WORLDWIDE wwPDB PROTEIN DATA BANK

Full wwPDB X-ray Structure Validation Report (i)

Jan 6, 2025 – 02:25 PM JST

PDB ID	:	8XRZ
Title	:	Crystal structure of a novel PU plastic degradation enzyme with ligand from Thermaerobacter marianensis
Authors	:	Li, Z.S.; Wang, H.; Zheng, Z.R.; Cong, L.; Chen, Y.Y.; Han, X.; Wei, R.; Uwe, B.; liu, W.D.
Deposited on	:	2024-01-08
Resolution	:	2.11 Å(reported)

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

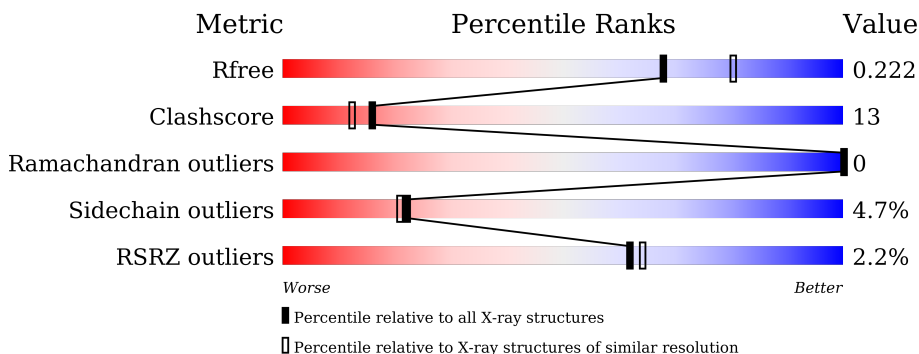|		
MolProbity	:	4.02b-467
Mogul	:	1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix)	:	1.21
EDS	:	3.0
buster-report	:	1.1.7 (2018)
Percentile statistics	:	20231227.v01 (using entries in the PDB archive December 27th 2023)
CCP4	:	9.0.004 (Gargrove)
Density-Fitness	:	1.0.11
Ideal geometry (proteins)	:	Engh & Huber (2001)
Ideal geometry (DNA, RNA)	:	Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP)	:	2.40

1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:
X-RAY DIFFRACTION

The reported resolution of this entry is 2.11 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	Percentile Ranks	Value
Rfree		0.222
Clashscore		13
Ramachandran outliers		0
Sidechain outliers		4.7%
RSRZ outliers		2.2%

Worse *Better*

▌Percentile relative to all X-ray structures

▯Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	164625	7689 (2.14-2.10)
Clashscore	180529	8431 (2.14-2.10)
Ramachandran outliers	177936	8366 (2.14-2.10)
Sidechain outliers	177891	8367 (2.14-2.10)
RSRZ outliers	164620	7689 (2.14-2.10)

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 <=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	527	.% 66% 27% · 6%
1	B	527	2% 65% 29% · 6%
1	C	527	4% 67% 25% · 6%
1	D	527	2% 66% 27% · 6%

2 Entry composition ⓘ

There are 4 unique types of molecules in this entry. The entry contains 15514 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 Carboxylic ester hydrolase.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	494	Total	C	N	O	S	0	0	0
			3748	2382	686	671	9			
1	B	498	Total	C	N	O	S	0	0	0
			3772	2396	690	677	9			
1	C	493	Total	C	N	O	S	0	0	0
			3740	2376	685	670	9			
1	D	495	Total	C	N	O	S	0	0	0
			3757	2387	687	674	9			

There are 96 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-6	MET	-	initiating methionine	UNP E6SHQ4
A	-5	HIS	-	expression tag	UNP E6SHQ4
A	-4	HIS	-	expression tag	UNP E6SHQ4
A	-3	HIS	-	expression tag	UNP E6SHQ4
A	-2	HIS	-	expression tag	UNP E6SHQ4
A	-1	HIS	-	expression tag	UNP E6SHQ4
A	0	HIS	-	expression tag	UNP E6SHQ4
A	1	GLU	-	expression tag	UNP E6SHQ4
A	2	ASN	-	expression tag	UNP E6SHQ4
A	3	LEU	-	expression tag	UNP E6SHQ4
A	4	TYR	-	expression tag	UNP E6SHQ4
A	5	PHE	-	expression tag	UNP E6SHQ4
A	6	GLN	-	expression tag	UNP E6SHQ4
A	7	GLY	-	expression tag	UNP E6SHQ4
A	8	ALA	-	expression tag	UNP E6SHQ4
A	9	GLY	-	expression tag	UNP E6SHQ4
A	10	ALA	-	expression tag	UNP E6SHQ4
A	11	GLY	-	expression tag	UNP E6SHQ4
A	12	ALA	-	expression tag	UNP E6SHQ4
A	13	GLY	-	expression tag	UNP E6SHQ4
A	14	ALA	-	expression tag	UNP E6SHQ4

Continued on next page...

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
A	15	GLY	-	expression tag	UNP E6SHQ4
A	16	ALA	-	expression tag	UNP E6SHQ4
A	215	ALA	SER	engineered mutation	UNP E6SHQ4
B	-6	MET	-	initiating methionine	UNP E6SHQ4
B	-5	HIS	-	expression tag	UNP E6SHQ4
B	-4	HIS	-	expression tag	UNP E6SHQ4
B	-3	HIS	-	expression tag	UNP E6SHQ4
B	-2	HIS	-	expression tag	UNP E6SHQ4
B	-1	HIS	-	expression tag	UNP E6SHQ4
B	0	HIS	-	expression tag	UNP E6SHQ4
B	1	GLU	-	expression tag	UNP E6SHQ4
B	2	ASN	-	expression tag	UNP E6SHQ4
B	3	LEU	-	expression tag	UNP E6SHQ4
B	4	TYR	-	expression tag	UNP E6SHQ4
B	5	PHE	-	expression tag	UNP E6SHQ4
B	6	GLN	-	expression tag	UNP E6SHQ4
B	7	GLY	-	expression tag	UNP E6SHQ4
B	8	ALA	-	expression tag	UNP E6SHQ4
B	9	GLY	-	expression tag	UNP E6SHQ4
B	10	ALA	-	expression tag	UNP E6SHQ4
B	11	GLY	-	expression tag	UNP E6SHQ4
B	12	ALA	-	expression tag	UNP E6SHQ4
B	13	GLY	-	expression tag	UNP E6SHQ4
B	14	ALA	-	expression tag	UNP E6SHQ4
B	15	GLY	-	expression tag	UNP E6SHQ4
B	16	ALA	-	expression tag	UNP E6SHQ4
B	215	ALA	SER	engineered mutation	UNP E6SHQ4
C	-6	MET	-	initiating methionine	UNP E6SHQ4
C	-5	HIS	-	expression tag	UNP E6SHQ4
C	-4	HIS	-	expression tag	UNP E6SHQ4
C	-3	HIS	-	expression tag	UNP E6SHQ4
C	-2	HIS	-	expression tag	UNP E6SHQ4
C	-1	HIS	-	expression tag	UNP E6SHQ4
C	0	HIS	-	expression tag	UNP E6SHQ4
C	1	GLU	-	expression tag	UNP E6SHQ4
C	2	ASN	-	expression tag	UNP E6SHQ4
C	3	LEU	-	expression tag	UNP E6SHQ4
C	4	TYR	-	expression tag	UNP E6SHQ4
C	5	PHE	-	expression tag	UNP E6SHQ4
C	6	GLN	-	expression tag	UNP E6SHQ4
C	7	GLY	-	expression tag	UNP E6SHQ4
C	8	ALA	-	expression tag	UNP E6SHQ4

Continued from previous page...

