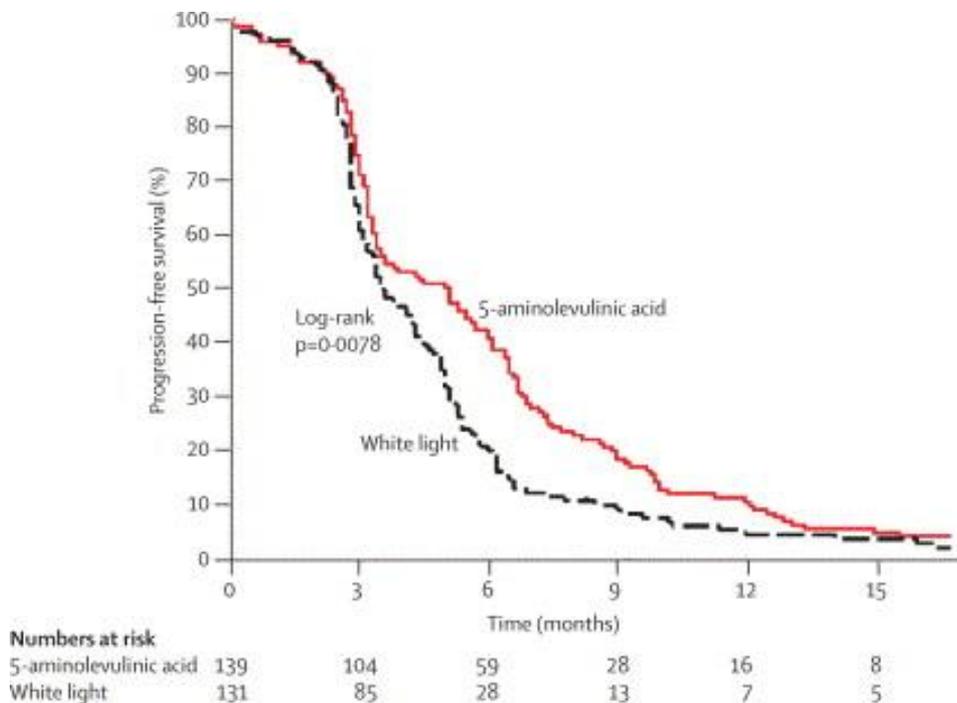
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique



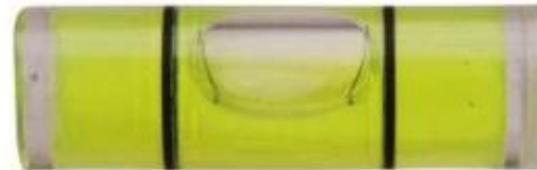
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique



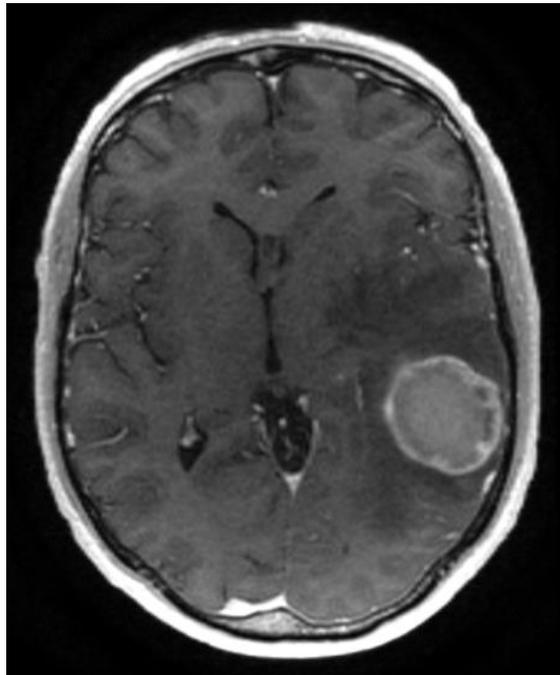
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine



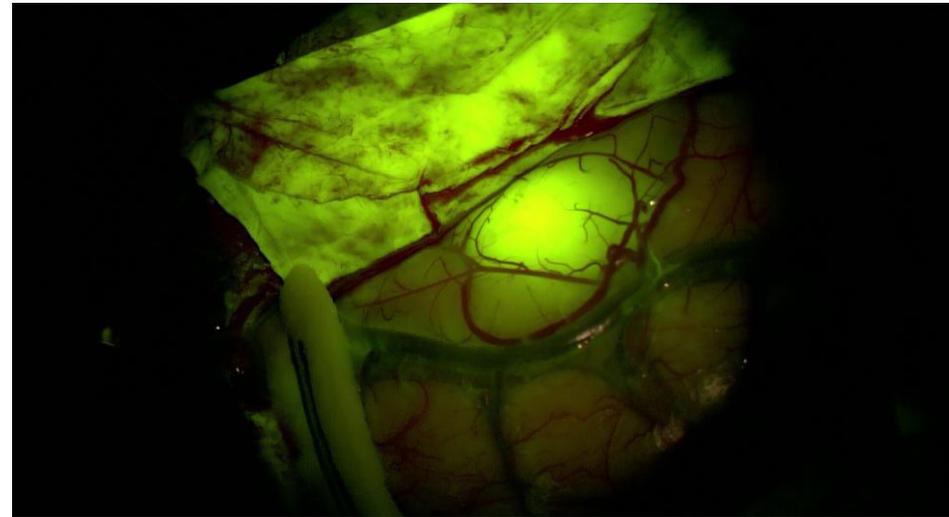
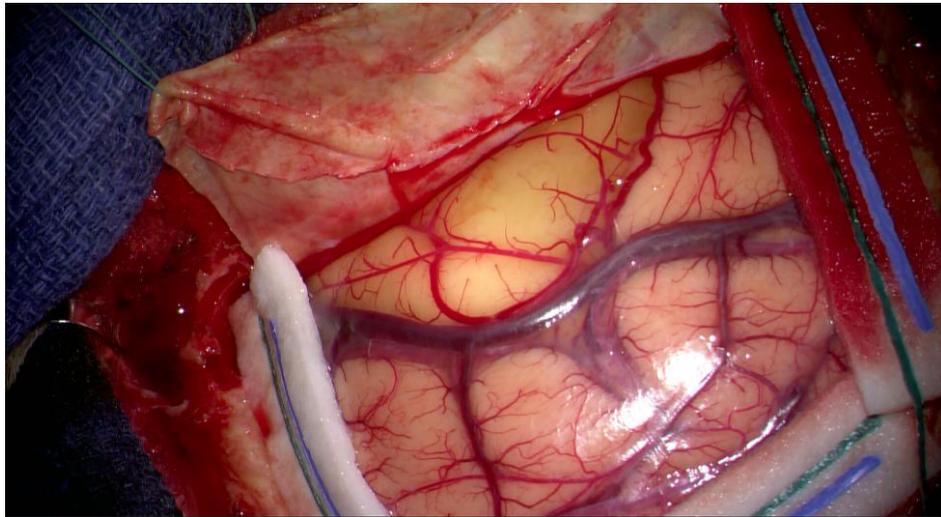
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine



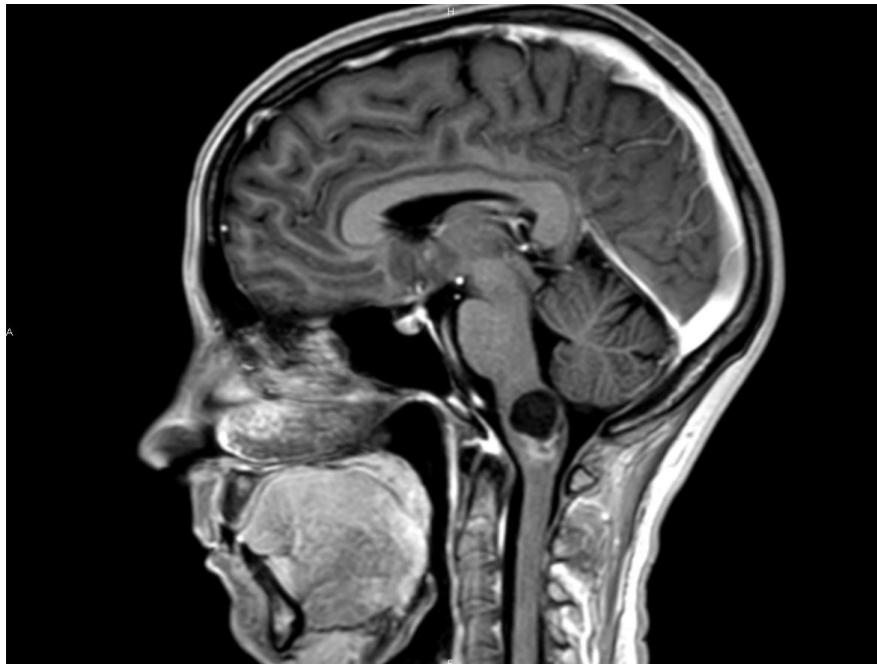
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine



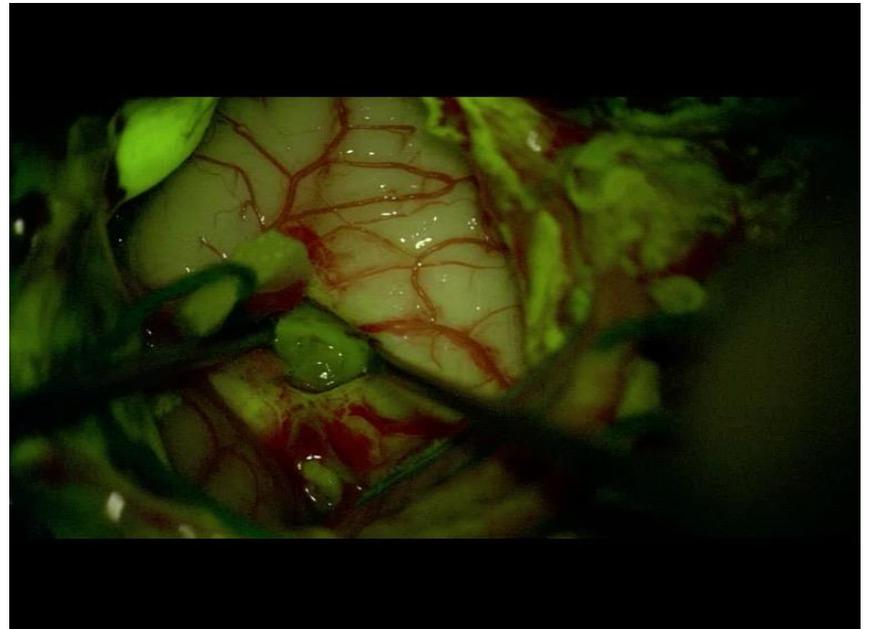
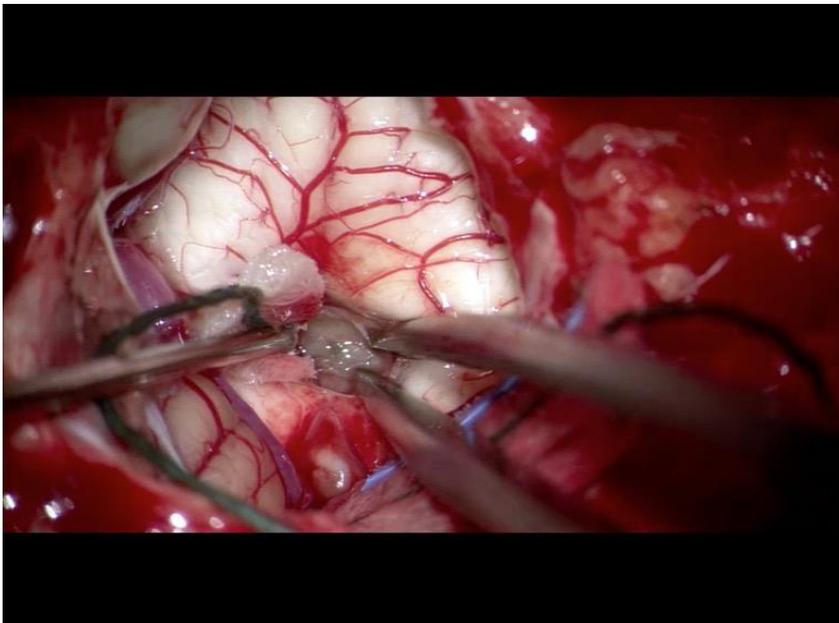
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine



Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine



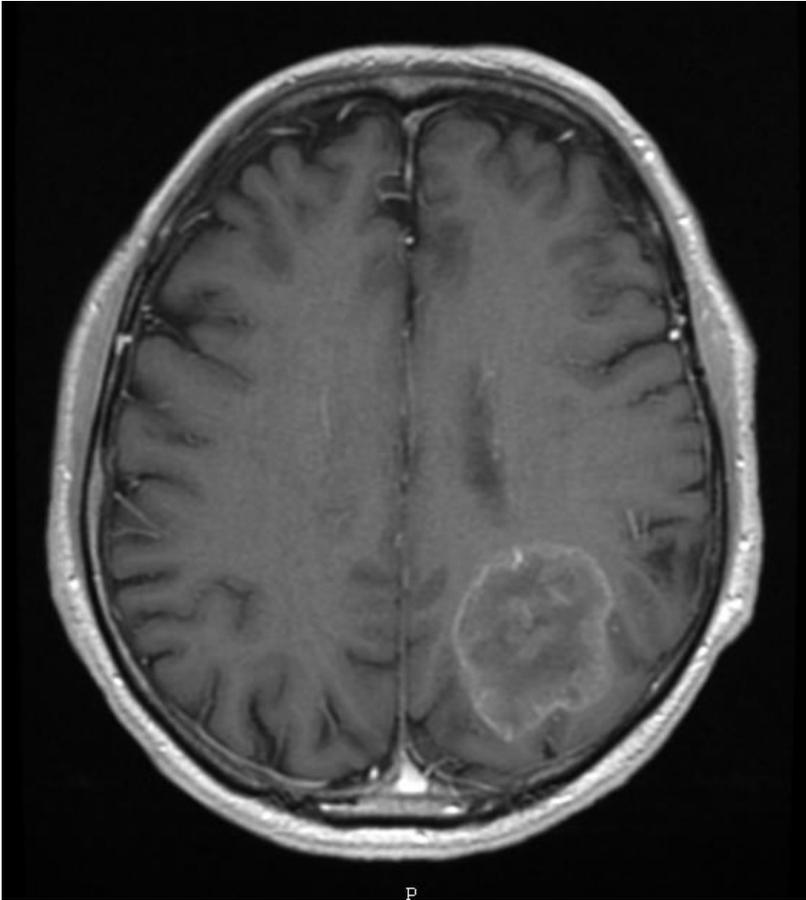
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine
 - Glioblastomes
 - Exérèses complètes X2
 - Pas de morbidité neurologique surajoutée
 - Pas de morbidité systémique

