

Renaud Jolivet, PhD

Joint Titular Professor in Medical Physics

CERN, EP-DI (50%)

University of Geneva, Dpt. de physique nucléaire et corpusculaire (50%)

Education:	Physics, MSc Neuroscience, PhD	Started in January 2016
Expertise:	Computational biology Experimental neuroscience Medical data	Raised 0.86 MCHF research funds in 2016
Trajectory:	Lausanne, Switzerland Zurich, Switzerland Kyoto, Japan Tokyo, Japan London, UK Geneva, Switzerland	

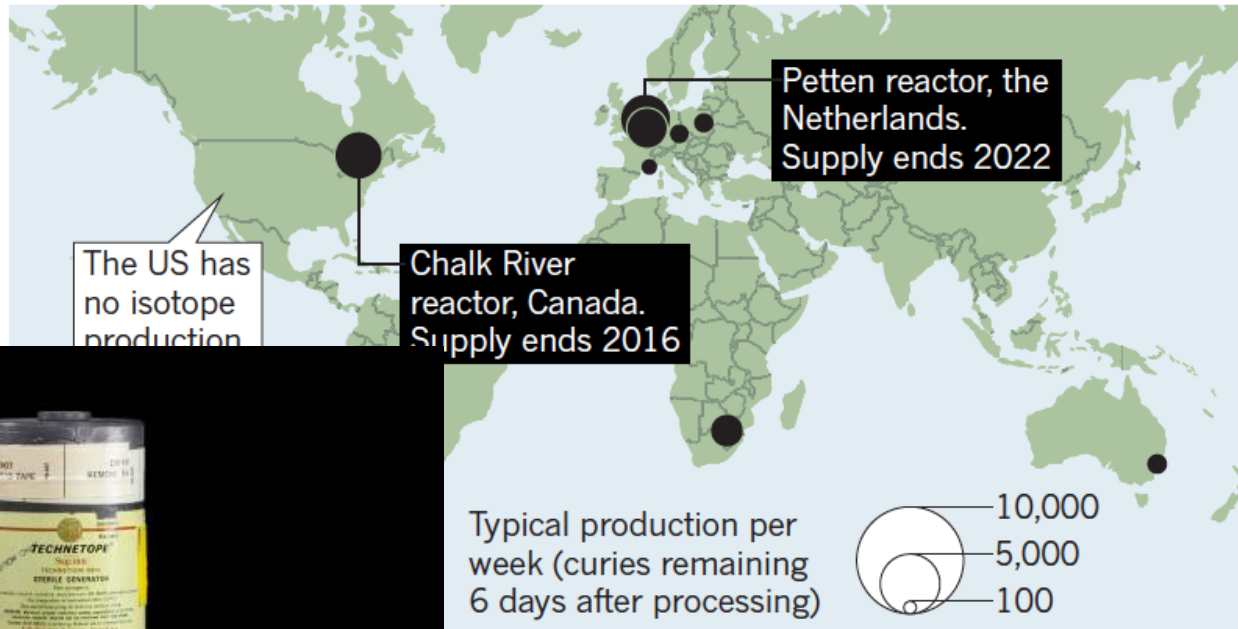
Projects

1. Production of radionuclides (Tc99m)
2. Utilization of radioactive emitters for the treatment of brain cancers
3. Neurophysics
4. International Brain Laboratory

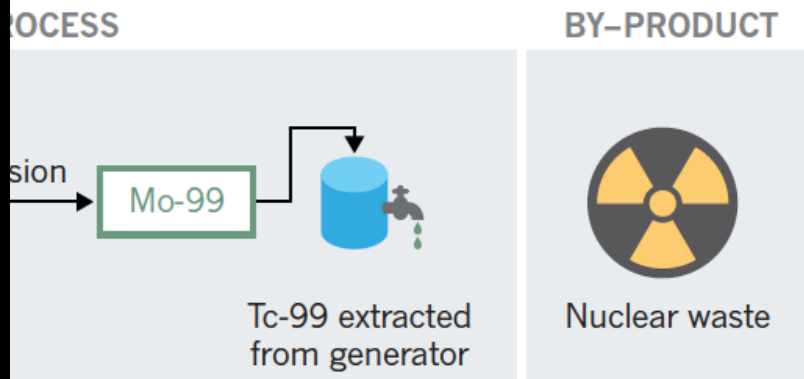
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Tc99m



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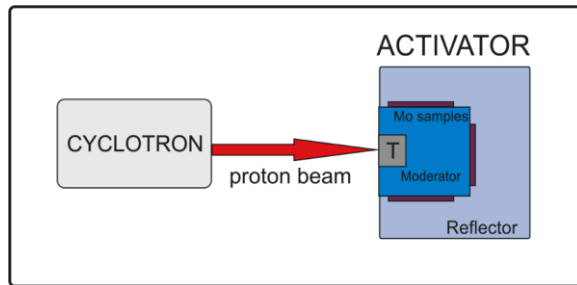


