



# Full wwPDB X-ray Structure Validation Report ⓘ

Mar 5, 2026 – 05:21 PM UTC

PDB ID : 5FWG / pdb\_00005fwg  
Title : TETRA-(5-FLUOROTRYPTOPHANYL)-GLUTATHIONE TRANSFERASE  
Authors : Parsons, J.F.; Xiao, G.; Armstrong, R.N.; Gilliland, G.L.  
Deposited on : 1997-11-08  
Resolution : 2.00 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](mailto: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 : 4-5-2 with Phenix2.0  
Mogul : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 2.0  
EDS : 3.0  
Buster-report : wwPDB partial adaption of 1.1.7 (2018)  
Percentile statistics : 20250101.v01 (using entries in the PDB archive January 1st 2025)  
CCP4 : 9.0.010 (Gargrove)  
Density-Fitness : 1.0.12  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.49

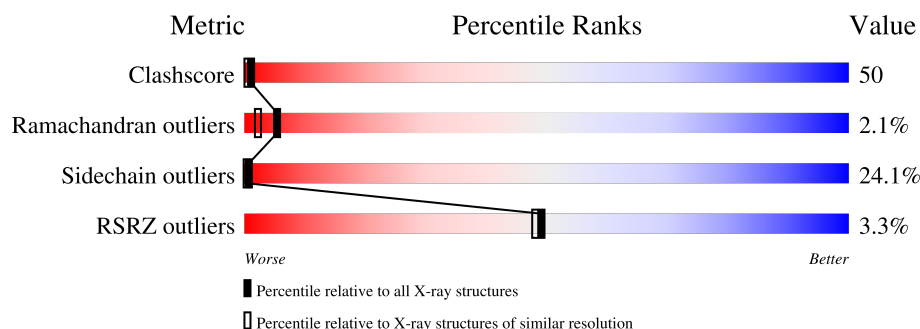
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 2.00 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))
Clashscore	190562	11152 (2.00-2.00)
Ramachandran outliers	187476	11031 (2.00-2.00)
Sidechain outliers	187428	11029 (2.00-2.00)
RSRZ outliers	180081	10067 (2.00-2.00)

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  $\geq 3$ , 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	217	<div> <div>3%</div> <div> <div></div> <div>30%</div> <div>44%</div> <div>21%</div> <div>5%</div> </div> </div>
1	B	217	<div> <div>4%</div> <div> <div></div> <div>24%</div> <div>43%</div> <div>26%</div> <div>6%</div> </div> </div>

## 2 Entry composition

There are 3 unique types of molecules in this entry. The entry contains 4085 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.

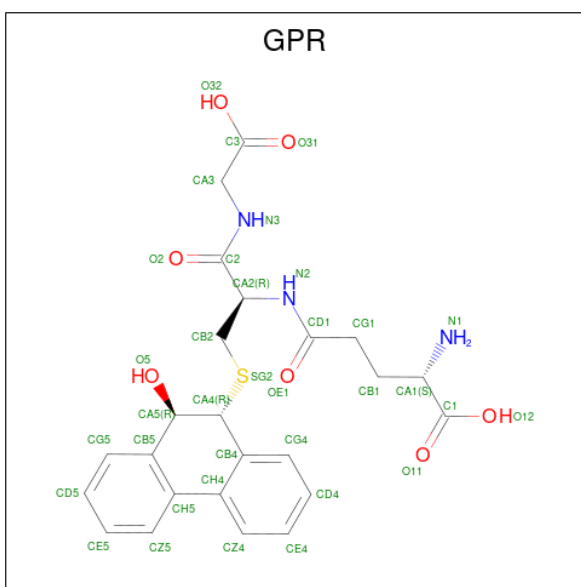
- Molecule 1 is a protein called TETRA-(5-FLUOROTRYPTOPHANYL)-GLUTATHIONE TRANSFERASE MU CLASS.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	A	217	Total	C	F	N	O	S	0	0	0
			1822	1177	4	303	327	11			
1	B	217	Total	C	F	N	O	S	0	0	0
			1822	1177	4	303	327	11			

There are 8 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	7	FTR	TRP	conflict	UNP P04905
A	45	FTR	TRP	conflict	UNP P04905
A	146	FTR	TRP	conflict	UNP P04905
A	214	FTR	TRP	conflict	UNP P04905
B	7	FTR	TRP	conflict	UNP P04905
B	45	FTR	TRP	conflict	UNP P04905
B	146	FTR	TRP	conflict	UNP P04905
B	214	FTR	TRP	conflict	UNP P04905

- Molecule 2 is (9R,10R)-9-(S-GLUTATHIONYL)-10-HYDROXY-9,10-DIHYDROPHENANTHRENE (CCD ID: GPR) (formula: C<sub>24</sub>H<sub>27</sub>N<sub>3</sub>O<sub>7</sub>S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
2	A	1	Total 35	C 24	N 3	O 7	S 1	0	0
2	B	1	Total 35	C 24	N 3	O 7	S 1	0	0

- Molecule 3 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
3	A	167	Total O 167 167	0	0
3	B	204	Total O 204 204	0	0



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	86.94Å 68.75Å 80.54Å 90.00° 105.08° 90.00°	Depositor
Resolution (Å)	65.00 – 2.00 65.00 – 2.00	Depositor EDS
% Data completeness (in resolution range)	90.0 (65.00-2.00) 93.9 (65.00-2.00)	Depositor EDS
$R_{merge}$	0.07	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	6.54 (at 1.99Å)	Xtriage
Refinement program	TNT 5E, X-PLOR	Depositor
R, $R_{free}$	0.180 , (Not available) 0.185 , (Not available)	Depositor DCC
$R_{free}$ test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	16.4	Xtriage
Anisotropy	0.752	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.42 , 139.8	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
$F_o, F_c$ correlation	0.92	EDS
Total number of atoms	4085	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	33.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 5.30% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

<sup>2</sup>Theoretical 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

### 5.1 Standard geometry

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

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	1.38	5/1799 (0.3%)	2.02	45/2411 (1.9%)
1	B	1.41	6/1799 (0.3%)	2.11	72/2411 (3.0%)
All	All	1.39	11/3598 (0.3%)	2.07	117/4822 (2.4%)

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	21	GLU	CD-OE2	6.71	1.38	1.25
1	B	57	PRO	N-CA	-6.02	1.40	1.47
1	B	5	GLY	CA-C	5.52	1.56	1.52
1	B	155	VAL	CA-C	-5.46	1.45	1.52
1	A	5	GLY	CA-C	-5.45	1.48	1.52
1	A	156	ASP	CA-C	5.26	1.59	1.52
1	A	201	ARG	NE-CZ	-5.26	1.27	1.33
1	A	31	ARG	CA-C	-5.15	1.46	1.53
1	B	91	GLU	C-N	5.02	1.40	1.33
1	B	105	ASP	N-CA	5.02	1.52	1.46
1	A	176	ALA	CA-C	-5.01	1.45	1.52

All (117) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	21	GLU	CB-CG-CD	10.96	131.24	112.60
1	B	41	ASP	CA-CB-CG	-10.21	102.39	112.60
1	B	8	ASN	N-CA-CB	-9.07	95.09	110.50
1	B	175	ASP	CA-CB-CG	-8.73	103.87	112.60
1	B	144	ARG	N-CA-C	7.96	119.93	109.83
1	B	199	SER	N-CA-C	7.70	119.89	110.41
1	A	170	GLU	O-C-N	7.68	125.88	121.27
1	B	124	PRO	N-CA-C	-7.45	104.16	113.84