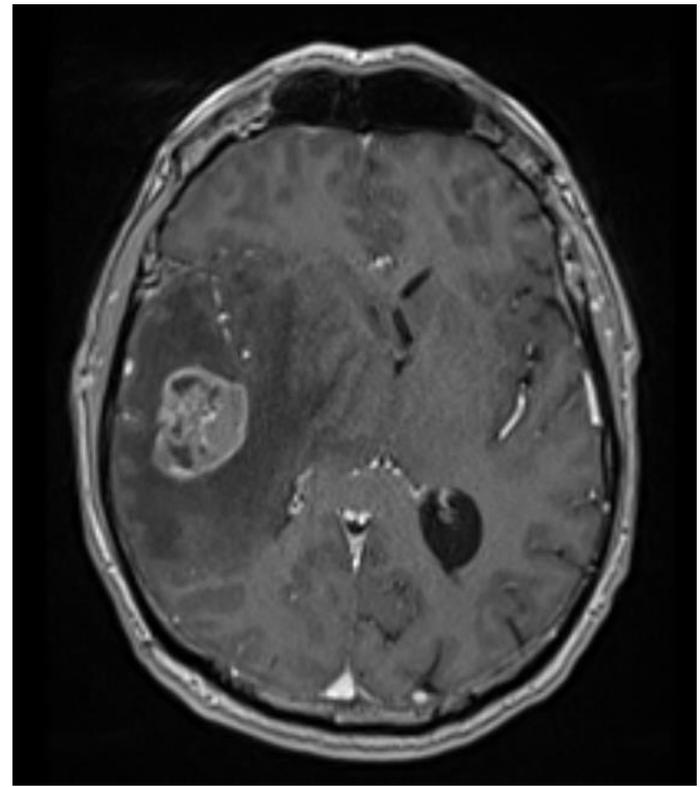
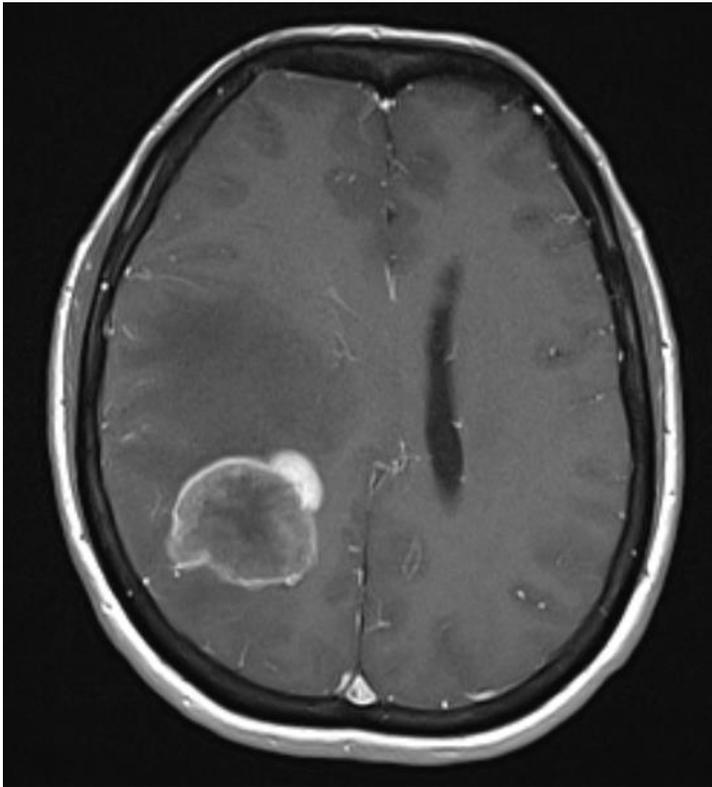
Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine
 - Glioblastomes
 - Métastases
 - Fluorescence tumorale dans tous les cas
 - Mais

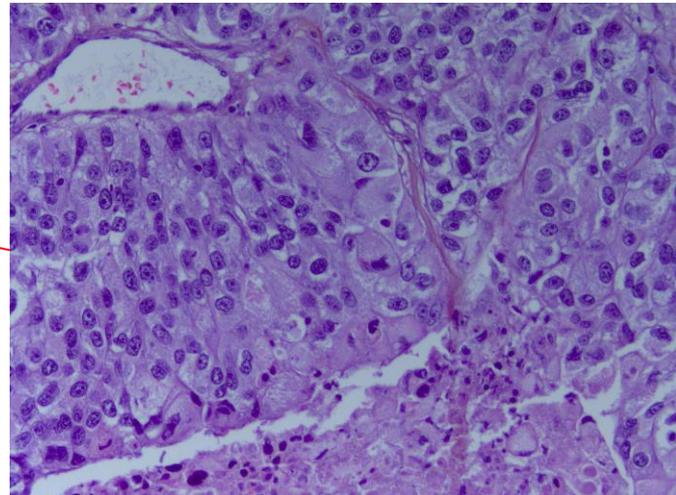
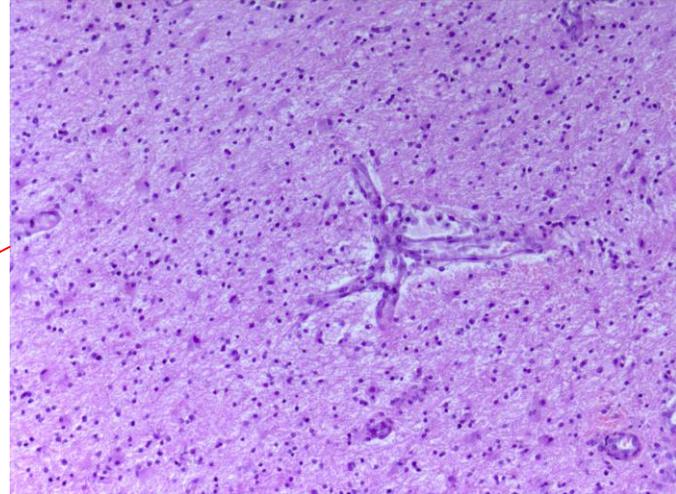
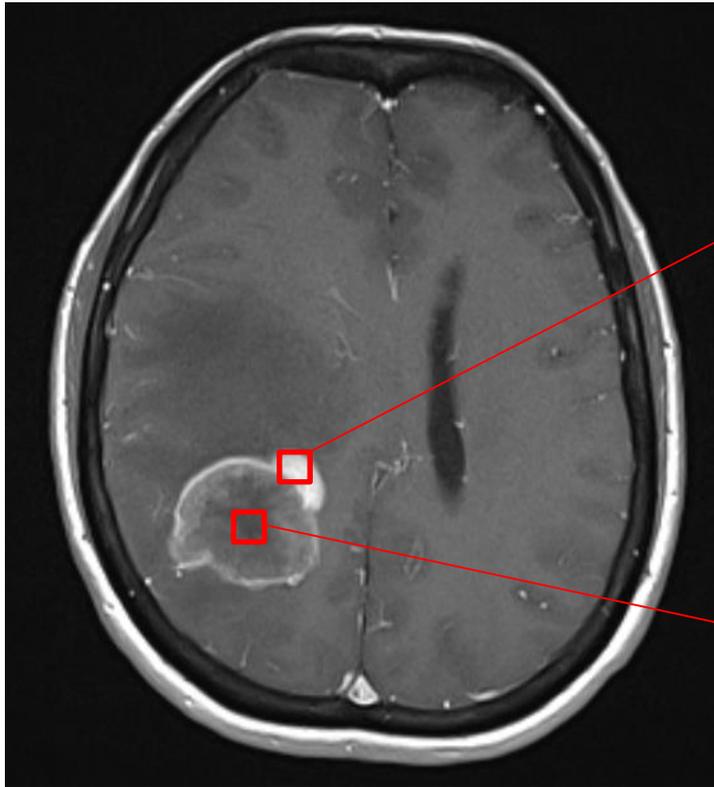
Visualisation



