



6th Framework Programme
Anticipating scientific and technological needs

NEST

New and Emerging Science and Technology

REFERENCE DOCUMENT ON

“What it means to be human”

2005/2006-NEST-PATHFINDER INITIATIVES

24 October 2005

This document complements the NEST 2005/2006 work programme, by providing more detailed guidance to proposers on the above PATHFINDER initiative.

This is a version of the reference document referring to the call FP6-NEST-2005-Path-HUM topic ref. “What it means to be human”, with the call deadline on 15 February 2006.

This call is only open for CAs and SSAs.

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Please note that there is a National Contact Point (NCP) for NEST in your country who can offer personalized services. The mission of NEST NCPs is to inform, advise and support potential applicants in the preparation, submission and follow-up of NEST proposals.

For contact details: <http://www.cordis.lu/nest/ncp.htm>

1. RATIONALE AND OBJECTIVES

The response to the first and second Calls on “*What it means to be human*” has successfully laid the basis for the initiative. **To complete the research agenda, the initiative is continued under this work programme in the form of Coordination and Support Actions.** A particular concern is to further expand the inter-disciplinary aspects and broaden the scope of disciplines brought together.

It is a European initiative, which aims to build cross-national as well as cross-disciplinary links, in order to support the development of European competence which will have payoffs for science, for society and for the economy in the longer term.

New developments in genomics, neurobiology, etc., are making it possible to examine cognitive phenomena at different levels of analysis, linking genetic and biological dimensions to the behavioural and ultimately social and cultural. This suggests the prospect of a more integrated understanding of the human mind/brain, in the sense of an organ which has been shaped by human evolution, and which encompasses (amongst others) the following ideas:

- that “individual intelligence” is multidimensional, encompassing cognitive, emotional, communicational, perceptual, and other faculties that are highly inter-linked, and functionally integrated;
- that the characteristics of the mind are intimately connected to the structural features of the brain, and human biology in a more general sense;
- that the human brain and mental faculties have been influenced by multiple selection pressures, operating at different levels, with significant interactions between physiological, mental, cultural and environmental factors;
- that the mature mind is created through a process of individual development, linking genetic, environmental and socio-cultural factors, which is itself the outcome of evolutionary processes.

This global understanding of the mind is clearly a very long way off. But in order to make progress towards it, there is crucial need for interdisciplinary work, to generate concepts that make sense not only at a particular level of analysis, but also within a broader “system of understanding” that encompasses these different levels. For example, if the links between genetics and mental faculties are to be understood, there will be a need to find categories for defining behavioural phenomena which allow them to be linked to genetic factors, and vice versa. This need for interdisciplinary work is all the more pressing because of the very rapid pace of developments in the various relevant fields, in particular in biology and genomics.

The combination of different levels of analysis and a wide range of scientific fields, would seem to open up an infinite variety of research directions. On the other hand, a more integrated, inter-disciplinary philosophy should also help to define more clearly the *constraints* on plausible explanation of mental phenomena, by “triangulating” between different perspectives. It will surely serve the cognitive sciences and the other disciplines involved by generating concepts, insights and explanations that are scientifically rigorous, and thus help to make real progress *within* any of these disciplines.

The question “*what features make human cognitive abilities unique, and what are the origins of these features?*” is scientifically precise and limited, but can be addressed from a

number of disciplinary angles – from genetics through brain sciences through to cultural analysis and the humanities. For this reason it offers a productive arena for real interdisciplinary work.

2. ORGANISATION OF THE INITIATIVE

Research projects funded under the previous two calls of the WIMTBH initiative involved the different combinations of disciplines, and focused on the questions: “*what features make human cognitive abilities unique, and what are the origins of these features?*” These projects embraced the following ideas:

- Understanding human cognitive faculties from a ***comparative and evolutionary*** perspective: how we have become what we are. The basic point of interest is the apparent paradox between, on one hand small genetic differences between human and other species and, on the other apparently vastly different higher cognitive capabilities. It is hoped that by forging an understanding of how large qualitative changes emerge from small quantitative changes, it may be possible to arrive at answers (or at least constrain the possible answers) to important open questions about how the mind and brain work.
- The focus on ***higher cognitive faculties***, such as thinking, reasoning and decision making, including co-operative behaviour– the faculties that appear to be unique to humans.
- It is important, however, that higher cognitive faculties are understood, both functionally and in an evolutionary sense, in the context of other mental capabilities, as well as from the perspective of individual human development (from embryo to adult) as regards higher cognitive functions, considering the fact that the mature mind is created by processes involving socio-cultural and genetic components and indeed the evolutionary development of the physiological traits of the human being.
- The unit of analysis is considered to be the individual, while acknowledging that individual intelligence, and in particular higher cognitive processes cannot be fully addressed without reference to ***social and cultural factors***, and that genetic and biological research depends on understanding of individuals within ***populations***.