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	47	ASN	N-CA-CB	7.28	121.43	110.22
1	A	137	TYR	N-CA-CB	7.21	120.83	110.16
1	A	150	ASP	CA-CB-CG	-7.18	105.42	112.60
1	B	70	THR	N-CA-CB	7.02	122.60	111.43
1	B	8	ASN	OD1-CG-ND2	-6.98	115.62	122.60
1	B	130	ILE	N-CA-C	6.78	123.52	108.88
1	A	67	ARG	CD-NE-CZ	6.76	133.87	124.40
1	B	25	SER	N-CA-CB	6.66	119.89	110.36
1	A	29	GLU	CA-C-N	6.63	131.93	121.72
1	A	29	GLU	C-N-CA	6.63	131.93	121.72
1	B	139	GLU	N-CA-CB	6.61	120.52	110.28
1	A	177	PHE	N-CA-C	6.60	121.77	110.02
1	A	55	ASP	CB-CG-OD2	-6.57	103.29	118.40
1	A	111	ILE	CB-CA-C	-6.53	103.52	111.88
1	B	37	ALA	C-N-CD	-6.50	106.31	120.60
1	B	216	ASN	N-CA-C	6.37	120.36	112.59
1	B	17	ARG	NE-CZ-NH2	-6.33	113.50	119.20
1	A	156	ASP	CA-CB-CG	-6.33	106.27	112.60
1	A	50	PHE	N-CA-C	6.32	119.71	112.57
1	B	14	HIS	CA-C-O	6.30	124.13	118.33
1	A	43	SER	N-CA-C	6.27	119.78	111.75
1	B	52	LEU	N-CA-C	6.25	121.05	113.17
1	B	187	PHE	CA-CB-CG	-6.15	107.65	113.80
1	B	47	ASN	CA-CB-CG	6.13	118.73	112.60
1	B	154	TYR	N-CA-C	6.13	119.86	112.38
1	B	116	ASN	CA-CB-CG	6.10	118.70	112.60
1	B	174	LEU	CA-C-N	-5.97	112.20	120.38
1	B	174	LEU	C-N-CA	-5.97	112.20	120.38
1	A	16	ILE	CA-C-O	5.96	127.67	121.05
1	B	134	MET	O-C-N	5.94	128.42	122.12
1	B	195	ALA	CA-C-N	-5.91	112.76	120.44
1	B	195	ALA	C-N-CA	-5.91	112.76	120.44
1	B	168	ILE	CA-C-O	5.91	127.11	120.85
1	B	54	LEU	O-C-N	-5.90	116.13	123.04
1	A	104	MET	CA-C-N	-5.88	112.44	120.44
1	A	104	MET	C-N-CA	-5.88	112.44	120.44
1	B	129	THR	N-CA-CB	5.87	119.60	110.44
1	A	40	TYR	CA-CB-CG	-5.86	103.36	113.90
1	A	205	THR	CA-C-O	-5.86	114.95	120.34
1	A	162	ILE	N-CA-C	5.81	116.55	110.62
1	B	27	TYR	N-CA-CB	-5.81	102.55	111.56
1	B	102	GLN	N-CA-CB	-5.79	101.60	110.12

*Continued on next page...*



*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	105	ASP	CB-CA-C	-5.78	102.06	110.96
1	B	4	LEU	CA-C-N	-5.77	117.20	122.80
1	B	4	LEU	C-N-CA	-5.77	117.20	122.80
1	A	179	ASN	CA-C-O	5.76	127.76	121.02
1	B	184	LEU	N-CA-C	-5.76	104.00	111.02
1	B	177	PHE	N-CA-C	5.73	120.42	108.39
1	B	195	ALA	N-CA-C	-5.70	104.97	111.07
1	B	93	ARG	N-CA-CB	-5.70	101.75	110.01
1	A	191	LYS	N-CA-C	5.65	122.83	110.80
1	B	69	ILE	CA-CB-CG1	5.63	119.97	110.40
1	A	69	ILE	N-CA-C	5.63	116.22	108.12
1	B	110	LEU	CA-C-O	5.62	126.38	120.42
1	B	138	SER	CB-CA-C	-5.61	101.83	110.81
1	A	176	ALA	CA-C-N	-5.60	116.55	123.21
1	A	176	ALA	C-N-CA	-5.60	116.55	123.21
1	A	46	LEU	N-CA-CB	5.59	120.00	110.50
1	A	3	ILE	CB-CA-C	-5.57	102.32	110.62
1	B	116	ASN	CA-C-N	5.56	125.92	119.47
1	B	116	ASN	C-N-CA	5.56	125.92	119.47
1	A	207	ILE	CB-CG1-CD1	-5.56	102.13	113.80
1	B	174	LEU	CA-C-O	5.55	125.48	119.15
1	B	108	MET	CA-C-N	-5.54	112.42	120.29
1	B	108	MET	C-N-CA	-5.54	112.42	120.29
1	A	95	ARG	CD-NE-CZ	5.52	132.13	124.40
1	B	32	TYR	CA-C-N	-5.51	113.81	122.73
1	B	32	TYR	C-N-CA	-5.51	113.81	122.73
1	B	3	ILE	CA-CB-CG1	5.49	119.73	110.40
1	B	116	ASN	O-C-N	5.49	125.97	121.31
1	B	180	LEU	O-C-N	5.48	128.01	122.09
1	A	48	GLU	N-CA-CB	5.44	118.82	110.61
1	A	162	ILE	CA-C-O	5.44	126.60	120.95
1	A	73	ASN	N-CA-CB	5.43	118.59	110.22
1	B	157	PHE	CA-CB-CG	-5.41	108.39	113.80
1	B	179	ASN	CA-CB-CG	5.40	118.00	112.60
1	A	107	ARG	CD-NE-CZ	-5.39	116.85	124.40
1	A	16	ILE	CB-CA-C	-5.38	104.97	112.02
1	B	26	SER	CA-C-O	5.38	126.23	120.32
1	A	193	ILE	CB-CA-C	-5.36	105.00	112.02
1	A	202	TYR	CB-CA-C	5.34	118.78	109.65
1	B	199	SER	CA-C-N	-5.29	111.27	121.58
1	B	199	SER	C-N-CA	-5.29	111.27	121.58
1	B	107	ARG	CB-CA-C	-5.28	102.59	110.88

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	174	LEU	CA-C-O	5.27	125.40	119.18
1	B	166	TYR	CA-CB-CG	-5.27	104.42	113.90
1	B	101	ASN	N-CA-C	5.26	117.09	111.36
1	A	164	ASP	CB-CA-C	5.24	119.10	110.88
1	B	177	PHE	CA-C-N	5.22	126.37	119.84
1	B	177	PHE	C-N-CA	5.22	126.37	119.84
1	A	97	ASP	CA-C-O	5.21	126.07	120.55
1	B	176	ALA	CA-C-N	-5.15	116.83	123.16
1	B	176	ALA	C-N-CA	-5.15	116.83	123.16
1	A	49	LYS	CB-CA-C	5.13	119.36	110.84
1	B	196	TYR	CA-C-N	-5.13	112.89	120.28
1	B	196	TYR	C-N-CA	-5.13	112.89	120.28
1	B	177	PHE	O-C-N	5.13	125.98	121.37
1	B	89	THR	CA-C-N	-5.10	113.45	120.28
1	B	89	THR	C-N-CA	-5.10	113.45	120.28
1	A	67	ARG	CG-CD-NE	5.08	123.18	112.00
1	A	210	LYS	N-CA-C	5.08	117.47	111.33
1	B	17	ARG	NE-CZ-NH1	5.07	126.57	121.50
1	B	138	SER	CA-C-N	-5.07	112.60	120.31
1	B	138	SER	C-N-CA	-5.07	112.60	120.31
1	A	8	ASN	CB-CA-C	5.07	119.73	110.10
1	A	167	HIS	CA-CB-CG	-5.05	108.75	113.80
1	B	161	ASP	N-CA-C	5.05	116.78	111.28
1	A	173	CYS	N-CA-C	5.04	121.53	110.80
1	A	151	LYS	CB-CA-C	5.03	119.24	109.33

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

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	1822	0	1799	174	0
1	B	1822	0	1799	195	0
2	A	35	0	25	6	0
2	B	35	0	25	7	0

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
3	A	167	0	0	17	0
3	B	204	0	0	13	1
All	All	4085	0	3648	366	1

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 50.

