

Practical course

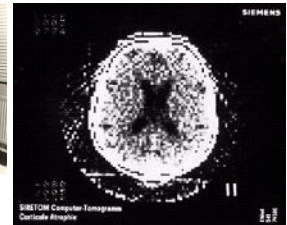
Neuroradiological Application of **Computed Tomography**

Jörg Schmehl

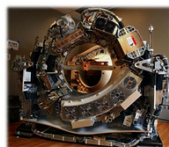
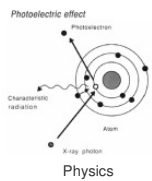
Department of Diagnostic and Interventional Neuroradiology



Sir Godfrey Hounsfield



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Engine

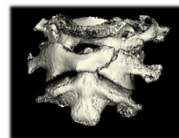


Image processing

Clinical Application

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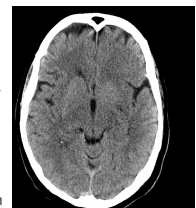
Bild Rekonstruktion



Rohdaten

Math. Basis:
Radon-Transformation
(1917)

Praktisch:
a) Fourier Transformation
oder
b) filtered
backprojection



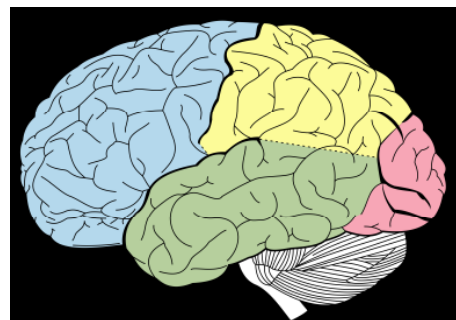
CT Bild

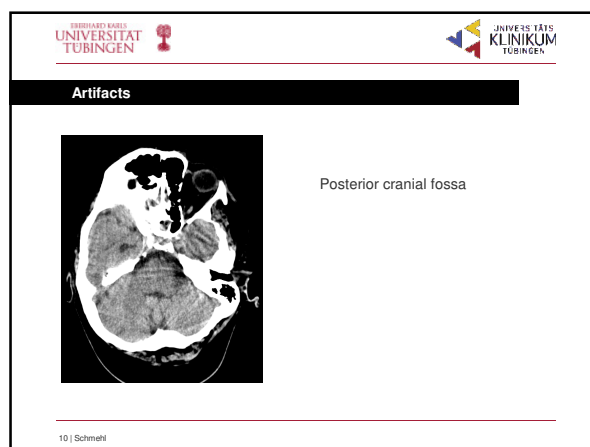
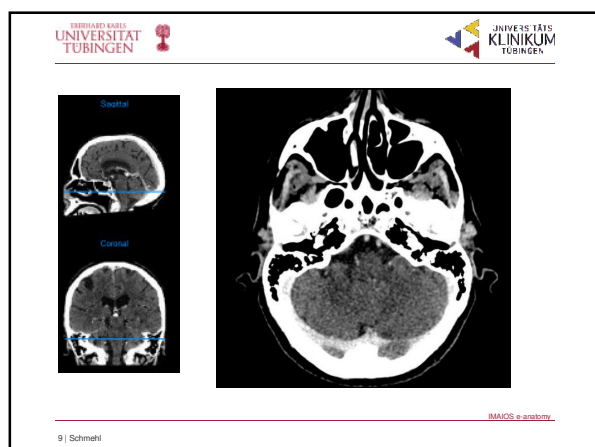
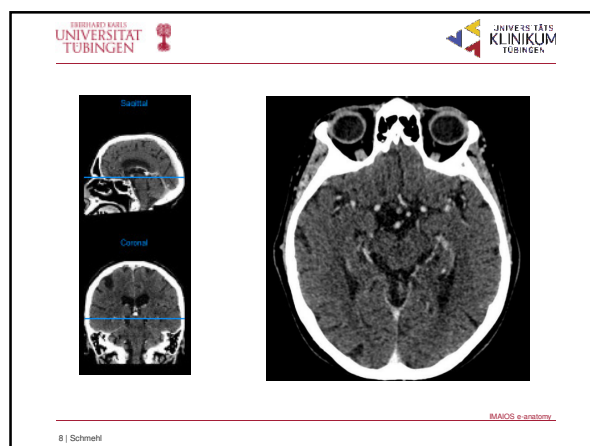
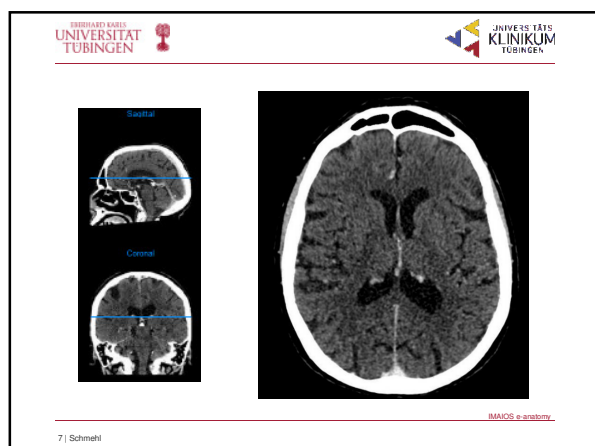
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Indications for cCT

