



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 13, 2023 – 12:52 pm GMT

PDB ID : 8BNS
Title : Crystal structure of Pif1 from Sulfurihydrogenibium sp in complex with ADP
Authors : Rety, S.; Chen, W.F.; Xi, X.G.
Deposited on : 2022-11-14
Resolution : 3.24 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

The following versions of software and data (see [references ⓘ](#)) were used in the production of this report:

MolProbity : 4.02b-467
Mogul : 1.8.4, CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.32.1
buster-report : 1.1.7 (2018)
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)
Refmac : 5.8.0158
CCP4 : 7.0.044 (Gargrove)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.32.1

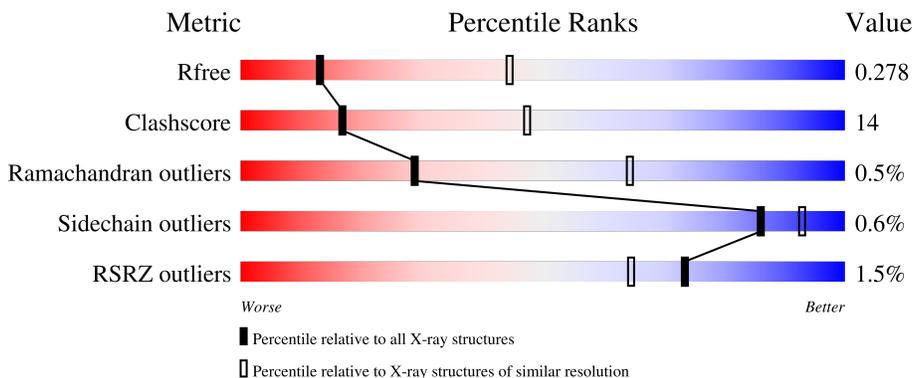
1 Overall quality at a glance i

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 3.24 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	130704	1619 (3.28-3.20)
Clashscore	141614	1755 (3.28-3.20)
Ramachandran outliers	138981	1728 (3.28-3.20)
Sidechain outliers	138945	1727 (3.28-3.20)
RSRZ outliers	127900	1567 (3.28-3.20)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	517	 2% 57% 26% 16%
1	B	517	 2% 53% 28% 16%
1	C	517	 2% 53% 29% 16%
1	D	517	 2% 56% 25% 16%

2 Entry composition [i](#)

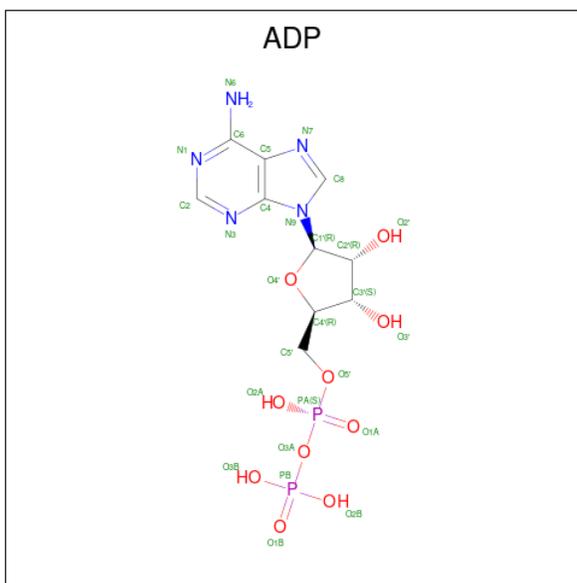
There are 2 unique types of molecules in this entry. The entry contains 14316 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, the ZeroOcc column contains the number of atoms modelled with zero occupancy, the AltConf column contains the number of residues with at least one atom in alternate conformation and the Trace column contains the number of residues modelled with at most 2 atoms.

- Molecule 1 is a protein called AAA ATPase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	433	Total	C	N	O	S	0	0	0
			3552	2310	576	658	8			
1	B	433	Total	C	N	O	S	0	0	0
			3552	2310	576	658	8			
1	C	433	Total	C	N	O	S	0	0	0
			3552	2310	576	658	8			
1	D	433	Total	C	N	O	S	0	0	0
			3552	2310	576	658	8			

- Molecule 2 is ADENOSINE-5'-DIPHOSPHATE (three-letter code: ADP) (formula: C₁₀H₁₅N₅O₁₀P₂) (labeled as "Ligand of Interest" by depositor).



Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	
			Total	C	N	O			P
2	A	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
2	B	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

Continued on next page...

Continued from previous page...

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	C	1	Total	C	N	O	P	0	0
			27	10	5	10	2		
2	D	1	Total	C	N	O	P	0	0
			27	10	5	10	2		

LEU	SER	LEU	LEU	LEU	PRO	LEU	GLU	GLU	ILE	ILE	ILE	ILE	ILE	ALA	ALA	ILE	SER	GLU	LYS	LYS	PRO	PRO	ILE	GLU	ILE	ILE	VAL	VAL	TYR	LEU	LEU	LYS	SER	SER	ASP	VAL	VAL	LYS	LYS	LYS	ARG	VAL	VAL	ILE	ILE	ILE	PRO	PRO	LYS	LYS	LYS	GLY	GLY	MET	ASP	TYR	ASN	ASN	GLY	ALA	ALA	GLY	PHE	LEU	GLY	VAL	GLU
GLY	PHE	CYS	THR	ILE	ARG	LYS	ASP	ASP	ARG	VAL	PHE	ILE	ASN	ASN	VAL	VAL	GLU	LYS	LYS	G32	T33	G34	G35	K48	K49	S151	S152	E153	K154	K155	F156	I160	S163	P164	F165	I68	H69	F74	I78	T79	L80	S81	S82	V83	I93	Y94	K95	D98	A99	D103	M107	D111	E118	F119	F120												

● Molecule 1: AAA ATPase



M1	I2	Q3	T4	L17	M18	E19	N20	GLU	VAL	VAL	G29	G30	R30	A31	G32	T33	G34	K35	K48	K49	S151	S152	E153	K154	K155	F156	I160	S163	P164	F165	I68	H69	F74	I78	T79	L80	S81	S82	V83	I93	Y94	K95	D98	A99	D103	M107	D111	E118	F119	F120
K121	I122	K125	Q126	F131	G132	G133	I134	Q135	VAL	L136	I137	L142	Y143	Q144	L145	L146	P146	T150	S151	S152	E153	K154	K155	F156	I160	S163	P164	F165	I68	H69	F74	I78	T79	L80	S81	S82	V83	I93	Y94	K95	D98	A99	D103	M107	D111	E118	F119	F120		
Y217	I218	P219	D220	F221	E222	P223	D224	E225	I230	L238	A239	D240	K241	I242	N243	Q244	Q245	E248	K249	L250	K251	H255	V256	Y257	I261	F265	E275	L276	V277	I278	K279	T282	Q283	V284	M285	L286	L287	W295	S299	K301	R302	E307	K310	I315	V318					
E319	L320	E325	P330	Y339	Y340	D341	K348	G353	Y358	K361	P362	A363	W364	A365	I366	T367	I368	H369	K370	Q372	T375	F376	D377	K378	V379	I380	I381	D382	I383	G384	R385	G386	T387	F388	Q392	L393	A396	R399	C400	R401	S402	L403	V407	L408	I412	I414				
S413	E414	K415	Y416	I417	M418	L419	D420	R422	Y430	K433	LEU	SER	SER	CYS	THR	ILE	ARG	LEU	PRO	ASP	ASP	ARG	GLU	LYS	ILE	GLU	VAL	ILE	ALA	LEU	GLU	ILE	ILE	SER	VAL	VAL	ASP	LYS	SER	ASP	VAL	LYS	ARG	VAL	ILE	ILE	PRO	LYS	LYS	ILE

● Molecule 1: AAA ATPase



M1	I2	Q3	T4	V5	E6	F7	M8	E9	Q10	L17	T21	N24	V25	L26	T27	V28	G29	R30	T33	I50	V58	H69	F74	I78	T79	L80	S81	S82	V83	I86	K87	P88	K89	N90	E91	I92	I93	Y94	K95	K96	L97	D98	A99	M107	D111	D114														
L120	H123	G124	K125	Q126	P127	F131	G132	G133	I134	L136	L138	Q144	L145	P146	P147	S163	P164	F165	F166	F167	D168	I170	S171	F172	F177	E178	F179	G281	V180	E181	L182	Y186	Q188	K189	D190	E191	M196	Y199	R201	T205	K208	E211	M214	Y217	I218															
P219	D220	F221	P223	D224	E225	K226	E227	F228	Y229	I230	Y231	L233	T234	W364	A365	I366	S371	Q372	T375	I381	D382	G384	R385	G386	G391	Q392	L393	T282	Q283	W284	M285	L286	L287	Q292	G293	R294	W295	S299	K301	R302	V303	K308	V309	K310	D314	I315														
V318	E319	L320	E321	E325	V326	Q329	P330	F331	Y358	K361	P362	W364	A365	I366	S371	Q372	T375	I381	D382	G384	R385	G386	G391	Q392	L393	T282	Q283	W284	M285	L286	L287	Q292	G293	R294	W295	S299	K301	R302	V303	K308	V309	K310	D314	I315																
LEU	SER	SER	LYS	ILE	ARG	LYS	PRO	LEU	ASP	GLU	GLU	LYS	ILE	GLU	ILE	ILE	ILE	LYS	PRO	PRO	ILE	GLU	ILE	ILE	VAL	VAL	TYR	LEU	LEU	LYS	SER	ASP	VAL	VAL	LYS	LYS	ARG	VAL	ILE	ILE	PRO	PRO	LYS	LYS	GLY	GLY	MET	ASP	TYR	ASN	ASN	GLY	ALA	ALA	GLU	PHE	LEU	GLY	VAL	GLU