All (366) 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:67:ARG:HG3	1:B:69:ILE:HD11	1.41	1.02
1:B:116:ASN:ND2	1:B:118:ASP:H	1.57	1.01
1:A:32:TYR:HD1	1:A:44:GLN:HG2	1.25	0.99
1:A:216:ASN:HD22	1:A:217:LYS:N	1.63	0.96
1:A:150:ASP:N	1:A:151:LYS:HE2	1.81	0.96
1:B:201:ARG:HH11	1:B:201:ARG:HG2	1.28	0.96
1:A:150:ASP:H	1:A:151:LYS:HE2	1.29	0.95
1:A:211:LEU:HD12	1:A:211:LEU:H	1.31	0.92
1:B:116:ASN:HD22	1:B:118:ASP:H	1.07	0.92
1:A:122:GLN:HE22	1:A:125:GLU:HG3	1.36	0.90
1:A:11:GLY:HA2	2:A:218:GPR:HZ5	1.53	0.88
1:B:15:PRO:HB2	1:B:76:MET:CE	2.04	0.87
1:B:123:LYS:HB3	1:B:124:PRO:HD3	1.56	0.87
1:B:15:PRO:HB2	1:B:76:MET:HE3	1.57	0.85
1:B:21:GLU:HG3	1:B:196:TYR:HB2	1.58	0.85
1:A:91:GLU:HG2	1:B:67:ARG:HH22	1.44	0.81
1:A:7:FTR:HH2	1:A:42:ARG:HG2	1.63	0.81
1:B:95:ARG:O	1:B:99:VAL:HG23	1.82	0.80
1:A:108:MET:HA	1:A:111:ILE:CG1	2.14	0.78
1:A:21:GLU:HG3	1:A:196:TYR:CG	2.18	0.78
1:A:111:ILE:HG23	1:A:208:PHE:CE1	2.18	0.77
1:B:124:PRO:O	1:B:128:LYS:HG3	1.86	0.76
1:B:67:ARG:HG3	1:B:69:ILE:CD1	2.14	0.76
1:B:21:GLU:HG2	3:B:824:HOH:O	1.86	0.76
1:B:214:FTR:CE3	1:B:215:SER:HB2	2.15	0.76
1:B:67:ARG:CG	1:B:69:ILE:HD11	2.15	0.75
1:A:32:TYR:CD1	1:A:44:GLN:HG2	2.17	0.74
1:B:104:MET:HE3	1:B:104:MET:O	1.87	0.74
1:A:40:TYR:CE1	1:A:211:LEU:HG	2.22	0.74
1:B:128:LYS:HB2	1:B:128:LYS:NZ	2.03	0.74
1:B:159:ALA:O	1:B:163:LEU:HD13	1.87	0.74

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:106:ASN:HA	1:B:109:GLN:OE1	1.89	0.73
1:A:40:TYR:CD1	1:A:211:LEU:HG	2.22	0.73
1:A:93:ARG:HD3	3:A:623:HOH:O	1.89	0.72
1:A:160:TYR:HD1	1:A:184:LEU:HD12	1.54	0.72
1:A:211:LEU:HD12	1:A:211:LEU:N	2.04	0.72
1:B:116:ASN:HD22	1:B:118:ASP:N	1.84	0.72
1:B:12:LEU:HD23	1:B:12:LEU:H	1.54	0.72
1:A:192:LYS:HE2	3:A:543:HOH:O	1.88	0.71
1:A:10:ARG:NH2	1:A:164:ASP:OD1	2.22	0.71
1:A:150:ASP:HB2	1:A:151:LYS:CE	2.21	0.71
1:B:14:HIS:CD2	1:B:18:LEU:HD11	2.25	0.70
1:B:177:PHE:O	1:B:180:LEU:HB2	1.90	0.70
1:B:91:GLU:O	1:B:95:ARG:HG3	1.92	0.70
1:A:144:ARG:HG2	1:A:149:GLY:HA2	1.74	0.70
1:B:201:ARG:HD3	1:B:201:ARG:N	2.07	0.70
1:B:68:LYS:C	1:B:69:ILE:HD13	2.17	0.69
1:B:113:LEU:HD22	1:B:126:PHE:CD2	2.28	0.69
1:A:160:TYR:CD1	1:A:184:LEU:HD12	2.27	0.69
1:B:170:GLU:HB3	1:B:173:CYS:HB3	1.75	0.69
1:A:187:PHE:O	1:A:190:LEU:HD12	1.91	0.69
1:B:16:ILE:HG13	1:B:76:MET:HE1	1.76	0.69
1:B:126:PHE:HA	1:B:129:THR:HG23	1.75	0.68
1:B:128:LYS:HD3	3:B:741:HOH:O	1.94	0.68
2:B:218:GPR:HA4	3:B:682:HOH:O	1.93	0.68
1:A:94:ILE:O	1:A:98:ILE:HG13	1.93	0.68
1:B:21:GLU:OE2	1:B:192:LYS:HB3	1.93	0.68
1:B:201:ARG:HD3	1:B:201:ARG:H	1.57	0.68
1:B:61:TYR:HD1	1:B:63:ILE:HD13	1.59	0.68
1:B:186:ARG:HG3	3:B:723:HOH:O	1.94	0.67
1:B:95:ARG:NH1	1:B:147:PHE:O	2.29	0.66
1:B:201:ARG:HG2	1:B:201:ARG:NH1	2.07	0.66
1:A:113:LEU:HD13	1:A:122:GLN:HG3	1.78	0.66
1:A:150:ASP:H	1:A:151:LYS:CE	2.08	0.66
1:A:81:ARG:CZ	1:B:93:ARG:HG2	2.26	0.66
1:B:82:LYS:HG3	3:B:868:HOH:O	1.96	0.65
2:B:218:GPR:HA2	3:B:682:HOH:O	1.96	0.65
1:B:174:LEU:O	1:B:175:ASP:C	2.35	0.65
1:B:123:LYS:HB3	1:B:124:PRO:CD	2.27	0.65
1:A:21:GLU:HG3	1:A:196:TYR:CD2	2.31	0.65
1:B:170:GLU:HG3	1:B:173:CYS:HB3	1.78	0.65
1:B:175:ASP:OD1	1:B:181:LYS:HE3	1.97	0.65