Chain	Residue	Modelled	Actual	Comment	Reference
C	9	GLY	-	expression tag	UNP E6SHQ4
C	10	ALA	-	expression tag	UNP E6SHQ4
C	11	GLY	-	expression tag	UNP E6SHQ4
C	12	ALA	-	expression tag	UNP E6SHQ4
C	13	GLY	-	expression tag	UNP E6SHQ4
C	14	ALA	-	expression tag	UNP E6SHQ4
C	15	GLY	-	expression tag	UNP E6SHQ4
C	16	ALA	-	expression tag	UNP E6SHQ4
C	215	ALA	SER	engineered mutation	UNP E6SHQ4
D	-6	MET	-	initiating methionine	UNP E6SHQ4
D	-5	HIS	-	expression tag	UNP E6SHQ4
D	-4	HIS	-	expression tag	UNP E6SHQ4
D	-3	HIS	-	expression tag	UNP E6SHQ4
D	-2	HIS	-	expression tag	UNP E6SHQ4
D	-1	HIS	-	expression tag	UNP E6SHQ4
D	0	HIS	-	expression tag	UNP E6SHQ4
D	1	GLU	-	expression tag	UNP E6SHQ4
D	2	ASN	-	expression tag	UNP E6SHQ4
D	3	LEU	-	expression tag	UNP E6SHQ4
D	4	TYR	-	expression tag	UNP E6SHQ4
D	5	PHE	-	expression tag	UNP E6SHQ4
D	6	GLN	-	expression tag	UNP E6SHQ4
D	7	GLY	-	expression tag	UNP E6SHQ4
D	8	ALA	-	expression tag	UNP E6SHQ4
D	9	GLY	-	expression tag	UNP E6SHQ4
D	10	ALA	-	expression tag	UNP E6SHQ4
D	11	GLY	-	expression tag	UNP E6SHQ4
D	12	ALA	-	expression tag	UNP E6SHQ4
D	13	GLY	-	expression tag	UNP E6SHQ4
D	14	ALA	-	expression tag	UNP E6SHQ4
D	15	GLY	-	expression tag	UNP E6SHQ4
D	16	ALA	-	expression tag	UNP E6SHQ4
D	215	ALA	SER	engineered mutation	UNP E6SHQ4

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O_4S).

SO4

O1

O

O3 O⁻ —— S —— O⁻ O4

S

O

O2
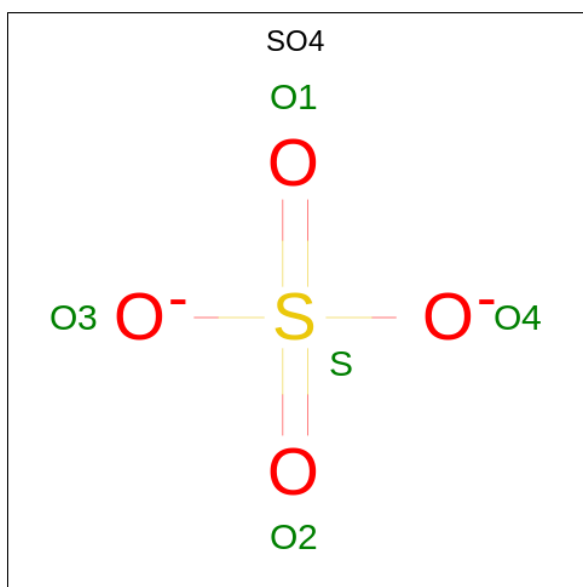
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
2	A	1	Total	O	S	0	0
			5	4	1		

- Molecule 3 is 4-oxidanylbutyl {N}-[4-[(4-aminophenyl)methyl]phenyl]carbamate (three-letter code: A1D5F) (formula: $C_{18}H_{22}N_2O_3$) (labeled as "Ligand of Interest" by depositor).

A1D5F

C05
NO1
C06　　NH₂
C02
C08　C07　C03
C04
C09
C10　C23
C11　C22
C12
O21 O　NH
C14　N13
C16　O15
C18　C17
HO　C19
O20
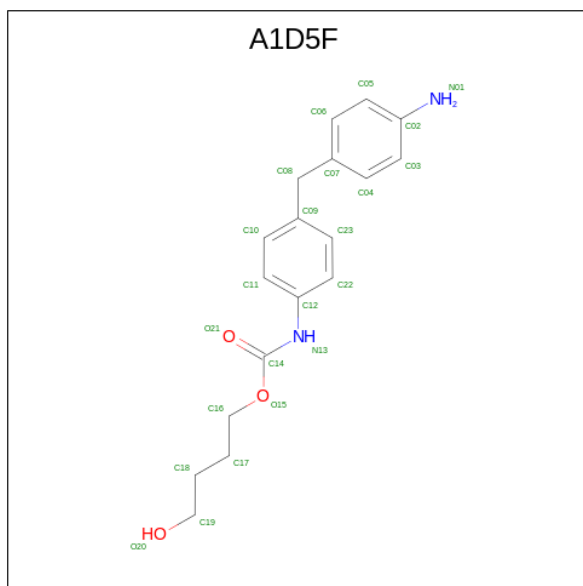
Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
3	C	1	Total	C	N	O	0	0
			23	18	2	3		

- Molecule 4 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	122	Total 122	O 122	0	0
4	B	115	Total 115	O 115	0	0
4	C	110	Total 110	O 110	0	0
4	D	122	Total 122	O 122	0	0

3 Residue-property plots ⓘ

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geomet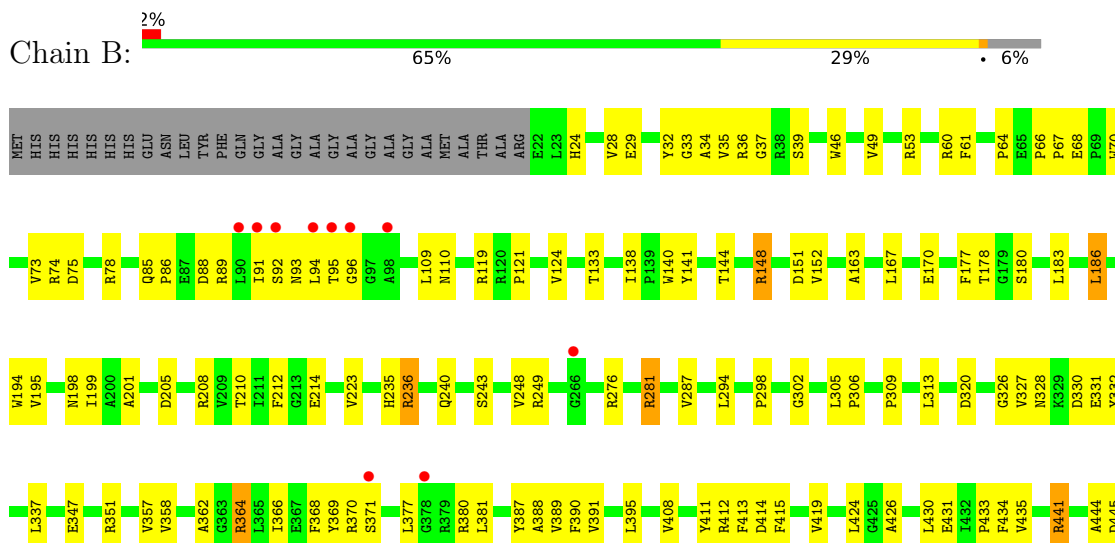ry and electron density. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. A red dot above a residue indicates a poor fit to the electron density (RSRZ > 2). Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

• Molecule 1: Carboxylic ester hydrolase

• Molecule 1: Carboxylic ester hydrolase

R446 G449 T450 V457 A460 M461 H462 R463 A464 W465 R470 P474 Q475 H476 D477 G478 L479 E488 E489 M493 V494 F495 E498 E502 R503 D504 P505 W506 R507 A508 E509 R510 E511 V512 W513 A516 G519 ALA

• Molecule 1: Carboxylic ester hydrolase

Chain C:

4%

67%   25%   • 6%

MET HIS HIS HIS HIS HIS GLU ASN LEU TYR PHE GLN GLY ALA GLY ALA ALA GLY ALA ALA GLY ALA MET ALA THR ALA ARG GLU L23 V28 V35 R38 W46 V49 R53 P54 P55 V56 R60 E68 A76 P81 A82 S83 V84 Q85 R89 L90

I91 S92 N93 L94 T95 G96 G97 A98 T99 L100 E104 D105 Y108 L109 S115 P116 R120 P121 V122 Y131 L132 T133 G136 S137 I138 P139 W140 V153 N158 L161 G162 L183 L186 W194 V195 R196 E197 N198 I199 A200 A201 F202 G203 G204 D205 V209

F212 G213 E214 A215 A218 G219 S220 V221 L225 A230 F234 I238 S241 G242 S243 G247 V248 R249 S253 R256 V261 R272 R276 S277 L278 V287 L290 G291 P292 G297 P298 E307 R315 D320 V325 K329 D330 E331 Y332 N333

L337 Q338 D339 R351 Q352 R353 V354 E355 A356 V357 V358 G359 P360 A361 A362 G363 R364 F368 Y369 R370 S376 L377 G378 R379 L382 A388 R392 G393 M394 R412 F413 D414 F415 E416 T417 L420 V423 L424 G425 A426 C427 H428 A429 L430 E431 I432 P433 F434 N437

