



TITOLO PROGETTO

MATCHIT - MATrix for CHEMical IT
Linea finanziamento: VII FP - Cooperation
Area Scientifico Disciplinare: 15e Scienze e tecnologie per lo sviluppo e la governance sostenibili: aspetti economici, sociali ed ambientali

STRUTTURA (Dipartimento/Centro) :European Center for Living Technology

DOCENTE RESPONSABILE SCIENTIFICO :POLI Irene

DATI FINANZIARI

Costo Complessivo del Progetto	Finanziamento Complessivo Assegnato	Costo totale delle attività a Ca' Foscari	Assegnazione Complessiva a Ca' Foscari
3.946.431	2.999.999	180.954	138.516

**INIZIO ATTIVITA' (previsione)
2009**

**FINE ATTIVITA' (previsione)
2012**

ABSTRACT PROGETTO

MATCHIT (MATrix for CHEMical IT) will develop programmable information chemistry by introducing an addressable chemical container (chemtainer) production system and interfacing it with electronic computers via MEMS technology with regulatory feedback loops. As in the biological subcellular matrix, the chemical containers at the micro- and nanoscales will be self-assembling, replicable and self-repairing. At the nanoscale, DNA containers will provide a programmable and replicable chemistry in which positional information can be harnessed for a range of nanoscale utilities. At the microscale, containers based on DNA-labeled heterophase droplets and vesicles, will form microscopic labeled reaction vessels that can themselves determine their next processing steps. Their DNA-based addresses will be computable, enabling parallel chemical programming in a new multilevel architecture through autonomous address modification and resolution at the container-container, container-surface, and container-molecule levels, providing a concrete embedded application for DNA computing. This generic programmable information chemistry will not only be an enabling technology for "immersed systems" IT applications in the life sciences, chemistry, and nanotechnology, but also promote a deeper understanding of the computational power of coupled production and information processes, as in biology, and provide a platform for building the more organic computers of the future.

MATCHIT will investigate the general use of self-assembling chemtainers for information-intensive Chem-IT. The project will develop and apply multiscale physical simulation tools and novel embedded IT architectures to process and integrate modular chemical and digital information. It will integrate and disseminate multidisciplinary European activities in Chem-IT, supported by the European Center for Living Technology and provide an assessment of the likely long-term socio-technical impact of this powerful technology.