3. WHAT KIND OF PROJECTS WILL BE PURSUED IN THIS CALL?

The work programme specifies that only CAs and SSAs will be funded under this PATHFINDER initiative.

This call aims to deepen cross-national and cross-disciplinary links through CAs that will help build a broad European strategic agenda, exploiting the synergies between investigations in different fields. Proposals should reflect the objective of bringing together research from different disciplines and levels of analysis in novel combinations, to address specific questions which have high scientific interest in the context of the quest for an *integrated* understanding of human cognition.

It will involve:

- Networking Actions (using the CA instrument - co-ordination action), the function of which will be to provide a mechanism for the research projects funded under the

WIMTBH initiative to cooperate and interact with each other (see below), to develop a wider “community of knowledge” in the field across Europe, to promote a wider understanding of the implications of research across the various relevant disciplines, as regards “what it means to be human”.

- Support Actions (using the SSA instrument – specific support action), focusing on the conceptual and practical questions associated specifically with the PATHFINDER topic “what it means to be human”.
- STREPS (specific targeted research projects) will not be funded in this call.

In its management role, the Commission, for its part, will work to build links between this initiative and other research programmes and associated activities, at national, European and international levels.

The selection criteria (see below) are intended to ensure that proposals selected will be those considered to have the highest overall “value-added” in terms of advancing science and long term impact.

International co-operation (partners outside the EU and Associated states) are welcomed. However, it should be noted that partners from countries with highly developed Science/Technology capabilities (US, Japan, Canada, Australia...) will normally not be able to receive funds from NEST.

4. WHAT IS THE FUNCTION OF THE INSTRUMENTS?

CO-ORDINATION ACTION (S)

Proposals for the **Co-ordination Action(s) (CA)**¹ supporting this PATHFINDER initiative should *help to co-ordinate existing and future (STREP) research projects funded under the initiative*. They should aim to network European activities in relevant fields around the theme of “What it means to be human”.

Creating a European forum for the development and exchange of ideas, on a cross-disciplinary basis, is core to the networking approach. Proposals for the Co-ordination Action(s) associated with this PATHFINDER initiative should involve the extended EU “What it means to be human” science community and could, for example, stimulate the collaboration between cognitive scientists, sociologists, neuroscientists, anthropologists, biologists, etc.

For the purposes described above the CA instrument may involve various different types of activity, e.g. exchanges of personnel, promoting short stays of senior scientists, supporting advanced training activities such as Summer Schools, feasibility studies, interdisciplinary dialogue and interchange, seminar series on key topics, etc. Thus, the strategy adopted and the specific work carried out could be configured in a number of different ways. The CA should therefore consider innovative ways of building interaction and communication across diverse fields. The project could consider how the broader interdisciplinary research agenda might develop in the future, and also address the question of how outcomes from this initiative might lead to practical applications of the knowledge generated. Without such a

¹ The possibility of more than one Co-ordination Action might be considered if there are compelling reasons for this.

stimulus, progress will be slow and centred on specific sectors, and opportunities for sharing of expertise and the development of more generic approaches will be lost.

The CA also provides the research community with a means to generate ideas for further development of "*what it means to be human*" within the institutional environment of the European Research Area, including European and other programmes for training, mobility, infrastructure development, etc.

When preparing and submitting a CA proposal, the proposers should include the possibility that current and future research projects funded under this initiative may participate in the activities of the CA, if appropriate.

SPECIFIC SUPPORT ACTIONS (S)

Proposals for **Specific Support Actions (SSAs)**, which are linked to the development and implementation of existing PATHFINDER initiatives, are also encouraged. These may include for example, activities to assist in the mapping and developing more detailed definition of the fields in question, assessing future development prospects and trends in the fields.

A high level of public interest might be expected in this field of research, and this suggests that it will be important to involve a wider range of actors than those involved in the research projects, or indeed the research community more broadly.

