

## Italian EMBnet node: AGM2011 report



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ITB, the Institute of Biomedical Technologies, is an institute of the Italian [National Research Council](#)<sup>1</sup> (CNR); it is composed by 4 sections, located in Milano (from where the Institute is directed), Bari, Pisa and Padova. The ITB-Bari (Bioinformatics and Genomics) is the national node of EMBnet in Italy: Domenica D'Elia is the node manager, and Andreas Gisel is a regular member.

URL: <http://www.ba.itb.cnr.it>

### Infrastructure

ITB-Bari hosts the infrastructures for wet and dry laboratories. The wet lab is equipped with instruments for molecular biology studies, cell culture, light microscopy, citofluorimetry and deep sequencing (454 GSFLX Roche). The bioinformatics platform consists on a **Sistem Server HP** Proliant DL 580 (4 CPU Quad-Core Xeon, 32 GB RAM 2.4GHz, storage 6 Tera), **Server Cluster HP** Proliant DL 380 (4 CPU Quad-Core Xeon 2.4GHz, 15 nodes with 30 CPU, Storage 2 Tera), **GSFLX Titanium Cluster** (1 Head node with 2 Intel dual core 2.33GHz, 16GB RAM 4 Node slave with 2 Intel dual core 2.33GHz, 4 GB RAM for each nodes) and **Development Workstation e4** (2 CPU Quad-Core Xeon 2.4GHz, 2 Tesla c1060 Video cards with CUDA, 16 GB Ram, Storage 8 Tera). Further, ITB-Bari is part of the [INFN production GRID](#)<sup>2</sup>, and has within the Virtual Organisation 'bio', several thousand CPUs at its disposal.

### Research Activities

The bioinformatics activities of ITB-Bari are mainly focused on the development of bioinformatics tools for the management and analysis of Next Generation Sequencing data (NGS). In addition,

investigations using data-mining tools for genome-wide binding-site analysis, and development of algorithms in gene ontology applications are running. NGS activities focus on the development of algorithms for RNA-seq and analysis of small RNAs, as well as the provision of analysis services on these topics. Further, we are developing reference sequence databases for different themes, such as non-coding RNA to efficiently support NGS data analysis.

Research lines include experimental and bioinformatics studies of transcriptional and post-transcriptional regulatory processes of genes involved in the pathophysiology of cell proliferation, such as the characterisation of new modulators of p53 family member stability and activity; functional analysis and genome-wide investigation of the transcriptome profile for the identification of molecular biomarkers; *in vivo* investigation of the clustering of isoform expression in endometrial tissue. ITB-Bari has also developed a new protocol for the preparation and amplification of representative and strand-specific cDNA libraries for NGS applications (patent number: RM2010A000293). Metagenomics studies are oriented towards evaluation of the taxonomical and functional complexity of environmental microbial communities. The above-mentioned research activities are supported by different national and European projects. The bioinformatics tools and resources of ITB-Bari are available at: <http://bioinformatics.ba.itb.cnr.it/>.

### Networking

ITB-Bari is part of the core organisation for the establishment of an [Italian network on NGS data-production research centres](#)<sup>3</sup>, an initiative started by agreements established during the 2010 NGS workshop organised in Bari with the support of the CNR-Department of Life Sciences. A Web portal affiliated to [COST Action BM1006](#)<sup>4</sup> has also been created: "[Italian NGS Network for Data Analysis](#)"<sup>5</sup>.

### Dissemination

From 2008 to 2010, ITB-Bari was responsible for organising the following EMBnet AGMs, conferences and workshops in Bioinformatics:

1 <http://www.cnr.it>

2 <http://grid.infn.it>

3 <http://ngsnetwork.ba.itb.cnr.it/>

4 <http://w3.cost.eu/index.php?id=212&action=number=BM1006>

5 <http://www.nextgenerationsequencing.it/>

- EMBnet AGM 2008 (Martina Franca) and AGM 2010 (Ruvo di Puglia);
- International Bioinformatics Conference to celebrate the 20th Anniversary of EMBnet (Martina Franca, 2008);
- Seventh Annual Meeting of the Bioinformatics Italian Society, [BITS 2010](#)<sup>6</sup>;
- [NGS data-analysis workshop, 2009](#)<sup>7</sup> (Rome);
- [NGS workshop, First Edition, 2009](#)<sup>8</sup> (Bari);
- [NGS workshop, Second Edition, 2010](#)<sup>9</sup> (Bari);

The Bari NGS Workshop, [in its third edition](#)<sup>10</sup>, will be organised in October 2011.

We published many articles in local and national magazines, and released interviews on local TV stations talking about bioinformatics and molecular biology research activities and their social impact on human health and the environment; and EMBnet activities and missions (see links to local and national magazines in: <http://www.embnet.org/en/EMBnet20thAnniversary>; <http://www.artventuno.com/>).

## Education and Training in Bioinformatics

The ITB-Bari organises courses and tutorials in bioinformatics at local and national levels. Tutorials and hands-on courses were organised as satellite events at conferences and workshops listed above. We also organise Masters courses as part of collaborative agreements with Regional Associations, such as the Master in Bioinformatics and Molecular Epidemiology Techniques Applied to Infectious Diseases (2011-2012), under the Memorandum of Understanding signed with the ABAP – [Associazione Biologi Ambientalisti Pugliesi](#)<sup>11</sup>. ITB-Bari is also active in projects for the dissemination of scientific culture in molecular biology, biotechnology and bioinformatics in middle and high schools, and participates in national and regional Fairs and Festivals of Innovation ([December, 2010](#)<sup>12</sup>; [September 2011](#)<sup>13</sup>).

6 <http://bits2010.ba.itb.cnr.it/>

7 [www.nextgenerationsequencing.org](http://www.nextgenerationsequencing.org)

8 [http://mi.caspur.it/workshop\\_NGS09/](http://mi.caspur.it/workshop_NGS09/)

9 [http://mi.caspur.it/workshop\\_NGS10/](http://mi.caspur.it/workshop_NGS10/)

10 [http://mi.caspur.it/workshop\\_NGS11/](http://mi.caspur.it/workshop_NGS11/)

11 <http://www.infoabap.it/ABAP/ABAPeng.html>

12 <http://www.ba.itb.cnr.it/wp/category/eventi-2/>

13 <http://www.ba.itb.cnr.it/wp/2011/10/%E2%80%9Clight-2011-la-notte-dei-ricercatori%E2%80%9D-porte-aperte-al-futuro/>