BIONEXT
Drug and interactome designer

The goal

BIONEXT S.A. is a Biotechnology company created in April 2009 to provide cutting-edge and creative bioinformatics and cheminformatics solutions to achieve comprehensive molecule **structure and reactivity studies**, even in cellular context.

The unique ability of BIONEXT to perform high quality **virtual screening of molecular regions** allows to revolutionize some aspects of the drug development.

Context and needs

Ever-lasting and recurring issues even reinforced by current headline news

Time development	Lack of efficacy
*A virus can mutate and become dangerous in a few months while developing an active treatment may take **more than 15 years***	*The efficacy of a compound not only depend of its affinity with its wished target, but also of its **affinity with other targets** in the cell*

BIONEXT solutions helps dramatically decrease development time and increase efficacy of compounds

Application areas

| Fundamental Research	Industrial Research	Toxicology
To better understand molecular mechanisms and system biology	*To identify and characterize molecular targets and compounds*	*To identify and characterize some of the molecular causes of toxicity*

MSVM: solution for Molecular Structure Visualization and Mapping

Much more than a simple visualization software, **MSVM*** has been designed to improve the understanding of molecular functions and mechanisms. This unique **research platform** is the core of BIONEXT solutions and provides **simple, fast and accurate** answers to today's complex questions.
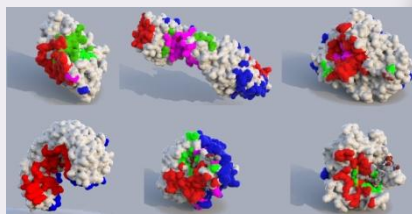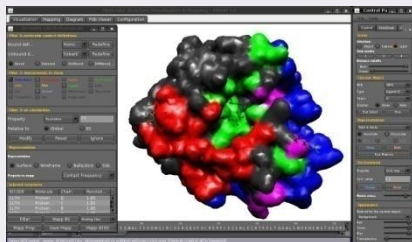
MSVM Molecular Cartography

(*) MSVM works on
Windows, OSX, Linux
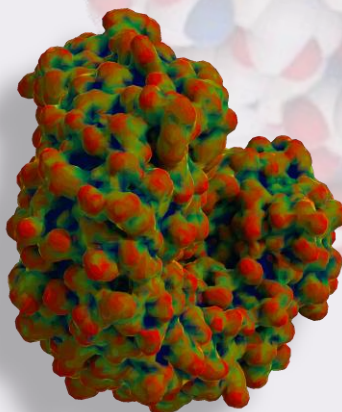
Special features:
- Photo-realistic visualisations
- Precise moves with 3D Mouse ( )
- Molecular types differentiation
- Several surface representations
- Slideshow for large dataset study
- Direct access to Uniprot and PDB

Optional modules:
- Detection of structural fingerprints
- Molecular interaction analysis
- Molecular Cartography
- Comparison of molecular regions
- Virtual Screening (*see BVS*)

« As better visualization also means better understanding »

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BVS: BIONEXT Virtual Screening

The **BVS module** allows to analyze and compare more precisely the molecular structures by defining **true molecular regions** of variable physico-chemical properties, shapes and sizes. BIONEXT has demonstrated that even two completely different molecules can share a same function if they share a same functional region.

Example of regions to screen:

zanamivir
(H1N1)

saquinavir
(Sida)

dithranol
(Toxic)

ATP
*(Energy)*

RAR
(Expression)
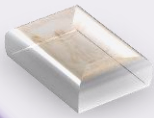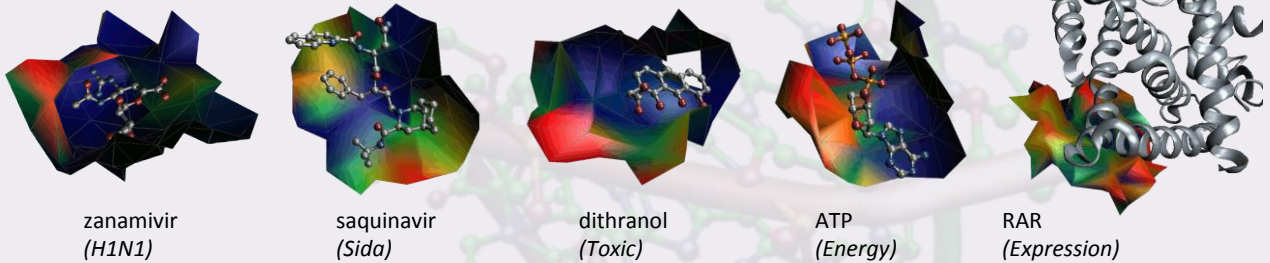
The BIONEXT **CRYSTAL** database contains 90 million molecular regions generated from the 60,000 available molecular structures. BIONEXT Screening Databases can be easily built to **work on specific organisms and/or tissues**.

BVS application examples and benefits
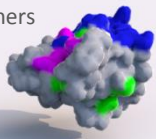
1 **To identify the molecules that share a particular region**
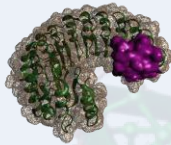
Different molecules having the same region
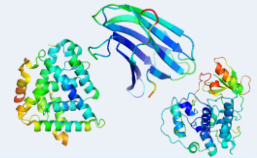
1 BVS unit

2 **To functionally characterize a molecule**

Different binding sites and new partners

3 **To detect specific regions**

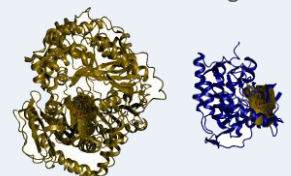Some specific regions

- *CRYSTAL*
- *Uniprot*
- *PDB*
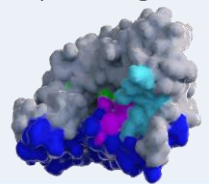
4 **To identify molecular targets of compound**
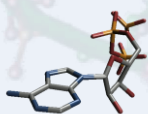
Some molecular targets

Two patents deposited July, 2009