4 Data and refinement statistics i

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α , β , γ	113.14Å 129.29Å 113.69Å 90.00° 103.40° 90.00°	Depositor
Resolution (Å)	110.59 – 3.24 110.59 – 3.24	Depositor EDS
% Data completeness (in resolution range)	62.6 (110.59-3.24) 62.0 (110.59-3.24)	Depositor EDS
R_{merge}	0.15	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.46 (at 3.26Å)	Xtrriage
Refinement program	PHENIX 1.20.1_4487, PHENIX 1.20.1_4487	Depositor
R, R_{free}	0.238 , 0.270 0.242 , 0.278	Depositor DCC
R_{free} test set	1575 reflections (4.97%)	wwPDB-VP
Wilson B-factor (Å ²)	82.1	Xtrriage
Anisotropy	0.111	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.32 , 71.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.158 for l,-k,h	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	14316	wwPDB-VP
Average B, all atoms (Å ²)	103.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The analyses of the Patterson function reveals a significant off-origin peak that is 44.20 % of the origin peak, indicating pseudo-translational symmetry. The chance of finding a peak of this or larger height randomly in a structure without pseudo-translational symmetry is equal to 1.5806e-04. The detected translational NCS is most likely also responsible for the elevated intensity ratio.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section: ADP

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 5$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z >5	RMSZ	# Z >5
1	A	0.34	0/3630	0.57	2/4891 (0.0%)
1	B	0.33	0/3630	0.61	3/4891 (0.1%)
1	C	0.31	0/3630	0.57	2/4891 (0.0%)
1	D	0.30	0/3630	0.58	2/4891 (0.0%)
All	All	0.32	0/14520	0.58	9/19564 (0.0%)

Chiral center outliers are detected by calculating the chiral volume of a chiral center and verifying if the center is modelled as a planar moiety or with the opposite hand. A planarity outlier is detected by checking planarity of atoms in a peptide group, atoms in a mainchain group or atoms of a sidechain that are expected to be planar.

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	8
1	B	0	14
1	C	0	8
1	D	0	9
All	All	0	39

There are no bond length outliers.

All (9) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	221	PHE	C-N-CA	9.90	146.45	121.70
1	A	218	ILE	C-N-CD	-7.55	104.00	120.60
1	D	179	PHE	C-N-CA	6.96	139.09	121.70
1	D	224	ASP	C-N-CA	5.69	135.93	121.70
1	A	219	PRO	CA-N-CD	-5.42	103.92	111.50
1	C	142	LEU	CA-CB-CG	5.15	127.15	115.30
1	B	187	ARG	C-N-CA	5.12	134.50	121.70
1	C	28	VAL	C-N-CA	-5.11	111.57	122.30

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	223	PRO	N-CA-C	5.02	125.14	112.10

There are no chirality outliers.

All (39) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	218	ILE	Peptide
1	A	221	PHE	Peptide
1	A	307	GLU	Peptide
1	A	308	LYS	Peptide
1	A	414	GLU	Peptide
1	A	421	LYS	Peptide
1	A	66	GLN	Peptide
1	A	67	THR	Peptide
1	B	187	ARG	Peptide
1	B	188	GLN	Peptide
1	B	189	LYS	Peptide
1	B	216	ARG	Sidechain
1	B	223	PRO	Peptide
1	B	224	ASP	Peptide
1	B	310	LYS	Peptide
1	B	384	GLY	Peptide
1	B	386	GLY	Peptide
1	B	387	THR	Peptide
1	B	412	ILE	Peptide
1	B	413	SER	Peptide
1	B	414	GLU	Peptide
1	B	421	LYS	Peptide
1	C	219	PRO	Peptide
1	C	221	PHE	Peptide
1	C	30	ARG	Sidechain
1	C	31	ALA	Peptide
1	C	320	LEU	Peptide
1	C	367	THR	Peptide
1	C	386	GLY	Peptide
1	C	388	PHE	Peptide
1	D	144	GLN	Peptide
1	D	172	PHE	Peptide
1	D	178	GLU	Peptide
1	D	218	ILE	Peptide
1	D	227	GLU	Peptide
1	D	3	GLN	Peptide

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Group
1	D	302	ARG	Peptide
1	D	310	LYS	Peptide
1	D	421	LYS	Peptide

5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	3552	0	3605	101	0
1	B	3552	0	3604	114	0
1	C	3552	0	3605	105	0
1	D	3552	0	3605	89	0
2	A	27	0	12	1	0
2	B	27	0	12	0	0
2	C	27	0	12	0	0
2	D	27	0	12	0	0
All	All	14316	0	14467	405	0

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 14.

All (405) close contacts within the same asymmetric unit are listed below, sorted by their clash magnitude.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:216:ARG:NH1	1:B:406:LEU:O	2.02	0.92
1:A:217:TYR:O	1:A:219:PRO:HD2	1.78	0.84
1:A:214:ASN:HA	1:A:217:TYR:CE2	2.14	0.82
1:C:31:ALA:H	1:C:35:LYS:NZ	1.79	0.81
1:B:226:LYS:H	1:B:226:LYS:HD2	1.46	0.80
1:A:383:ILE:HG23	1:A:410:LYS:HD2	1.65	0.79
1:B:187:ARG:HD3	1:B:189:LYS:HG2	1.65	0.79
1:A:58:VAL:HG23	1:A:269:ASP:HB3	1.65	0.78
1:B:30:ARG:NH2	1:B:394:TYR:OH	2.19	0.75
1:A:88:PRO:HG2	1:A:91:LYS:HG2	1.68	0.75
1:C:245:GLN:O	1:C:249:LYS:NZ	2.20	0.74
1:D:88:PRO:HG2	1:D:91:LYS:HG2	1.70	0.73

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:318:VAL:O	1:C:325:GLU:HA	1.89	0.72
1:B:88:PRO:HG2	1:B:91:LYS:HG2	1.71	0.72
1:D:295:TRP:HE1	1:D:326:VAL:HG11	1.53	0.72
1:D:292:GLN:OE1	1:D:294:ARG:NH1	2.23	0.72
1:B:163:SER:OG	1:B:168:ASP:OD2	2.07	0.71
1:A:220:ASP:O	1:A:222:GLU:N	2.23	0.71
1:C:310:LYS:HD2	1:D:309:VAL:HA	1.73	0.71
1:B:389:SER:HB2	1:B:392:GLN:HB2	1.72	0.71
1:D:145:LEU:HD21	1:D:392:GLN:HG3	1.73	0.70
1:A:268:LYS:HB2	1:A:269:ASP:HA	1.73	0.70
1:B:173:ASN:OD1	1:B:174:GLU:N	2.25	0.69
1:C:31:ALA:H	1:C:35:LYS:HZ3	1.40	0.69
1:A:179:PHE:HB2	1:A:430:TYR:HD2	1.58	0.69
1:D:366:ILE:HD13	1:D:371:SER:HB3	1.74	0.69
1:B:30:ARG:HH21	1:B:197:LEU:HG	1.59	0.68
1:C:220:ASP:O	1:C:222:GLU:N	2.28	0.67
1:B:58:VAL:HG23	1:B:269:ASP:HB3	1.77	0.67
1:D:303:VAL:HG22	1:D:318:VAL:HG22	1.77	0.66
1:C:146:PRO:HB2	1:C:164:PRO:HG2	1.76	0.66
1:D:375:THR:HB	1:D:401:ARG:HG2	1.77	0.66
1:A:50:ILE:HG22	1:A:99:ALA:HB3	1.77	0.66
1:C:196:LEU:HD21	1:C:213:LEU:HD21	1.78	0.66
1:C:412:ILE:HB	1:C:414:GLU:HG3	1.78	0.65
1:C:2:ILE:HD11	1:C:4:THR:HG23	1.78	0.65
1:C:179:PHE:HB2	1:C:430:TYR:HD2	1.61	0.65
1:A:210:LEU:O	1:A:213:LEU:HB2	1.96	0.65
1:A:53:LEU:HB3	1:A:68:ILE:HG12	1.77	0.65
1:A:412:ILE:HG22	1:A:414:GLU:OE2	1.97	0.65
1:D:94:TYR:H	1:D:97:LEU:HD13	1.62	0.64
1:D:234:THR:OG1	1:D:384:GLY:O	2.14	0.64
1:C:310:LYS:HB3	1:D:310:LYS:HG3	1.79	0.64
1:B:94:TYR:H	1:B:97:LEU:HD13	1.62	0.64
1:B:216:ARG:HH12	1:B:406:LEU:C	2.01	0.64
1:B:145:LEU:HD11	1:B:392:GLN:HG3	1.80	0.64
1:C:151:SER:HA	1:C:154:LYS:HB2	1.80	0.64
1:D:79:THR:HG23	1:D:82:SER:H	1.62	0.64
1:C:32:GLY:O	1:C:185:VAL:HA	1.99	0.63
1:A:257:TYR:HE2	1:A:278:ILE:HD11	1.63	0.63
1:B:382:ASP:HA	1:B:409:LYS:HB2	1.81	0.63
1:D:302:ARG:HB3	1:D:319:GLU:HB3	1.81	0.63
1:D:80:LEU:O	1:D:83:VAL:HG12	1.98	0.63