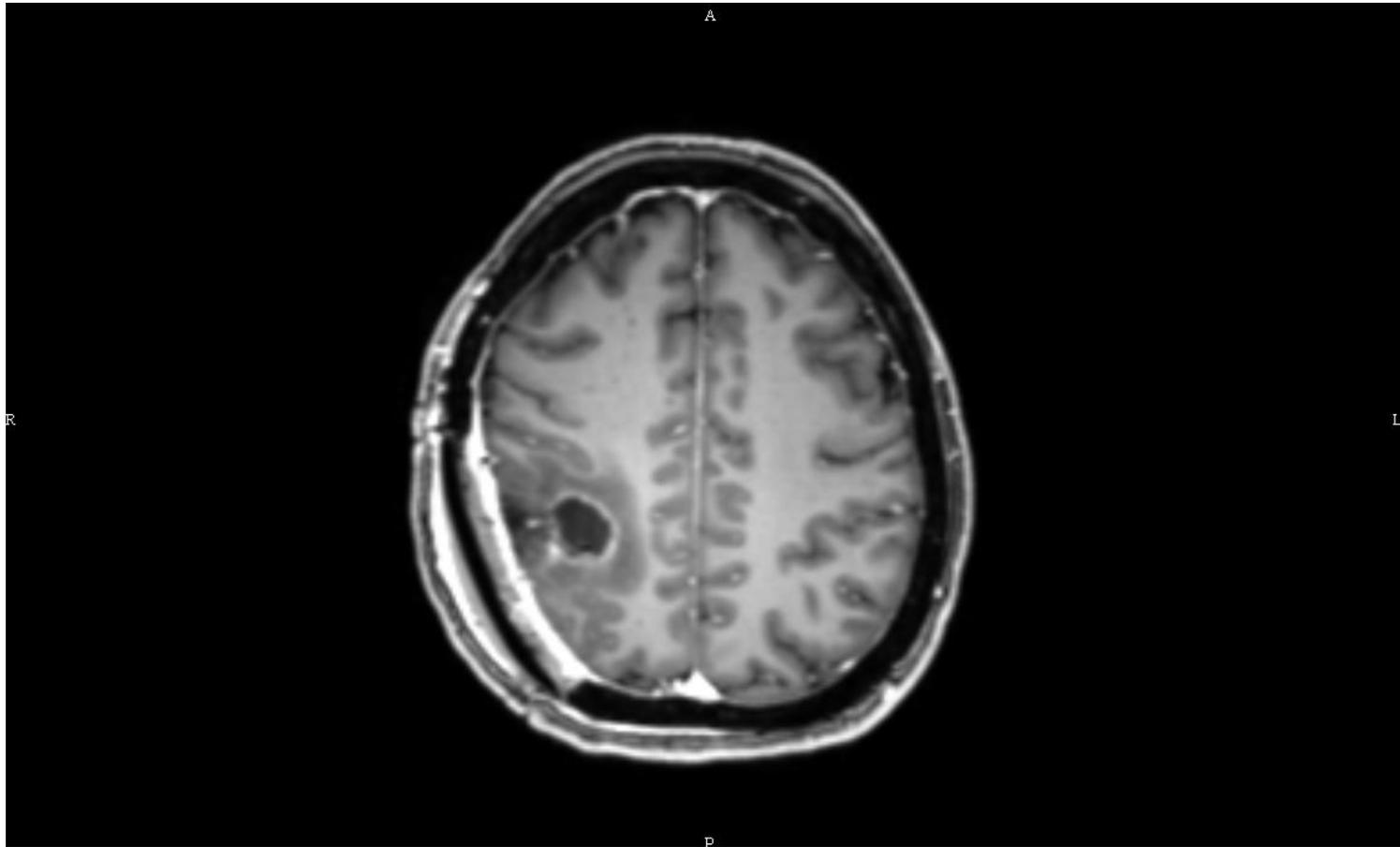
Visualisation



Visualisation

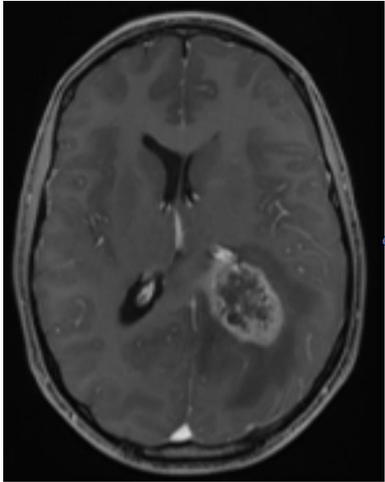


Visualisation



Visualisation

- Fluorescence intraopératoire
 - Acide 5-aminolévulinique
 - Fluorescéine
 - Glioblastomes
 - Métastases
 - Autres histologies
 - Ependymomes : bof (fluorescence courte)
 - Astrocytome pilocytique
 - Gangliogliomes
 - Lymphomes, abcès...



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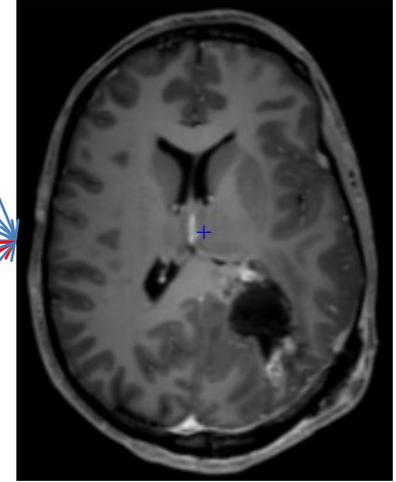
Anatomie morphologique

