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**Call Title: Theme 4 – NMP - Nanosciences, Nanotechnologies, Materials and new Production Technologies – SMALL 2011**

- Call identifier: **FP7-NMP-2011-SMALL-5**
- Date of publication: 20 July 2010
- **Deadline: 4 November 2010** at 17.00.00 (Brussels local time); first stage proposal
- Indicative budget: EUR 99.5 million
- Funding Scheme: Small or medium scale focused research projects

**SELECTED PRIORITY TOPICS:**

**Activity/area: Ensuring the safety of Nanotechnology**

**Topic: NMP.2011.1.3-2 Worker protection and exposure risk management strategies for nanomaterial production, use and disposal**

*Technical content/scope*

The number of products involving nanotechnology is steadily increasing in the market place. Consequently, the number of workers dealing with the production or handling of nanomaterials is also on the rise. As is the case with any kind of industrial activity, nanotechnology workers must be guaranteed a safe working environment. Thus, proposals under this topic should be focussed on consistent and integrated strategies for mitigation of the risk of workers dealing with nanomaterials as additives or part of processing steps in manufacturing, and should include all relevant worker exposure scenarios related to nanomaterial production, use and disposal.

Proposals should be focussed on integration of:

1. Nanomaterial design options to reduce hazard and/or (accidental) exposure emission potential by e.g.:

- development of novel methods for reducing worker exposure through deepening the knowledge of the principles which drive the formation of stable aggregates of larger, less risk-posing dimensions;
- development of appropriate methods aiming at risk remediation e.g. by imparting or increasing the tunable (e.g. via physico-chemical switches) aggregation of nanomaterials, thereby leading to the formation of less risk-posing species, also through the use of intervening molecules or treatments;
- development of innovative methods for removing nanoparticles from the environment/workplace through exploiting specific nanomaterial (magnetic, optical, electrical, electrochemical, physical) properties should be addressed.

2. Assessment of the effectiveness of existing technical and management exposure reduction protocols and –strategies, e.g.:

- control banding/ filtration / personnel protective equipment etc. by determination the levels of exposure for workers who are currently exposed when handling nanomaterials across the various industry sectors and different scales of industry.

3. Evaluating of current (occasional and accidental) exposure risk management strategies, e.g. confinement of processes:

- on the level of exposure by exposure analysis by evaluating the effect of ‘Good Practices’ on exposure levels;
- on the level of health impact by future evaluation e.g. health impact assessment by exploring possibilities to establish exposed worker cohorts and epidemiological studies related to well identified exposure scenarios

An important aspect of the work will be the consideration of nanoparticles in real conditions, e.g. as components of complex mixtures – and the interaction of nanoparticles with surrounding chemicals and other processing chemicals at all stages of nanomaterials production, use and disposal. This is an area where the involvement of industry partners with specific processing challenges is encouraged.

In order to avoid duplication of activities, proposals should consider the activities of the OECD Working Party on Manufactured Nanomaterials, ISO-TC229, and those of other relevant initiatives.

The active participation of relevant partners from outside the EU should add to the scientific and/or technological excellence of the project and/or lead to an increased impact of the research to be undertaken; this will be considered by the evaluators.

### *Expected impact*

The research should result in practical and cost effective strategies for reduction of worker exposure to nanomaterials during all stages of nanomaterials production, use and disposal that have been tested in an industrial setting, and represent a significant advance beyond the current state-of-the-art. These strategies should be especially applicable to SMEs who do not have the resources for complete divisions dedicated to occupational exposure. For maximising their impact, funded projects will be expected to establish synergy with the EU nano-safety Infrastructure<sup>7</sup>, to contribute to the advancement of the EU nano-safety cluster<sup>8</sup> goals and agenda, to facilitate research cohesion and integration in this area. This will be reflected in the evaluation of the proposal potential impact. The necessary resources and tasks are also expected to be foreseen in the proposals.

### **Activity/area: Innovative materials for advanced applications**

#### **Topic: NMP.2011.2.2-2 Biomaterials for tissue engineering for age-related cancer and sensory organ diseases**

##### *Technical content/scope*

Cancer and sensory diseases disproportionately affect the ageing population and are associated with disability, diminished quality of life, and increased costs for health care and long-term care.

Maintaining quality of life in a population affected by these diseases is therefore one of the great challenges of the 21st Century (see also COM(2009) 180). Biomaterials represent a promising avenue to improve the quality of life of people disabled by these diseases. Age-related cancer diseases (such as colon-rectal, urogenital, tracheal cancers) and age-related sensory organ diseases (such as cataract, macular degeneration and hearing loss) are targeted within this call.

Research proposals are expected to be highly focused on clearly identified clinical needs, not being limited to basic research. The proposed biomaterials are expected to be tailored to the patients and to the degenerative diseases representing a step change beyond the state of the art. A proof of concept for the described application is expected.

Osteoarticular diseases foreseeing bone and cartilage regeneration or knee/hip implants are not addressed by this topic as already covered by previous calls. Neurodegenerative diseases (such as Alzheimer, Parkinson etc) and development of (nano)materials for the targeted delivery of pharmaceutical or bioactive agents have already been covered by other actions and are not addressed here.

Dedicated modelling, standardisation and/or the production of (certified) reference materials may also be addressed as an integrated part of the research proposal. To exploit the potential of multiple use that materials often offer, one research work package may investigate possible use in a substantially different field of industrial application; such a work package should not account for more than 10% of the total resources. Gender differences in regard to the targeted clinical application should be considered, where appropriate.

In order to ensure the industrial relevance and impact of the research effort, the active participation of industrial partners and clinicians represents an added value to the activities and this will be reflected in the evaluation, under the criteria Implementation and Impact.

##### *Expected impact*

- (i) Innovative biomaterials especially for the therapy of diseases whose treatment currently relies (mainly) on pharmaceuticals, and/or
- (ii) Improved performance of prostheses and devices, and/or
- (iii) Improved quality of life thanks to increased biocompatibility and longer duration of implants, and/or
- (iv) Success of European biomaterials industries, and/or
- (v) Contribution to achieving EU policies, such as those mentioned in COM(2009) 180 final.