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:255:TYR:OH	1:D:280:LYS:NZ	2.31	0.63
1:C:93:ILE:HD11	1:C:339:TYR:HA	1.81	0.63
1:A:234:THR:OG1	1:A:384:GLY:O	2.11	0.62
1:B:319:GLU:HG3	1:B:324:GLU:H	1.63	0.62
1:A:309:VAL:H	1:B:310:LYS:HB2	1.64	0.62
1:C:241:LYS:O	1:C:245:GLN:N	2.29	0.61
1:D:282:THR:HG22	1:D:364:TRP:HH2	1.63	0.61
1:A:206:GLU:O	1:A:209:ASP:N	2.29	0.61
1:B:282:THR:HG22	1:B:364:TRP:HH2	1.64	0.61
1:D:221:PHE:O	1:D:222:GLU:HB2	1.99	0.61
1:B:203:LYS:HE2	1:B:418:TRP:HB3	1.83	0.61
1:C:257:TYR:HE2	1:C:278:ILE:HD11	1.65	0.60
1:B:9:GLU:HG2	1:B:10:GLN:H	1.66	0.60
1:D:17:LEU:HD22	1:D:178:GLU:HG2	1.82	0.60
1:C:285:MET:HG2	1:C:363:ALA:HB2	1.82	0.60
1:C:302:ARG:NH2	1:C:319:GLU:OE1	2.35	0.60
1:A:285:MET:HB2	1:A:363:ALA:HB2	1.84	0.60
1:D:228:PHE:CE2	1:D:321:GLU:HA	2.37	0.60
1:D:420:ASP:OD2	1:D:422:ARG:NH1	2.35	0.60
1:D:224:ASP:O	1:D:225:GLU:HG3	2.02	0.59
1:A:214:ASN:HA	1:A:217:TYR:CZ	2.37	0.59
1:B:383:ILE:HG13	1:B:385:ARG:HA	1.84	0.59
1:A:256:VAL:HG22	1:A:277:VAL:HG12	1.84	0.59
1:A:410:LYS:HB3	1:A:412:ILE:HD11	1.83	0.59
1:A:67:THR:HG23	1:A:70:SER:HB2	1.85	0.58
1:B:92:GLU:OE2	1:B:342:LYS:HE3	2.02	0.58
1:B:202:ASN:HB2	1:B:204:THR:HG22	1.85	0.58
1:D:58:VAL:HG23	1:D:269:ASP:HB3	1.85	0.58
1:B:69:HIS:HA	1:B:74:PHE:HB2	1.85	0.58
1:C:230:ILE:HD11	1:C:366:ILE:HB	1.84	0.58
1:C:282:THR:HG22	1:C:364:TRP:HH2	1.68	0.58
1:D:384:GLY:N	1:D:385:ARG:HA	2.18	0.58
1:B:179:PHE:HB2	1:B:430:TYR:HD2	1.70	0.57
1:C:150:THR:O	1:C:153:GLU:N	2.38	0.57
1:C:30:ARG:H	1:C:33:THR:HG21	1.68	0.57
1:D:214:ASN:O	1:D:218:ILE:HG13	2.04	0.57
1:A:217:TYR:HH	1:A:413:SER:HG	1.41	0.57
1:A:217:TYR:C	1:A:219:PRO:HD2	2.26	0.57
1:B:233:THR:OG1	1:B:239:ALA:HB2	2.05	0.56
1:C:214:ASN:HA	1:C:217:TYR:CE2	2.40	0.56
1:D:198:ASN:OD1	1:D:201:ARG:NH2	2.38	0.56

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:421:LYS:HG3	1:B:424:VAL:HB	1.87	0.56
1:B:31:ALA:H	1:B:35:LYS:NZ	2.03	0.56
1:C:163:SER:HB2	1:C:168:ASP:OD2	2.05	0.56
1:D:78:ILE:HD13	1:D:86:ILE:HD11	1.86	0.56
1:A:28:VAL:HG11	1:A:142:LEU:HG	1.88	0.56
1:A:39:LEU:HD13	1:A:101:VAL:HG11	1.87	0.56
1:B:228:PHE:HE2	1:B:302:ARG:HB2	1.70	0.56
1:B:302:ARG:NH2	1:B:319:GLU:OE1	2.39	0.56
1:C:307:GLU:HB3	1:C:315:ILE:HB	1.87	0.56
1:D:111:ASP:OD1	1:D:111:ASP:N	2.40	0.55
1:D:295:TRP:NE1	1:D:326:VAL:HG11	2.20	0.55
1:B:2:ILE:HG22	1:B:4:THR:HG22	1.87	0.55
1:A:217:TYR:OH	1:A:413:SER:OG	2.16	0.55
1:A:366:ILE:HD13	1:A:371:SER:HB3	1.87	0.55
1:D:222:GLU:O	1:D:223:PRO:C	2.44	0.55
1:C:377:ASP:HA	1:C:401:ARG:HB2	1.89	0.55
1:D:29:GLY:HA3	1:D:33:THR:OG1	2.06	0.55
1:C:187:ARG:NH1	1:C:375:THR:OG1	2.39	0.55
1:C:69:HIS:HA	1:C:74:PHE:HB2	1.88	0.55
1:D:30:ARG:HH11	1:D:201:ARG:HH21	1.55	0.55
1:D:114:ASP:OD2	1:D:170:ILE:HG12	2.07	0.55
1:A:17:LEU:O	1:A:21:THR:OG1	2.25	0.55
1:D:17:LEU:O	1:D:21:THR:OG1	2.26	0.54
1:B:80:LEU:O	1:B:83:VAL:HG12	2.07	0.54
1:B:162:LYS:HG3	1:B:168:ASP:HB3	1.88	0.54
1:B:216:ARG:NH1	1:B:216:ARG:HB3	2.23	0.54
1:C:3:GLN:CD	1:C:3:GLN:O	2.46	0.54
1:D:120:LEU:HD13	1:D:134:ILE:HD11	1.90	0.54
1:B:90:ASN:O	1:B:93:ILE:HG12	2.08	0.53
1:B:17:LEU:O	1:B:21:THR:OG1	2.26	0.53
1:B:198:ASN:OD1	1:B:201:ARG:NH2	2.42	0.53
1:B:207:GLU:HA	1:B:210:LEU:HB2	1.89	0.53
1:C:265:PHE:HE1	1:C:353:GLY:C	2.11	0.53
1:D:383:ILE:HD11	1:D:410:LYS:HG3	1.90	0.53
1:C:187:ARG:HH22	1:C:375:THR:HG21	1.74	0.53
1:C:238:LEU:O	1:C:242:ILE:HG22	2.09	0.53
1:A:224:ASP:OD1	1:A:225:GLU:N	2.41	0.53
1:D:24:ASN:O	1:D:177:PHE:HA	2.09	0.53
1:A:309:VAL:HG22	1:A:310:LYS:O	2.09	0.53
1:D:214:ASN:HA	1:D:217:TYR:HB2	1.90	0.52
1:B:27:ILE:HA	1:B:180:VAL:O	2.09	0.52

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:145:LEU:HD11	1:C:392:GLN:HG2	1.92	0.52
1:C:210:LEU:O	1:C:213:LEU:HB2	2.10	0.52
1:D:257:TYR:HE2	1:D:278:ILE:HD11	1.74	0.52
1:C:301:GLY:HA2	1:C:320:LEU:HA	1.91	0.52
1:D:179:PHE:CD1	1:D:430:TYR:HB3	2.44	0.52
1:A:217:TYR:CD1	1:A:217:TYR:N	2.72	0.52
1:A:408:LEU:HG	1:A:410:LYS:O	2.09	0.52
1:B:296:ILE:HG22	1:B:299:SER:HB2	1.92	0.52
1:B:330:PRO:HD3	1:B:358:TYR:CZ	2.45	0.52
1:B:379:VAL:HG21	1:B:400:CYS:SG	2.50	0.52
1:C:261:ILE:HG23	1:C:265:PHE:HB2	1.90	0.52
1:D:233:THR:OG1	1:D:239:ALA:HB2	2.10	0.52
1:D:285:MET:HB2	1:D:363:ALA:HB2	1.90	0.52
1:C:368:ILE:HD11	1:C:399:ARG:HG3	1.91	0.52
1:D:286:LEU:HB2	1:D:299:SER:O	2.08	0.52
1:A:410:LYS:HE2	1:A:412:ILE:HD11	1.91	0.51
1:B:234:THR:HG23	1:B:388:PHE:HD2	1.73	0.51
1:D:95:LYS:NZ	1:D:123:HIS:O	2.43	0.51
1:A:412:ILE:HG22	1:A:414:GLU:CD	2.31	0.51
1:A:79:THR:HG23	1:A:82:SER:H	1.76	0.51
1:B:375:THR:HB	1:B:401:ARG:HG3	1.93	0.51
1:A:414:GLU:HG2	1:A:415:LYS:N	2.25	0.51
1:C:219:PRO:HD3	1:C:407:VAL:HG13	1.92	0.51
1:B:165:PHE:HE2	1:B:422:ARG:HE	1.59	0.51
1:A:315:ILE:HG23	1:A:329:GLN:HG2	1.93	0.51
1:B:310:LYS:HG2	1:B:313:GLU:C	2.31	0.51
1:B:229:TYR:O	1:B:283:GLN:NE2	2.35	0.51
1:B:43:ARG:NH2	1:B:64:LYS:O	2.43	0.50
1:B:207:GLU:HA	1:B:210:LEU:HD12	1.93	0.50
1:B:109:ARG:NH2	1:B:111:ASP:OD2	2.36	0.50
1:A:2:ILE:HG13	1:A:3:GLN:H	1.76	0.50
1:A:146:PRO:HB3	1:A:165:PHE:CZ	2.47	0.50
1:C:384:GLY:N	1:C:385:ARG:HA	2.26	0.50
1:B:129:GLU:HG3	1:B:130:PRO:HD3	1.92	0.50
1:C:219:PRO:HB3	1:C:221:PHE:H	1.76	0.50
1:D:124:GLY:HA3	1:D:132:GLY:HA3	1.93	0.50
1:A:207:GLU:HA	1:A:210:LEU:HB3	1.93	0.50
1:B:223:PRO:O	1:B:225:GLU:HA	2.12	0.50
1:A:29:GLY:HA3	1:A:33:THR:OG1	2.11	0.50
1:B:25:VAL:HG12	1:B:178:GLU:HB2	1.94	0.50
1:C:30:ARG:H	1:C:33:THR:CG2	2.25	0.49

