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## Student Research Project with the Pharma-IT Platform

Suitable for Bachelor's and Master's level, for student with a chemical/biological/life science as well as a computer science / machine learning background

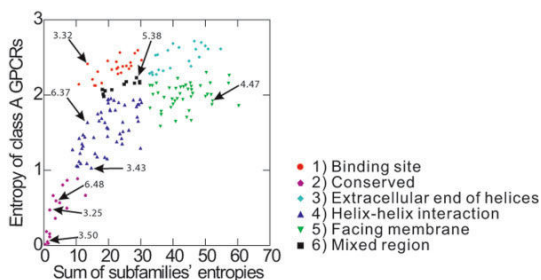
Leiden / Amsterdam Center for Drug Research (LACDR, [www.lacdr.nl](http://www.lacdr.nl)) and

Leiden Institute for Advanced Computer Science (LIACS, [www.liacs.nl](http://www.liacs.nl))

### *Two-entropies analysis of viral reverse transcriptases*

Two-entropies analysis is a bioinformatics approach to analyze the potential role of individual residues in a protein. It has been previously successfully applied to the transmembrane regions of class A GPCRs. Within this class the method was able to successfully differentiate between different functional clusters of residues in the proteins.

The goal of the project is to apply a two entropy analysis to viral reverse transcriptase proteins. A subfamily is defined as the combination of wild type viral protein with all documented mutations, a family consists of the reverse transcriptases of both the human immunodeficiency virus (HIV) and the hepatitis c virus (HCV). The results of the project will be used in the prediction of mutations that add to resistance of viral species to anti-retroviral therapy.



#### **Requirements**

We are looking for a master student with an interest in computational research/ bioinformatics. **No previous experience in the field is required.** We encourage students to publish their results if possible and the project results allow.

*Example of a two entropy plot by K. Ye et al. The differences in the entropy allow differentiation between the different functional groups present within the transmembrane regions of the proteins.*

#### **What can you learn?**

Applied bioinformatics, multiple sequence alignment, using industry standard software Pipeline Pilot

#### **Requirements**

Projects within the Pharma-IT Platform are usually concerned with the analysis of life science data using novel computational techniques, thus our research is interdisciplinary and we have both life scientists and computer scientists working in our group. Accordingly, most projects advertised in the context of the Pharma-IT Platform are suitable for undergraduate (BSc) as well as graduate (MSc) student with either a chemical/biological/life science or a computer science/machine learning background. **No previous experience in the other field is required,** but interest to either get familiar with life science data, or with computational methods, would clearly be an advantage. We strongly support students to publish their results if possible and the project results are suitable. For discussing individual projects, or to suggest your own ideas, please contact either Andreas or Michael directly.

#### **Contact:**

For more information and to discuss details of the project contact Andreas Bender ([Andreas.Bender@pharma-it.net](mailto:Andreas.Bender@pharma-it.net)) or Michael Emmerich ([Michael.Emmerich@pharma-it.net](mailto:Michael.Emmerich@pharma-it.net)). We are looking forward to hearing from you!

More information about the Pharma-IT Platform, currently ongoing research projects and people involved can be found on the Internet at [www.pharma-it.net](http://www.pharma-it.net).