T438 G443 A444 D445 R446 F447 T448 G449 R454 A458 Q459 A460 M461 H462 R463 A464 W465 E489 F495 P499 A508 V512 W513 A514 A515 ALA GLY VAL GLY ALA

• Molecule 1: Carboxylic ester hydrolase

Chain D:

2%

66%   27%   • 6%

MET HIS HIS HIS HIS HIS GLU ASN LEU TYR PHE GLN GLY ALA GLY ALA ALA GLY ALA ALA GLY ALA MET ALA THR ALA ARG E22 L23 H24 D25 T30 R31 Y32 R36 G37 R38 T42 K47 R53 V56 R60 E65 P66 P67 E68 P69 W70 V73 R74

D75 A76 F79 S83 V84 Q85 P86 R89 L90 I91 S92 N93 L94 Q102 D103 E104 N110 S115 R119 R120 P121 V122 W125 L132 T133 W140 R148 D151 V155 T156 L161 G162 A163 F166 L167 Y168 L169 E170 D171 A172 F173 T178 G179

L183 G184 I185 L186 D187 Q188 L192 I199 D205 R208 V209 T210 I211 F212 G213 E214 S220 V221 G222 L225 A226 R231 G232 L233 R236 A237 I238 R249 A258 A259 R260 H264 A265 G266 V267 A274 L275 L278 R281 A282 W283 V299 T303

E307 H308 P309 A312 L313 A314 R315 G316 A317 V323 L324 V325 K329 D330 L337 Q338 L350 V358 G359 P360 A361 R364 E367 F368 Y369 R370 S371 R372 G373 E374 L381 Y387 V391 R392 G393 M394 L395 D399 R403 V404 V408 W409 A410 E416 T417

L424 G425 A426 C427 P433 N437 T438 L439 A444 T450 R454 H462 A469 R470 E471 G472 D477 D486 V501 W506 R507 A508 E509 R510 E511 V512 A515 A516 GLY VAL GLY ALA

4 Data and refinement statistics ⓘ

Property	Value	Source
Space group	P 61	Depositor
Cell constants a, b, c, α, β, γ	81.57Å 81.57Å 667.53Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	48.52 – 2.11 48.52 – 2.11	Depositor EDS
% Data completeness (in resolution range)	99.9 (48.52-2.11) 100.0 (48.52-2.11)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$< I/\sigma(I) >$ [1]	2.33 (at 2.10Å)	Xtriage
Refinement program	REFMAC 5.8.0419	Depositor
R, R_{free}	0.191 , 0.225 0.196 , 0.222	Depositor DCC
R_{free} test set	7256 reflections (5.06%)	wwPDB-VP
Wilson B-factor (Å^2)	37.7	Xtriage
Anisotropy	0.029	Xtriage
Bulk solvent k_{sol}(e/Å^3), B_{sol}(Å^2)	0.37 , 36.1	EDS
L-test for twinning [2]	$< |L| > = 0.47, < L^2 > = 0.30$	Xtriage
Estimated twinning fraction	0.186 for h,-h-k,-l	Xtriage
F_o,F_c correlation	0.95	EDS
Total number of atoms	15514	wwPDB-VP
Average B, all atoms (Å^2)	39.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.63% of the height of the origin peak. No significant pseudotranslation is detected.*

---

[1]Intensities estimated from amplitudes.

[2]Theoretical values of $< |L| >$, $< L^2 >$ 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: A1D5F, SO4

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	0.56	0/3850	0.79	0/5259
1	B	0.56	0/3874	0.81	0/5291
1	C	0.58	0/3842	0.81	0/5248
1	D	0.56	0/3859	0.80	0/5271
All	All	0.56	0/15425	0.80	0/21069

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

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	3748	0	3680	99	0
1	B	3772	0	3701	113	0
1	C	3740	0	3666	83	0
1	D	3757	0	3686	95	0
2	A	5	0	0	0	0
3	C	23	0	0	1	0
4	A	122	0	0	11	0
4	B	115	0	0	10	0
4	C	110	0	0	4	0

Continued on next page...

Continued from previous page...

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	D	122	0	0	7	0
All	All	15514	0	14733	387	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 13.

All (387) 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:236:ARG:HH11	1:B:236:ARG:CG	1.66	1.07
1:B:236:ARG:HH11	1:B:236:ARG:HG2	1.25	1.01
1:A:439:LEU:HD13	1:A:454:ARG:HG3	1.49	0.92
1:C:461:MET:HA	4:C:716:HOH:O	1.82	0.78
1:C:352:GLN:OE1	1:C:353:ARG:NH1	2.17	0.77
1:B:236:ARG:HH11	1:B:236:ARG:HG3	1.50	0.76
1:D:121:PRO:HG2	1:D:470:ARG:HG2	1.67	0.76
1:A:370:ARG:HG2	1:A:377:LEU:HD11	1.65	0.76
1:B:151:ASP:HB3	1:B:470:ARG:HH21	1.53	0.73
1:A:302:GLY:HA2	1:A:306:PRO:HA	1.70	0.72
1:C:153:VAL:HG11	1:C:199:ILE:HD11	1.71	0.71
1:B:357:VAL:HG12	1:B:358:VAL:HG13	1.73	0.71
1:C:337:LEU:HD21	1:C:420:LEU:HD13	1.72	0.71
1:D:507:ARG:O	1:D:510:ARG:HG3	1.92	0.69
1:A:42:THR:HG22	1:A:43:VAL:HG23	1.73	0.69
1:D:329:LYS:NZ	1:D:330:ASP:OD2	2.26	0.69
1:A:307:GLU:OE1	1:A:315:ARG:NH2	2.26	0.69
1:A:46:TRP:HZ3	1:A:113:SER:HB3	1.58	0.68
1:B:236:ARG:HG2	1:B:236:ARG:NH1	2.01	0.68
1:C:28:VAL:HG11	1:C:202:PHE:CE1	2.28	0.68
1:B:49:VAL:HB	1:B:109:LEU:HD12	1.76	0.68
1:D:102:GLN:OE1	1:D:281:ARG:NH2	2.27	0.67
1:C:369:TYR:HH	1:C:513:TRP:HE1	1.41	0.66
1:A:230:ALA:N	4:A:702:HOH:O	2.29	0.66
1:C:329:LYS:HB3	1:C:426:ALA:HB3	1.78	0.66
1:C:249:ARG:NH1	1:C:253:SER:OG	2.28	0.65
1:B:387:TYR:HA	1:B:391:VAL:HB	1.80	0.65
1:A:350:LEU:HB3	1:A:381:LEU:HD12	1.80	0.64
1:B:88:ASP:HB2	1:B:133:THR:HG21	1.80	0.64
1:C:331:GLU:OE1	1:C:428:HIS:ND1	2.30	0.64
1:B:236:ARG:CG	1:B:236:ARG:NH1	2.38	0.64
1:B:488:GLU:HG2	1:B:489:GLU:HG2	1.79	0.64