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:108:MET:O	1:A:112:MET:HG3	1.96	0.65
1:A:217:LYS:OXT	1:A:217:LYS:HG3	1.98	0.64
1:B:88:GLU:OE1	1:B:151:LYS:NZ	2.30	0.64
1:B:108:MET:HA	1:B:108:MET:HE3	1.79	0.64
1:A:67:ARG:NH1	1:A:78:TYR:OH	2.30	0.63
1:A:151:LYS:HE2	1:A:151:LYS:H	1.64	0.63
1:B:16:ILE:HG13	1:B:76:MET:CE	2.29	0.63
1:A:216:ASN:HD22	1:A:217:LYS:H	1.47	0.63
1:A:81:ARG:NE	1:B:90:GLU:OE2	2.29	0.62
1:B:107:ARG:O	1:B:111:ILE:HG22	1.99	0.62
1:B:138:SER:OG	1:B:179:ASN:ND2	2.29	0.62
1:B:37:ALA:HB3	3:B:790:HOH:O	1.99	0.62
1:A:8:ASN:HB3	1:A:32:TYR:O	1.99	0.62
1:A:121:LYS:HE2	1:A:121:LYS:H	1.63	0.62
1:A:194:SER:O	1:A:198:LYS:HD3	2.00	0.62
1:A:7:FTR:CH2	1:A:42:ARG:HG2	2.29	0.62
1:B:108:MET:HA	1:B:108:MET:CE	2.30	0.61
1:A:106:ASN:ND2	1:A:137:TYR:OH	2.29	0.61
1:A:146:FTR:CE2	1:A:152:VAL:HG22	2.30	0.61
1:A:71:GLN:O	1:A:74:ALA:HB3	1.99	0.61
1:A:13:THR:O	1:A:14:HIS:C	2.39	0.61
1:B:144:ARG:HG2	1:B:149:GLY:HA2	1.83	0.60
1:A:7:FTR:HH2	1:A:42:ARG:CG	2.31	0.60
1:A:186:ARG:HG3	1:A:186:ARG:HH11	1.66	0.60
1:B:161:ASP:O	1:B:165:GLN:HG3	2.01	0.60
1:A:116:ASN:OD1	1:A:118:ASP:N	2.29	0.60
1:A:135:LYS:HE3	1:A:136:LEU:CD2	2.31	0.60
1:A:202:TYR:CE2	1:A:204:SER:HB2	2.37	0.60
1:A:10:ARG:HH22	1:A:164:ASP:CG	2.10	0.60
1:B:116:ASN:HD22	1:B:116:ASN:C	2.10	0.59
1:B:109:GLN:HG3	1:B:133:LYS:NZ	2.17	0.59
1:A:88:GLU:N	1:A:92:GLU:OE1	2.30	0.59
1:A:150:ASP:CB	1:A:151:LYS:HD3	2.32	0.59
1:B:1:PRO:HB2	1:B:27:TYR:HA	1.85	0.59
1:A:58:ASN:OD1	2:A:218:GPR:N3	2.36	0.59
1:A:83:HIS:O	1:A:84:HIS:ND1	2.36	0.59
1:B:145:PRO:HB2	1:B:146:FTR:CD1	2.33	0.59
1:B:82:LYS:HE2	3:B:628:HOH:O	2.03	0.59
1:A:125:GLU:HG3	3:A:814:HOH:O	2.03	0.58
1:A:216:ASN:HD22	1:A:216:ASN:C	2.10	0.58
1:A:88:GLU:HB2	1:A:92:GLU:OE1	2.02	0.58

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:35:GLY:O	1:B:40:TYR:HA	2.02	0.58
1:A:150:ASP:CA	1:A:151:LYS:HE2	2.34	0.58
1:B:2:MET:HE1	3:B:628:HOH:O	2.03	0.58
1:B:61:TYR:CD1	1:B:63:ILE:HD13	2.38	0.58
1:B:15:PRO:HB2	1:B:76:MET:HE1	1.85	0.58
1:A:186:ARG:HH11	1:A:186:ARG:CG	2.17	0.57
1:A:207:ILE:HD11	1:A:214:FTR:CH2	2.34	0.57
1:B:130:ILE:HB	1:B:131:PRO:HD3	1.86	0.57
1:A:49:LYS:HE2	3:A:630:HOH:O	2.05	0.57
1:A:128:LYS:O	1:A:131:PRO:HD2	2.04	0.57
1:B:184:LEU:O	1:B:187:PHE:N	2.38	0.57
1:A:193:ILE:O	1:A:197:MET:HG3	2.03	0.57
1:B:212:ALA:HB3	1:B:216:ASN:HB3	1.86	0.57
1:B:106:ASN:OD1	1:B:109:GLN:OE1	2.22	0.57
1:B:108:MET:HA	1:B:111:ILE:CG2	2.34	0.57
1:B:183:PHE:O	1:B:184:LEU:C	2.41	0.56
1:B:2:MET:HE2	1:B:82:LYS:NZ	2.21	0.56
1:A:150:ASP:HB2	1:A:151:LYS:HD3	1.88	0.56
1:B:197:MET:HG2	1:B:202:TYR:CZ	2.41	0.56
1:A:123:LYS:O	1:A:124:PRO:C	2.47	0.56
1:B:181:LYS:HE2	3:B:670:HOH:O	2.06	0.56
1:A:16:ILE:HG22	1:A:20:LEU:HD12	1.86	0.56
1:B:141:LEU:O	1:B:144:ARG:HB2	2.06	0.56
1:B:163:LEU:N	1:B:163:LEU:HD12	2.19	0.56
1:A:112:MET:HG2	3:A:615:HOH:O	2.06	0.55
1:B:170:GLU:O	1:B:173:CYS:HB3	2.06	0.55
1:A:68:LYS:NZ	3:A:830:HOH:O	2.39	0.55
1:A:55:ASP:HB2	3:A:848:HOH:O	2.05	0.55
1:A:3:ILE:HG22	1:A:4:LEU:N	2.20	0.55
1:A:108:MET:HA	1:A:111:ILE:HD11	1.88	0.55
1:B:187:PHE:HA	1:B:190:LEU:HD22	1.87	0.55
1:B:187:PHE:O	1:B:190:LEU:HD22	2.06	0.55
1:A:151:LYS:CE	1:A:151:LYS:H	2.20	0.54
1:A:16:ILE:HD13	1:A:76:MET:SD	2.46	0.54
1:A:161:ASP:O	1:A:165:GLN:HG3	2.06	0.54
1:B:39:ASP:C	1:B:40:TYR:HD1	2.16	0.54
1:A:209:SER:HB3	2:A:218:GPR:HE4	1.88	0.54
1:B:12:LEU:HD23	1:B:12:LEU:N	2.19	0.54
1:A:150:ASP:HB2	1:A:151:LYS:HE2	1.89	0.54
1:B:95:ARG:HH11	1:B:148:ALA:C	2.15	0.54
1:A:78:TYR:CE2	1:A:82:LYS:HE2	2.42	0.54

