ViroLab

A Virtual Laboratory for Decision Support in Viral Diseases Treatment

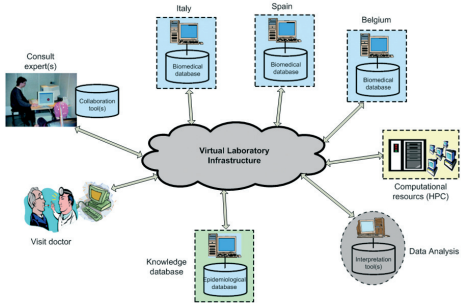
The ViroLab project is funded by the EC as a STREP in the area of integrated biomedical information for better health. Its duration is determined for three years from March 2006 until February 2009.

ViroLab`s mission is to provide researchers and medical doctors in Europe with a virtual laboratory for infectious diseases. As a prototype for this virtual laboratory, the problem of HIV drug resistance is chosen. There are two reasons supporting this choice. Firstly, HIV drug resistance is increasing in Europe, with failure of complete virus suppression for many HIV infected persons. Secondly, HIV drug resistance is one of few medical areas where genetic information is widely used for many years and related data is available.

These available clinical and patient databases can be used to relate genotype to drug-susceptibility phenotype. The data spans all temporal and spatial scales from the genome to the clinical data and is distributed over various sources in different formats (virological, clinical, drug databases) that change over time. Using a Grid-based service-oriented architecture, ViroLab 'vertically' integrates biomedical information from viruses (proteins, mutations), patients (e.g. viral load), and literature (drug resistance experiments).

The virtual laboratory furthermore supports tools for statistics, visualization, modeling and simulation, as well as data integration and mining, to predict the temporal virological and immunological response of viruses with complex mutation patterns to drug therapy. The laboratory provides medical doctors with a decision support system to rank drugs targeted at patients. It helps virologists to study trends on individual, population, and epidemiological level. By virtualizing hardware, computer infrastructure, and databases, the virtual laboratory is a user friendly environment, with tailored workflow templates to automate tasks.

The main objectives of the ViroLab project can be summarized as followed:



- To develop a virtual laboratory system infrastructure for transparent workflow, data access, experiment execution, and collaboration.
- To develop a virtual organization (VO), providing the 'glue' for binding all involved components and parties of the virtual laboratory.
- To virtualize and enhance state-of-the-art in genotypic resistance interpretation tools, and integrate them into the virtual laboratory.
- To establish epidemiological validation that ViroLab correctly and quantitatively predicts virological and immunological outcome.

Partners

- Universiteit van Amsterdam, Netherlands
- Universitair Medisch Centrum Utrecht, Netherlands
- Universität Stuttgart, Germany
- Università Cattolica del Sacro Cuore, Italy
- Institute de Recerca de la SIDA, Spain
- Università degli Studi di Brescia, Italy
- Katholieke Universiteit Leuven, Belgium
- Eötvös Loránd Tudományegetem, Hungary
- Gridwise Technologies, Poland
- Akademickie Centrum Komputerowe Cyfronet AGH, Poland
- University College London, UK
- Virology Education B.V., Netherlands

Contact: Matthias Assel

Höchstleistungsrechenzentrum Universität Stuttgart, Nobelstraße 19, 70569 Stuttgart, Germany
Phone: ++49-711-685-62515
E-Mail: assel@hlrs.de WWW: http://www.virolab.org