Anatomie fonctionnelle

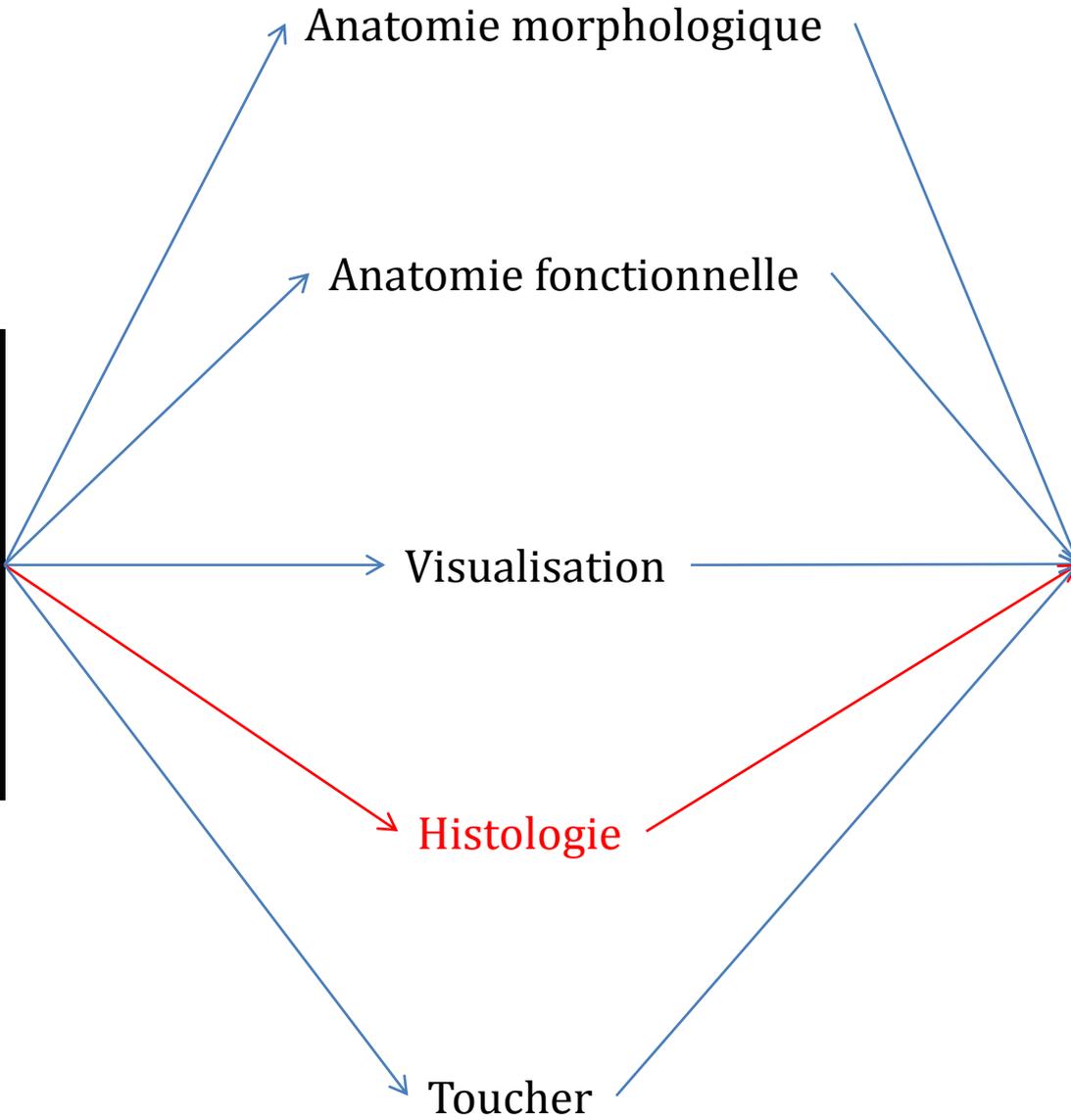
Visualisation

Histologie

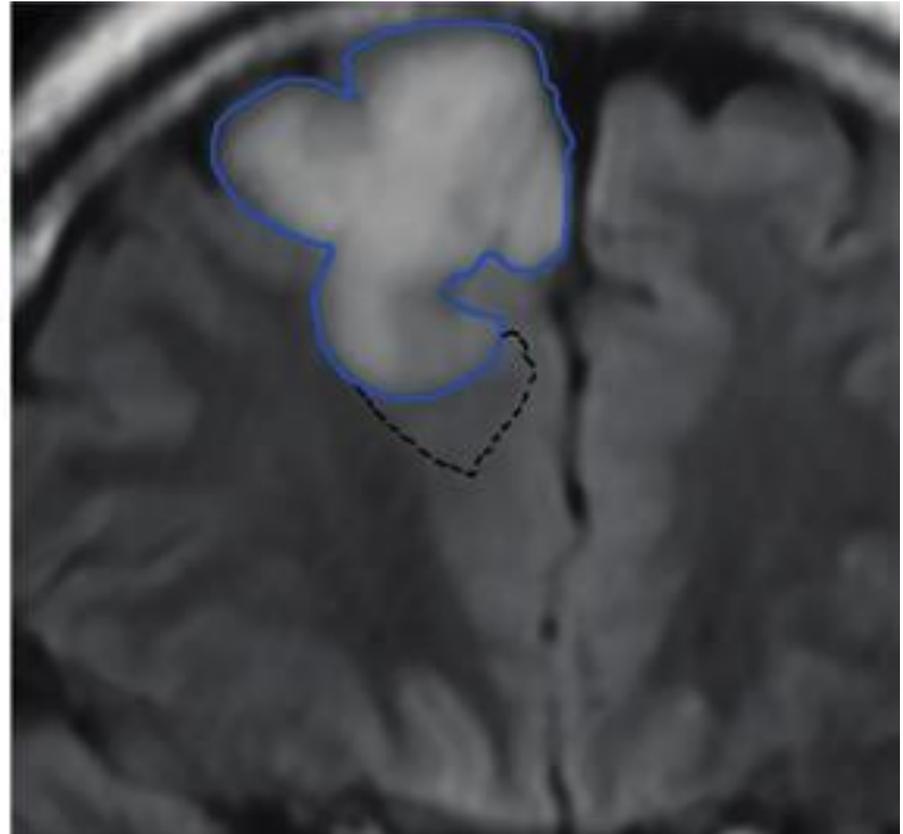
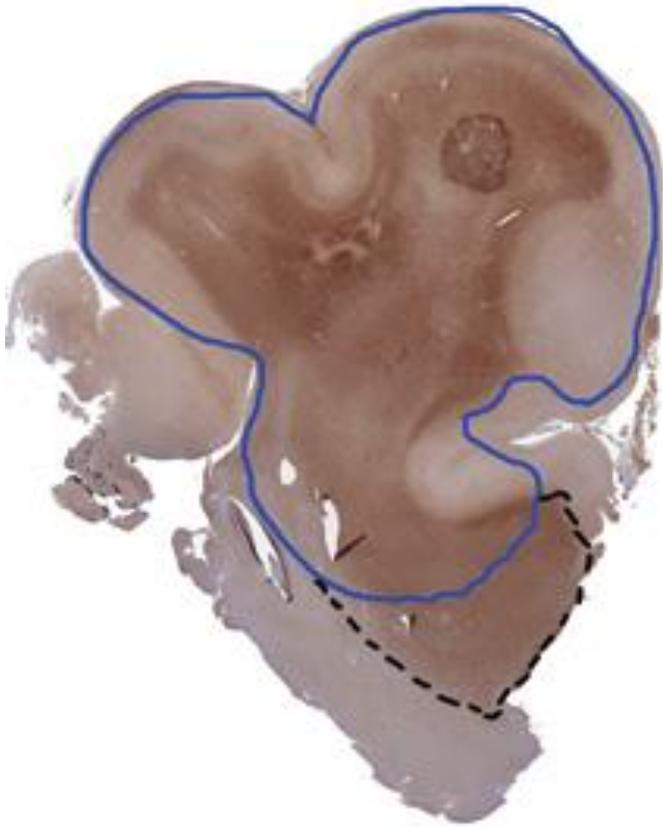
Toucher