- Patient with head injury / Trauma
- Detect signs of increased intracranial pressure (ICP)
- Stroke
- Imaging of vascular pathology
- Assessment of osseous structures
- Detection of parenchymal lesions e.g. metastatic disease

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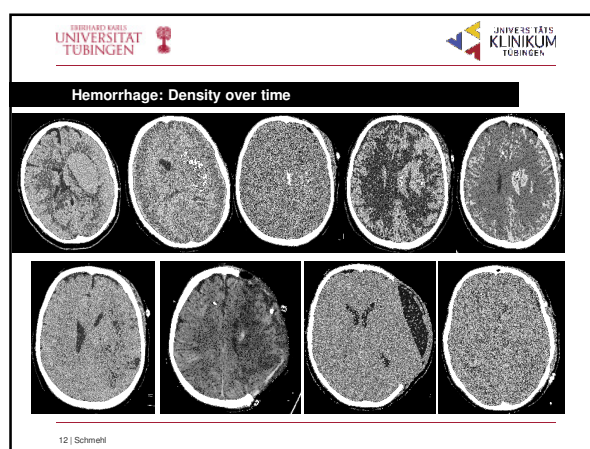




Hounsfield units [HU] ?	
Grey matter/basal ganglia	35-40 HU
White matter	25-30 HU
Blood	30-45 HU

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Bier et al., 2016

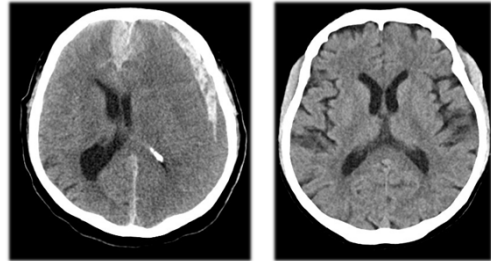


Imaging in Trauma

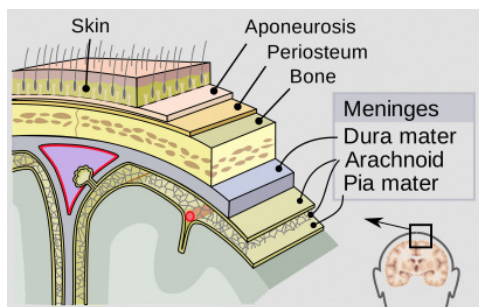
- Intracranial Hemorrhage
- Contusion
- Fractures

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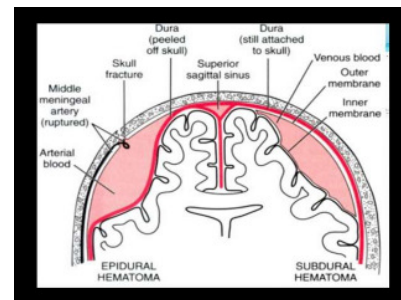
Case: Motorcycle accident



