

BioCog is a FP7 project funded by the European Commission with the final aim of establishing valid biomarkers panels for risk analysis and clinical outcome prediction of Postoperative Delirium/Postoperative Cognitive Dysfunction (POD/POCD) in the elderly people.

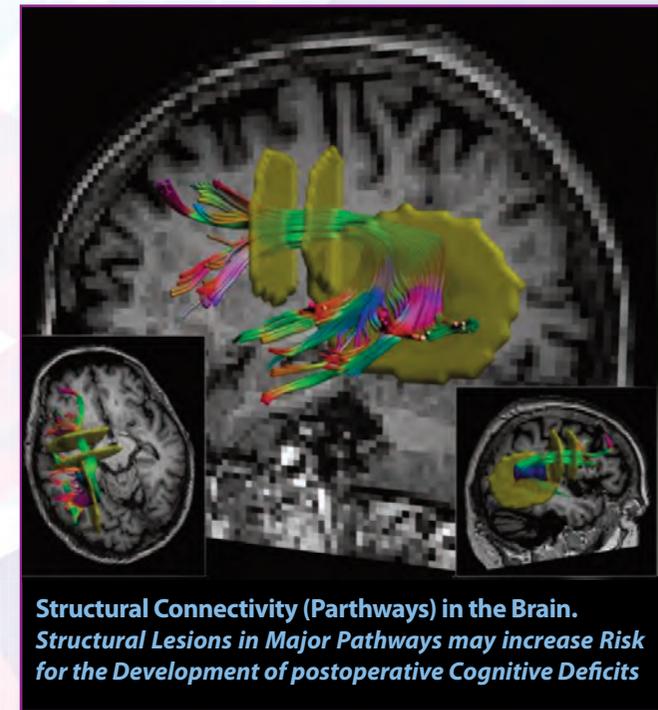
Developing and providing biomarker solutions to clinicians, academia and biopharmaceutical industry is now one of the most rapidly expanding economic sectors in Europe and abroad. The European Medicines Agency (EMA) expects that the use of biomarkers in research will contribute to faster public access to new medicines since it considerably improves clinical disease management and because the process of traditional clinical outcome-based drug development (with comparatively little use of biomarkers) can be long, expensive and uncertain.

Overall cognitive impairments are increasingly prevalent in our aging society. In particular, Postoperative Cognitive Impairment (PCI) has an incidence of 20-80%, with elderly patients at highest risk, and is characterized by progressive deterioration of sensory and cognitive function following surgery. Within PCI, **Postoperative Delirium (POD)** is frequently followed by a more chronic phase, i.e., **Postoperative Cognitive Dysfunction (POCD)** which tends to persist over time. Recently the association of postoperative delirium - subsequent dementia, and a relationship between delirium – mortality have been reported. The burden of POD/POCD are associated with longer and more costly hospital treatments,

increased mortality, and dependency on social transfer payments.

POD/POCD is a multicausal condition and any research aimed at identifying clinically valid biomarkers, which are not available at present, require a multidisciplinary approach with a well-coordinated joint efforts. Within BioCog an outstanding consortium of scientists from 5 different EU countries, clinicians and bioinformatics is working together to establish valid biomarkers panels for risk evaluation and clinical outcome prediction of POD/POCD in a cohort of 1200 patients, aged 65 to 80 undergoing major elective surgery. A **“multivariate expert system”** will be generated to predict POC/POCD and to allow accurate patient stratification (subtyping), integrating neuroimaging and molecular data, with high potential interest for **commercialization**. **The expert system will be the result of** Integration of neuroimaging biomarkers, which directly provide information on brain structure/function with high **sensitivity**, combined with complementary knowledge on **specific** pathomechanisms from **molecular biomarkers** (cholinergic, inflammatory, metabolic) as obtained from body fluids (plasma, cerebrospinal fluid (CSF)).

Possible final stakeholders could be: 1) the patients that will benefit by new and personalised clinical management tool; 2) physicians and hospital departments involved in pre-surgical decision making; 3) pharmaceutical industry intending to conduct biomarker-based drug trials in POD/POCD. Furthermore, the first state-of-the art, worldwide, clinical database and biobank will be created. Both the expert system and the reference database/biobank will expand the



Structural Connectivity (Parthways) in the Brain.
Structural Lesions in Major Pathways may increase Risk for the Development of postoperative Cognitive Deficits

leadership of the contributing academic institutions in this particular research area. In addition, the newly created biobank will become an integral part of the **European Biobanking and Biomolecular Resources Research Infrastructure (BBMRI)**.

The BioCog consortium will also analyse the **health-economic impact** of biomarker-guided strategy. At the same time, European-wide cooperation between academia and SMEs in this project will facilitate the dissemination of our expert system, i.e., when approaching potential customers like university hospitals and industry R&D departments.

For more details on our project and on the workplan, please visit our website at www.biocog.eu

Academic and Research Institutes



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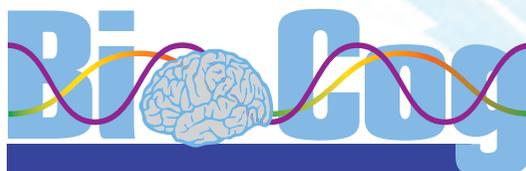
Cellogic

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Management



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BIOmarker
Development
for Postoperative
COGnitive
Impairment
in the Elderly

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EC Contribution
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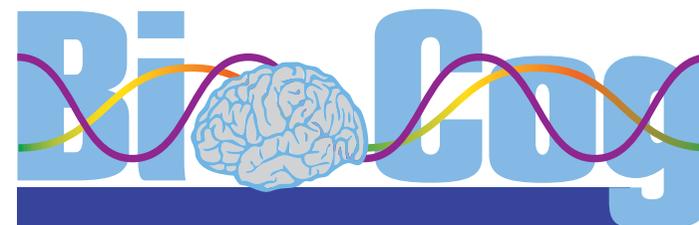
Duration
60 months



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