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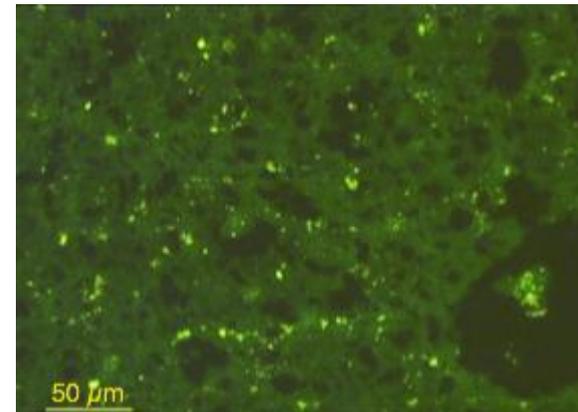
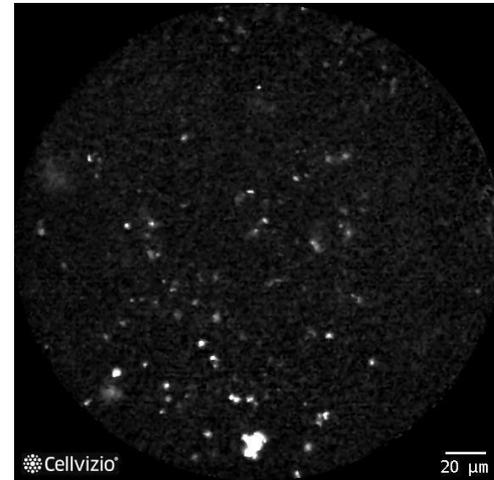