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:119:PHE:O	1:B:123:LYS:HB2	2.07	0.54
1:B:121:LYS:HD2	1:B:122:GLN:OE1	2.07	0.54
1:A:10:ARG:HB3	1:A:207:ILE:HA	1.90	0.53
1:B:71:GLN:O	1:B:75:ILE:HG13	2.08	0.53
1:B:151:LYS:HG3	1:B:152:VAL:O	2.07	0.53
1:B:170:GLU:CB	1:B:173:CYS:HB3	2.38	0.53
1:B:10:ARG:HB3	1:B:207:ILE:HA	1.89	0.53
1:B:12:LEU:H	1:B:12:LEU:CD2	2.21	0.53
1:B:130:ILE:N	1:B:131:PRO:HD2	2.22	0.53
1:B:198:LYS:NZ	3:B:546:HOH:O	2.28	0.53
1:B:170:GLU:CG	1:B:173:CYS:HB3	2.39	0.53
1:A:207:ILE:HD11	1:A:214:FTR:CZ3	2.39	0.53
1:A:67:ARG:NH1	1:A:78:TYR:CE1	2.77	0.53
1:A:135:LYS:CE	1:A:136:LEU:HG	2.39	0.53
1:A:45:FTR:CE2	1:A:49:LYS:HG3	2.39	0.53
1:A:108:MET:HA	1:A:111:ILE:CD1	2.39	0.53
1:B:122:GLN:O	1:B:123:LYS:HB2	2.09	0.53
1:B:113:LEU:HD22	1:B:126:PHE:CG	2.44	0.53
1:B:214:FTR:CZ3	1:B:215:SER:HB2	2.38	0.53
1:B:8:ASN:OD1	1:B:8:ASN:N	2.26	0.53
1:A:18:LEU:HD13	1:A:187:PHE:CZ	2.44	0.52
1:B:206:PRO:HB3	1:B:217:LYS:N	2.24	0.52
1:A:14:HIS:HB3	1:A:15:PRO:HD3	1.92	0.52
1:A:88:GLU:OE1	1:A:88:GLU:HA	2.10	0.52
1:B:99:VAL:O	1:B:100:GLU:C	2.53	0.52
1:B:34:MET:HB3	1:B:41:ASP:O	2.09	0.52
1:B:8:ASN:OD1	1:B:32:TYR:O	2.27	0.52
1:A:39:ASP:HA	3:A:593:HOH:O	2.10	0.52
1:A:94:ILE:HD13	1:B:67:ARG:HD2	1.91	0.52
1:A:49:LYS:HD3	1:A:50:PHE:CE1	2.45	0.51
1:A:211:LEU:H	1:A:211:LEU:CD1	2.15	0.51
1:A:11:GLY:CA	2:A:218:GPR:HZ5	2.33	0.51
1:A:21:GLU:HG3	1:A:196:TYR:CD1	2.45	0.51
1:B:145:PRO:HG2	1:B:150:ASP:HA	1.91	0.51
1:A:150:ASP:HB2	1:A:151:LYS:CD	2.39	0.51
1:B:162:ILE:HD11	1:B:166:TYR:HE2	1.74	0.51
1:B:39:ASP:OD1	1:B:39:ASP:N	2.31	0.51
1:B:157:PHE:N	1:B:157:PHE:CD1	2.78	0.51
1:A:91:GLU:OE2	1:B:67:ARG:NH1	2.42	0.50
2:A:218:GPR:HB12	3:A:779:HOH:O	2.11	0.50
1:B:199:SER:HB2	1:B:201:ARG:HE	1.76	0.50

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:144:ARG:HG2	1:A:149:GLY:CA	2.40	0.50
1:B:104:MET:HE3	1:B:104:MET:C	2.36	0.50
1:B:118:ASP:OD2	1:B:122:GLN:OE1	2.29	0.50
1:B:2:MET:C	1:B:3:ILE:HD13	2.36	0.50
1:A:151:LYS:HE2	1:A:151:LYS:N	2.27	0.50
1:B:7:FTR:HB2	1:B:8:ASN:OD1	2.12	0.50
1:A:40:TYR:O	1:A:41:ASP:C	2.54	0.50
1:B:211:LEU:O	1:B:212:ALA:O	2.29	0.50
1:A:34:MET:SD	1:A:211:LEU:HD11	2.52	0.50
1:B:126:PHE:CA	1:B:129:THR:HG23	2.39	0.50
1:A:20:LEU:HD23	1:A:25:SER:CB	2.42	0.49
1:A:180:LEU:O	1:A:181:LYS:C	2.53	0.49
1:B:201:ARG:HH11	1:B:201:ARG:CG	2.11	0.49
1:A:35:GLY:O	1:A:40:TYR:HA	2.13	0.49
1:B:203:LEU:C	1:B:203:LEU:HD12	2.36	0.49
1:B:13:THR:HG23	1:B:16:ILE:HD12	1.95	0.49
1:B:116:ASN:ND2	1:B:118:ASP:N	2.41	0.49
1:A:92:GLU:OE2	1:A:151:LYS:HE3	2.13	0.49
1:B:108:MET:HA	1:B:111:ILE:HG22	1.94	0.49
1:B:108:MET:HE3	1:B:108:MET:CA	2.43	0.49
1:B:113:LEU:HD11	1:B:122:GLN:O	2.13	0.49
1:A:122:GLN:HE22	1:A:125:GLU:CG	2.14	0.49
1:A:167:HIS:NE2	1:A:171:PRO:O	2.45	0.49
1:A:108:MET:HA	1:A:111:ILE:HG13	1.91	0.49
1:B:7:FTR:HE3	1:B:8:ASN:OD1	2.12	0.48
1:A:125:GLU:OE1	1:A:125:GLU:O	2.31	0.48
1:B:208:PHE:CD2	1:B:215:SER:HB3	2.48	0.48
1:A:159:ALA:O	1:A:160:TYR:C	2.54	0.48
1:B:130:ILE:HG21	1:B:173:CYS:HB2	1.95	0.48
1:A:144:ARG:CG	1:A:149:GLY:HA2	2.43	0.48
1:B:104:MET:HE3	1:B:104:MET:CA	2.44	0.48
1:B:115:TYR:O	1:B:117:PRO:HD3	2.12	0.48
1:B:6:TYR:CG	1:B:7:FTR:N	2.82	0.48
1:B:104:MET:HE1	1:B:108:MET:SD	2.54	0.48
1:B:109:GLN:HG3	1:B:133:LYS:HZ3	1.79	0.48
1:A:93:ARG:NH1	3:A:623:HOH:O	2.35	0.48
1:B:130:ILE:N	1:B:131:PRO:CD	2.77	0.48
1:B:13:THR:O	1:B:13:THR:HG22	2.14	0.47
1:B:2:MET:HG2	1:B:64:ASP:HA	1.95	0.47
1:A:6:TYR:CG	1:A:7:FTR:N	2.82	0.47
1:B:128:LYS:HB3	1:B:128:LYS:HE2	1.67	0.47