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:85:GLN:O	1:B:281:ARG:NH2	2.31	0.64
1:C:464:ALA:HB3	4:C:716:HOH:O	1.97	0.64
1:D:120:ARG:NE	1:D:151:ASP:OD1	2.25	0.63
1:A:327:VAL:HG21	1:A:391:VAL:HG22	1.80	0.63
1:D:368:PHE:CZ	1:D:372:ARG:HD3	2.33	0.63
1:D:132:LEU:HD23	1:D:162:GLY:HA2	1.81	0.62
1:D:56:VAL:HG12	1:D:104:GLU:HG2	1.81	0.62
1:A:500:ARG:NH2	1:A:502:GLU:OE2	2.31	0.61
1:B:140:TRP:HE1	1:B:444:ALA:HB2	1.65	0.61
1:D:316:GLY:HA2	1:D:404:VAL:HG11	1.81	0.61
1:A:370:ARG:HG2	1:A:377:LEU:CD1	2.31	0.61
1:C:28:VAL:HG11	1:C:202:PHE:CZ	2.36	0.61
1:C:219:GLY:HA2	1:C:243:SER:O	2.01	0.61
1:B:332:TYR:HE1	1:B:389:VAL:HG21	1.65	0.61
1:D:122:VAL:HB	1:D:209:VAL:HG22	1.81	0.61
1:D:433:PRO:HB2	1:D:439:LEU:HD23	1.83	0.61
1:D:231:ARG:NH1	1:D:317:ALA:O	2.34	0.60
1:D:90:LEU:HD13	1:D:338:GLN:HG3	1.83	0.60
1:D:437:ASN:HB2	1:D:462:HIS:CG	2.37	0.60
1:B:248:VAL:HG22	1:B:298:PRO:HB2	1.84	0.59
1:C:120:ARG:O	1:C:205:ASP:N	2.29	0.59
1:A:162:GLY:O	1:A:166:PHE:N	2.32	0.58
1:A:248:VAL:HG21	1:A:309:PRO:HG2	1.86	0.58
1:A:249:ARG:NH1	1:A:294:LEU:O	2.37	0.58
1:A:489:GLU:OE1	1:A:503:ARG:NE	2.36	0.57
1:B:332:TYR:CE1	1:B:389:VAL:HG21	2.39	0.57
1:C:261:VAL:HG22	1:C:290:LEU:HD11	1.86	0.56
1:B:419:VAL:HG11	1:B:446:ARG:O	2.05	0.56
1:B:507:ARG:HA	1:B:510:ARG:HE	1.70	0.56
1:A:357:VAL:HG12	1:A:358:VAL:HG13	1.87	0.56
1:D:192:LEU:HB3	1:D:233:LEU:HB3	1.88	0.56
1:D:74:ARG:NH1	4:D:614:HOH:O	2.39	0.56
1:A:95:THR:HG22	1:A:97:GLY:H	1.71	0.56
1:D:506:TRP:O	1:D:510:ARG:HG2	2.05	0.56
1:B:236:ARG:HG3	1:B:236:ARG:NH1	2.15	0.56
1:C:351:ARG:HH22	1:C:363:GLY:HA2	1.70	0.56
1:B:370:ARG:HG3	1:B:380:ARG:HH12	1.70	0.56
1:C:131:TYR:CZ	1:C:298:PRO:HD3	2.41	0.56
1:C:132:LEU:HD22	1:C:287:VAL:HG11	1.88	0.55
1:A:186:LEU:HA	1:A:189:ILE:HD12	1.86	0.55
1:B:29:GLU:HA	1:B:34:ALA:HA	1.88	0.55

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:367:GLU:O	1:D:371:SER:OG	2.24	0.55
1:D:387:TYR:HA	1:D:391:VAL:HB	1.88	0.55
1:B:144:THR:HB	1:B:441:ARG:HH22	1.70	0.55
1:D:350:LEU:HB3	1:D:381:LEU:HD12	1.87	0.55
1:A:154:VAL:HB	4:A:710:HOH:O	2.07	0.55
1:D:125:TRP:HB3	1:D:156:THR:HG22	1.89	0.55
1:A:420:LEU:HB3	1:A:423:VAL:HG22	1.89	0.55
1:D:509:GLU:HA	1:D:512:VAL:HG12	1.89	0.54
1:C:307:GLU:OE2	1:C:315:ARG:NH2	2.40	0.54
1:D:60:ARG:NH1	1:D:283:TRP:HE1	2.05	0.54
1:B:331:GLU:HB3	1:B:390:PHE:CD2	2.41	0.54
1:C:83:SER:HB3	1:C:161:LEU:HD12	1.88	0.54
1:C:499:PRO:HD2	1:D:403:ARG:NH2	2.21	0.54
1:B:508:ALA:O	1:B:512:VAL:HG12	2.08	0.54
1:B:370:ARG:O	1:B:380:ARG:NH1	2.34	0.54
1:A:229:ALA:HB3	4:A:702:HOH:O	2.08	0.54
1:A:319:ARG:HA	1:A:406:ALA:HB2	1.90	0.54
1:B:370:ARG:NH1	4:B:603:HOH:O	2.25	0.54
1:A:143:GLY:HA3	4:A:710:HOH:O	2.08	0.53
1:D:450:THR:HG22	4:D:615:HOH:O	2.08	0.53
1:A:215:ALA:HB2	1:A:428:HIS:HE2	1.72	0.53
1:A:366:ILE:O	1:A:370:ARG:HG3	2.09	0.53
1:A:163:ALA:HB1	1:A:167:LEU:HD22	1.91	0.53
1:C:413:PHE:CZ	1:C:415:PHE:HB3	2.44	0.53
1:D:364:ARG:NH1	1:D:515:ALA:O	2.40	0.53
1:B:124:VAL:N	1:B:210:THR:O	2.34	0.52
1:B:302:GLY:HA2	1:B:306:PRO:HA	1.91	0.52
1:C:132:LEU:HD23	1:C:162:GLY:HA2	1.92	0.52
1:C:358:VAL:HG23	1:C:362:ALA:HB2	1.90	0.52
1:A:62:ARG:NH2	1:A:276:ARG:HH22	2.08	0.52
1:C:325:VAL:HG22	1:C:394:MET:HG3	1.90	0.52
1:B:460:ALA:HB1	1:B:479:LEU:HD21	1.90	0.52
1:C:355:GLU:O	1:C:359:GLY:N	2.37	0.52
1:D:236:ARG:HD3	1:D:472:GLY:HA2	1.91	0.52
1:B:505:PRO:HG2	1:B:506:TRP:CE3	2.45	0.52
1:C:214:GLU:HG3	1:C:431:GLU:OE1	2.10	0.52
1:D:125:TRP:HH2	1:D:214:GLU:HB2	1.75	0.52
1:B:148:ARG:CD	4:B:702:HOH:O	2.56	0.52
1:B:412:ARG:NH2	1:B:414:ASP:OD2	2.37	0.51
1:D:501:VAL:HG23	4:D:643:HOH:O	2.11	0.51
1:D:86:PRO:HD2	1:D:132:LEU:O	2.11	0.51

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:260:ARG:O	1:D:264:HIS:ND1	2.43	0.51
1:D:330:ASP:O	1:D:427:CYS:HA	2.11	0.51
1:A:58:PRO:O	1:A:62:ARG:NH1	2.42	0.51
1:A:351:ARG:HG2	1:A:366:ILE:HD13	1.93	0.51
1:A:62:ARG:CZ	1:A:276:ARG:HH22	2.24	0.51
1:D:25:ASP:OD1	1:D:38:ARG:NE	2.42	0.51
1:D:395:LEU:O	1:D:399:ASP:OD2	2.28	0.51
1:C:35:VAL:HG11	1:C:49:VAL:HG13	1.93	0.50
1:C:412:ARG:NH2	1:C:414:ASP:OD2	2.27	0.50
1:B:388:ALA:HB2	1:B:513:TRP:HH2	1.76	0.50
1:C:434:PHE:HB3	1:C:458:ALA:HA	1.94	0.50
1:A:46:TRP:CZ3	1:A:113:SER:HB3	2.43	0.50
1:A:380:ARG:O	1:A:383:PRO:HD2	2.11	0.50
1:A:504:ASP:N	1:A:505:PRO:HD3	2.27	0.50
1:B:53:ARG:HG3	1:B:66:PRO:O	2.11	0.50
1:B:461:MET:HG2	1:B:495:PHE:CD1	2.46	0.50
1:C:85:GLN:HB2	1:C:133:THR:HA	1.94	0.50
1:B:24:HIS:N	1:B:39:SER:O	2.26	0.50
1:B:512:VAL:HG13	1:B:513:TRP:HD1	1.77	0.50
1:C:339:ASP:OD2	1:C:353:ARG:NH2	2.41	0.50
1:D:260:ARG:NH1	4:D:621:HOH:O	2.43	0.49
1:C:215:ALA:HB1	3:C:601:A1D5F:N13	2.27	0.49
1:B:445:ASP:HB2	1:B:450:THR:HG22	1.95	0.49
1:D:36:ARG:HB2	1:D:73:VAL:HG12	1.94	0.49
1:D:47:LYS:HB3	1:D:79:PHE:HA	1.94	0.49
1:D:170:GLU:HG2	1:D:178:THR:HA	1.94	0.49
1:A:236:ARG:HG2	1:A:322:ALA:HB3	1.94	0.49
1:A:445:ASP:OD1	1:A:445:ASP:N	2.45	0.49
1:A:110:ASN:ND2	1:A:156:THR:OG1	2.43	0.49
1:C:28:VAL:CG1	1:C:202:PHE:CZ	2.94	0.49
1:B:53:ARG:NH1	1:B:68:GLU:OE2	2.46	0.49
1:C:351:ARG:NH2	1:C:363:GLY:HA2	2.27	0.49
1:B:249:ARG:N	1:B:298:PRO:O	2.46	0.49
1:C:445:ASP:OD1	1:C:445:ASP:N	2.46	0.49
1:B:36:ARG:HB2	1:B:73:VAL:CG1	2.43	0.48
1:D:307:GLU:HG3	1:D:312:ALA:HB2	1.95	0.48
1:D:119:ARG:HG2	1:D:205:ASP:HB2	1.96	0.48
1:A:32:TYR:OH	1:A:66:PRO:HB3	2.13	0.48
1:C:272:ARG:CZ	1:C:276:ARG:NH1	2.77	0.48
1:C:212:PHE:HB2	1:C:238:ILE:HB	1.96	0.48
1:C:54:PRO:HB3	1:C:105:ASP:HB2	1.96	0.48