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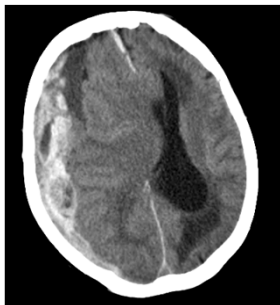


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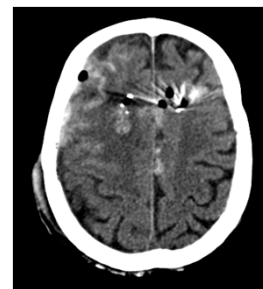
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Case: 73-yo female patient after bike accident

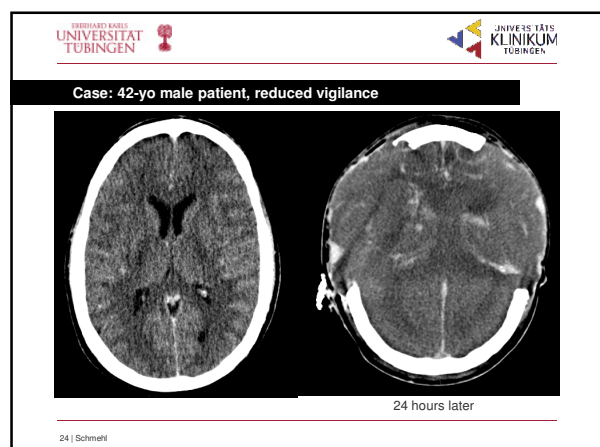
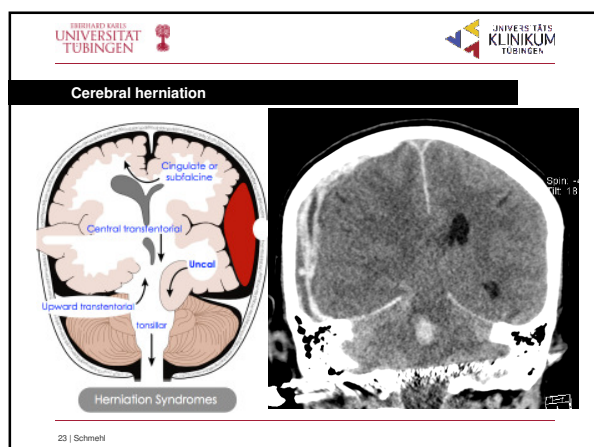
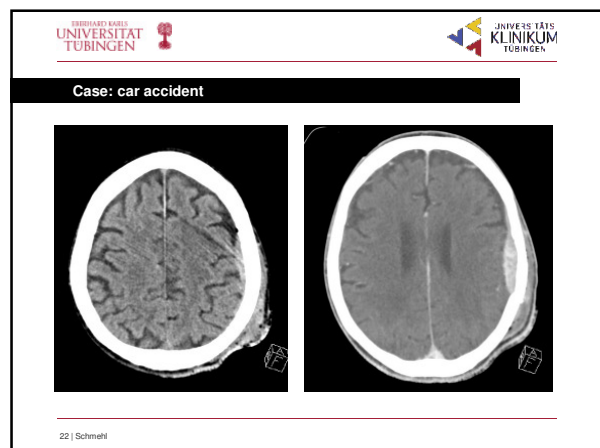
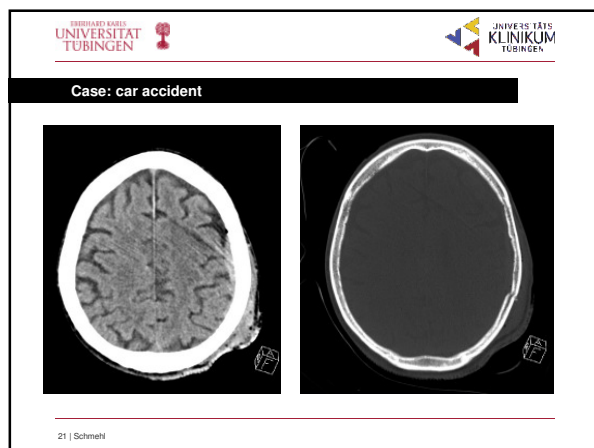
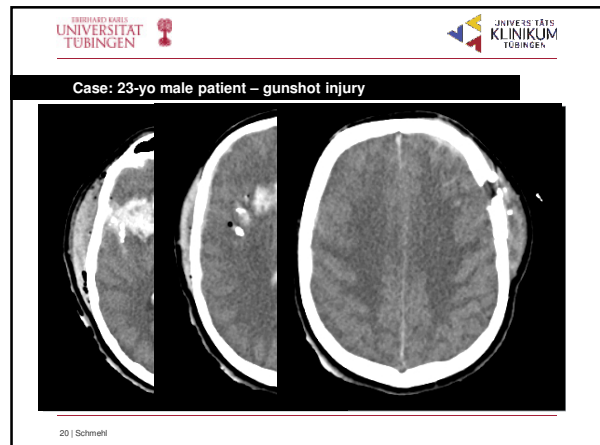
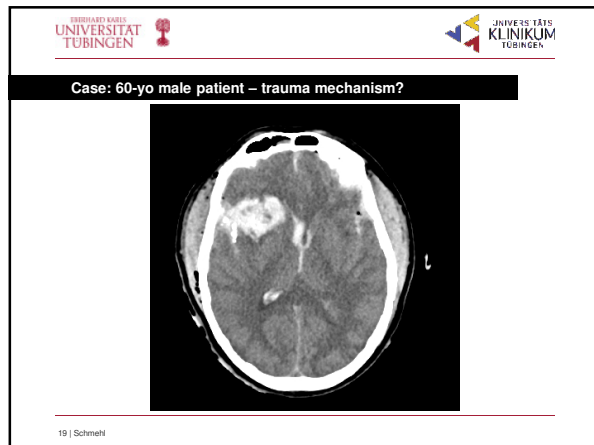


