

Future and Emerging Technologies

Proactive Initiatives in FP7 call 6



European Commission
Information Society and Media



Brain Inspired ICT Origins

- ‘Beyond-the-horizon’
 - Thematic Group 4: ‘Bio-ICT Synergies’, (March 06)
- Topical workshops
 - ‘Neuro-Information Science’, (January 08).
- Public consultation, ISTAG FET group, ...
- related FET proactive initiatives in FP5 and FP6:
 - Bio-inspired Intelligent Information Systems
 - Neuro-IT in FP5 (eg ALG, LPS)



Brain Inspired ICT rationale and objectives

Rationale

The way the brain works present many advantages over current ICT systems:

- Vastly more adaptable
- Much lower power
- Fault tolerant
- ...

General objective

to exploit advances in ICT and neuroscience in order:

- 1. to better understand how the brain processes information and/or how it communicates with the peripheral nervous system (PNS),**
- 2. to pave the way for future information technologies and potential applications including healthcare**



Brain Inspired ICT research topics (1)

1. Development of multi-scale models of information processing and communication in the brain and/or PNS.
 - combining recordings/imaging of brain activity on several spatial and/or temporal scales simultaneously.
 - could address higher level cognitive processes
 - should foster joint progress and synergy in ICT and the bio- and neuro-sciences.



Brain Inspired ICT research topics (2)

2. Hardware Implementations of Neural Circuits that mimic information processing in the brain or PNS.
 - implementations should demonstrate either the emulation of significant functionality of a neural system or the performance of specified processing tasks.

NB. IPs should address both research topics, 1 and 2.
STREPs can address either topic 1 or topic 2.



Brain Inspired ICT **Expected Impact**

The research should lead to:

- Improved design principles for bio-hybrid artefacts involving engineered components that directly communicate with the nervous system.
- Computational systems that emulate human skills or exploit underlying principles for new forms of general purpose computing.
- Contributions towards improved diagnosis/treatment of neurological disorders
- Experimental data archived with sufficient appropriate meta-data to facilitate re-use in another research context.



Brain Inspired ICT **interdisciplinarity and ethics**

- The topics in this objective require close collaboration between researchers in many disciplines from both technological domains and the life-sciences.
- Proposers should carefully read the “FET Proactive Guide for Applicants” before writing a proposal.
- Particular attention should be paid to the sections dealing with ethical issues, eg if the research involves the use of animals then this should be carefully justified



Brain Inspired ICT

ICT-2009.8.8, Call 6

- Budget: 15 M€
- Funding schemes:
STREPs (RT 1. or 2., >30%), IPs (RT 1. and 2., >50%)
- Contact: [pekka.karp \(at\) ec.europa.eu](mailto:pekka.karp@ec.europa.eu)
[julian.ellis \(at\) ec.europa.eu](mailto:julian.ellis@ec.europa.eu)
- Background documents
 - **'Neuro-Information Science' workshop, Jan. 08**
ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/fet-proactive/nis-01_en.pdf
 - **nEUro-IT.net roadmap, 2006**
http://www.neuro-it.net/pdf_dateien/Roadmapv2.0.pdf
- Web page on Cordis:
http://cordis.europa.eu/fp7/ict/fet-proactive/brainict_en.html