*Continued on next page...*



*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:151:LYS:HG2	1:B:153:THR:CG2	2.45	0.47
1:B:2:MET:CE	1:B:82:LYS:NZ	2.78	0.47
1:A:113:LEU:CD1	1:A:122:GLN:HG3	2.44	0.47
1:A:186:ARG:CG	1:A:186:ARG:NH1	2.77	0.47
1:B:195:ALA:O	1:B:196:TYR:C	2.57	0.47
1:B:162:ILE:HD11	1:B:166:TYR:CE2	2.50	0.47
1:A:11:GLY:HA2	2:A:218:GPR:CZ5	2.34	0.47
1:A:150:ASP:CB	1:A:151:LYS:HE2	2.44	0.47
1:A:91:GLU:HG3	3:A:622:HOH:O	2.15	0.46
1:A:170:GLU:HA	1:A:171:PRO:HD2	1.55	0.46
1:A:122:GLN:O	1:A:122:GLN:NE2	2.48	0.46
1:A:77:ARG:O	1:A:81:ARG:HG3	2.15	0.46
1:B:144:ARG:HG3	1:B:145:PRO:HD2	1.96	0.46
1:A:40:TYR:CG	1:A:211:LEU:HG	2.51	0.46
1:B:61:TYR:CD1	1:B:63:ILE:CD1	2.99	0.46
1:A:40:TYR:CD2	1:A:211:LEU:CD2	2.99	0.46
1:A:151:LYS:CD	1:A:151:LYS:N	2.79	0.46
1:B:193:ILE:HG22	1:B:197:MET:HE2	1.97	0.46
1:A:3:ILE:CG2	1:A:4:LEU:N	2.79	0.46
1:B:58:ASN:OD1	2:B:218:GPR:N3	2.42	0.46
1:A:45:FTR:CZ2	1:A:49:LYS:HG3	2.45	0.46
1:B:88:GLU:HG2	1:B:92:GLU:OE1	2.16	0.46
1:B:163:LEU:N	1:B:163:LEU:CD1	2.79	0.46
1:A:105:ASP:OD1	2:B:218:GPR:N1	2.37	0.46
1:A:6:TYR:O	1:A:31:ARG:HA	2.17	0.45
1:B:2:MET:HE2	1:B:82:LYS:HZ1	1.80	0.45
1:B:12:LEU:N	1:B:12:LEU:CD2	2.78	0.45
1:A:7:FTR:NE1	1:A:59:LEU:HD12	2.32	0.45
1:B:207:ILE:HD12	1:B:215:SER:OG	2.17	0.45
1:B:209:SER:O	1:B:210:LYS:C	2.59	0.45
1:B:24:ASP:HB2	1:B:192:LYS:NZ	2.32	0.45
1:B:24:ASP:HB2	1:B:192:LYS:HZ1	1.82	0.45
1:A:67:ARG:NH1	1:A:78:TYR:CZ	2.85	0.45
1:B:177:PHE:HA	1:B:178:PRO:HD2	1.77	0.45
1:B:212:ALA:O	1:B:213:GLN:NE2	2.50	0.45
1:A:123:LYS:HB3	1:A:124:PRO:HD3	1.99	0.45
1:A:160:TYR:O	1:A:164:ASP:HB3	2.16	0.45
1:B:2:MET:CE	1:B:82:LYS:HZ3	2.29	0.45
1:A:42:ARG:HG2	1:A:42:ARG:NH1	2.32	0.44
1:A:173:CYS:HB2	3:A:551:HOH:O	2.17	0.44
1:B:46:LEU:N	1:B:46:LEU:CD1	2.79	0.44

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:18:LEU:HD13	1:A:187:PHE:CE2	2.52	0.44
1:A:72:SER:HB2	3:A:750:HOH:O	2.17	0.44
1:A:202:TYR:HE2	1:A:204:SER:HB2	1.81	0.44
1:B:123:LYS:N	1:B:124:PRO:CD	2.79	0.44
1:A:106:ASN:HA	1:A:109:GLN:OE1	2.17	0.44
1:B:172:LYS:O	1:B:175:ASP:N	2.41	0.44
1:A:111:ILE:HG23	1:A:208:PHE:HE1	1.77	0.44
1:B:144:ARG:HB2	1:B:144:ARG:HE	1.62	0.44
1:A:102:GLN:HE21	1:A:106:ASN:HD21	1.65	0.44
1:B:94:ILE:O	1:B:98:ILE:HG13	2.18	0.44
1:B:106:ASN:HA	1:B:109:GLN:CD	2.42	0.44
1:A:162:ILE:HA	1:A:162:ILE:HD12	1.70	0.44
1:B:37:ALA:HA	1:B:38:PRO:HA	1.56	0.44
1:B:40:TYR:O	1:B:41:ASP:C	2.60	0.44
1:B:123:LYS:CB	1:B:124:PRO:HD3	2.39	0.44
1:A:76:MET:HE2	1:A:158:LEU:HD13	1.99	0.43
1:B:48:GLU:O	1:B:49:LYS:C	2.59	0.43
1:B:104:MET:CE	1:B:108:MET:SD	3.06	0.43
1:B:144:ARG:CG	1:B:149:GLY:HA2	2.47	0.43
1:A:83:HIS:C	1:A:84:HIS:CG	2.96	0.43
1:A:135:LYS:HE3	1:A:136:LEU:HD23	1.99	0.43
1:B:109:GLN:HG3	1:B:133:LYS:HZ1	1.84	0.43
1:B:187:PHE:CD1	1:B:190:LEU:HD23	2.53	0.43
1:A:78:TYR:CZ	1:A:82:LYS:HE2	2.53	0.43
1:B:34:MET:HA	1:B:41:ASP:O	2.18	0.43
1:A:207:ILE:HD12	1:A:207:ILE:HG21	1.55	0.43
2:B:218:GPR:HA4	2:B:218:GPR:HA2	1.69	0.43
1:B:32:TYR:CD1	1:B:32:TYR:N	2.86	0.43
1:A:91:GLU:O	1:A:95:ARG:HG3	2.16	0.43
1:A:100:GLU:HA	1:A:158:LEU:HD23	2.00	0.43
1:A:14:HIS:HB2	3:A:638:HOH:O	2.18	0.43
1:B:108:MET:CA	1:B:111:ILE:HG22	2.49	0.43
1:A:186:ARG:NH1	1:A:186:ARG:HB2	2.34	0.42
1:B:12:LEU:CD2	2:B:218:GPR:SG2	3.07	0.42
1:A:108:MET:HA	1:A:111:ILE:HG12	1.97	0.42
1:B:70:THR:O	1:B:71:GLN:HB2	2.19	0.42
1:A:60:PRO:HG2	1:A:75:ILE:HD12	2.02	0.42
1:B:51:LYS:HE2	3:B:605:HOH:O	2.19	0.42
1:B:108:MET:CE	1:B:111:ILE:HG21	2.50	0.42
1:B:128:LYS:HG2	3:B:789:HOH:O	2.17	0.42
1:B:160:TYR:CD1	1:B:184:LEU:HD23	2.55	0.42

