**Supplementary Table 1:** Potential inhibitors of FGFR4 identified from virtual screening.

|  |  |  |  |
| --- | --- | --- | --- |
| **Ligand Name** | **Structure** | **Score** | **Minimized RMSD** |
| PubChem-137300327 |  | -10.05 | 1.422 |
| PubChem-20868770 |  | -9.03 | 1.514 |
| PubChem-42852342 |  | -8.86 | 1.491 |
| PubChem-46045273 |  | -8.65 | 1.517 |
| PubChem-46045028 |  | -8.62 | 1.422 |
| PubChem-136498886 |  | -8.62 | 1.422 |
| PubChem-42852344 |  | -8.57 | 1.564 |
| PubChem-46064646 |  | -8.51 | 1.653 |
| PubChem-46064449 |  | -8.42 | 1.395 |
| PubChem-135566848 |  | -8.4 | 1.496 |
| PubChem-46045027 |  | -8.39 | 1.463 |
| PubChem-121057779 |  | -8.39 | 1.201 |
| PubChem-46045032 |  | -8.35 | 1.368 |
| PubChem-121057779 |  | -8,39 | 1.201 |
| PubChem-46045032 |  | -8,35 | 1.368 |
| PubChem-74763324 |  | -8.31 | 1.763 |
| PubChem-121057804 |  | -8,27 | 1.795 |
| PubChem-74763182 |  | -8,26 | 1.087 |
| PubChem-118659256 |  | -8,24 | 1.975 |
| PubChem-21283339 |  | -8,15 | 1.512 |
| PubChem-46045036 |  | -8,13 | 1.698 |
| PubChem-42852340 |  | -8,12 | 1.46 |
| PubChem-86279119 |  | -8,05 | 1.074 |
| PubChem-45529170 |  | -8.04 | 1.525 |

**Supplementary Table 2:** Grid box parameters used for docking with gatekeeper mutant FGFR1-4.

|  |  |  |  |
| --- | --- | --- | --- |
| **Receptor Protein** | **Grid Box Center** | **Number of Points** | **Spacing (Å)** |
|  | **X** | **Y** | **Z** | **X dimension** | **Y dimension** | **Z dimension** |  |
| V561MFGFR1 (PDB ID: 4RWI) | -8.83 | -5.22 | 12.35 | 28 | 28 | 28 | 0.375 |
| V564FFGFR2 (PDB ID: 7KIE) | 23.55 | 18.55 | 26.75 | 28 | 28 | 28 | 0.375 |
| V564IFGFR2 | 23.55 | 18.55 | 26.75 | 28 | 28 | 28 | 0.375 |
| V564MFGFR2 | 23.55 | 18.55 | 26.75 | 28 | 28 | 28 | 0.375 |
| V555LFGFR3 | 2.10 | -5.91 | -23.63 | 28 | 28 | 28 | 0.375 |
| V555MFGFR3 | 2.10 | -5.91 | -23.63 | 28 | 28 | 28 | 0.375 |
| V550MFGFR4 (PDB ID: 5XFJ) | -39.911 | -15.664 | 378.265 | 32 | 38 | 36 | 0.375 |