Curriculum

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Ideology

- Technology/method-oriented (problem-oriented ?)
- ‘Open’ model of student participation
- Certificate (50 – 60% of activities at least 10 %(?) outside home university + exam ?)
- Make our activities open for students outside the consortium and attract new consortium members (negotiate with RFBR and RHSF about travel grants)

Educational activities

- Summer/Winter Schools (3)
- On-site training in partner Universities
- Web-seminars
- Practical placements (3 months; should be justified by scientific collaboration?)
- Annual science fairs (students evaluation and feedback)

School structure: Neurobiotechnology 1, 2, 3

- Duration: 7 days

1. Theoretical tutorials
2. Practicum
3. Science fair (student reports)
4. Generic skills

- Career in life sciences
- Grant writing
- Presentation skills
- Paper writing

} Invite people from outside of consortium

School structure: Neurobiotechnology 1, 2, 3

- Cognitive (coordinator ?)
- Cellular (coordinator ?)
- Computational (coordinator ?)

- Topical schools (e.g. learning and memory; disease)

- Decide schools schedule (e.g. NNU – computational)

- Prepare school proposals by June

Continues activities

- Web-seminars Frontiers in Neurosciences (invited talks; rotate host universities; post to iTunes U)
- On-site training in partner Universities (modify existing courses ?; important deliverable)
- Modular intensive courses (credited in review)
  - important for ECTS implementation
  - E.g. 5(?) hot topics
    - New genetic applications for neuroscience
    - Neuroeconomics
    - Deep data processing
    - Computational approaches for disease modeling…

Curriculum

Information needed:

- List of labs and lecturers in RF and EU
- Number of students
- List of labs for student placements (EU and RF)
  - → divide into lecture series and practical courses

→ Create web interface for such information

Curriculum suggested topics for modular courses (cellular)

- Electrophysiological application for *in vivo* and *in vitro* studies
- Imaging brain tissue *in vitro* (ion-selective and voltage-sensitive dyes)
- Model organisms in neuroscience research
- Use of viral transfection techniques
- Optogenetics: new field in biomedical research
- Functional Connectivity: combining immunohystochemistry, electrophysiology and structure reconstruction
- Modeling disease *in vivo* and *in vitro*
- Growing neurons in culture

Curriculum (cognitive)

- Combining genetics and brain imaging
- Machine learning techniques in neuroscience
- Brain Imaging
- Neuroscience of psychiatry disorders
- Applied Neuroscience:
- BCI (brain computer interfaces)
- Neurofeeback – correction of behavior
- Neuromonitoring – monitoring of mental functions: anesthesia, concentration of pilots dispatchers
- Neuroeconomics – interdisciplinary models of decision making an behavior
- Functional Connectivity – structure and dynamics of macro-level neural networks
- Animal behaviour: how to evaluate cognitive processes

Curriculum (computational)

- Making models *in silico*. Available tools and approaches
- *single neuron models;*
- *neuronal population models;*
- *glial cell models;*
- *neural networks*
- Understanding channel behaviour
- Drug design
- Advanced data processing for EEG/MEG
- Oscillations in the brain
- Computational models of cognitive processes