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:148:ARG:HD3	4:B:702:HOH:O	2.12	0.48
1:B:249:ARG:NH2	1:B:294:LEU:O	2.45	0.48
1:C:200:ALA:HA	1:C:204:GLY:O	2.13	0.48
1:D:53:ARG:N	1:D:65:GLU:O	2.38	0.48
1:D:226:ALA:HB2	1:D:309:PRO:HA	1.96	0.48
1:C:417:THR:HG22	1:C:425:GLY:O	2.13	0.48
1:D:168:TYR:CD2	1:D:299:VAL:HG11	2.49	0.48
1:B:434:PHE:CD2	1:B:457:VAL:HG22	2.49	0.47
1:C:136:GLY:N	1:C:158:ASN:OD1	2.32	0.47
1:B:214:GLU:HG3	1:B:431:GLU:OE2	2.14	0.47
1:C:199:ILE:N	4:C:707:HOH:O	2.47	0.47
1:C:218:ALA:HB3	1:C:242:GLY:HA3	1.95	0.47
1:D:278:LEU:HD23	1:D:283:TRP:CD2	2.49	0.47
1:B:504:ASP:OD1	1:B:510:ARG:NE	2.48	0.47
1:C:109:LEU:HD11	1:C:194:TRP:CZ3	2.48	0.47
1:A:196:ARG:NH1	4:A:715:HOH:O	2.46	0.47
1:C:122:VAL:HB	1:C:209:VAL:HG22	1.95	0.47
1:D:267:VAL:HG13	1:D:274:ALA:HB3	1.97	0.47
1:A:168:TYR:OH	1:A:251:ALA:HB1	2.15	0.47
1:D:163:ALA:HB3	1:D:283:TRP:HB3	1.96	0.47
1:A:398:ALA:HA	1:A:408:VAL:HG21	1.97	0.47
1:B:60:ARG:O	1:B:276:ARG:NH1	2.42	0.47
1:B:119:ARG:HB3	1:B:205:ASP:HB2	1.96	0.47
1:B:223:VAL:HG13	1:B:305:LEU:HD13	1.97	0.47
1:A:276:ARG:HA	1:A:276:ARG:HD2	1.78	0.47
1:B:138:ILE:HB	1:B:141:TYR:CD2	2.50	0.47
1:A:214:GLU:HG3	1:A:431:GLU:OE2	2.15	0.46
1:A:273:GLU:O	1:A:277:SER:OG	2.27	0.46
1:B:506:TRP:O	1:B:510:ARG:N	2.40	0.46
1:D:454:ARG:NH2	4:D:615:HOH:O	2.40	0.46
1:B:28:VAL:HG13	1:B:201:ALA:HB1	1.97	0.46
1:B:32:TYR:CD2	1:B:67:PRO:HG2	2.51	0.46
1:C:60:ARG:NH1	1:C:278:LEU:O	2.46	0.46
1:B:163:ALA:O	1:B:167:LEU:HB2	2.16	0.46
1:B:460:ALA:HA	1:B:476:HIS:CE1	2.51	0.46
1:C:91:ILE:O	1:C:95:THR:OG1	2.33	0.46
1:D:211:ILE:HD12	1:D:221:VAL:HG13	1.97	0.46
1:A:53:ARG:HD3	1:A:59:LEU:HD11	1.97	0.46
1:B:208:ARG:NE	4:B:609:HOH:O	2.38	0.46
1:D:507:ARG:HA	1:D:510:ARG:HD3	1.98	0.46
1:B:463:ARG:HH22	1:B:477:ASP:CG	2.19	0.46

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:89:ARG:H	1:C:89:ARG:HE	1.63	0.46
1:A:351:ARG:NH2	1:D:367:GLU:OE2	2.49	0.46
1:B:377:LEU:O	1:B:381:LEU:HG	2.15	0.46
1:A:129:GLY:O	1:A:130:ALA:HB3	2.16	0.46
1:A:387:TYR:HA	1:A:391:VAL:HB	1.98	0.46
1:D:369:TYR:HD1	1:D:372:ARG:HH21	1.62	0.46
1:A:507:ARG:HA	1:A:510:ARG:HE	1.80	0.45
1:B:411:TYR:HA	1:B:493:MET:O	2.15	0.45
1:C:430:LEU:HA	1:C:447:PHE:HE1	1.80	0.45
1:D:170:GLU:OE2	1:D:179:GLY:N	2.36	0.45
1:A:107:LEU:HD21	1:A:160:ARG:HG3	1.97	0.45
1:C:90:LEU:HD11	1:C:337:LEU:HB2	1.97	0.45
1:A:349:ALA:O	1:A:353:ARG:NH1	2.49	0.45
1:A:131:TYR:N	4:A:720:HOH:O	2.49	0.45
1:D:275:LEU:HD12	1:D:283:TRP:HH2	1.82	0.45
1:A:167:LEU:HD12	1:A:167:LEU:HA	1.79	0.45
1:B:96:GLY:H	1:B:446:ARG:HH12	1.63	0.45
1:D:70:TRP:NE1	1:D:74:ARG:HB2	2.32	0.45
1:A:54:PRO:HD2	4:A:733:HOH:O	2.17	0.45
1:A:95:THR:HG23	1:A:443:GLY:O	2.16	0.45
1:A:326:GLY:HA3	1:A:411:TYR:CE2	2.52	0.45
1:C:329:LYS:NZ	1:C:330:ASP:OD2	2.50	0.45
1:A:119:ARG:NH1	4:A:721:HOH:O	2.50	0.45
1:B:435:VAL:O	1:B:462:HIS:ND1	2.50	0.45
1:C:60:ARG:NH2	1:C:278:LEU:O	2.47	0.45
1:C:212:PHE:CB	1:C:238:ILE:HB	2.47	0.45
1:A:331:GLU:HB3	1:A:390:PHE:CD2	2.52	0.45
1:A:514:ALA:HB2	4:A:752:HOH:O	2.17	0.45
1:B:177:PHE:HA	4:B:602:HOH:O	2.16	0.45
1:C:90:LEU:HD13	1:C:338:GLN:HG3	1.98	0.45
1:D:337:LEU:HD21	1:D:424:LEU:HD21	1.99	0.45
1:C:364:ARG:HH22	1:C:515:ALA:HB3	1.82	0.45
1:C:445:ASP:O	1:C:449:GLY:N	2.46	0.44
1:D:36:ARG:O	1:D:76:ALA:HB3	2.17	0.44
1:B:35:VAL:HG12	1:B:74:ARG:HB3	1.99	0.44
1:B:163:ALA:HB2	1:B:287:VAL:CG2	2.46	0.44
1:B:170:GLU:HG2	1:B:178:THR:HA	1.98	0.44
1:A:272:ARG:HD3	1:A:276:ARG:NH1	2.33	0.44
1:B:362:ALA:O	1:B:366:ILE:HG13	2.17	0.44
1:D:210:THR:OG1	1:D:236:ARG:HB2	2.18	0.44
1:A:199:ILE:HD12	1:A:199:ILE:HA	1.88	0.44

