Supp.1. The list of 57 global descriptors

2D van der Waals surface area
2D van der Waals volume
2D van der Waals surface area of H-bond acceptor atoms
2D van der Waals surface area of H-bond donor atoms
2D van der Waals surface area of all H-bond atoms
2D van der Waals hydrophobic surface area
2D van der Waals surface area of negative chargable group
2D van der Waals surface area of positive chargable group
2D van der Waals surface area of polar group
Calculated logP
Calculated molecular refractivity
Calculated buffer solubility
Charge_polarization
Formal_charge
Fraction of 2D van der Waals surface area of chargable groups
Fraction of 2D van der Waals surface area of H-bond acceptor groups
Fraction of 2D van der Waals surface area of H-bond donor groups
Fraction of 2D van der Waals hydrophobic surface area
Fraction of 2D van der Waals surface area of negative chargable groups
Fraction of 2D van der Waals surface area of polar groups
Fraction of 2D van der Waals surface area of positive chargable groups
Fraction of aromatic atoms
Fraction of hetero atoms
Fraction of rotatable bonds
Hydrophobic surface area (The sum of van der Waals surface area with absolute values of MPEOE charges less than 0.2)
Local dipole index (the average of the charge differences over all bonded atom pairs)
Molecular weight
Negative charged polar surface area (The sum of van der Waals surface area with values of MPEOE charges less than 0.2)
Number of aromatic bonds
Number of aromatic rings
Number of H-bond acceptors
Number of H-bond donors
Number of N
Number of negative chargable groups  
Number of negative charged groups  
Number of O  
Number of P  
Number of positive chargable groups  
Number of positive charged groups  
Number of rigid bonds  
Number of rings  
Number of rotatable bonds  
Polarity parameter  
Polarizability (by Miller method)  
Positive charged polar surface area (The sum of van der Waals surface area with values of MPEOE charges greater than 0.2)  
Pure water solubility  
Maximum negative charge  
Maximum positive charge  
Ratio donors to acceptor (The number of hydrogen bond donors / The number of hydrogen bond acceptors)  
Relative negative charge (The partial charge of the most negative atom divided by the total negative charge)  
Relative positive charge (The partial charge of the most positive atom divided by the total negative charge)  
Calculated boiling point  
Calculated melting point  
Solvation free energy  
Total absolute atomic charge  
Total negative charge  
Total positive charge

**Supp2. List of tested promiscuous drugs.**

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Pharmacological action from MeSH$^1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZD6474$^{2,3}$</td>
<td>Not annotated</td>
</tr>
<tr>
<td>SU6668$^2$</td>
<td>Not annotated</td>
</tr>
<tr>
<td>EKB569$^3$</td>
<td>Not annotated</td>
</tr>
<tr>
<td>Compound</td>
<td>Category</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Imatinib</td>
<td>Antineoplastic Agents (Protein Kinase Inhibitors)</td>
</tr>
<tr>
<td>Sutent</td>
<td>Antineoplastic Agents (Angiogenesis Inhibitors)</td>
</tr>
<tr>
<td>Sorafenib</td>
<td>Antineoplastic Agents (Protein Kinase Inhibitors)</td>
</tr>
<tr>
<td>AG-013736</td>
<td>Not annotated</td>
</tr>
<tr>
<td>Staurosporine</td>
<td>Enzyme Inhibitors</td>
</tr>
<tr>
<td>Aspirin</td>
<td>Anti-Inflammatory Agents, Fibrinolytic Agents, Platelet Aggregation Inhibitors (Cyclooxygenase Inhibitors)</td>
</tr>
<tr>
<td>Clozapine</td>
<td>Antipsychotic Agents (Serotonin Antagonists, GABA Antagonists)</td>
</tr>
<tr>
<td>Aripiprazole</td>
<td>Antipsychotic Agents</td>
</tr>
<tr>
<td>Ziprasidone</td>
<td>Antipsychotic Agents (Serotonin Antagonists, Dopamine Antagonists)</td>
</tr>
<tr>
<td>Zotepine</td>
<td>Antipsychotic Agents</td>
</tr>
<tr>
<td>Quetiapine</td>
<td>Antipsychotic Agents</td>
</tr>
<tr>
<td>Olanzapine</td>
<td>Antiemetics, Antipsychotic Agents (Serotonin Uptake Inhibitors)</td>
</tr>
<tr>
<td>Risperidone</td>
<td>Antipsychotic Agents (Serotonin Antagonists, Dopamine Antagonists)</td>
</tr>
<tr>
<td>Haloperidol</td>
<td>Antiemetics, Antipsychotic Agents (Dopamine Antagonists), Anti-Dyskinesia Agents</td>
</tr>
<tr>
<td>Chlorpromazine</td>
<td>Antiemetics, Antipsychotic Agents (Dopamine Antagonists)</td>
</tr>
<tr>
<td>Imipramine</td>
<td>Antidepressive Agents (Tricyclic Adrenergic Uptake Inhibitors)</td>
</tr>
<tr>
<td>Agomelatine</td>
<td>Hypnotics and Sedatives</td>
</tr>
<tr>
<td>Clotrimazole</td>
<td>Anti-Infective Agents, Local Antifungal Agents</td>
</tr>
<tr>
<td>Benzyl Benzoate</td>
<td>Insecticides</td>
</tr>
<tr>
<td>Nicardipine</td>
<td>Antihypertensive Agents (Calcium Channel Blockers), Vasodilator Agents</td>
</tr>
<tr>
<td>Delavirdine</td>
<td>Anti-HIV Agents (Reverse Transcriptase Inhibitors)</td>
</tr>
</tbody>
</table>
Supp3. List of tested H1-antihistaminergic drugs.

<table>
<thead>
<tr>
<th>Generation</th>
<th>Drugs</th>
</tr>
</thead>
</table>
| 1st generation | * Ethylenediamine class: Diphenhydramine, Carbinoxamine, Doxylamine, Clemastine, Dimenhydrinate  
* Alkylamine class: Chlorphenamine, Brompheniramine  
* Piperazine class: Cyclizine, Hydrixyzine, Meclizine  
* Tricyclics and Tetracyclics class: Promethazine, Alimemazine, Cyprohepatadine, Azatadine, Ketotifen |
| 2nd generation | Acrivastine, Cetirizine, Loratadine, Terfenadine, Azelastine, Levocabastine |
| 3rd generation | Desloratadine, Fexofenadine |