Tc99m

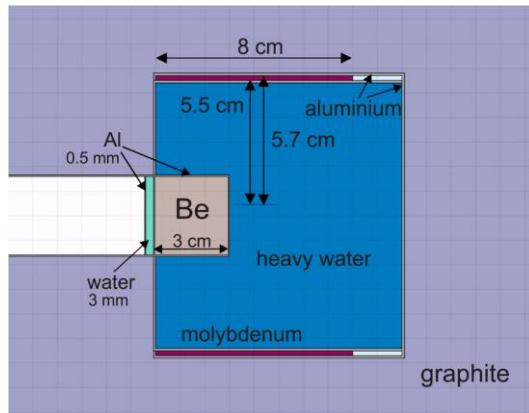
Collaboration:

CERN – University of Geneva – University of Zürich – PSI

a)



b)



Dr Bradley Childs
(Boninchi Foundation)

Projects

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MEDICIS-Promed network

Overall objective: Characterise the efficacy of nuclear medicine isotopes produced at the CERN-MEDICIS facility for the treatment of brain tumours.

Specific objectives: Develop the surgical approach for brachytherapy in small animals.

Investigate the impact of nuclear medicine isotopes on healthy tissue...

Investigate the impact of nuclear medicine isotopes in brain tumour environments...

... In particular on the brain vasculature and on brain immune cells.



Ioanna Prionisti
(MEDICIS-Promed
MSCA ITN)



Projects

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3. **Neurophysics**
4. International Brain Laboratory

Neurophysics

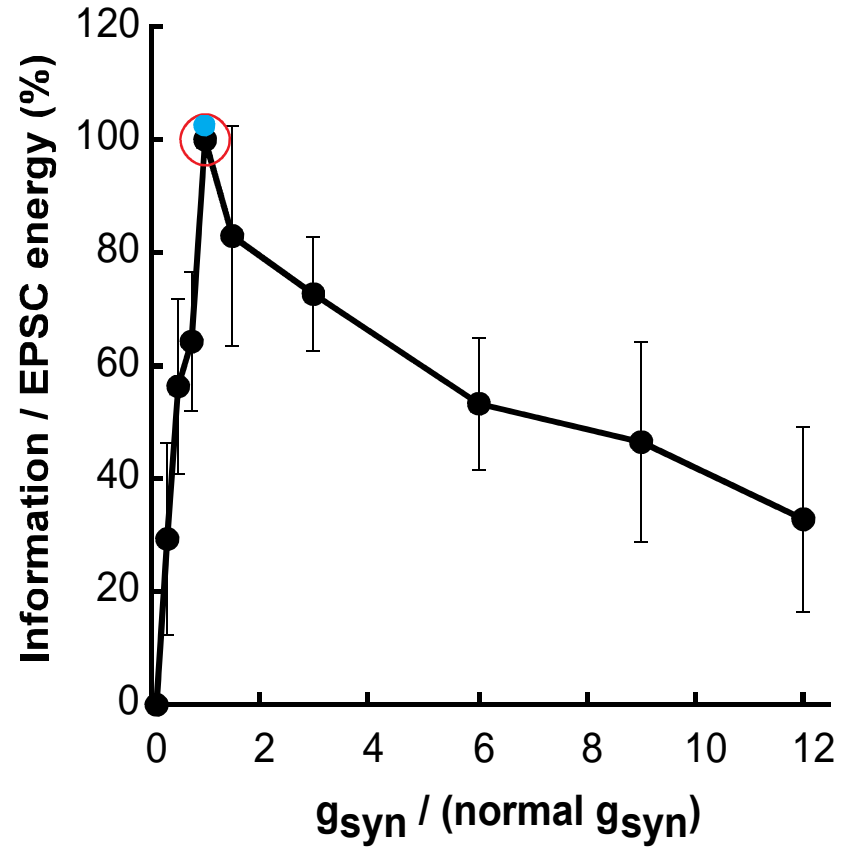
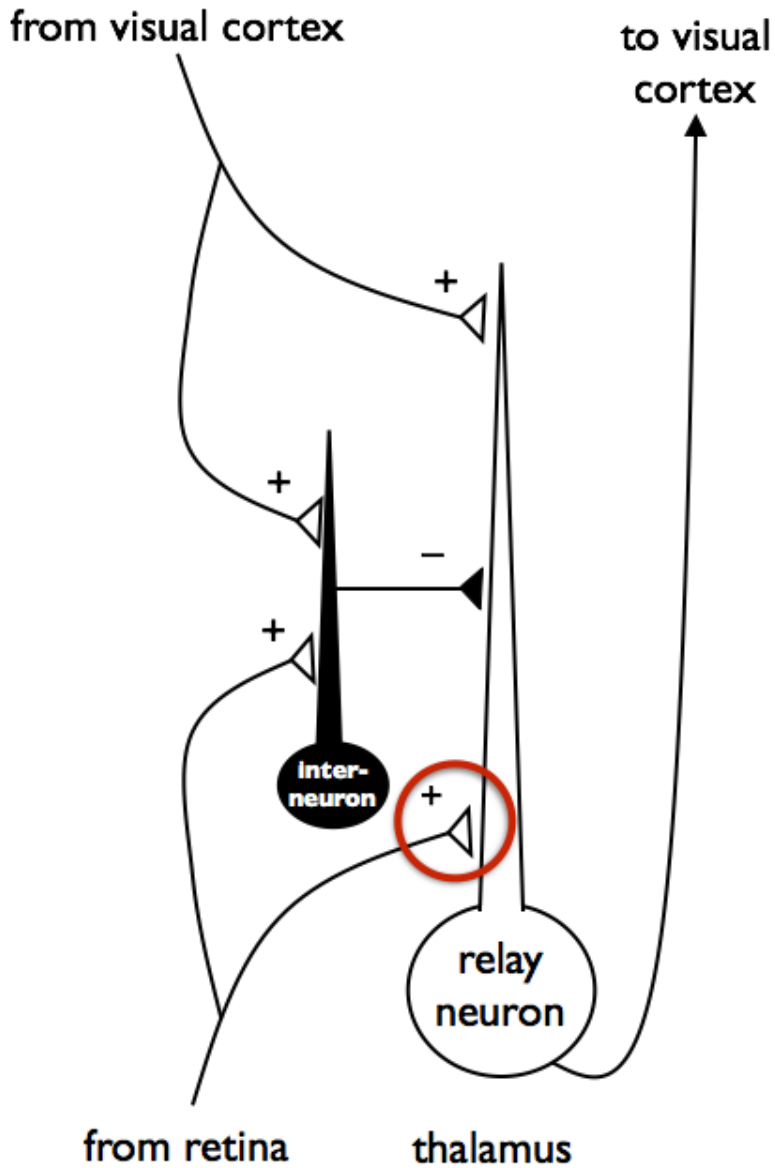