Specific Support Actions do *not support research and technological development per se*. They differ from Co-ordination actions in that they may involve a single participant and tend to be '*one shot*' actions of relatively limited duration.

Activities that do not serve the NEST objectives and the "*What it means to be human*" topic in particular, or that would take place anyway without Commission support will not be supported.

5. LINKS WITH OTHER ACTIVITIES AND EXPLANATION OF THE RESULTS

Proposers should be aware of other activities in the 6th Framework programme that bear on cognitive sciences, including research on neurosciences under Thematic Priority 1 (Genomics) and on neuro-informatics under the Thematic Priority 2 (Information Society Technologies, under the heading "Future and Emerging Technologies").

It should, however be understood that the objectives of this NEST PATHFINDER initiative are distinct and clearly differentiated in their form and content from these other FP6 activities.

6. PRESENTATION OF PROPOSALS

Proposals will be presented as individual FULL PROPOSALS for Co-ordination actions (CAs) or Specific Support Actions (SSAs) to meet the deadline 15 February 2006. They will be evaluated individually, according to the standard FP6 evaluation criteria for these instruments. A guide for proposers, and guidance notes for proposal evaluation will be published on the NEST web-site.

A pre-proposal check service will be provided up to three weeks before the deadline. This will enable brief feedback to be given to proposers, in order to help them assure the

eligibility and judge the relevance of their proposals. This service is to assist proposers; it does not contribute to the official independent evaluation (peer review) of proposals, once they are submitted.

Proposers are encouraged to be concise and address the specific evaluation criteria in their proposals:

- **Relevance:** the specific objectives of the proposal and the cross-disciplinary dimension should be clearly set out. It should be shown how the proposal meets the requirements set out above, including ambitious goals and the broader spirit of the PATHFINDER initiative on “what it means to be human.”
- **Excellence:** The research should be presented in the context of an assessment of the current state of the art in the relevant fields, demonstrating the specific advances that are to be sought and how these derive from advances in the various disciplines and from the cross-disciplinary work involved. The feasibility of the methodology should be clearly demonstrated.
- **Impact:** the specific impact of the work in terms of scientific advance (empirical and theoretical) should be stated and justified, broader potential impacts and applicability in the short or long term should be set out.
- **Consortium:** The required full range of competences necessary to perform and integrate the proposed research should be demonstrated. For CAs the consortium has to consist of at least three independent participants from three different Member States or associated States with at least two Member States or Associated Candidate Countries.
- **Financial aspects:** the requirements for, and the use of, funds should be sufficiently detailed for the independent evaluators to assess the feasibility and cost-effectiveness of the use of resources (personnel and equipment). Project lifespan should not exceed 3 years for CAs. The indicative Community contribution for CAs is normally up to a maximum of 2M€. Project lifespan for SSAs is normally 2 years with a maximum EC contribution of 250.000 M€.
- **Management:** The organisation of the work, including the ways in which cross-disciplinary effort will be achieved, should be set out. Any relevant ethical considerations should be stated, as well as the ways these will be addressed in the course of the project.

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Projects funded (or under negotiation) as a result of the first and second Call on “*What it means to be human*” in alphabetical order:

ABSTRACT- Explaining the formation and use of abstract concepts by human beings.

ANALOGY- Cognitive and evolutionary perspectives of analogical thinking.

APES- Comparative study of “human specific” genes.

CALACEI- Humans spend much of their time talking and listening: acquisition of these linguistic abilities.

ChlaSc- What makes us smart?- structural complexity in language and other cognitive systems.

EDICI- Learning by imitation.

EDCBNL- Co-evolution of neural and morphological lateralization with social behaviours.

FAR- Origin and mechanism of rules based systems: use of logic and mathematics for reasoning.

GEBACO- The genetic basis for cooperation.

HANDTOMOUTH- Speech and tool use co-evolution.

NEUROCOM- Language and communication: behavioural testing with cutting edge neuro-imaging.

Paul Broca II- Human brain asymmetry: the link to language and genes.

PKB- Exploring the origins of the human mind.

REFCOM- Human capacity to communicate verbally and non-verbally.

SEDSU- How sign use changes with the evolutionary development of species and within individual development.

Wayfinding- The evolutionary history of spatial orientation and memory as cognitive skills.

A list of proposal abstracts of these PATHFINDER projects, is published on the NEST website to allow potential proposers, (especially for CAs and SSAs), to have an idea of all projects selected for funding.