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Case: 60-yo male patient – trauma mechanism?

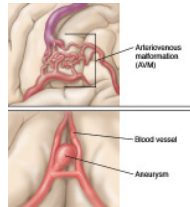


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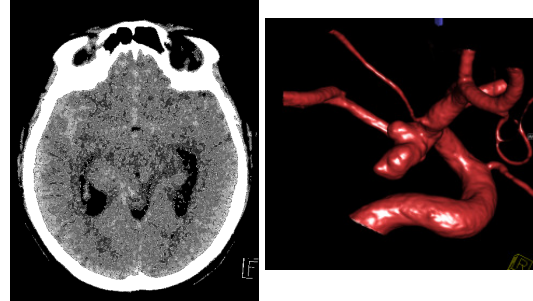
Intracranial Hemorrhage

- Localization
- Typical versus atypical
- Origin / Source

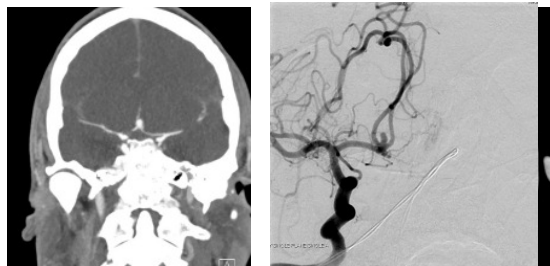


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Case: 50-yo female patient, sudden headache



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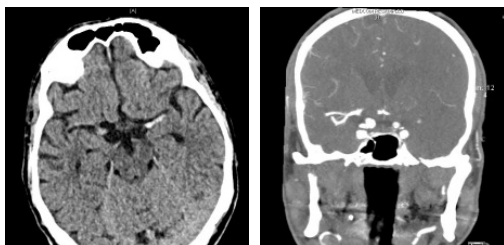
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Imaging in Stroke