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:120:LEU:HD13	1:C:134:ILE:HD11	1.93	0.49
1:C:79:THR:HG23	1:C:82:SER:H	1.76	0.49
1:C:111:ASP:N	1:C:111:ASP:OD1	2.45	0.49
1:B:185:VAL:HG11	1:B:190:ASP:HB2	1.93	0.49
1:B:324:GLU:HG3	1:B:325:GLU:H	1.77	0.49
1:A:143:TYR:HE2	1:A:201:ARG:HD3	1.78	0.49
1:C:380:ILE:HA	1:C:407:VAL:O	2.13	0.49
1:D:90:ASN:O	1:D:93:ILE:HG12	2.12	0.49
1:A:265:PHE:HE1	1:A:353:GLY:C	2.15	0.49
1:C:17:LEU:O	1:C:21:THR:OG1	2.31	0.49
1:A:388:PHE:CE2	1:A:393:LEU:HD13	2.47	0.49
1:B:295:TRP:CD1	1:B:326:VAL:HG11	2.48	0.49
1:C:367:THR:O	1:C:370:LYS:N	2.32	0.49
1:C:420:ASP:OD2	1:C:422:ARG:NH2	2.46	0.49
1:A:14:ALA:HB2	1:A:180:VAL:HG11	1.94	0.48
1:C:191:GLU:O	1:C:195:LYS:HG2	2.13	0.48
1:C:224:ASP:OD1	1:C:225:GLU:N	2.45	0.48
1:B:221:PHE:CD2	1:B:222:GLU:HG2	2.49	0.48
1:A:33:THR:HB	1:A:182:LEU:CB	2.43	0.48
1:A:90:ASN:O	1:A:93:ILE:HG12	2.12	0.48
1:A:414:GLU:OE2	1:A:416:TYR:HE2	1.97	0.48
1:C:93:ILE:CD1	1:C:339:TYR:HA	2.43	0.48
1:C:30:ARG:NH1	1:C:198:ASN:OD1	2.47	0.48
1:A:156:PHE:O	1:A:160:ILE:HG12	2.14	0.48
1:A:218:ILE:HG22	1:A:219:PRO:O	2.13	0.48
1:B:111:ASP:OD1	1:B:111:ASP:N	2.44	0.48
1:B:213:LEU:HD23	1:B:403:LEU:HD21	1.96	0.48
1:B:14:ALA:HB2	1:B:180:VAL:HG11	1.95	0.48
1:D:318:VAL:O	1:D:325:GLU:HA	2.14	0.48
1:B:279:LYS:O	1:B:282:THR:OG1	2.22	0.48
1:C:144:GLN:NE2	1:C:372:GLN:OE1	2.46	0.48
1:A:214:ASN:HD22	1:A:217:TYR:HE2	1.61	0.47
1:B:32:GLY:O	1:B:186:TYR:HB2	2.14	0.47
1:B:390:HIS:O	1:B:390:HIS:ND1	2.47	0.47
1:D:69:HIS:HA	1:D:74:PHE:HB2	1.95	0.47
1:A:329:GLN:HB3	1:A:330:PRO:HD2	1.95	0.47
1:B:79:THR:HG23	1:B:82:SER:H	1.78	0.47
1:D:26:LEU:HD12	1:D:138:LEU:HD12	1.96	0.47
1:A:209:ASP:HA	1:A:212:GLU:HB2	1.96	0.47
1:C:56:THR:HG23	1:C:107:MET:HE3	1.95	0.47
1:C:165:PHE:HE2	1:C:422:ARG:HE	1.62	0.47

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:33:THR:HB	1:A:182:LEU:HB3	1.97	0.47
1:A:284:VAL:HB	1:A:360:LEU:HD22	1.97	0.47
1:C:285:MET:HB2	1:C:361:LYS:HG2	1.95	0.47
1:B:243:ASN:ND2	1:B:365:ALA:O	2.45	0.47
1:C:286:LEU:HB2	1:C:299:SER:O	2.14	0.47
1:C:330:PRO:HD3	1:C:358:TYR:CZ	2.50	0.47
1:D:415:LYS:O	1:D:418:TRP:NE1	2.43	0.47
1:A:261:ILE:HG23	1:A:265:PHE:HB2	1.97	0.47
1:C:381:ILE:HD12	1:C:396:ALA:HB1	1.97	0.47
1:D:308:LYS:HA	1:D:314:ASP:HB2	1.97	0.47
1:D:421:LYS:HG3	1:D:424:VAL:HB	1.97	0.47
1:A:230:ILE:HD11	1:A:366:ILE:HB	1.97	0.47
1:D:107:MET:HA	1:D:147:PRO:HG3	1.97	0.47
1:B:188:GLN:N	1:B:189:LYS:HG3	2.30	0.46
1:B:223:PRO:O	1:B:224:ASP:C	2.53	0.46
1:B:228:PHE:CE2	1:B:302:ARG:HB2	2.49	0.46
1:C:416:TYR:HA	1:C:418:TRP:HD1	1.79	0.46
1:A:111:ASP:OD1	1:A:111:ASP:N	2.47	0.46
1:C:131:PHE:O	1:C:134:ILE:HG12	2.15	0.46
1:C:248:GLU:O	1:C:251:LYS:HG2	2.15	0.46
1:A:53:LEU:HD23	1:A:68:ILE:HG23	1.97	0.46
1:A:94:TYR:H	1:A:97:LEU:HD13	1.80	0.46
1:B:414:GLU:O	1:B:415:LYS:HG3	2.16	0.46
1:C:31:ALA:H	1:C:35:LYS:HZ1	1.58	0.46
1:A:2:ILE:CG1	1:A:3:GLN:H	2.29	0.46
1:C:239:ALA:HB3	1:C:367:THR:HG22	1.98	0.46
1:C:376:PHE:HB2	1:C:379:VAL:HG12	1.98	0.46
1:A:196:LEU:HD21	1:A:213:LEU:HD21	1.98	0.46
1:B:120:LEU:HB3	1:B:131:PHE:O	2.17	0.45
1:B:187:ARG:HB3	1:B:189:LYS:HG2	1.97	0.45
1:D:287:LEU:HD21	1:D:361:LYS:HD3	1.97	0.45
1:A:231:TYR:HB2	1:A:365:ALA:CB	2.47	0.45
1:C:265:PHE:CE1	1:C:353:GLY:C	2.90	0.45
1:D:28:VAL:HG23	1:D:181:GLU:HG3	1.99	0.45
1:A:256:VAL:HG13	1:A:275:GLU:HG3	1.98	0.45
1:C:48:LYS:O	1:C:98:ASP:HB2	2.17	0.45
1:B:228:PHE:CE1	1:B:321:GLU:HA	2.51	0.45
1:C:381:ILE:HB	1:C:408:LEU:HG	1.98	0.45
1:A:216:ARG:HA	1:A:216:ARG:HD3	1.74	0.45
1:C:377:ASP:N	1:C:401:ARG:HE	2.15	0.45
1:A:124:GLY:HA3	1:A:132:GLY:HA3	1.99	0.45