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:388:ALA:HB2	1:C:513:TRP:HH2	1.82	0.44
1:D:140:TRP:CZ2	1:D:444:ALA:HA	2.52	0.44
1:B:507:ARG:NH1	4:B:607:HOH:O	2.36	0.44
1:D:53:ARG:HD2	1:D:68:GLU:HG3	2.00	0.44
1:D:325:VAL:O	1:D:410:ALA:HA	2.16	0.44
1:C:392:ARG:NH1	4:C:720:HOH:O	2.51	0.44
1:B:445:ASP:O	1:B:449:GLY:N	2.50	0.44
1:A:23:LEU:HA	1:A:39:SER:O	2.17	0.44
1:B:194:TRP:O	1:B:198:ASN:N	2.49	0.44
1:D:121:PRO:HG3	1:D:208:ARG:NH2	2.33	0.44
1:A:247:GLY:HA2	1:A:294:LEU:HD23	2.00	0.43
1:A:445:ASP:O	1:A:449:GLY:N	2.51	0.43
1:B:180:SER:HA	1:B:183:LEU:HG	2.00	0.43
1:C:35:VAL:HB	1:C:76:ALA:HB2	2.00	0.43
1:C:368:PHE:CD2	1:C:512:VAL:HG11	2.52	0.43
1:B:368:PHE:HD1	1:B:369:TYR:CD2	2.36	0.43
1:B:430:LEU:O	1:B:433:PRO:HD2	2.17	0.43
1:B:504:ASP:OD2	1:B:510:ARG:NH2	2.51	0.43
1:A:330:ASP:O	1:A:427:CYS:HA	2.18	0.43
1:A:350:LEU:O	1:A:354:VAL:HG23	2.19	0.43
1:A:408:VAL:HG13	1:A:485:TYR:HB3	2.00	0.43
1:B:33:GLY:HA3	1:B:70:TRP:CE2	2.53	0.43
1:B:140:TRP:NE1	1:B:444:ALA:HB2	2.32	0.43
1:B:505:PRO:HB2	4:B:691:HOH:O	2.18	0.43
1:A:302:GLY:CA	1:A:306:PRO:HA	2.45	0.43
1:C:230:ALA:HB1	1:C:234:PHE:HE2	1.82	0.43
1:D:166:PHE:HE1	1:D:185:ILE:HG12	1.84	0.43
1:B:151:ASP:HB3	1:B:470:ARG:NH2	2.28	0.43
1:B:327:VAL:HG21	1:B:391:VAL:HG22	2.01	0.43
1:B:463:ARG:NH2	4:B:616:HOH:O	2.42	0.43
1:C:138:ILE:HG23	1:C:139:PRO:HD2	1.99	0.43
1:D:437:ASN:HB2	1:D:462:HIS:CD2	2.53	0.43
1:A:110:ASN:HB2	1:A:112:TRP:CZ3	2.53	0.43
1:A:146:LEU:HG	1:A:462:HIS:HE1	1.84	0.43
1:B:512:VAL:HG13	1:B:513:TRP:CD1	2.52	0.43
1:C:56:VAL:HG12	1:C:104:GLU:HB3	2.01	0.43
1:D:211:ILE:O	1:D:237:ALA:HA	2.19	0.43
1:D:486:ASP:OD1	1:D:486:ASP:N	2.52	0.43
1:B:347:GLU:HG2	1:B:377:LEU:HD22	1.99	0.43
1:C:272:ARG:NE	1:C:276:ARG:NH1	2.67	0.43
1:C:437:ASN:HB2	1:C:462:HIS:ND1	2.34	0.43

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:78:ARG:HA	1:B:78:ARG:HD3	1.78	0.43
1:A:329:LYS:HB3	1:A:329:LYS:HE3	1.57	0.43
1:A:411:TYR:HA	1:A:493:MET:O	2.19	0.42
1:B:86:PRO:HA	4:B:626:HOH:O	2.19	0.42
1:B:89:ARG:HD2	1:B:93:ASN:OD1	2.19	0.42
1:B:388:ALA:HB2	1:B:513:TRP:CH2	2.52	0.42
1:B:395:LEU:HD13	1:B:510:ARG:HG2	1.99	0.42
1:B:502:GLU:OE1	1:B:505:PRO:HB3	2.19	0.42
1:A:445:ASP:HB2	1:A:450:THR:HG22	2.01	0.42
1:B:248:VAL:HG11	1:B:309:PRO:HD2	2.01	0.42
1:C:46:TRP:CZ2	1:C:116:PRO:HG3	2.54	0.42
1:C:459:GLN:HG3	1:D:314:ALA:HB3	2.00	0.42
1:D:32:TYR:CG	1:D:67:PRO:HG2	2.54	0.42
1:D:477:ASP:N	1:D:477:ASP:OD1	2.52	0.42
1:A:182:ASN:HD22	1:A:304:VAL:HB	1.84	0.42
1:B:330:ASP:OD2	1:B:426:ALA:N	2.47	0.42
1:D:83:SER:HB3	1:D:161:LEU:HD12	2.01	0.42
1:A:214:GLU:HA	1:A:240:GLN:O	2.20	0.42
1:B:281:ARG:NH2	4:B:626:HOH:O	2.51	0.42
1:B:503:ARG:HG2	1:B:503:ARG:HH11	1.85	0.42
1:D:25:ASP:HA	1:D:37:GLY:O	2.20	0.42
1:D:507:ARG:HA	1:D:510:ARG:CD	2.50	0.42
1:A:189:ILE:O	1:A:193:ARG:HG3	2.20	0.42
1:A:248:VAL:HG11	1:A:309:PRO:CD	2.50	0.42
1:A:273:GLU:O	1:A:277:SER:N	2.44	0.42
1:C:333:ASN:ND2	1:C:423:VAL:O	2.38	0.42
1:C:430:LEU:O	1:C:433:PRO:HD2	2.20	0.42
1:A:428:HIS:O	1:A:429:ALA:HB3	2.19	0.42
1:D:359:GLY:HA3	1:D:360:PRO:HD3	1.91	0.42
1:A:239:LEU:HB2	1:A:325:VAL:HG23	2.02	0.42
1:A:492:VAL:HG21	1:A:506:TRP:HZ3	1.85	0.42
1:C:195:VAL:O	1:C:199:ILE:HB	2.20	0.42
1:D:417:THR:HG22	1:D:425:GLY:O	2.20	0.42
1:A:89:ARG:O	1:A:93:ASN:HB2	2.20	0.42
1:A:165:GLY:O	1:A:183:LEU:HB2	2.20	0.42
1:D:278:LEU:HD23	1:D:283:TRP:CE2	2.55	0.42
1:D:403:ARG:HA	1:D:403:ARG:HD3	1.83	0.42
1:A:294:LEU:HD12	1:A:294:LEU:HA	1.87	0.41
1:B:248:VAL:HG21	1:B:309:PRO:HG2	2.01	0.41
1:D:416:GLU:HB3	1:D:425:GLY:HA2	2.01	0.41
1:C:183:LEU:HD23	1:C:186:LEU:HD12	2.02	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:330:ASP:O	1:C:427:CYS:HA	2.19	0.41
1:D:183:LEU:HD23	1:D:186:LEU:HD12	2.01	0.41
1:D:222:GLY:HA2	1:D:225:LEU:HD12	2.02	0.41
1:C:221:VAL:O	1:C:225:LEU:HG	2.20	0.41
1:C:253:SER:HA	1:C:256:ARG:NH2	2.35	0.41
1:D:148:ARG:NH1	4:D:629:HOH:O	2.52	0.41
1:D:249:ARG:HG3	4:D:609:HOH:O	2.20	0.41
1:A:62:ARG:HH22	1:A:272:ARG:NH1	2.18	0.41
1:B:64:PRO:HD2	1:B:186:LEU:HB3	2.02	0.41
1:B:364:ARG:HD2	1:B:516:ALA:HA	2.00	0.41
1:A:249:ARG:O	1:A:299:VAL:HA	2.20	0.41
1:A:329:LYS:NZ	1:A:416:GLU:OE2	2.49	0.41
1:A:451:ALA:O	1:A:454:ARG:NE	2.41	0.41
1:B:460:ALA:HB1	1:B:479:LEU:CD2	2.50	0.41
1:B:121:PRO:HB2	1:B:152:VAL:HG12	2.02	0.41
1:B:328:ASN:O	1:B:331:GLU:HG2	2.21	0.41
1:D:125:TRP:CH2	1:D:214:GLU:HB2	2.54	0.41
1:D:387:TYR:CE1	1:D:392:ARG:HB3	2.55	0.41
1:A:82:ALA:O	1:A:102:GLN:HA	2.20	0.41
1:B:61:PHE:HE1	1:B:163:ALA:O	2.03	0.41
1:B:326:GLY:HA3	1:B:411:TYR:CE2	2.55	0.41
1:C:81:PRO:HD2	1:C:108:TYR:CE2	2.55	0.41
1:A:53:ARG:N	1:A:65:GLU:O	2.32	0.41
1:A:261:VAL:O	1:A:286:ALA:HB1	2.20	0.41
1:A:506:TRP:O	1:A:510:ARG:HG3	2.21	0.41
1:B:195:VAL:O	1:B:199:ILE:HB	2.20	0.41
1:B:337:LEU:HD21	1:B:424:LEU:HD21	2.03	0.41
1:B:391:VAL:HG11	1:B:506:TRP:CD1	2.56	0.41
1:C:92:SER:O	1:C:96:GLY:N	2.39	0.41
1:D:210:THR:OG1	1:D:469:ALA:HA	2.21	0.41
1:A:112:TRP:HB2	4:A:710:HOH:O	2.20	0.41
1:A:119:ARG:HB3	1:A:205:ASP:HB2	2.03	0.41
1:A:320:ASP:CG	4:A:705:HOH:O	2.59	0.41
1:B:37:GLY:HA3	1:B:46:TRP:CD1	2.56	0.41
1:B:60:ARG:HG2	1:B:61:PHE:N	2.35	0.41
1:B:327:VAL:O	1:B:412:ARG:HA	2.21	0.41
1:B:370:ARG:HG3	1:B:380:ARG:NH1	2.36	0.41
1:C:414:ASP:HB2	1:C:495:PHE:O	2.20	0.41
1:C:434:PHE:HE2	1:C:454:ARG:HB2	1.86	0.41
1:D:85:GLN:HB2	1:D:133:THR:HA	2.03	0.41
1:D:140:TRP:NE1	1:D:444:ALA:HB2	2.36	0.41

Continued on next page...

