

# BIOINFOGRID



**Summary:** The project aims to promote the Bioinformatics Grid application for life science, in order to carry out Bioinformatics research based on the Grid networking technology. More specifically the BioinfoGRID project will evaluate applications in the fields of Genomics, Proteomics, Transcriptomics and Molecular Dynamics, reducing data processing time by distributing the calculation on thousands of computers using the European Grid infrastructure network.

**Objectives:** The BioinfoGRID Specific Support Action (SSA) will combine Bioinformatics services and applications for molecular biology users with the Grid Infrastructure created by the EGEE Project (6th Framework Program). BioinfoGRID also aims:

- to expand the Grid awareness inside the bioinformatics community and in conjunction with the European Grid Infrastructure Projects, to promote dissemination and tutoring events where Grid experts can discuss the available Grid services and the user requirements with real life examples.
- to evaluate and adopt high-level user interfaces, common to all the different BIOINFOGRID applications, to exploit, in a more user-friendly approach, the Grid services provided by European Grid Infrastructures.
- to organize Bioinformatics Portals, to simplify the services invocation or the jobs submission to the Grid, and Workflows, to dynamically establish complex biologic analysis chains.
- to organize an international conference for GRID Bioinformatics applications, with the participation of a large Bioinformatics user community, as main dissemination activity of the project.

**Technical approach:** Grid technology is a very important step forward from the web, which simply allows the sharing of information over the internet. The massive potential of Grid technology will be indispensable when dealing with both the complexity of models and the enormous quantity of data, for example, in searching the human genome or when carrying out simulations of molecular dynamics for the study of new drugs. The BioinfoGRID Virtual Organisation of users will be authorized to run the Bioinformatics challenges on the European Grid Infrastructure.

**Service activities:** BioinfoGRID project will contribute to:

- identify and promote common components and solutions for the feasibility studies of the applications included in the project.
- evaluate the services provided by the European Grid Infrastructures.
- establish relations with Grid infrastructure projects, in particular with EGEE, to provide feedback in order to improve the European Grid Infrastructure.
- provide the technical support required by the user and for resource integration.

**Project name:** BioinfoGRID  
**Contract no.:** 026808  
**Project type:** SSA

**Start date:** 1.1.2006  
**Duration:** 24 months

**Total budget:** EUR 1 054 208  
**Funding from the EC:**  
EUR 1 050 000

**Web site:**  
[www.itb.cnr.it/bioinfoGRID](http://www.itb.cnr.it/bioinfoGRID)

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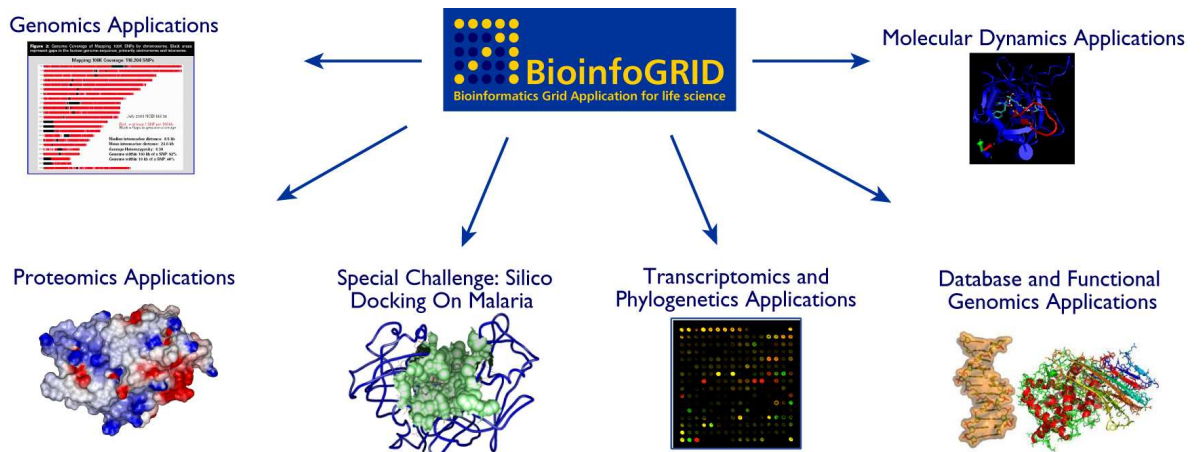
**Project participants:**

CNR-ITB	IT
INFN	IT
DKFZ	DE
CNRS	FR
UCAM	UK
CILEA	IT
STC	DE

**Key words:**  
Grid technology  
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**Collaboration with other EC funded projects:**  
EGEEII  
SHARE  
EELA  
DILIGENT  
BELIEF  
EMBRACE  
SYMBIOMATICS

**BioinfoGRID:** Bioinformatics Grid Application for life science



**Research activity areas:** Data challenges will be organized to perform:

*Genomics Applications in GRID*

- Analysis of cDNA data based on GRID.
- Analysis of rule-based multiple alignments in GRID.

*Proteomics Applications in GRID*

- Analysis for domain search for protein functional domain analysis in GRID.

*Transcriptomics Applications in GRID*

- Microarray data analysis based on the GRID platform.

*Database and Functional Genomics Applications*

- Clustering of Gene Ontology gene products by their functionality.

*Molecular Dynamics and Docking Applications*

- Participation to a large scale deployment of In Silico Docking On Malaria
- Participation to a large scale deployment of In Silico Docking On Avian Flu.

**User communities:** The BioinfoGRID SSA will establish a common ground for collaboration between the European Grid Infrastructure providers and the Bioinformatics research user community in various fields of Bioinformatics applications. This will be achieved through specific studies for each reference application in the Bioinformatics domain in which experts of various disciplines can collaborate on the solution of highly complex problems.

**International dimension:** BioinfoGRID project will contribute to use the Grid technology and Bioinformatics applications as a global network of several research laboratory using thousands of interconnected computers, allowing the shared use of computing power, data storage and complex data analysis. A new challenge of the World wide In Silico Docking on Malaria and Avian Flu will be organized in conjunction with international research groups in this field. An international conference and course for GRID Bioinformatics applications will be organized by the BioinfoGRID project.

**Innovation:** The BioinfoGRID programme will cover the most contemporary uncharted fields of investigation in biological and medical research. The project will support studies on applications for distributed laboratory management systems for microarray technology, for gene expression studies, for gene data mining, for analysis of cDNA data, for Phylogenetic analysis, for protein functional analysis and for molecular dynamics simulations in GRID.

**Success stories:** A new challenge of the Wide In Silico Docking on Malaria and Avian Flu will contribute to produce new discovery that may contribute in finding new specific cure.