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:125:LYS:O	1:A:127:PRO:HD3	2.17	0.45
1:C:219:PRO:HB3	1:C:221:PHE:N	2.32	0.45
1:C:382:ASP:OD1	1:C:383:ILE:N	2.50	0.45
1:C:403:LEU:HD23	1:C:403:LEU:HA	1.85	0.45
1:A:381:ILE:HB	1:A:408:LEU:CD1	2.46	0.45
1:C:18:MET:HG2	1:C:137:ILE:HD13	1.99	0.45
1:C:286:LEU:HD22	1:C:295:TRP:CD2	2.52	0.45
1:D:283:GLN:HA	1:D:301:GLY:O	2.17	0.45
1:A:330:PRO:HD3	1:A:358:TYR:CE1	2.52	0.45
1:A:376:PHE:HB2	1:A:379:VAL:HG12	1.99	0.45
1:D:186:TYR:O	1:D:188:GLN:HG2	2.18	0.45
1:C:126:GLN:O	1:C:132:GLY:HA2	2.17	0.44
1:A:48:LYS:O	1:A:98:ASP:HB2	2.18	0.44
1:A:54:ALA:O	1:A:68:ILE:HG13	2.17	0.44
1:B:214:ASN:HA	1:B:217:TYR:CD2	2.52	0.44
1:C:283:GLN:O	1:C:362:PRO:HA	2.18	0.44
1:A:28:VAL:HG23	1:A:181:GLU:HG3	1.99	0.44
1:A:165:PHE:HE2	1:A:422:ARG:HE	1.65	0.44
1:A:185:VAL:HG21	1:A:194:ILE:HD13	1.99	0.44
1:D:315:ILE:HG13	1:D:329:GLN:HG2	1.99	0.44
1:A:306:ILE:HG12	1:A:316:ILE:HA	1.99	0.44
1:B:141:ASP:OD2	1:B:144:GLN:NE2	2.50	0.44
1:B:286:LEU:HB2	1:B:299:SER:O	2.18	0.44
1:C:256:VAL:HG22	1:C:277:VAL:HG12	2.00	0.44
1:A:320:LEU:H	1:A:324:GLU:H	1.65	0.44
1:B:9:GLU:OE1	1:B:9:GLU:N	2.44	0.44
1:B:206:GLU:O	1:B:209:ASP:N	2.51	0.44
1:B:329:GLN:HB3	1:B:330:PRO:HD2	2.00	0.44
1:C:125:LYS:HE3	1:C:134:ILE:HG22	1.99	0.44
1:D:383:ILE:HG22	1:D:386:GLY:H	1.82	0.44
1:A:9:GLU:HG2	1:A:10:GLN:N	2.32	0.44
1:A:309:VAL:HG21	1:A:313:GLU:C	2.37	0.44
1:B:201:ARG:HB2	1:B:394:TYR:OH	2.18	0.44
1:D:17:LEU:HD13	1:D:178:GLU:HB3	1.99	0.44
1:A:126:GLN:NE2	1:A:129:GLU:OE1	2.46	0.44
1:D:208:LYS:O	1:D:211:GLU:HG3	2.17	0.44
1:D:303:VAL:HA	1:D:318:VAL:HA	1.98	0.44
1:A:286:LEU:HG	1:A:360:LEU:HD21	1.99	0.44
1:A:315:ILE:HG21	1:A:327:PRO:HB2	1.99	0.44
1:B:181:GLU:OE1	1:B:431:GLN:NE2	2.42	0.44
1:B:190:ASP:HB3	1:B:194:ILE:HG12	1.99	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:231:TYR:HE2	1:B:409:LYS:HZ3	1.66	0.44
1:B:415:LYS:HB3	1:B:418:TRP:HE1	1.83	0.44
1:B:8:ASN:ND2	1:B:11:PHE:HB2	2.33	0.43
1:B:9:GLU:HG2	1:B:10:GLN:N	2.31	0.43
1:B:393:LEU:HB3	1:B:417:ILE:HA	1.99	0.43
1:A:309:VAL:HG21	1:A:312:ASN:O	2.18	0.43
1:B:285:MET:HB2	1:B:363:ALA:HB2	2.00	0.43
1:C:99:ALA:HA	1:C:135:GLN:O	2.18	0.43
1:A:184:LYS:HB3	1:A:186:TYR:CE1	2.54	0.43
1:D:391:GLY:HA3	1:D:420:ASP:HB2	2.00	0.43
1:C:30:ARG:N	1:C:33:THR:HG21	2.32	0.43
1:C:50:ILE:HG22	1:C:99:ALA:HB3	1.99	0.43
1:C:156:PHE:O	1:C:160:ILE:HG12	2.19	0.43
1:C:209:ASP:HA	1:C:212:GLU:HB2	2.01	0.43
1:C:372:GLN:HA	1:C:399:ARG:NH2	2.34	0.43
1:D:30:ARG:NH1	1:D:201:ARG:HH21	2.17	0.43
1:D:217:TYR:C	1:D:219:PRO:HD3	2.38	0.43
1:D:221:PHE:O	1:D:221:PHE:CG	2.70	0.43
1:A:414:GLU:HG2	1:A:415:LYS:H	1.84	0.43
1:C:383:ILE:H	1:C:383:ILE:HG13	1.64	0.43
1:A:78:ILE:HD13	1:A:78:ILE:HA	1.89	0.43
1:A:381:ILE:HB	1:A:408:LEU:HD12	2.00	0.43
1:A:28:VAL:O	1:A:182:LEU:N	2.44	0.43
1:B:222:GLU:HA	1:B:223:PRO:HD3	1.71	0.43
1:C:2:ILE:HD11	1:C:4:THR:CG2	2.46	0.43
1:C:341:ASP:HB2	1:C:348:LYS:HE2	2.01	0.42
1:B:234:THR:CG2	1:B:388:PHE:HD2	2.32	0.42
1:B:240:ASP:O	1:B:244:GLN:HG2	2.18	0.42
1:D:3:GLN:HG3	1:D:7:PHE:HE1	1.84	0.42
1:D:120:LEU:HB2	1:D:131:PHE:HA	2.01	0.42
1:D:125:LYS:O	1:D:127:PRO:HD3	2.18	0.42
1:C:218:ILE:N	1:C:219:PRO:HD2	2.34	0.42
1:C:285:MET:HB3	1:C:287:LEU:HG	2.01	0.42
1:A:323:GLY:HA3	1:A:324:GLU:HA	1.79	0.42
1:B:287:LEU:HD21	1:B:361:LYS:CE	2.49	0.42
1:B:308:LYS:HA	1:B:314:ASP:HB2	2.01	0.42
1:C:55:PRO:HD3	1:C:103:ASP:O	2.19	0.42
1:C:206:GLU:O	1:C:209:ASP:N	2.40	0.42
1:D:28:VAL:O	1:D:182:LEU:N	2.48	0.42
1:D:189:LYS:HA	1:D:191:GLU:OE2	2.19	0.42
1:D:231:TYR:HB2	1:D:365:ALA:HB2	2.01	0.42

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:127:PRO:HA	1:B:132:GLY:HA2	2.01	0.42
1:D:255:TYR:HB2	1:D:278:ILE:HG13	1.99	0.42
1:A:78:ILE:HD11	1:A:86:ILE:HD11	2.01	0.42
1:B:296:ILE:HG12	1:B:297:ASN:H	1.84	0.42
1:B:394:TYR:HB2	1:B:417:ILE:O	2.20	0.42
1:D:393:LEU:HD12	1:D:393:LEU:HA	1.84	0.42
1:A:80:LEU:HD11	1:A:118:GLU:HG3	2.02	0.42
1:A:309:VAL:HG13	1:A:310:LYS:O	2.20	0.42
1:B:31:ALA:H	1:B:35:LYS:HZ1	1.67	0.42
1:B:238:LEU:O	1:B:242:ILE:HG13	2.20	0.42
1:B:375:THR:HA	1:B:399:ARG:O	2.20	0.42
1:D:217:TYR:O	1:D:219:PRO:HD3	2.20	0.42
1:D:240:ASP:O	1:D:244:GLN:HG2	2.19	0.42
1:C:196:LEU:O	1:C:200:ILE:HG13	2.19	0.42
1:B:231:TYR:HD1	1:B:364:TRP:O	2.03	0.41
1:C:53:LEU:HD23	1:C:68:ILE:HG12	2.02	0.41
1:D:78:ILE:HD12	1:D:82:SER:OG	2.20	0.41
1:D:131:PHE:O	1:D:134:ILE:HG12	2.19	0.41
1:D:163:SER:HB2	1:D:168:ASP:OD2	2.19	0.41
1:D:256:VAL:HA	1:D:276:LEU:O	2.20	0.41
1:D:329:GLN:HB3	1:D:330:PRO:HD2	2.02	0.41
1:A:186:TYR:HB2	2:A:601:ADP:C8	2.55	0.41
1:C:52:VAL:HG12	1:C:63:ILE:HD12	2.02	0.41
1:C:239:ALA:O	1:C:243:ASN:ND2	2.53	0.41
1:D:26:LEU:HD11	1:D:166:PHE:CE2	2.55	0.41
1:D:145:LEU:HD23	1:D:145:LEU:HA	1.85	0.41
1:A:309:VAL:HG12	1:B:310:LYS:HD2	2.02	0.41
1:A:322:ASP:O	1:A:324:GLU:HB2	2.20	0.41
1:B:295:TRP:NE1	1:B:326:VAL:HG11	2.35	0.41
1:C:20:ASN:ND2	1:C:21:THR:HG23	2.35	0.41
1:C:275:GLU:HG2	1:C:277:VAL:HG13	2.02	0.41
1:C:277:VAL:HG23	1:C:277:VAL:O	2.21	0.41
1:D:8:ASN:ND2	1:D:10:GLN:H	2.19	0.41
1:D:231:TYR:HB2	1:D:365:ALA:CB	2.50	0.41
1:A:53:LEU:HD21	1:A:71:PHE:CD2	2.55	0.41
1:A:163:SER:OG	1:A:422:ARG:HD2	2.19	0.41
1:C:74:PHE:CG	1:C:78:ILE:HD13	2.55	0.41
1:D:243:ASN:OD1	1:D:365:ALA:N	2.50	0.41
1:B:187:ARG:HA	1:B:189:LYS:H	1.86	0.41
1:D:372:GLN:HG2	1:D:399:ARG:NH2	2.36	0.41
1:B:306:ILE:HG13	1:B:315:ILE:O	2.21	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:95:LYS:NZ	1:C:125:LYS:HA	2.36	0.41
1:C:118:GLU:O	1:C:122:ILE:HG12	2.21	0.41
1:B:30:ARG:HE	1:B:197:LEU:HD23	1.85	0.41
1:B:194:ILE:HD13	1:B:194:ILE:HA	1.88	0.41
1:B:234:THR:HG23	1:B:388:PHE:CD2	2.53	0.41
1:B:286:LEU:HD23	1:B:286:LEU:HA	1.86	0.41
1:A:403:LEU:HD23	1:A:403:LEU:HA	1.88	0.41
1:B:420:ASP:O	1:B:422:ARG:N	2.54	0.41
1:A:8:ASN:ND2	1:A:186:TYR:OH	2.54	0.41
1:A:197:LEU:HD12	1:A:197:LEU:HA	1.91	0.41
1:B:193:PHE:CZ	1:B:400:CYS:HB2	2.56	0.41
1:B:234:THR:HG22	1:B:392:GLN:NE2	2.36	0.41
1:C:80:LEU:O	1:C:83:VAL:HG12	2.21	0.41
1:A:30:ARG:NH2	1:A:198:ASN:OD1	2.53	0.41
1:B:163:SER:HB3	1:B:422:ARG:HD2	2.03	0.41
1:B:287:LEU:HD11	1:B:361:LYS:HG2	2.02	0.41
1:C:279:LYS:H	1:C:282:THR:HG21	1.86	0.41
1:C:393:LEU:HD12	1:C:393:LEU:HA	1.88	0.41
1:D:330:PRO:HA	1:D:358:TYR:HA	2.03	0.41
1:D:381:ILE:HB	1:D:408:LEU:HD12	2.03	0.41
1:B:91:LYS:H	1:B:91:LYS:HG3	1.71	0.40
1:B:226:LYS:HD2	1:B:226:LYS:N	2.24	0.40
1:B:103:ASP:OD1	1:B:104:GLU:N	2.52	0.40
1:D:50:ILE:HG22	1:D:99:ALA:HB3	2.03	0.40