Histologie



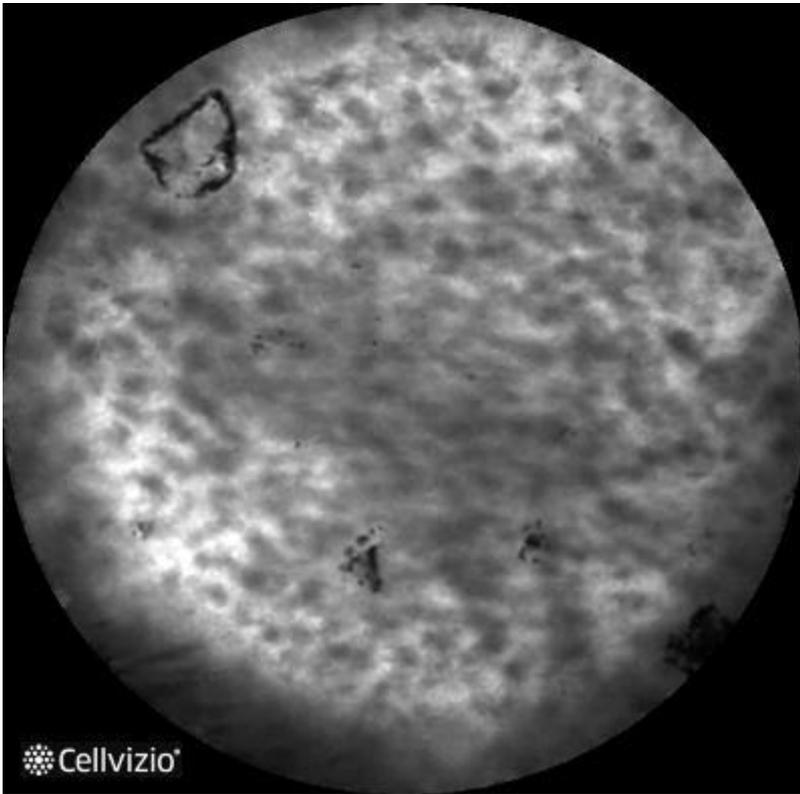
Histologie

- CellVizio

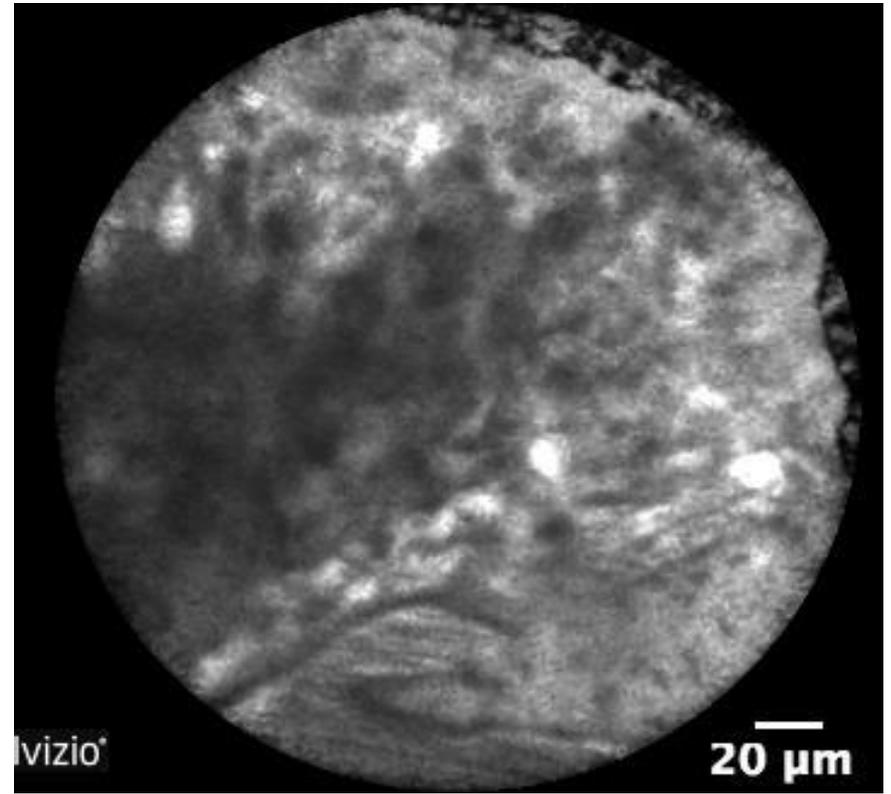


Histologie

- CellVizio



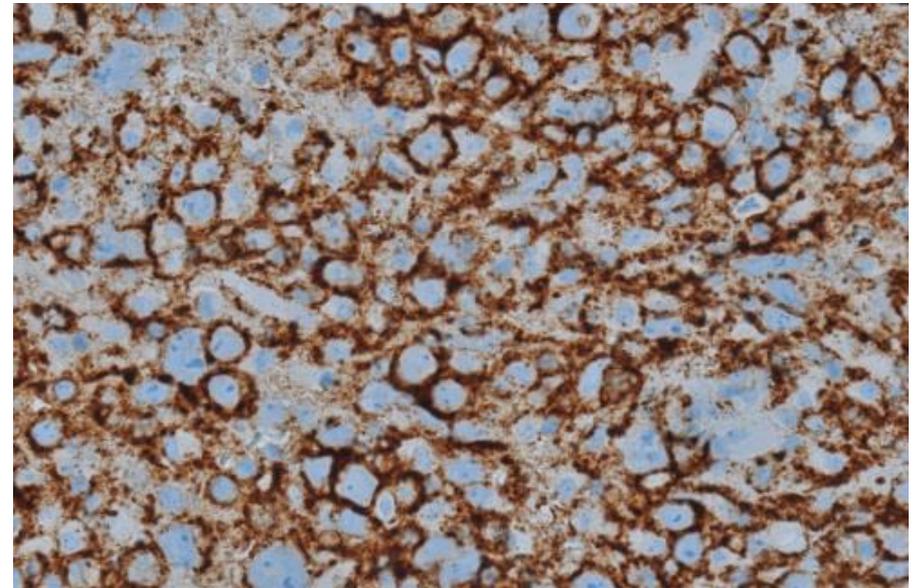
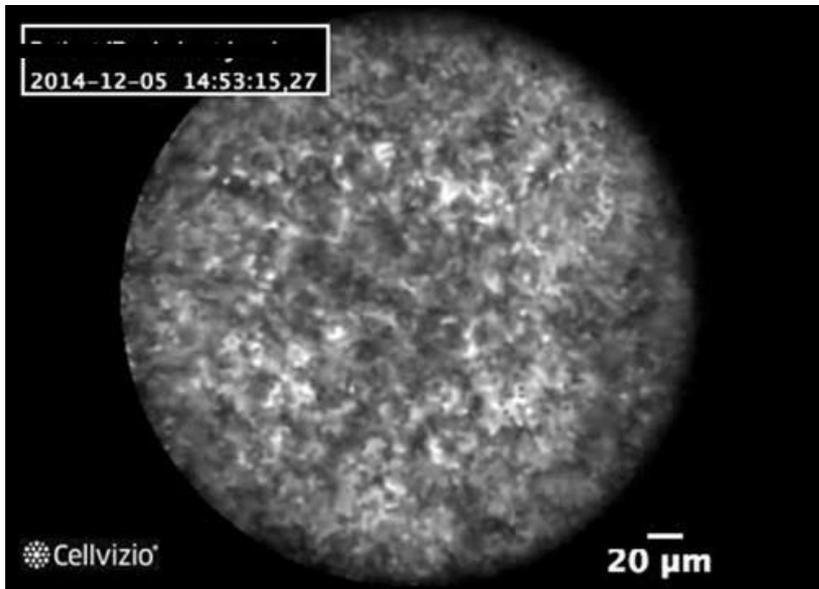
Grade II



Glioblastome

Histologie

- CellVizio



Lymphome B

Histologie

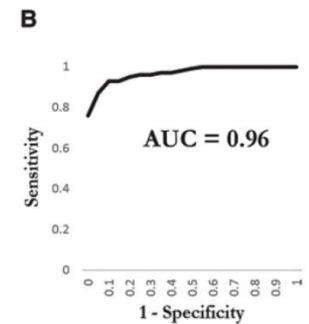
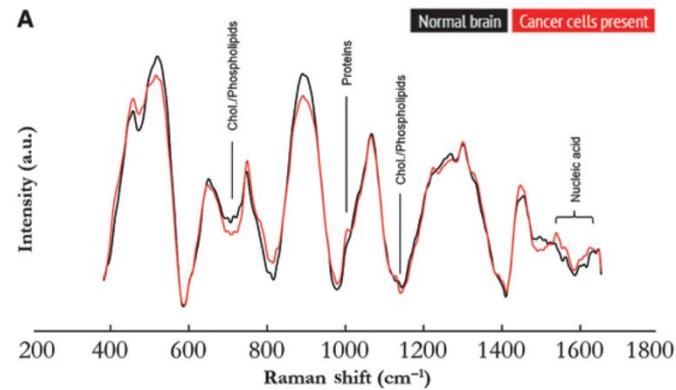
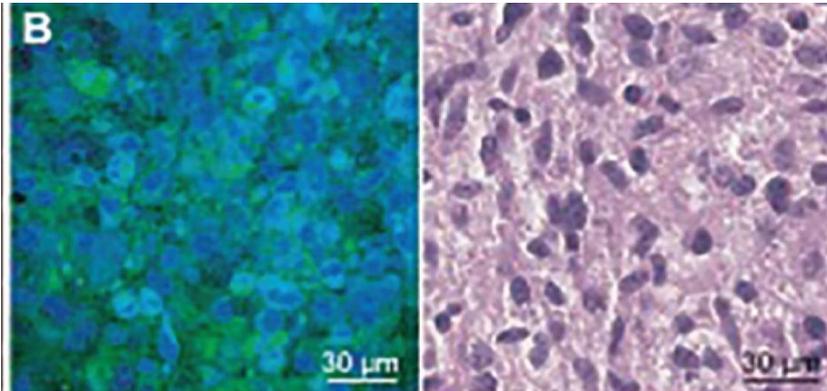
- CellVizio
- Spectroscopie Raman



$$P = \alpha_0 E_0 \cos(2\pi\nu_0 t) + \frac{1}{2} \left(\frac{\partial \alpha}{\partial q} \right)_0 q_0 [\cos(2\pi(\nu_0 + \nu_p)t) + \cos(2\pi(\nu_0 - \nu_p)t)]$$