Your brain
~20 W

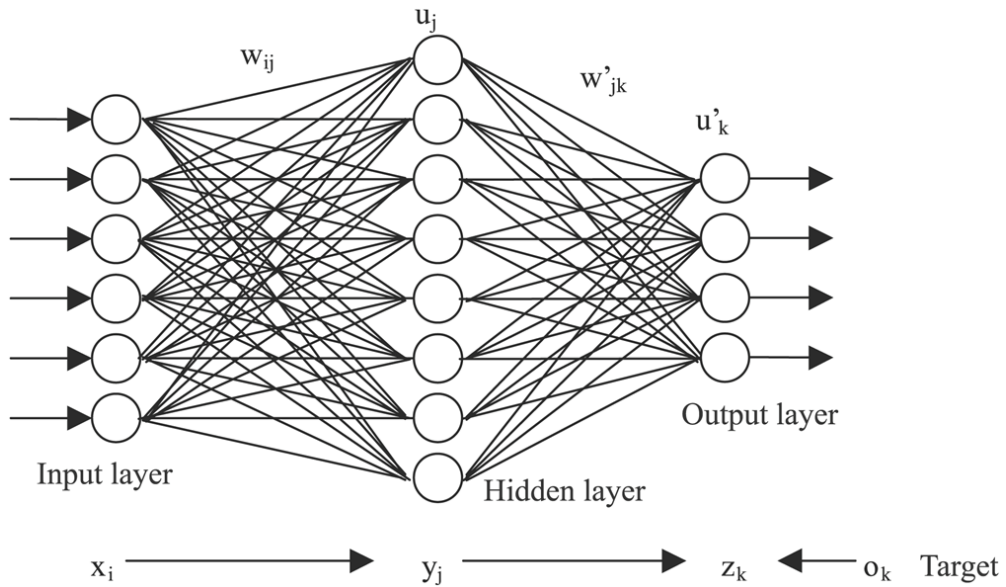


iMac
65 – 240 W

Neurophysics



Neurophysics



Mireille Conrad

+1 postdoc to be recruited

(Swiss National Science Foundation)



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International Brain Laboratory



1. Small-scale fragmented efforts inappropriate to tackle the brain's complexity
2. Integration of theory and experiments

International Brain Laboratory: Vision

Record (& manipulate) every spike in every neuron



Share every spike with every lab



Explain every spike in every neuron (theory)



Standard model of how the brain works



Build better brain-inspired computers

International Brain Laboratory: What role for CERN?

1. Providing expertise in aligning a scientific community behind shared objectives
2. Infrastructure and expertise in data sharing and analysis across multiple international research centres

International Brain Laboratory: Consortium

- 20 top-level theory and experimental labs in Europe and in the US:
 - Baylor College of Medicine, Princeton University, University College London, Cold Spring Harbor Laboratory, Howard Hughes Medical Institute, Columbia University, Stanford University, University of Geneva, Champalimaud Centre for the Unknown
- The Wellcome Trust, the Simons Foundation, the Hertie Foundation and the US Brain Initiative are all currently considering a major investment in the International Brain Laboratory.
- Planned starting date Autumn 2017.

Thank you for your attention!