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C-Tech Innovation



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...advantage through technology

NANOBADGE Concept



“Personal Easy-to-Use Device for Nanoparticle Measurements and Analysis of Nanotoxicity”

- NMP-2007-4.1.3-1 Specific, Easy-to-use Portable Devices for Measurement and Analysis
- 4-year *Large Scale Integrating Project* involves
- 18 organisations from 6 countries in a multidisciplinary partnership
 - SMEs (5), large industrials, researchers and public bodies
- Includes an exploitation route of research providers, technology transfer, equipment manufacturers and end-users.



Aims



- *NanoBadge* and its exploitation will provide:
- a safe, cost-effective means to measure and then minimise any exposure to nanoparticles;
- assurance that nanoparticle-based products are manufactured, handled and used in a responsible manner;
- information to the research and regulatory knowledge bases;
- a significant enabling contribution to the European Commission's Action Plan for Nanotechnology.



Innovation



- Self-contained personal monitoring system in a wearable badge to track individual workers' exposures to nanoparticles.
- Early solution for provision of personal monitoring of exposure to engineered nanoparticles - this does not currently exist.
- Further enhancement through application of different analytical techniques such as LIBS to provide specifically engineered nanoparticle concentrations as seen by workers
- Additional direct measurement of toxicity resulting from nanoparticle exposure, using specially developed human lung cell cultures on a badge insert that can be routinely analysed in a simple readout station.
- Combination of physico-chemical and toxicity measurements will facilitate previously unobtainable toxicological correlation.



Detailed Aims and Objectives



- Provide full personal monitoring of:
 - the individual workers' exposure to nanoparticles, AND
 - the toxicity of that exposure
- Suitable for wearing without interfering with the normal work activities
- Compact (approximately 50x100x10mm), lightweight and sterilisable
- Early indication (quick measurement shortly after end of work period)
- Low-cost device that is widely applicable
- Able to ensure compliance with Health & Safety guidelines (i.e. safe in use and disposal)
- Engineered to contain no materials that would pose ethical barriers



Summary



- Early solution to pressing need for personal monitoring of nanoparticle exposure via wearable badges.
- Advance beyond that technology to provide comprehensive information on the nanoparticles collected by the badges.
- Additional information on the toxic effects relevant to the individual to be provided by additional badge insert.
- All information to be readily available on a routine basis via on-site badge readers that require no special skills.
- Correlation between nanoparticle exposure and toxic effect as a major bonus.

