

Supplementary Info

Advanced Computational Pipeline for FAK Inhibitor Discovery: Combining Multiple Docking Methods with MD and QSAR for Cancer Therapy

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Table S1. Docking scores of selected molecules from virtual screening

Complex name	Docking score (kcal/mol)
4GU6 Reference Compound	-10,85
4GU6:Deferasirox	-9,95
4GU6:Polydatin	-9,78
4GU6:Nelarabine	-9,70
4GU6:Fenoterol	-9,43
4GU6:Clofarabine	-9,33
4GU6:Vidarabine	-9,12
4GU6:Fludarabine	-9,09
4GU6:Crizotinib	-9,09
4GU6:Lenalidomide	-9,09
4GU6:Amprenavir	-8,91
4GU6:Udenafil	-8,88
4GU6:Floctafenine	-8,83
4GU6:Quinethazone	-8,82
4GU6:Amodiaquine	-8,81
4GU6:Sotagliflozin	-8,80
4GU6:Dapagliflozin	-8,80
4GU6:Dyphylline	-8,77
4GU6:Flosequinan	-8,76
4GU6:Sulfinpyrazone	-8,76
4GU6:Methotrexate	-8,76
4GU6:Enprofylline	-8,75
4GU6:Capmatinib	-8,69
4GU6:Pomalidomide	-8,64
4GU6:Ademetionine	-8,63
4GU6:Didanosine	-8,62
4GU6:Oxyphenbutazone	-8,61

4GU6:Linezolid	-8,55
4GU6:Chlorthalidone	-8,55
4GU6:Warfarin	-8,54
4GU6:Gemcitabine	-8,53
4GU6:Alloin	-8,53
4GU6:Praziquantel	-8,48
4GU6:Flavin adenine dinucleotide	-8,47
4GU6:Famciclovir	-8,39
4GU6:Tipiracil	-8,38
4GU6:Edoxudine	-8,34
4GU6:Valganciclovir	-8,33
4GU6:Fluindione	-8,32
4GU6:Entecavir	-8,32
4GU6:Oxcarbazepine	-8,31
4GU6:Mefloquine	-8,30
4GU6:Mebendazole	-8,29
4GU6:Lactulose	-8,23
4GU6:Theophylline	-8,23
4GU6:Aminophylline	-8,22
4GU6:Rofecoxib	-8,20
4GU6:Adenosine	-8,19
4GU6:Zalcitabine	-8,19
4GU6:Bimatoprost	-8,18
4GU6:Anastrozole	-8,15
4GU6:NADH	-8,14
4GU6:Nylidrin	-8,13
4GU6:Tafluprost	-8,13
4GU6:Cytarabine	-8,12
4GU6:Bosutinib	-8,12
4GU6:Thalidomide	-8,12
4GU6:Anthralin	-8,12
4GU6:Flunitrazepam	-8,12
4GU6:Anisindione	-8,10
4GU6:Lactitol	-8,10
4GU6:Protirelin	-8,07
4GU6:Procaterol	-8,06
4GU6:Protokylol	-8,04

4GU6:Cianidanol	-8,03
4GU6:Ganciclovir	-8,03
4GU6:Celiprolol	-8,02
4GU6:Alprazolam	-8,01
4GU6:Levobunolol	-8,01
4GU6:Ferric derisomaltose	-8,00
4GU6:Pentoxifylline	-8,00

Table S2. MM/GBSA scores of top molecules after 1ns MD simulations

Protein-Ligand Complex	1 ns MD-MMGBSA (kcal/mol)
4GU6_Alloin	-73,15
4GU6_Amprenavir	-74,84
4GU6_Bimatoprost	-71,88
4GU6_Bosutinib	-75,79
4GU6_Lactulose	-71,93
4GU6_Polydatin	-70,45
4GU6-Tafluprost	-72,51
4GU6_Udenafil	-71,62
4GU6_Ferric_derisomaltose	-82,72
4GU6_Flavin_adenine_dinucleotide	-89,15
4GU6_Reference Compound	-69,56

Table S3. MM/GBSA scores of top molecules after 10ns MD simulations

Protein-Ligand Complex	10 ns MD-MMGBSA (kcal/mol)
4GU6_Alloin	-72,63
4GU6_Amprenavir	-75,86
4GU6_Bimatoprost	-72,08
4GU6_Bosutinib	-74,38
4GU6_Ferric_derisomaltose	-73,52
4GU6_Flavin_adenine_dinucleotide	-82,99
4GU6_Lactulose	-73,39
4GU6_Polydatin	-72,80
4GU6-Tafluprost	-73,13
4GU6_Reference Compound	-71,04

Table S4. MM/GBSA scores of top molecules after 100ns MD simulations

Protein-Ligand Complex	100 ns MD-MMGBSA (kcal/mol)
4GU6_Amprenavir	-75,54
4GU6_Bosutinib	-74,47
4GU6_Ferric_derisomaltose	-73,49
4GU6_Flavin_adenine_dinucleotide	-82,94
4GU6_Lactulose	-73,42
4GU6-Tafluprost	-73,49
4GU6_Reference Compound	-69,20

Table S5. MetaCore/MetaDrug binary QSAR therapeutic activity predictions for top molecules. The values presented in parentheses, Tanimoto Prioritization (TP), indicate the level of similarity between the structure being analyzed and the most closely related compound in the training set. Scores that are 0.5 or higher, which are predicted to potentially exhibit therapeutic activity, are emphasized in bold.