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:169:LEU:HD13	1:D:275:LEU:HD21	2.02	0.41
1:D:173:PHE:CE2	1:D:275:LEU:HD22	2.56	0.41
1:D:199:ILE:HD12	1:D:199:ILE:HA	1.90	0.41
1:D:236:ARG:NE	1:D:469:ALA:O	2.53	0.41
1:D:110:ASN:O	1:D:155:VAL:HA	2.21	0.41
1:B:36:ARG:NH1	1:B:75:ASP:OD1	2.53	0.40
1:B:214:GLU:HA	1:B:240:GLN:O	2.21	0.40
1:B:413:PHE:CZ	1:B:415:PHE:HB3	2.57	0.40
1:C:215:ALA:HA	1:C:241:SER:O	2.21	0.40
1:C:379:ARG:HA	1:C:382:LEU:HD12	2.03	0.40
1:D:188:GLN:OE1	1:D:220:SER:HB3	2.21	0.40
1:D:238:ILE:HA	1:D:324:LEU:O	2.21	0.40
1:A:420:LEU:HD13	1:A:420:LEU:HA	1.80	0.40
1:D:167:LEU:HD11	1:D:258:ALA:HA	2.03	0.40
1:A:230:ALA:HA	1:A:233:LEU:HD12	2.03	0.40
1:A:409:TRP:HB3	1:A:482:TRP:CZ2	2.56	0.40
1:B:313:LEU:HD23	1:B:313:LEU:HA	1.88	0.40
1:B:464:ALA:HA	1:B:474:PRO:O	2.21	0.40
1:C:197:GLU:HG3	1:C:198:ASN:ND2	2.35	0.40
1:D:167:LEU:HD23	1:D:169:LEU:HD21	2.04	0.40
1:D:323:VAL:O	1:D:408:VAL:HA	2.22	0.40
1:A:51:PHE:HD2	1:A:109:LEU:HG	1.86	0.40
1:A:196:ARG:HA	1:A:206:PRO:HB3	2.04	0.40
1:B:503:ARG:HH11	1:B:503:ARG:CG	2.34	0.40
1:C:247:GLY:O	1:C:297:GLY:HA3	2.22	0.40
1:B:36:ARG:HB2	1:B:73:VAL:HG11	2.03	0.40
1:C:53:ARG:HH11	1:C:68:GLU:HG3	1.86	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	492/527 (93%)	482 (98%)	10 (2%)	0	100	100
1	B	496/527 (94%)	488 (98%)	8 (2%)	0	100	100
1	C	491/527 (93%)	481 (98%)	10 (2%)	0	100	100
1	D	493/527 (94%)	484 (98%)	9 (2%)	0	100	100
All	All	1972/2108 (94%)	1935 (98%)	37 (2%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2   Protein sidechains ⓘ

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	364/382 (95%)	346 (95%)	18 (5%)	21	19
1	B	366/382 (96%)	345 (94%)	21 (6%)	17	15
1	C	363/382 (95%)	350 (96%)	13 (4%)	30	31
1	D	365/382 (96%)	349 (96%)	16 (4%)	24	23
All	All	1458/1528 (95%)	1390 (95%)	68 (5%)	22	21

All (68) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	71	SER
1	A	78	ARG
1	A	110	ASN
1	A	126	ILE
1	A	175	PRO
1	A	180	SER
1	A	212	PHE
1	A	243	SER
1	A	250	THR
1	A	272	ARG
1	A	276	ARG
1	A	329	LYS
1	A	371	SER

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	A	376	SER
1	A	394	MET
1	A	420	LEU
1	A	454	ARG
1	A	465	TRP
1	B	91	ILE
1	B	92	SER
1	B	94	LEU
1	B	95	THR
1	B	110	ASN
1	B	148	ARG
1	B	186	LEU
1	B	212	PHE
1	B	235	HIS
1	B	236	ARG
1	B	243	SER
1	B	281	ARG
1	B	320	ASP
1	B	351	ARG
1	B	364	ARG
1	B	371	SER
1	B	408	VAL
1	B	441	ARG
1	B	457	VAL
1	B	465	TRP
1	B	498	GLU
1	C	38	ARG
1	C	95	THR
1	C	100	LEU
1	C	115	SER
1	C	212	PHE
1	C	272	ARG
1	C	276	ARG
1	C	320	ASP
1	C	370	ARG
1	C	376	SER
1	C	438	THR
1	C	465	TRP
1	C	489	GLU
1	D	22	GLU
1	D	23	LEU
1	D	42	THR

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type
1	D	53	ARG
1	D	89	ARG
1	D	92	SER
1	D	94	LEU
1	D	115	SER
1	D	212	PHE
1	D	303	THR
1	D	374	GLU
1	D	394	MET
1	D	399	ASP
1	D	450	THR
1	D	477	ASP
1	D	510	ARG

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	C	102	GLN
1	C	264	HIS
1	C	401	GLN
1	D	240	GLN

5.3.3   RNA ⓘ

There are no RNA molecules in this entry.

5.4   Non-standard residues in protein, DNA, RNA chains ⓘ

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

5.5   Carbohydrates ⓘ

There are no oligosaccharides in this entry.

5.6   Ligand geometry ⓘ

2 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	SO4	A	601	-	4,4,4	0.56	0	6,6,6	0.21	0
3	A1D5F	C	601	-	24,24,24	1.54	4 (16%)	30,30,30	1.77	7 (23%)

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
3	A1D5F	C	601	-	-	6/14/14/14	0/2/2/2

All (4) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	C	601	A1D5F	C14-N13	3.86	1.44	1.36
3	C	601	A1D5F	O21-C14	-3.68	1.15	1.21
3	C	601	A1D5F	C22-C12	-2.77	1.34	1.39
3	C	601	A1D5F	C08-C07	2.17	1.59	1.52

All (7) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
3	C	601	A1D5F	O15-C14-N13	6.11	119.31	109.32
3	C	601	A1D5F	C12-N13-C14	-3.58	120.47	126.36
3	C	601	A1D5F	O21-C14-N13	-2.61	120.43	126.11
3	C	601	A1D5F	C08-C07-C06	-2.58	113.89	120.92
3	C	601	A1D5F	C05-C02-N01	-2.46	116.32	120.91
3	C	601	A1D5F	C08-C07-C04	2.32	127.25	120.92
3	C	601	A1D5F	O15-C14-O21	-2.08	120.26	124.25

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	C	601	A1D5F	O15-C14-N13-C12
3	C	601	A1D5F	O21-C14-N13-C12
3	C	601	A1D5F	O15-C16-C17-C18
3	C	601	A1D5F	N13-C14-O15-C16
3	C	601	A1D5F	O21-C14-O15-C16
3	C	601	A1D5F	C17-C18-C19-O20

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	C	601	A1D5F	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 then 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.

