Trixie Wagner, PhD [1]

Global Discovery Chemistry

Basel, Switzerland

In the drug discovery process, structure-activity relationships are studied to guide the modification of drug-like compounds to enhance the desired biological effect and minimize adverse effects. In the case of chiral molecules, their so-called absolute structure or configuration (the spatial arrangement of the atoms in space) plays a critical role for these investigations.

The classical and still most reliable way to obtain three-dimensional models - including the absolute configuration - is x-ray structure determination. The bottleneck of this technique, however, is the necessity to grow single crystals suitable for the analysis. Automated methods or high-throughput screens – widely used in protein crystallography – have not yet been established for small molecules.

The main focus of my work is to extend absolute structure determination to light atom compounds and to develop systematic approaches to the crystallization of pharmaceutically relevant organic molecules.

My research is concentrated on deriving predictive classification tools and maps of crystallization propensity in descriptor space by using public and in-house crystallographic

databases as well as conventional computational chemistry descriptors.

Our work covers these areas:

1. Exploiting the anomalous signal of light atom compounds by using intensity quotients and differences.
2. A systematic study of crystallization conditions and results in order to better understand the mechanism of crystallization and derive predictive tools.
3. Transfer of protein crystallization methodologies (e.g., microfluidic approaches) to chemical space. My group utilizes crystallography, chemistry, computational science and various other analytical techniques (NMR, OS, MS) to tackle research questions related to the general theme of “structural science”.

Selected Publications

Use of intensity quotients and differences in absolute structure refinement. [2]
Parsons S, Flack HD, Wagner T.
Acta Crystallogr. 2013; B69:249-259.

Stretching the Limit – Absolute Structure Determination from a Practical Point of View.
Wagner T.
ChemKrist Workshop Aachen/Mülheim Germany 2013 Sep.

GuideX: a Systematic Approach to Managing and Archiving Crystallization Data.
Wagner T, Rode B, Meyer C, Görlach E, Dix I, Patel J, Piechon P.
28th European Crystallography Meeting Warwick UK 2013 Aug.

Click here [3] for additional publications

Links
[1] https://www.novartis.com/our-science/postdoc-program/research-themes/computational-sciences/trixie-wagner-phd
[2] https://www.ncbi.nlm.nih.gov/pubmed/23719469
[3] https://www.ncbi.nlm.nih.gov/pubmed/?term=wagner%2C+trixie