There are no symmetry-related clashes.

5.3 Torsion angles [i](#)

5.3.1 Protein backbone [i](#)

In the following table, the Percentiles column shows the percent Ramachandran outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the backbone conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
1	A	431/517 (83%)	428 (99%)	0	3 (1%)	22 58

Continued on next page...

Continued from previous page...

Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
1	B	431/517 (83%)	429 (100%)	1 (0%)	1 (0%)	47	78
1	C	431/517 (83%)	426 (99%)	2 (0%)	3 (1%)	22	58
1	D	431/517 (83%)	429 (100%)	1 (0%)	1 (0%)	47	78
All	All	1724/2068 (83%)	1712 (99%)	4 (0%)	8 (0%)	29	64

All (8) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	219	PRO
1	A	221	PHE
1	A	223	PRO
1	C	219	PRO
1	C	223	PRO
1	D	222	GLU
1	C	221	PHE
1	B	222	GLU

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all X-ray entries followed by that with respect to entries of similar resolution.

The Analysed column shows the number of residues for which the sidechain conformation was analysed, and the total number of residues.

Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
1	A	392/470 (83%)	390 (100%)	2 (0%)	88	94
1	B	392/470 (83%)	389 (99%)	3 (1%)	81	91
1	C	392/470 (83%)	391 (100%)	1 (0%)	92	96
1	D	392/470 (83%)	389 (99%)	3 (1%)	81	91
All	All	1568/1880 (83%)	1559 (99%)	9 (1%)	86	93

All (9) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	217	TYR
1	A	377	ASP
1	B	216	ARG

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	B	295	TRP
1	B	322	ASP
1	C	295	TRP
1	D	1	MET
1	D	295	TRP
1	D	408	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. There are no such sidechains identified.

5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

5.6 Ligand geometry [i](#)

4 ligands are modelled in this entry.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with $|Z| > 2$ is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z > 2	Counts	RMSZ	# Z > 2
2	ADP	B	601	-	24,29,29	1.02	1 (4%)	29,45,45	1.47	4 (13%)
2	ADP	A	601	-	24,29,29	0.97	1 (4%)	29,45,45	1.51	4 (13%)
2	ADP	D	601	-	24,29,29	0.93	1 (4%)	29,45,45	1.51	5 (17%)
2	ADP	C	601	-	24,29,29	0.95	1 (4%)	29,45,45	1.56	4 (13%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
2	ADP	B	601	-	-	0/12/32/32	0/3/3/3
2	ADP	A	601	-	-	3/12/32/32	0/3/3/3
2	ADP	D	601	-	-	3/12/32/32	0/3/3/3
2	ADP	C	601	-	-	3/12/32/32	0/3/3/3

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	601	ADP	C5-C4	2.53	1.47	1.40
2	B	601	ADP	C5-C4	2.52	1.47	1.40
2	C	601	ADP	C5-C4	2.45	1.47	1.40
2	D	601	ADP	C5-C4	2.40	1.47	1.40

All (17) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	C	601	ADP	PA-O3A-PB	-4.11	118.71	132.83
2	D	601	ADP	PA-O3A-PB	-4.00	119.10	132.83
2	B	601	ADP	C3'-C2'-C1'	3.85	106.78	100.98
2	A	601	ADP	PA-O3A-PB	-3.83	119.67	132.83
2	C	601	ADP	C4-C5-N7	-3.22	106.04	109.40
2	C	601	ADP	C3'-C2'-C1'	3.19	105.78	100.98
2	A	601	ADP	N3-C2-N1	-3.10	123.84	128.68
2	D	601	ADP	C3'-C2'-C1'	3.05	105.57	100.98
2	D	601	ADP	N3-C2-N1	-3.03	123.94	128.68
2	A	601	ADP	C4-C5-N7	-2.98	106.29	109.40
2	B	601	ADP	N3-C2-N1	-2.98	124.02	128.68
2	C	601	ADP	N3-C2-N1	-2.98	124.03	128.68
2	A	601	ADP	C3'-C2'-C1'	2.89	105.33	100.98
2	B	601	ADP	C4-C5-N7	-2.75	106.53	109.40
2	D	601	ADP	C4-C5-N7	-2.75	106.53	109.40
2	B	601	ADP	PA-O3A-PB	-2.48	124.33	132.83
2	D	601	ADP	O3B-PB-O2B	2.03	115.41	107.64

There are no chirality outliers.

All (9) torsion outliers are listed below:

