



BioDec

New Software for the Postgenomics

BioDec: academic research become business

Innovation keeps flowing through the umbilical cord connecting BioDec to its originating bioinformatics research establishment, the Bologna Biocomputing Group (<http://www.biocomp.unibo.it>).

It all started back in 2002, when CASP (Critical Assessment of protein Structure Prediction) - winning predictors implemented with a graphic interface, the first BioDec products, were packaged for distribution. Top-notch technology is still there, deep in the heart of our products, grown from the original tools to the present-day integrated solutions and services.

Python and Plone

The flexible technological standard that we use to develop our user interfaces, is a celebrated free Content Management System, multi-awarded as “Best Open Source CMS”: Plone, an application framework based on the Python language.

A flexible framework supporting the pipeline from the wet lab to in silico analysis

LIMS: Bioinformation Management System

BMS includes a BioSQL browser and a Laboratory Information Management System, our LabData, software, for the management of shared laboratory data. It is conceived to:

- collect, manage and analyze laboratory data coming from specific molecular biology techniques, and store the related digital images: the BMS interface includes structured pages for the recording of technique-specific experimental data;
- manage a lab diary, recording aims and conditions of the experiment;
- customize workflows according to the specific technique or Customer needs, thus ensuring a full match between the rules adopted in the lab and the data lifecycle;

- share those data within a working group or an organization according to flexible, entirely user-defined security levels;
- manage and collect the data associated with periodical activities of instrument calibration and verification, thanks to custom forms for each instrument and metrologic technique.

Among the supported molecular biology techniques:

- ***Immunogenic assays:*** an user-compiled data grid may complement the image of the immunogen-coated grids / plates and allow the registration of data for each grid cell;
- ***Polymerase Chain Reaction techniques:*** specific information including data about amplification cycles is supported both for single sample PCR (usually leading to an electrophoresis) and for PCR array multi-sample analysis;
- ***Electrophoresis blot techniques:*** informations about experimental protocol are recorded, and gel images may be included;

Extra data types and pipeline customizations are available as new on-demand development.

Plone4bio free - the free BioSQL browser

Available as a GPL-licensed Plone product, Plone4bio may be freely downloaded and installed along with the accompanying documentation. A web-based integrated environment for the management and analysis of biosequences, it presently includes:

- a feature-rich graphic BioSQL browser, that may be used to explore data and metadata (annotations) of public databases including a selection of Uniprot, NCBI and Ensembl;
- an example predictor that may be used as a template for similar customized tools.

See <http://plone4bio.org> for further details.

Plone4bio - CMS for biosequence browsing and annotation

Leveraging on the power and flexibility of Plone4Bio, its commercial release provides an user-managed pipeline for biosequence analysis and comparison:

- **full CMS features:** Plone manages several standard content types like files, pages, RSS feeds (customized content types may be defined);
- **annotated databases:** our decoders (described below) have been used to annotate public databases including subsets from Uniprot, NCBI and Ensembl, thus disclosing specific properties of every biosequence. The information is cross-linked both internally and externally, as well as to the original database website;
- **user-defined biosequences:** a specific database may be instantiated and populated with the Customer's own biosequences, the subject of user-driven annotations;
- **decoders:** the available decoders may be for on-demand annotation of biosequences from any biosequence database.

BioDec Full

A combination of the two preceding packages, BioDec Full includes all the available components: Plone4bio, Annotated Databases, Decoders and LabData.

Decoders, our inner machinery

Based on state-of-art machine learning methods, the decoders are the inner mechanics of our solutions and are the results of a top-notch research activity.

- Subcellular localization decoder
- All-alpha transmembrane decoder
- Coiled-coil segment decoder
- Secondary structure decoder
- N-terminal Signal peptide decoder
- GPI-anchor peptide decoder
- Short Interfering RNA decoder
- Interaction patch decoder

Due 1st quarter 2010

- Disordered region decoder
- Transmembrane beta-barrel decoder
- Fold recognition system

Purchasing Biodec software

Our software may be purchased in SaaS or premise-based modes, according to a very simple pricing policy.

State-of-art postgenomics: consulting and custom software

An history of successful collaboration with some of the most important pharma / biotech companies in Italy, as well as our involvement in far-reaching projects including "TargetHerpes¹", make us very confident about our ability to solve a wide range of problems, both by designing custom software tools (including Decoders and user interfaces to public and private biosequence databases), and by supporting - with training or on-the-job mentoring - our Customer's research teams in developing their own software solutions.

References

The "People" section of BioDec web site, <http://www.biodec.com/about-us/people>, is a good starting point to navigate an extensive list of scientific papers covering our methods.

Our Customers include firms of the bio-pharma sector, such as Chiesi Group SpA, Dompé SpA, Externautics Srl, Primm Srl, Sigma-Tau SpA, and research institution among which we cite CNR and University of Bologna - CIRB.

BioDec participated into european projects such as TargetHerpes (<http://www.targetherpes.org>), together with other European partners from the academic and industrial world.

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1 See <http://www.targetherpes.org>