Antiviral Drug Design Platform: AD2P

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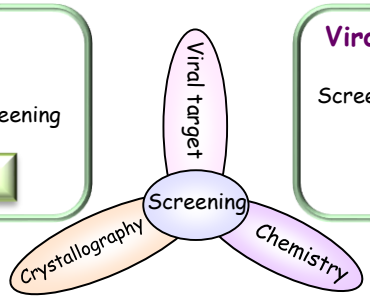
The emergence of viruses and the lack of therapeutic treatments directed against them is a growing worldwide threat. To address this problem we have designed a viral genomic approach focused on the inhibition of viral targets. The combination of our experience in crystallography, enzymology and chemistry allowed us to develop a workstation devoted to the screening of chemical compounds (from commercial or academic sources) on recombinant and purified viral proteins. Rational chemical design will lead to potential new medicines.

Interactions, Dynamics and Drug design Platform (INT-3D)

Molecular Modeling - Docking - In silico screening

Xavier Morelli: xavier.morelli@inserm.fr



Virology Screening Platform from Marseille Timone (PCVMT)

Screening against viruses (wild type and clinical isolates)

Animal experiments

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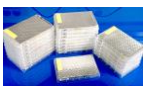
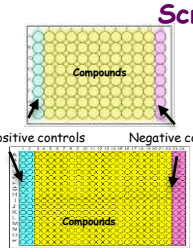
Screening Platform from Marseille-Luminy (PCML)



Chemical molecules
Natural extracts
(> 68.000)



In vitro Screening
(96 and/or 384 wells)

SAR

Data analysis

Data base - LISM

Molecules hits

- Biochemical characterization
(% Inhibition, IC50…)
- Lead optimization

Orthogonal validation
- Thermophoresis (Kd)
- Thermalshift assay (Tm)
- -Inhibition mode

Beckman – Biomek I5

Beckman – Biomek 4000

Perkin - Scintillation counter

BMG Labtech - Pherastar

Tecan- Safire2

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What can AD2P make for you ?

INT-3D

-Molecular modeling (3D-Model, structural alignment, virtual mutagenesis)
- Molecular dynamics simulations
-Docking (protein/protein ; protein/ligand)
-In silico screening (High throuput docking, pharmacore filtering, similarity research)
-Medecinal chemistry (Hit to lead optimization, QSAR…)
-Database management (In house database, dedicated database)

PCML

- Enzymes inhibitors screening
(miniaturization, assays developments (radioactivity, HTRF…), HTS)
-Protein-protein inhibitors screening
-Providing chemical libraries (in house or oriented chemical libraries)
-Synthesis of oriented chemical libraries and SAR

Your project

PCVMT

-In cellulo screening
(infected cells with wild-type virus or viral clinical isolates, resistance assays…)
-Animal experiments (rodents)

In order to speed-up the discovery process of new antiviral agents, we have developed a screening workstation, to test the potential inhibition of small organic molecules and natural products extracts. The three platforms share a common database and work on a dynamic interface. Chemical modifications, characterization of lead structures and development of innovating technologies are both on going.