*Continued on next page...*

*Continued from previous page...*

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:210:LYS:HD3	1:B:210:LYS:HA	1.79	0.42
1:A:201:ARG:NH1	3:A:792:HOH:O	2.51	0.42
1:B:39:ASP:C	1:B:40:TYR:CD1	2.97	0.42
1:B:130:ILE:O	1:B:133:LYS:N	2.51	0.42
1:A:177:PHE:O	1:A:178:PRO:C	2.63	0.42
1:B:108:MET:HE3	1:B:111:ILE:CG2	2.50	0.42
1:A:192:LYS:HG3	3:A:543:HOH:O	2.19	0.42
1:A:81:ARG:NH2	1:B:90:GLU:OE2	2.53	0.42
1:A:121:LYS:HE2	1:A:121:LYS:N	2.33	0.42
1:B:126:PHE:O	1:B:129:THR:HG23	2.19	0.42
1:A:37:ALA:HB2	1:A:40:TYR:OH	2.20	0.42
1:A:56:PHE:O	1:A:57:PRO:C	2.63	0.42
1:A:135:LYS:HE2	1:A:136:LEU:N	2.35	0.42
1:A:21:GLU:CD	1:A:196:TYR:CD1	2.98	0.41
1:B:67:ARG:HA	1:B:67:ARG:HD3	1.71	0.41
1:B:130:ILE:O	1:B:131:PRO:C	2.63	0.41
1:A:10:ARG:HD3	1:A:207:ILE:HG22	2.02	0.41
1:B:89:THR:H	1:B:92:GLU:HB2	1.85	0.41
1:B:119:PHE:CZ	1:B:214:FTR:HB3	2.55	0.41
1:A:40:TYR:CZ	1:A:211:LEU:HG	2.55	0.41
1:A:94:ILE:HD13	1:B:67:ARG:CD	2.50	0.41
1:A:119:PHE:CD1	1:A:119:PHE:C	2.97	0.41
1:B:113:LEU:CD2	1:B:126:PHE:CD2	3.00	0.41
1:B:116:ASN:HA	1:B:117:PRO:HD2	1.52	0.41
1:B:12:LEU:HD21	2:B:218:GPR:SG2	2.61	0.41
1:A:180:LEU:O	1:A:183:PHE:N	2.54	0.41
1:B:23:THR:O	1:B:24:ASP:C	2.63	0.41
1:B:77:ARG:HH11	1:B:77:ARG:HD3	1.63	0.41
1:B:108:MET:O	1:B:112:MET:SD	2.79	0.41
1:B:146:FTR:CE2	1:B:152:VAL:HG22	2.51	0.41
1:A:116:ASN:O	1:A:117:PRO:C	2.64	0.41
1:A:177:PHE:O	1:A:180:LEU:N	2.53	0.41
1:A:20:LEU:CD2	1:A:25:SER:CB	2.99	0.41
1:A:136:LEU:HD23	1:A:136:LEU:HA	1.85	0.41
1:A:146:FTR:HD1	1:A:150:ASP:O	2.21	0.41
1:A:146:FTR:HB2	1:A:156:ASP:OD2	2.21	0.41
1:A:153:THR:OG1	1:A:155:VAL:HG22	2.21	0.41
1:B:167:HIS:CG	1:B:174:LEU:HD22	2.56	0.41
1:A:55:ASP:HA	3:A:590:HOH:O	2.21	0.41
1:A:20:LEU:HD23	1:A:25:SER:HB2	2.03	0.40
1:A:40:TYR:CG	1:A:211:LEU:HD21	2.57	0.40

*Continued on next page...*

Continued from previous page...

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:214:FTR:O	1:A:215:SER:C	2.63	0.40
1:B:99:VAL:HG22	1:B:140:PHE:CE2	2.56	0.40
1:B:108:MET:CE	1:B:111:ILE:CG2	2.99	0.40
1:B:116:ASN:ND2	1:B:116:ASN:C	2.79	0.40
1:A:63:ILE:CG1	1:A:68:LYS:HD2	2.51	0.40
1:B:59:LEU:HA	1:B:60:PRO:HA	1.78	0.40
1:B:191:LYS:HE2	1:B:192:LYS:HE3	2.04	0.40

All (1) symmetry-related close contacts are listed below. The label for Atom-2 includes the symmetry operator and encoded unit-cell translations to be applied.

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:B:828:HOH:O	3:B:828:HOH:O[2_655]	1.95	0.25

## 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	211/217 (97%)	194 (92%)	16 (8%)	1 (0%)	24	21
1	B	211/217 (97%)	191 (90%)	12 (6%)	8 (4%)	2	1
All	All	422/434 (97%)	385 (91%)	28 (7%)	9 (2%)	5	2

All (9) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	123	LYS
1	B	191	LYS
1	B	212	ALA
1	B	8	ASN
1	B	41	ASP
1	B	213	GLN

Continued on next page...

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	173	CYS
1	B	36	ASP
1	A	71	GLN

### 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	193/193 (100%)	146 (76%)	47 (24%)	1	0
1	B	193/193 (100%)	147 (76%)	46 (24%)	1	0
All	All	386/386 (100%)	293 (76%)	93 (24%)	1	0

All (93) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	8	ASN
1	A	9	VAL
1	A	12	LEU
1	A	29	GLU
1	A	34	MET
1	A	41	ASP
1	A	42	ARG
1	A	46	LEU
1	A	48	GLU
1	A	49	LYS
1	A	51	LYS
1	A	55	ASP
1	A	63	ILE
1	A	66	SER
1	A	67	ARG
1	A	82	LYS
1	A	88	GLU
1	A	91	GLU
1	A	98	ILE
1	A	99	VAL

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	A	107	ARG
1	A	111	ILE
1	A	113	LEU
1	A	123	LYS
1	A	135	LYS
1	A	139	GLU
1	A	143	LYS
1	A	144	ARG
1	A	150	ASP
1	A	151	LYS
1	A	158	LEU
1	A	164	ASP
1	A	170	GLU
1	A	172	LYS
1	A	174	LEU
1	A	184	LEU
1	A	186	ARG
1	A	192	LYS
1	A	197	MET
1	A	198	LYS
1	A	200	SER
1	A	207	ILE
1	A	210	LYS
1	A	211	LEU
1	A	213	GLN
1	A	216	ASN
1	A	217	LYS
1	B	3	ILE
1	B	8	ASN
1	B	12	LEU
1	B	21	GLU
1	B	25	SER
1	B	36	ASP
1	B	39	ASP
1	B	40	TYR
1	B	41	ASP
1	B	43	SER
1	B	63	ILE
1	B	66	SER
1	B	69	ILE
1	B	79	LEU
1	B	88	GLU

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	90	GLU
1	B	93	ARG
1	B	104	MET
1	B	109	GLN
1	B	111	ILE
1	B	116	ASN
1	B	121	LYS
1	B	122	GLN
1	B	128	LYS
1	B	129	THR
1	B	138	SER
1	B	139	GLU
1	B	144	ARG
1	B	170	GLU
1	B	173	CYS
1	B	174	LEU
1	B	179	ASN
1	B	181	LYS
1	B	186	ARG
1	B	190	LEU
1	B	192	LYS
1	B	197	MET
1	B	201	ARG
1	B	203	LEU
1	B	204	SER
1	B	205	THR
1	B	209	SER
1	B	210	LYS
1	B	211	LEU
1	B	215	SER
1	B	217	LYS

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	44	GLN
1	A	47	ASN
1	A	83	HIS
1	A	106	ASN
1	A	122	GLN
1	A	165	GLN
1	A	216	ASN

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type
1	B	14	HIS
1	B	71	GLN
1	B	102	GLN
1	B	106	ASN
1	B	116	ASN
1	B	165	GLN
1	B	179	ASN
1	B	213	GLN

### 5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

8 non-standard protein/DNA/RNA residues 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	$\# Z  > 2$
1	FTR	A	45	1	15,16,17	1.07	1 (6%)	17,22,24	0.86	1 (5%)
1	FTR	A	7	1	15,16,17	0.83	0	17,22,24	0.88	0
1	FTR	A	146	1	15,16,17	0.79	0	17,22,24	1.41	3 (17%)
1	FTR	A	214	1	15,16,17	0.84	0	17,22,24	1.18	2 (11%)
1	FTR	B	214	1	15,16,17	0.96	1 (6%)	17,22,24	1.24	3 (17%)
1	FTR	B	146	1	15,16,17	1.03	0	17,22,24	1.06	0
1	FTR	B	45	1	15,16,17	1.08	1 (6%)	17,22,24	1.46	5 (29%)
1	FTR	B	7	1	15,16,17	0.88	0	17,22,24	1.07	1 (5%)

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
1	FTR	A	45	1	-	2/5/6/8	0/2/2/2
1	FTR	A	7	1	-	0/5/6/8	0/2/2/2
1	FTR	A	146	1	-	0/5/6/8	0/2/2/2
1	FTR	A	214	1	-	1/5/6/8	0/2/2/2
1	FTR	B	214	1	-	0/5/6/8	0/2/2/2
1	FTR	B	146	1	-	0/5/6/8	0/2/2/2
1	FTR	B	45	1	-	3/5/6/8	0/2/2/2
1	FTR	B	7	1	-	0/5/6/8	0/2/2/2