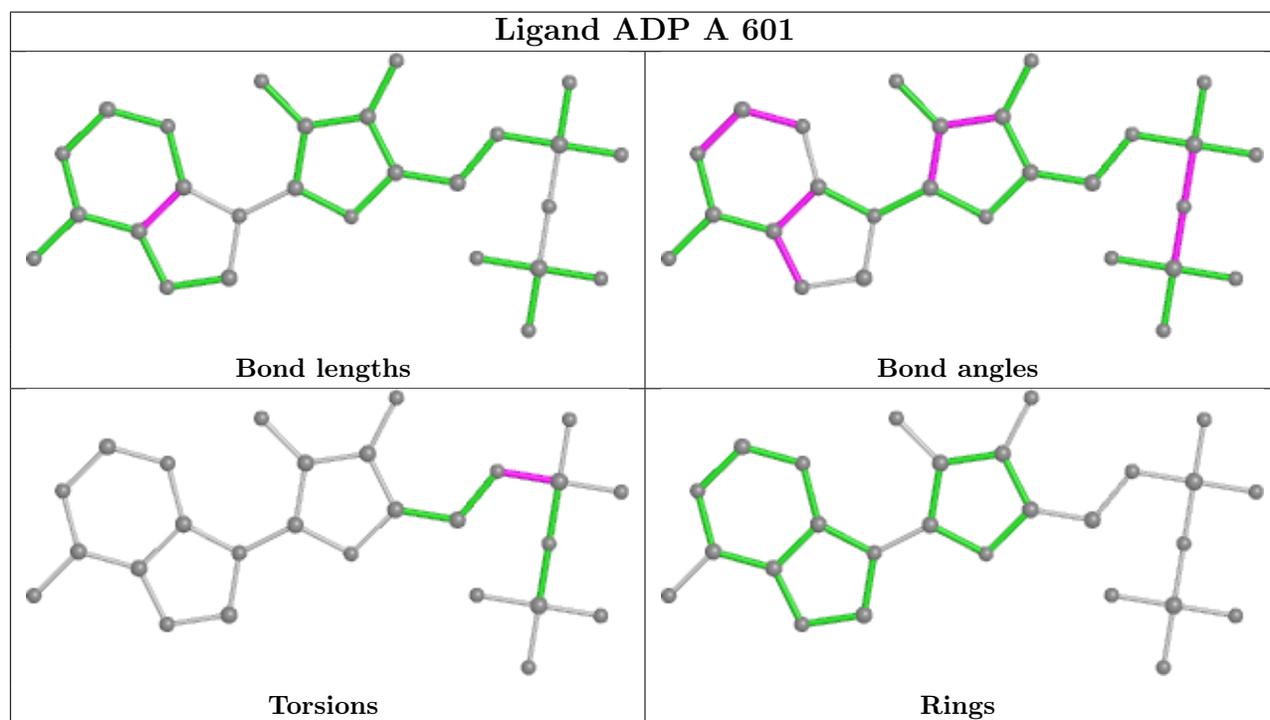
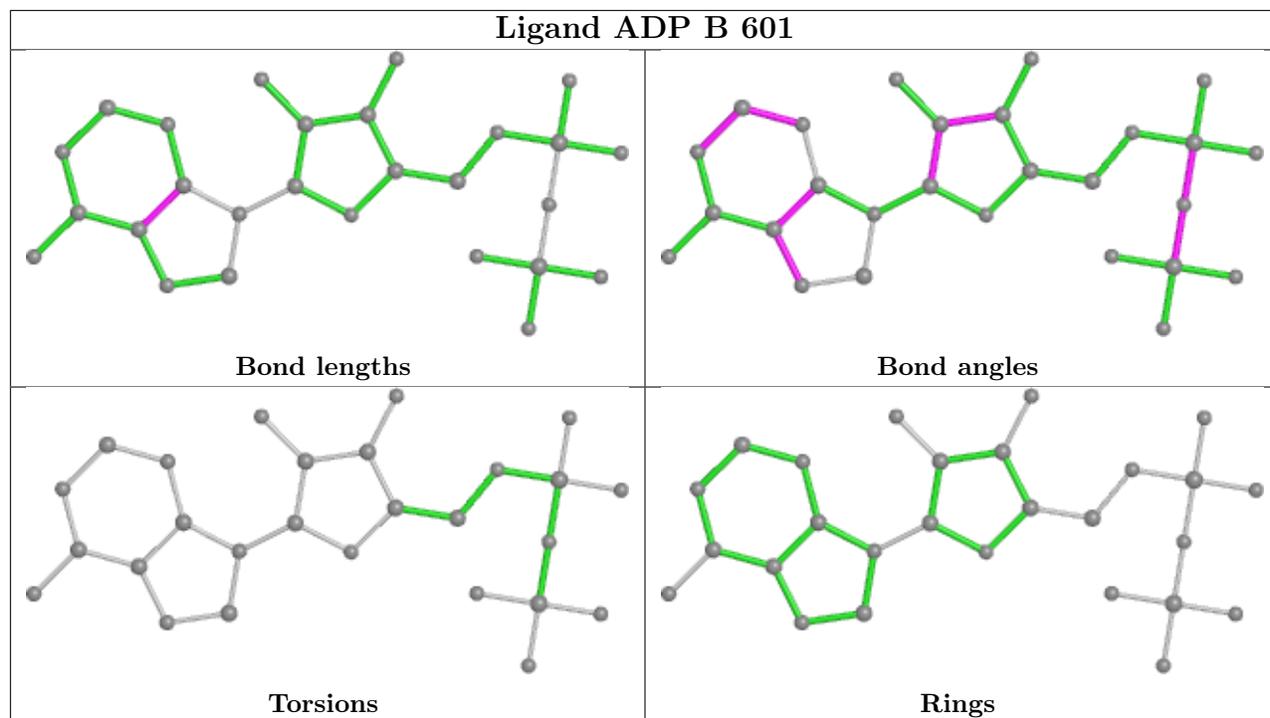
Mol	Chain	Res	Type	Atoms
2	A	601	ADP	C5'-O5'-PA-O2A
2	C	601	ADP	C5'-O5'-PA-O2A
2	D	601	ADP	C5'-O5'-PA-O1A
2	A	601	ADP	C5'-O5'-PA-O3A
2	C	601	ADP	C5'-O5'-PA-O3A
2	D	601	ADP	C5'-O5'-PA-O3A
2	A	601	ADP	C5'-O5'-PA-O1A
2	C	601	ADP	C5'-O5'-PA-O1A
2	D	601	ADP	C5'-O5'-PA-O2A

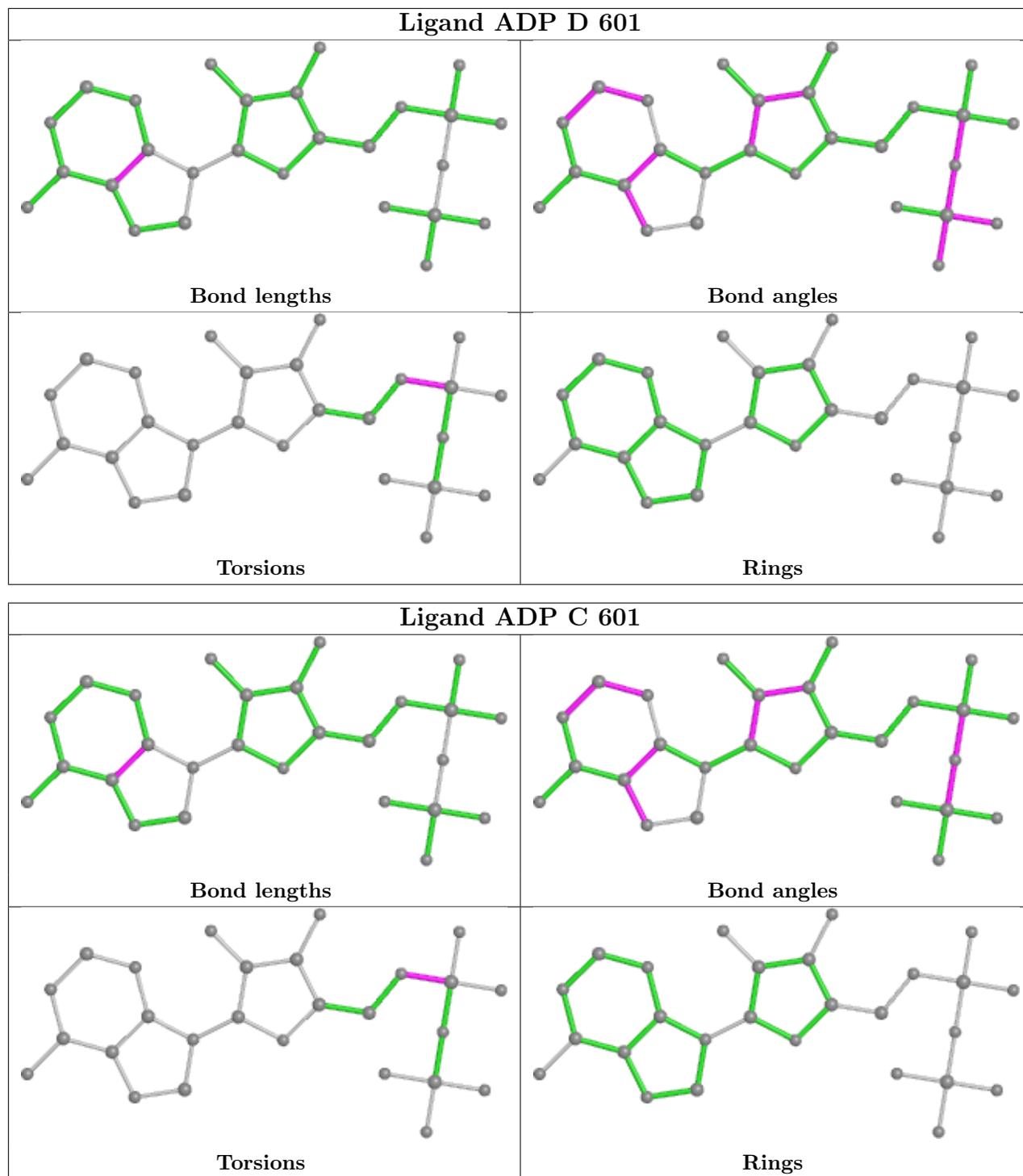
There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	601	ADP	1	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.





5.7 Other polymers [\(i\)](#)

There are no such residues in this entry.

5.8 Polymer linkage issues

There are no chain breaks in this entry.

6 Fit of model and data

6.1 Protein, DNA and RNA chains

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95th percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å ²)	Q<0.9
1	A	433/517 (83%)	0.12	4 (0%) 84 78	62, 96, 145, 199	0
1	B	433/517 (83%)	0.11	3 (0%) 87 83	53, 91, 139, 183	0
1	C	433/517 (83%)	0.27	7 (1%) 72 63	56, 104, 149, 171	0
1	D	433/517 (83%)	0.33	12 (2%) 53 41	59, 104, 158, 197	0
All	All	1732/2068 (83%)	0.21	26 (1%) 73 64	53, 99, 149, 199	0

All (26) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	D	413	SER	6.8
1	B	412	ILE	5.7
1	A	386	GLY	5.5
1	C	367	THR	3.6
1	D	229	TYR	3.3
1	D	217	TYR	3.0
1	B	291	TYR	3.0
1	C	413	SER	3.0
1	A	227	GLU	2.9
1	D	220	ASP	2.8
1	C	414	GLU	2.7
1	D	218	ILE	2.7
1	D	409	LYS	2.5
1	A	83	VAL	2.4
1	B	232	LEU	2.4
1	C	187	ARG	2.4
1	D	187	ARG	2.4
1	D	205	ILE	2.3
1	D	5	VAL	2.3
1	C	388	PHE	2.2
1	D	412	ILE	2.2

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	D	179	PHE	2.2
1	C	285	MET	2.1
1	C	387	THR	2.1
1	A	96	LYS	2.1
1	D	164	PRO	2.1

6.2 Non-standard residues in protein, DNA, RNA chains [i](#)

There are no non-standard protein/DNA/RNA residues in this entry.

6.3 Carbohydrates [i](#)

There are no monosaccharides in this entry.

