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**CHEMICAL FEATURE-BASED 3D  
PHARMACOPHORE MODELS FOR DRUG DESIGN:  
CURRENT AND FUTURE ASPECTS**

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Pharmacophore-based compound modeling, virtual screening, and bio-activity profiling has become a popular in silico technique for supporting medicinal chemists in their hit finding, hit expansion, hit to lead, and lead optimization programs. [1]

At Inte:Ligand GmbH, we have developed the LigandScout [2] platform as an integrated software solution containing rapid and efficient tools for automatic interpretation of ligand-protein interactions and subsequent transformation of this information into 3D chemical feature-based pharmacophore models. Additionally, pattern recognition-based algorithms were developed for ligand-based pharmacophore modeling in the absence of a target 3D structure, as well as for establishing novel accurate virtual screening procedures. Our recent interest is to incorporate the results of molecular dynamics simulation trajectories into the pharmacophore description, in order to develop pharmacophore ensembles representing the dynamic event of binding and to make this functionality available as LigandScout KNIME [3] extensions.

In the presentation, we will highlight successful applications of chemical feature-based 3D pharmacophore modeling within the early drug discovery process. Such examples range from drug repurposing, to in silico fragment-based hit discovery and discovery of novel protein-protein interface inhibitors.

In the hands-on workshop, we will show typical workflows using the novel LigandScout 4.0 Expert platform, including structure- and ligand-based pharmacophore modeling, virtual screening, hit list filtering, ligand profiling, and molecular docking.

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[1] Langer, T., *Pharmacophores in Drug Research*, *Mol. Inf.* **2010**, 29, 470-475.

[2] Wolber, G., Langer, T. ; *LigandScout: 3D Pharmacophores Derived from Protein-Bound Ligands and their Use as Virtual Screening Filters*, *J. Chem. Inf. Model.* **2005**, 45, 160-169.

[3] **KoNstanz Information MinEr**, available from KNIME.COM AG, Zurich, Switzerland (<http://knime.org>)

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