Name	Ref_10N	Bosutinib	Amprenavir	Ferric_derisomaltose	Tafluprost	Flavin_adenine_dinucleotide	Lactulose
RuleOf5	OK	OK	OK	OK	OK	OK	OK
Depression (TP)	0.81 (37.05)	0.39 (53.18)	0.46 (43.01)	0.12 (45.75)	0.03 (42.63)	0.15 (62.58)	0.12 (44.87)
Bacterial (TP)	0.61 (40.29)	0.48 (48.76)	0.18 (70.85)	0.73 (67.96)	0.15 (64.84)	0.24 (100.00)	0.69 (70.87)
Cancer (TP)	0.85 (57.09)	0.89 (100.00)	0.46 (45.10)	0.63 (82.86)	0.46 (45.58)	0.63 (73.01)	0.63 (79.45)
HIV (TP)	0.66 (35.21)	0.68 (45.82)	0.92 (100.00)	0.47 (51.85)	0.43 (43.59)	0.13 (100.00)	0.53 (50.72)
Heart Failure (TP)	0.60 (38.96)	0.62 (41.56)	0.83 (40.56)	0.41 (98.59)	0.42 (48.52)	0.19 (72.58)	0.31 (97.26)
Hyperlipidemia (TP)	0.38 (38.96)	0.47 (34.25)	0.41 (44.27)	0.64 (67.96)	0.75 (52.31)	0.03 (50.51)	0.53 (70.87)
Obesity (TP)	0.76 (39.93)	0.85 (43.20)	0.96 (87.90)	0.09 (47.56)	0.85 (41.34)	0.89 (64.51)	0.04 (48.15)
Allergy (TP)	0.66 (40.29)	0.62 (42.70)	0.33 (38.73)	0.56 (60.61)	0.36 (42.57)	0.07 (48.03)	0.63 (62.00)
Alzheimer (TP)	0.69 (34.62)	0.57 (40.26)	0.61 (38.39)	0.73 (36.99)	0.57 (46.02)	0.65 (73.01)	0.73 (38.10)
Parkinson (TP)	0.40 (36.34)	0.56 (44.72)	0.20 (39.15)	0.29 (64.81)	0.17 (44.15)	0.49 (45.62)	0.32 (66.06)
Thrombosis (TP)	0.43 (41.09)	0.46 (48.76)	0.33 (41.12)	0.26 (67.33)	0.36 (64.84)	0.39 (49.72)	0.12 (70.30)
Diabetes (TP)	0.66 (32.84)	0.43 (38.18)	0.69 (41.01)	0.13 (47.14)	0.16 (45.25)	0.24 (73.01)	0.14 (46.15)
Psoriasis (TP)	0.40 (31.44)	0.50 (37.50)	0.27 (41.01)	0.28 (67.96)	0.30 (43.11)	0.27 (55.22)	0.17 (70.87)
Viral (TP)	0.79 (41.45)	0.66 (48.76)	0.96 (100.00)	0.43 (43.21)	0.24 (41.97)	0.41 (72.58)	0.45 (43.29)
Migraine (TP)	0.62 (39.93)	0.51 (49.06)	0.93 (100.00)	0.50 (65.42)	0.58 (43.59)	0.09 (100.00)	0.51 (66.67)
Hypertension (TP)	0.70 (41.48)	0.57 (42.39)	0.74 (41.63)	0.41 (72.92)	0.16 (43.59)	0.48 (48.03)	0.42 (74.23)
Asthma (TP)	0.68 (34.16)	0.66 (45.82)	0.64 (49.83)	0.52 (45.37)	0.64 (43.11)	0.24 (72.58)	0.67 (48.15)
Pain (TP)	0.59 (36.33)	0.29 (42.11)	0.40 (39.23)	0.09 (67.96)	0.00 (45.58)	0.29 (50.51)	0.68 (70.87)

Skin Diseases (TP)	0.54 (36.34)	0.32 (39.31)	0.44 (39.02)	0.77 (51.85)	0.70 (40.46)	0.21 (42.60)	0.83 (51.82)
Osteoporosis (TP)	0.31 (41.09)	0.26 (53.18)	0.91 (100.00)	0.58 (61.26)	0.59 (41.34)	0.62 (64.33)	0.44 (62.50)
Inflammation (TP)	0.29 (35.53)	0.24 (49.06)	0.29 (41.63)	0.27 (67.96)	0.24 (64.84)	0.12 (37.14)	0.30 (70.87)
Angina (TP)	0.51 (35.85)	0.51 (45.17)	0.19 (82.89)	0.10 (98.59)	0.07 (37.82)	0.36 (60.06)	0.16 (97.26)
Arthritis (TP)	0.66 (34.16)	0.79 (38.61)	0.60 (49.83)	0.32 (51.56)	0.77 (33.33)	0.95 (64.51)	0.20 (50.38)
Mycosis (TP)	0.61 (34.02)	0.44 (37.13)	0.31 (63.17)	0.55 (45.64)	0.62 (41.34)	0.36 (50.53)	0.51 (45.70)
Schizophrenia (TP)	0.31 (43.39)	0.29 (49.06)	0.43 (70.85)	0.38 (67.33)	0.56 (48.52)	0.52 (78.22)	0.22 (70.30)