- ICB
- Extent of ischemia
- Vascular situation
- Perfusion

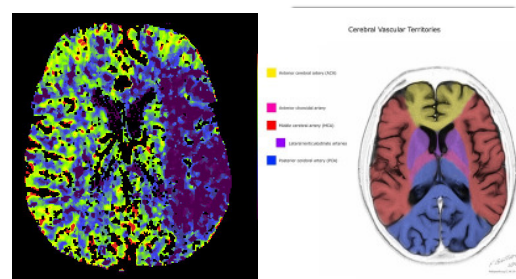
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Imaging in Stroke, early signs

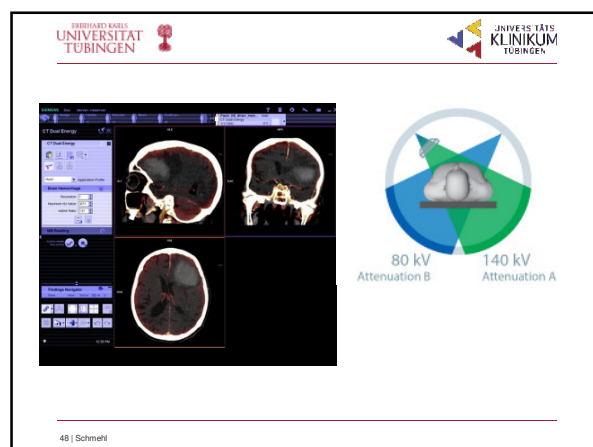
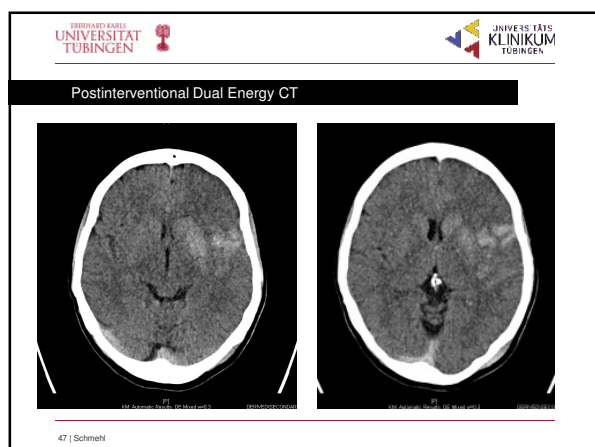
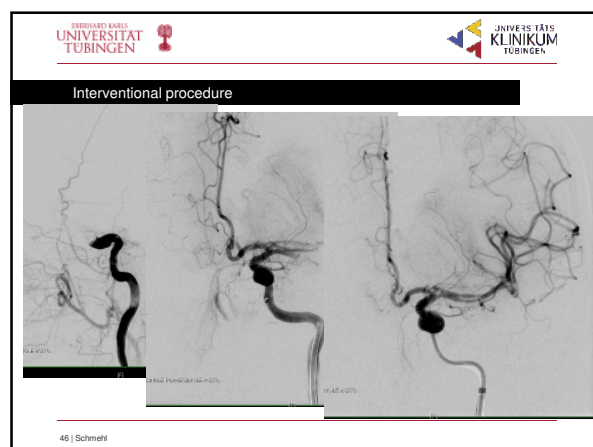
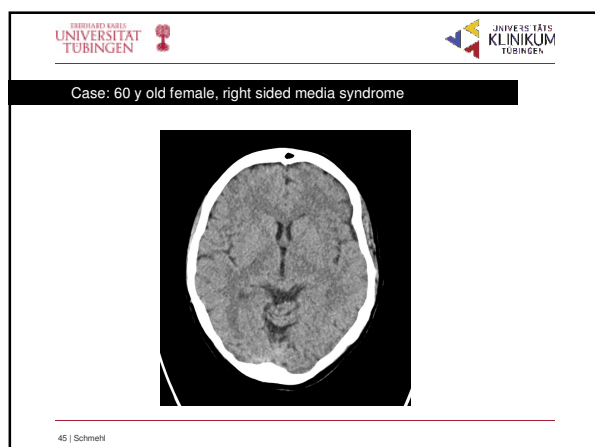
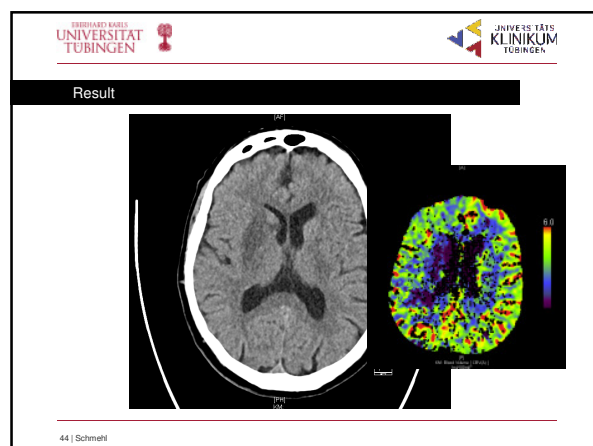
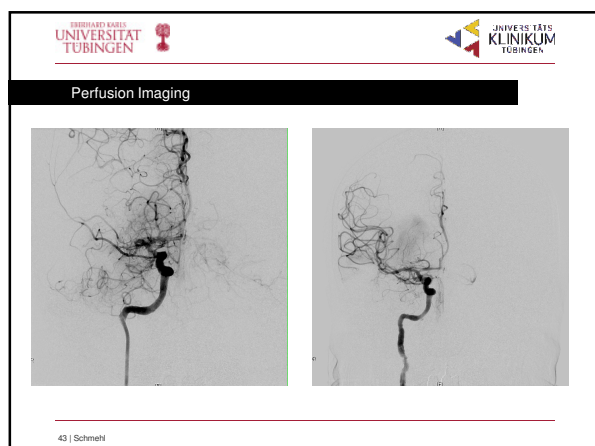