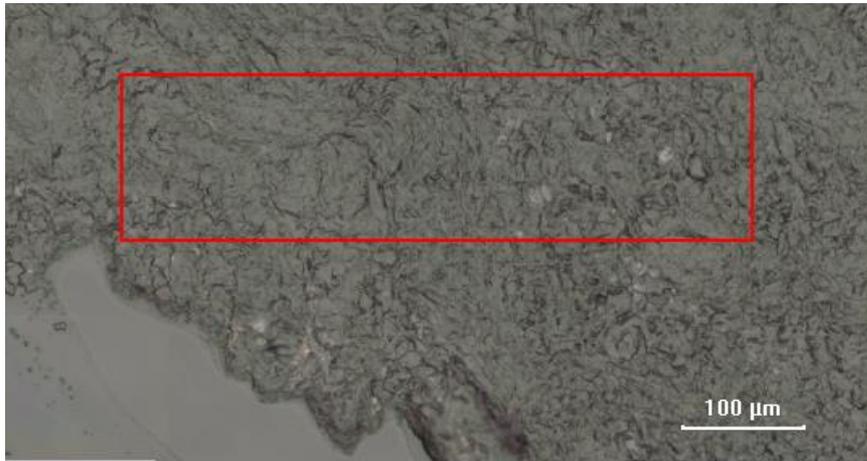
Histologie

- CellVizio
- Spectroscopie Raman



Histologie

- CellVizio
- Spectroscopie Raman



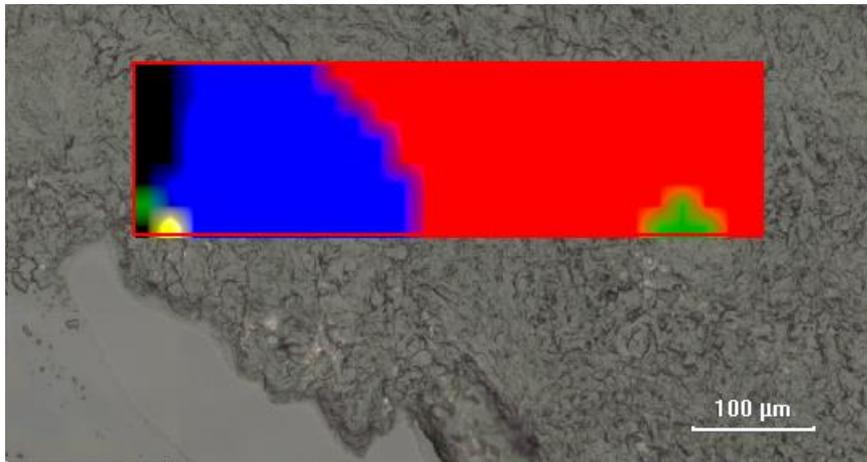
GBM



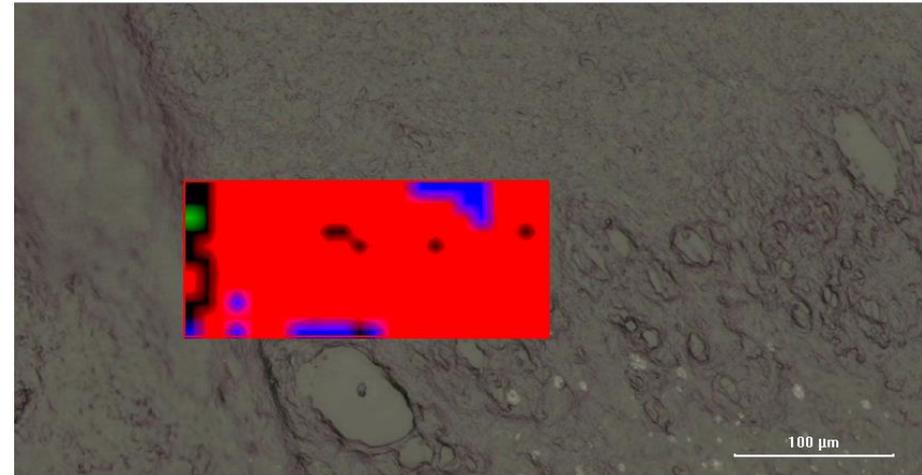
Astro Grade II

Histologie

- CellVizio
- Spectroscopie Raman



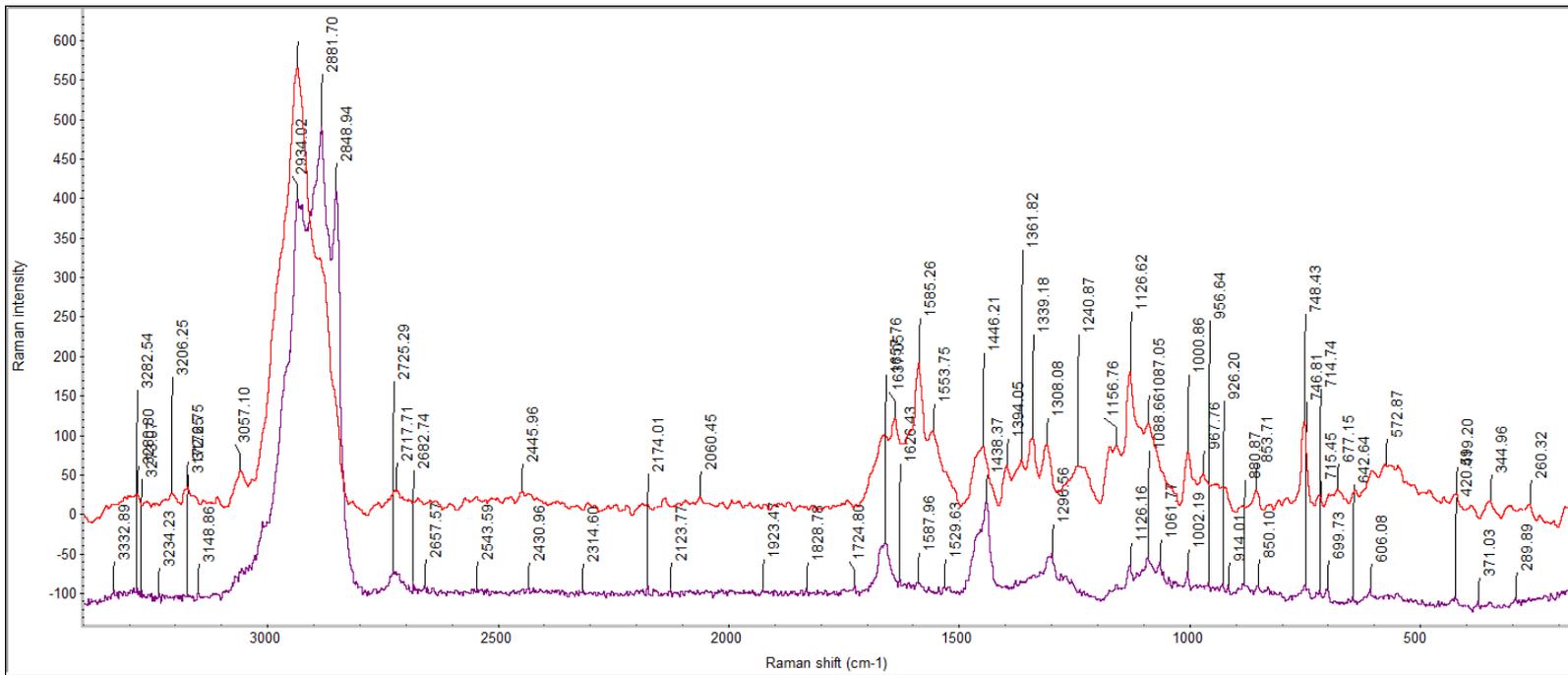
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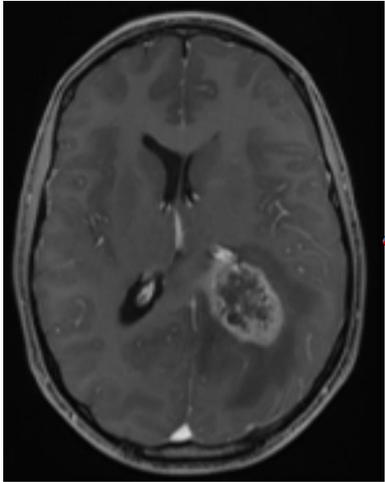


Astro Grade II

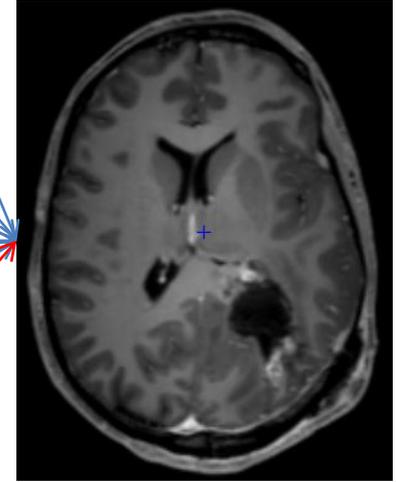
Histologie

- CellVizio
- Spectroscopie Raman





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TROU

Anatomie morphologique

Anatomie fonctionnelle

Visualisation

Histologie

Toucher