6.4 Ligands [i](#)

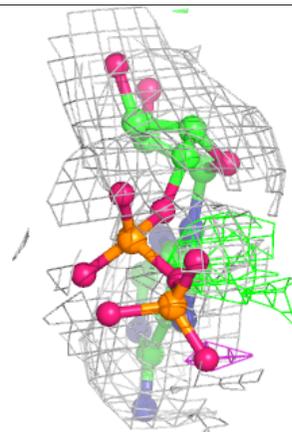
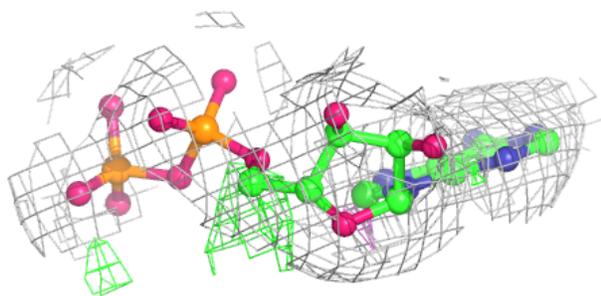
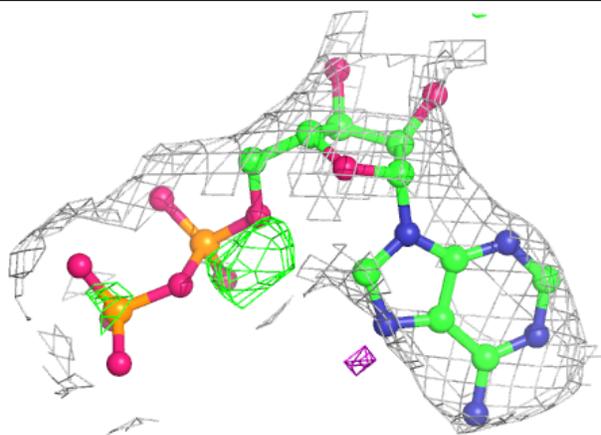
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
2	ADP	C	601	27/27	0.94	0.23	64,91,102,105	0
2	ADP	A	601	27/27	0.95	0.23	58,86,100,105	0
2	ADP	D	601	27/27	0.95	0.22	69,101,109,118	0
2	ADP	B	601	27/27	0.96	0.25	44,82,91,111	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.

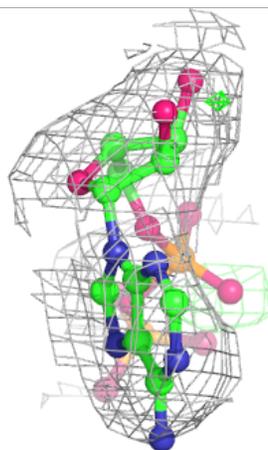
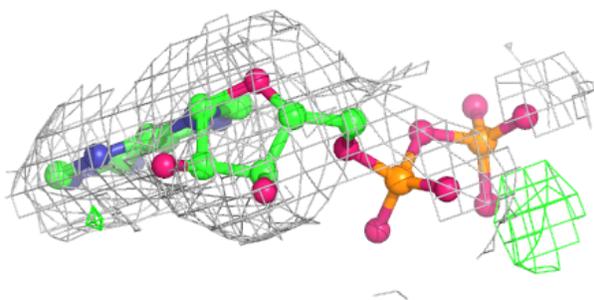
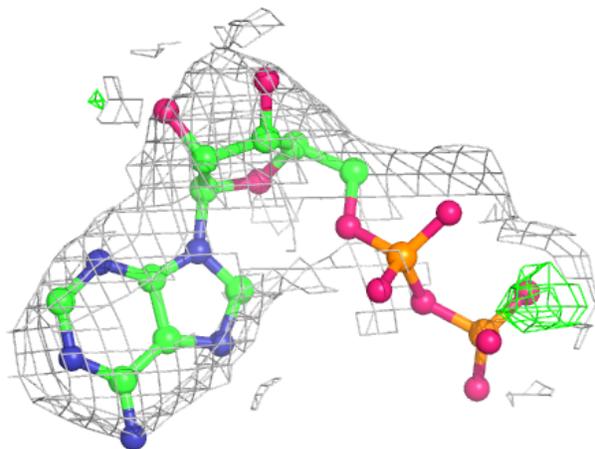
Electron density around ADP C 601:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



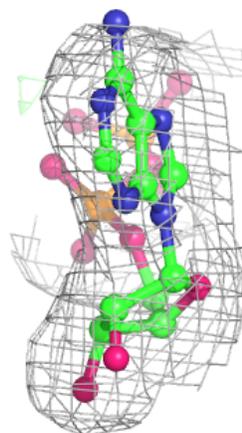
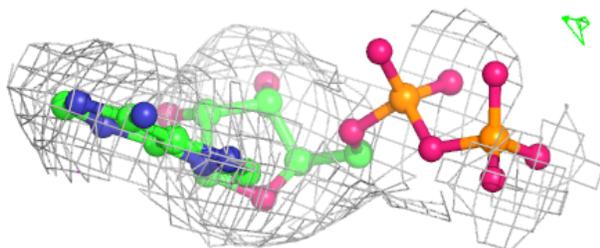
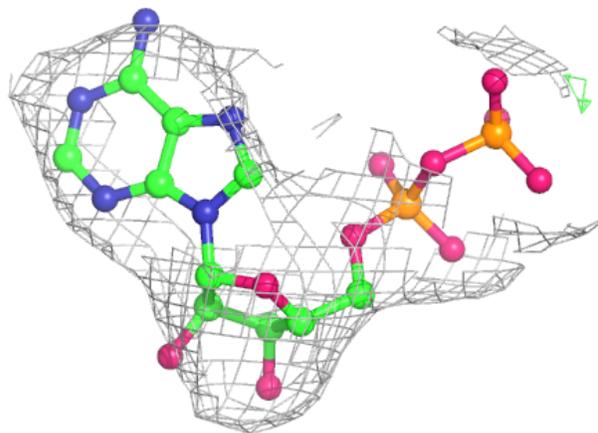
Electron density around ADP A 601:

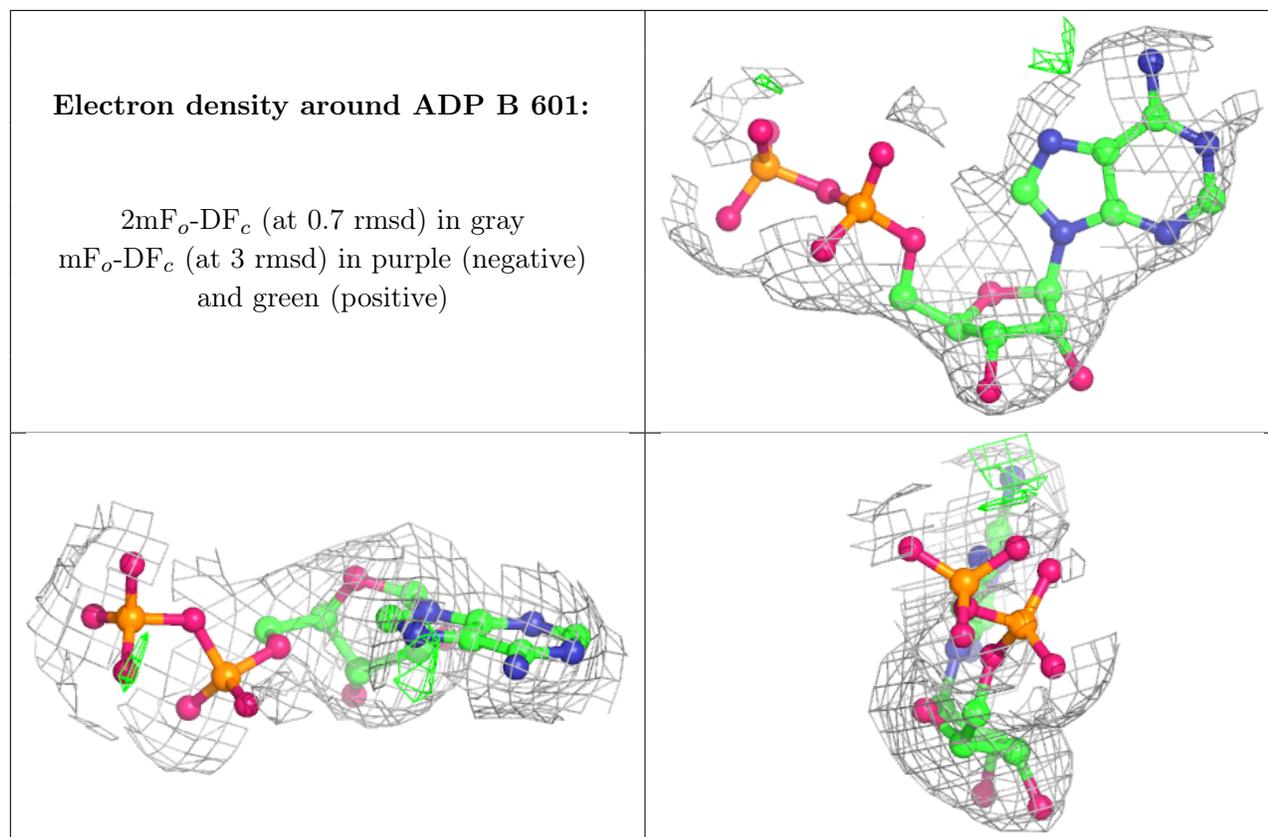
$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)



Electron density around ADP D 601:

$2mF_o-DF_c$ (at 0.7 rmsd) in gray
 mF_o-DF_c (at 3 rmsd) in purple (negative)
and green (positive)





6.5 Other polymers [i](#)

There are no such residues in this entry.