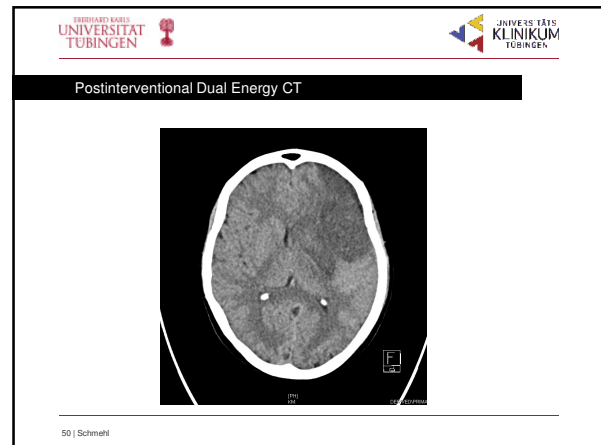
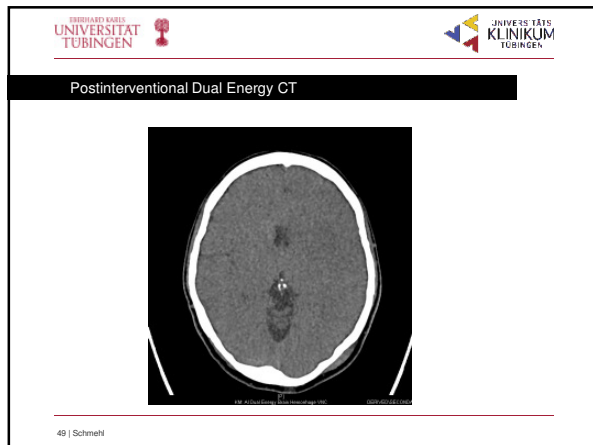
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Case: Right-sided hemiparesis



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Take Home Messages

1. Native CCT: Ischemia, Hemorrhage, CSF circulation
2. CT-Angiography: Embolic occlusion, Aneurysma, Stenosis
3. CT-Perfusion: Extent of Infarct core and Penumbra
4. CT-Venography: cerebral venous sinus thrombosis
5. Contrast enhanced CCT: Tumor, Inflammation

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