Ligand A1D5F C 601

Bond lengths

Bond angles

Torsions

Rings
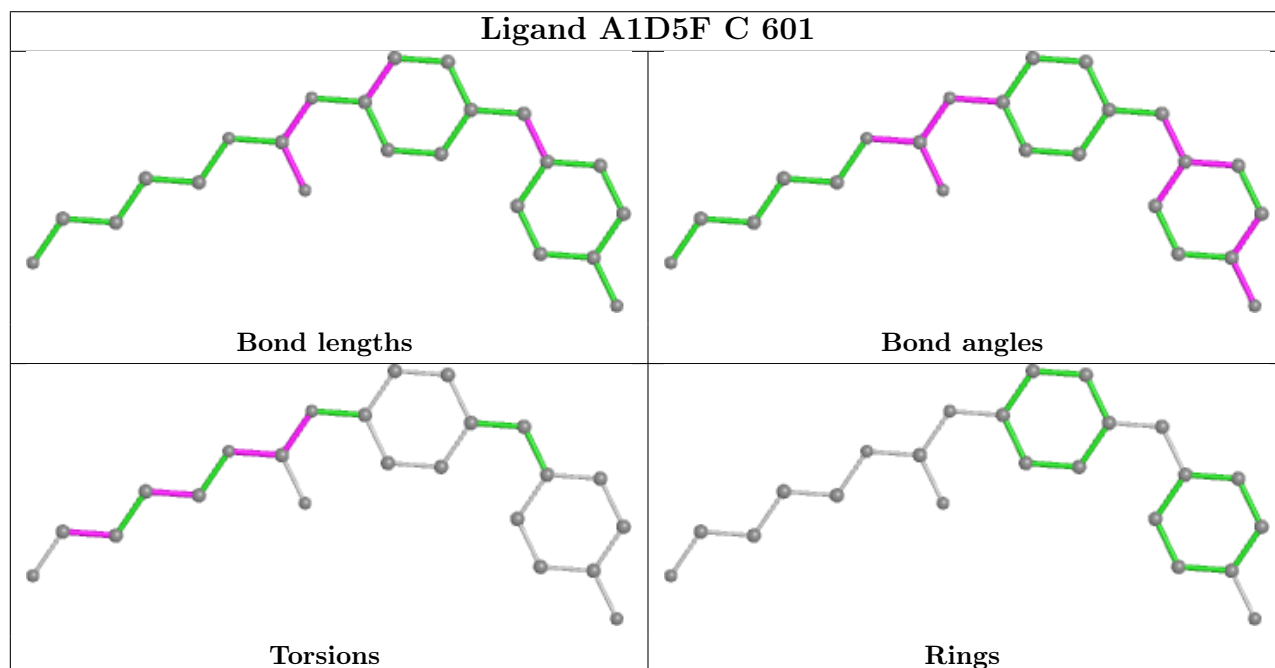
5.7 Other polymers ⓘ

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	494/527 (93%)	0.24	5 (1%)	79	81	25, 37, 57, 78	0
1	B	498/527 (94%)	0.16	10 (2%)	64	66	24, 36, 56, 90	0
1	C	493/527 (93%)	0.22	19 (3%)	44	46	26, 36, 58, 88	0
1	D	495/527 (93%)	0.23	10 (2%)	64	66	26, 37, 56, 75	0
All	All	1980/2108 (93%)	0.21	44 (2%)	62	64	24, 37, 57, 90	0

All (44) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	C	94	LEU	5.9
1	B	94	LEU	5.3
1	C	91	ILE	4.8
1	D	358	VAL	3.9
1	C	356	ALA	3.8
1	C	95	THR	3.5
1	D	265	ALA	3.4
1	A	454	ARG	3.4
1	B	96	GLY	3.3
1	C	98	ALA	3.1
1	D	30	THR	3.0
1	B	90	LEU	3.0
1	C	447	PHE	2.8
1	A	420	LEU	2.8
1	B	266	GLY	2.8
1	C	97	GLY	2.8
1	B	95	THR	2.8
1	B	371	SER	2.7
1	D	172	ALA	2.6
1	D	510	ARG	2.6
1	C	377	LEU	2.6

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	RSRZ
1	C	443	GLY	2.4
1	D	94	LEU	2.4
1	A	289	ALA	2.4
1	C	515	ALA	2.4
1	C	90	LEU	2.3
1	D	267	VAL	2.3
1	C	99	THR	2.3
1	C	357	VAL	2.3
1	C	358	VAL	2.3
1	B	91	ILE	2.3
1	A	98	ALA	2.2
1	A	516	ALA	2.2
1	C	508	ALA	2.2
1	B	378	GLY	2.2
1	D	373	GLY	2.2
1	D	516	ALA	2.2
1	B	92	SER	2.1
1	B	98	ALA	2.1
1	C	362	ALA	2.1
1	C	292	PRO	2.1
1	C	140	TRP	2.1
1	C	361	ALA	2.0
1	D	361	ALA	2.0

6.2 Non-standard residues in protein, DNA, RNA chains ⓘ

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

6.3 Carbohydrates ⓘ

There are no monosaccharides in this entry.

6.4 Ligands ⓘ

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.
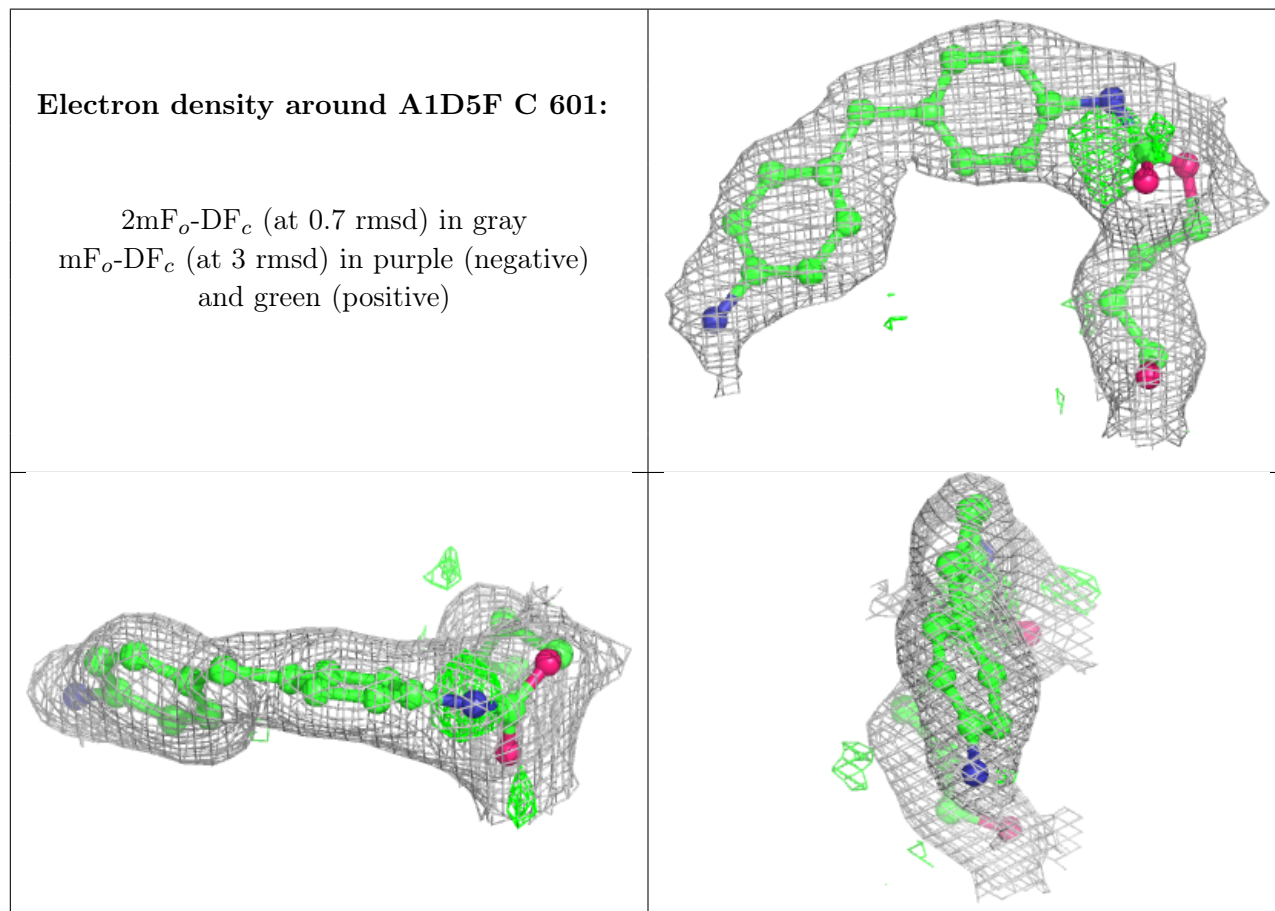
Continued on next page...

Continued from previous page...

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors($Å^2$)	Q<0.9
2	SO4	A	601	5/5	0.89	0.18	27,47,49,58	0
3	A1D5F	C	601	23/23	0.90	0.14	45,50,57,64	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 A1D5F C 601:

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

6.5 Other polymers ⓘ

There are no such residues in this entry.