All (3) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	45	FTR	CD1-CG	-2.83	1.32	1.36
1	B	214	FTR	CE3-CZ3	2.56	1.41	1.37
1	A	45	FTR	CD2-CE2	2.35	1.44	1.41

All (15) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	146	FTR	CZ2-CH2-CZ3	3.34	121.81	118.38
1	A	214	FTR	CZ2-CH2-CZ3	2.94	121.40	118.38
1	A	146	FTR	CH2-CZ3-CE3	-2.83	119.49	123.23
1	B	45	FTR	CE3-CD2-CE2	-2.52	116.93	119.39
1	B	45	FTR	CE3-CD2-CG	2.46	136.21	133.36
1	A	146	FTR	F-CZ3-CE3	2.40	121.69	118.28
1	B	45	FTR	CD2-CE2-NE1	-2.38	105.54	107.52
1	B	214	FTR	F-CZ3-CE3	2.34	121.60	118.28
1	A	45	FTR	CZ2-CH2-CZ3	2.32	120.76	118.38
1	B	45	FTR	CE2-NE1-CD1	2.18	111.01	109.08
1	B	214	FTR	CE3-CD2-CG	2.16	135.87	133.36
1	B	45	FTR	CB-CG-CD1	-2.11	122.86	126.97
1	B	7	FTR	CZ2-CH2-CZ3	2.06	120.50	118.38
1	B	214	FTR	CZ2-CH2-CZ3	2.05	120.48	118.38
1	A	214	FTR	CH2-CZ3-CE3	-2.02	120.57	123.23

There are no chirality outliers.

All (6) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
1	A	45	FTR	CA-CB-CG-CD2
1	A	45	FTR	CA-CB-CG-CD1
1	B	45	FTR	CA-CB-CG-CD2

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms
1	B	45	FTR	CA-CB-CG-CD1
1	A	214	FTR	C-CA-CB-CG
1	B	45	FTR	C-CA-CB-CG

There are no ring outliers.

7 monomers are involved in 21 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
1	A	45	FTR	2	0
1	A	7	FTR	5	0
1	A	146	FTR	3	0
1	A	214	FTR	3	0
1	B	214	FTR	3	0
1	B	146	FTR	2	0
1	B	7	FTR	3	0

## 5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

## 5.6 Ligand geometry [i](#)

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	GPR	A	218	-	35,37,37	3.11	13 (37%)	46,51,51	2.49	17 (36%)
2	GPR	B	218	-	35,37,37	1.72	10 (28%)	46,51,51	1.92	11 (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
2	GPR	A	218	-	-	4/27/43/43	0/3/3/3
2	GPR	B	218	-	-	4/27/43/43	0/3/3/3

All (23) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	A	218	GPR	CB2-SG2	-12.11	1.70	1.82
2	A	218	GPR	CG5-CB5	7.67	1.49	1.39
2	A	218	GPR	CD5-CE5	5.02	1.49	1.38
2	A	218	GPR	CH5-CH4	-4.38	1.38	1.47
2	B	218	GPR	CG5-CB5	3.74	1.44	1.39
2	A	218	GPR	CA4-SG2	-3.68	1.75	1.84
2	A	218	GPR	CD5-CG5	3.29	1.44	1.38
2	A	218	GPR	CB5-CA5	3.03	1.55	1.51
2	B	218	GPR	CH5-CH4	-2.99	1.41	1.47
2	A	218	GPR	CE4-CZ4	2.92	1.43	1.38
2	A	218	GPR	O5-CA5	2.88	1.48	1.42
2	B	218	GPR	CA4-SG2	-2.79	1.77	1.84
2	B	218	GPR	CB2-CA2	2.63	1.59	1.53
2	B	218	GPR	CD1-N2	2.57	1.39	1.34
2	A	218	GPR	CB2-CA2	2.50	1.59	1.53
2	B	218	GPR	CE4-CD4	2.37	1.43	1.38
2	B	218	GPR	CD5-CG5	2.36	1.42	1.38
2	A	218	GPR	CZ5-CH5	2.30	1.43	1.40
2	B	218	GPR	CZ5-CH5	2.28	1.43	1.40
2	B	218	GPR	CB5-CA5	-2.23	1.48	1.51
2	B	218	GPR	CD4-CG4	2.16	1.42	1.38
2	A	218	GPR	CD4-CG4	2.12	1.42	1.38
2	A	218	GPR	CG1-CD1	-2.00	1.47	1.51

All (28) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	A	218	GPR	CB2-CA2-N2	-8.22	89.56	111.06
2	A	218	GPR	CD5-CG5-CB5	-5.99	113.82	120.99
2	A	218	GPR	OE1-CD1-N2	-5.47	113.70	122.95
2	A	218	GPR	CZ5-CH5-CB5	4.74	123.64	118.50
2	B	218	GPR	CD4-CG4-CB4	-4.74	115.31	120.99
2	B	218	GPR	OE1-CD1-N2	-4.69	115.01	122.95
2	B	218	GPR	CZ4-CH4-CB4	3.71	122.53	118.50
2	B	218	GPR	CE4-CD4-CG4	3.65	124.74	120.24
2	B	218	GPR	O5-CA5-CB5	-3.56	103.63	110.42
2	B	218	GPR	CH5-CH4-CB4	-3.56	114.54	119.64

*Continued on next page...*

*Continued from previous page...*

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	B	218	GPR	CB2-CA2-C2	-3.47	101.63	109.46
2	B	218	GPR	CD4-CE4-CZ4	-3.46	115.97	120.24
2	A	218	GPR	CE5-CD5-CG5	3.46	124.51	120.24
2	A	218	GPR	CD4-CG4-CB4	-3.38	116.94	120.99
2	A	218	GPR	CA2-CB2-SG2	-3.00	102.75	113.66
2	A	218	GPR	CG1-CD1-N2	-2.95	110.66	115.86
2	A	218	GPR	O5-CA5-CB5	2.93	116.01	110.42
2	B	218	GPR	CB5-CA5-CA4	-2.75	103.57	110.64
2	B	218	GPR	CA2-CB2-SG2	-2.45	104.74	113.66
2	A	218	GPR	CA5-CA4-SG2	2.44	118.35	110.88
2	A	218	GPR	CE4-CD4-CG4	2.41	123.21	120.24
2	A	218	GPR	CB2-CA2-C2	-2.34	104.17	109.46
2	B	218	GPR	CB1-CA1-N1	2.33	116.19	110.12
2	A	218	GPR	CZ4-CH4-CB4	2.24	120.93	118.50
2	A	218	GPR	CH5-CH4-CB4	-2.20	116.49	119.64
2	A	218	GPR	CH4-CH5-CB5	-2.17	116.52	119.64
2	A	218	GPR	O5-CA5-CA4	-2.17	103.04	109.58
2	A	218	GPR	OE1-CD1-CG1	2.14	125.89	122.02

There are no chirality outliers.

All (8) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	B	218	GPR	N1-CA1-CB1-CG1
2	B	218	GPR	C1-CA1-CB1-CG1
2	B	218	GPR	OE1-CD1-N2-CA2
2	A	218	GPR	OE1-CD1-CG1-CB1
2	A	218	GPR	OE1-CD1-N2-CA2
2	A	218	GPR	CA2-CB2-SG2-CA4
2	A	218	GPR	O12-C1-CA1-N1
2	B	218	GPR	OE1-CD1-CG1-CB1

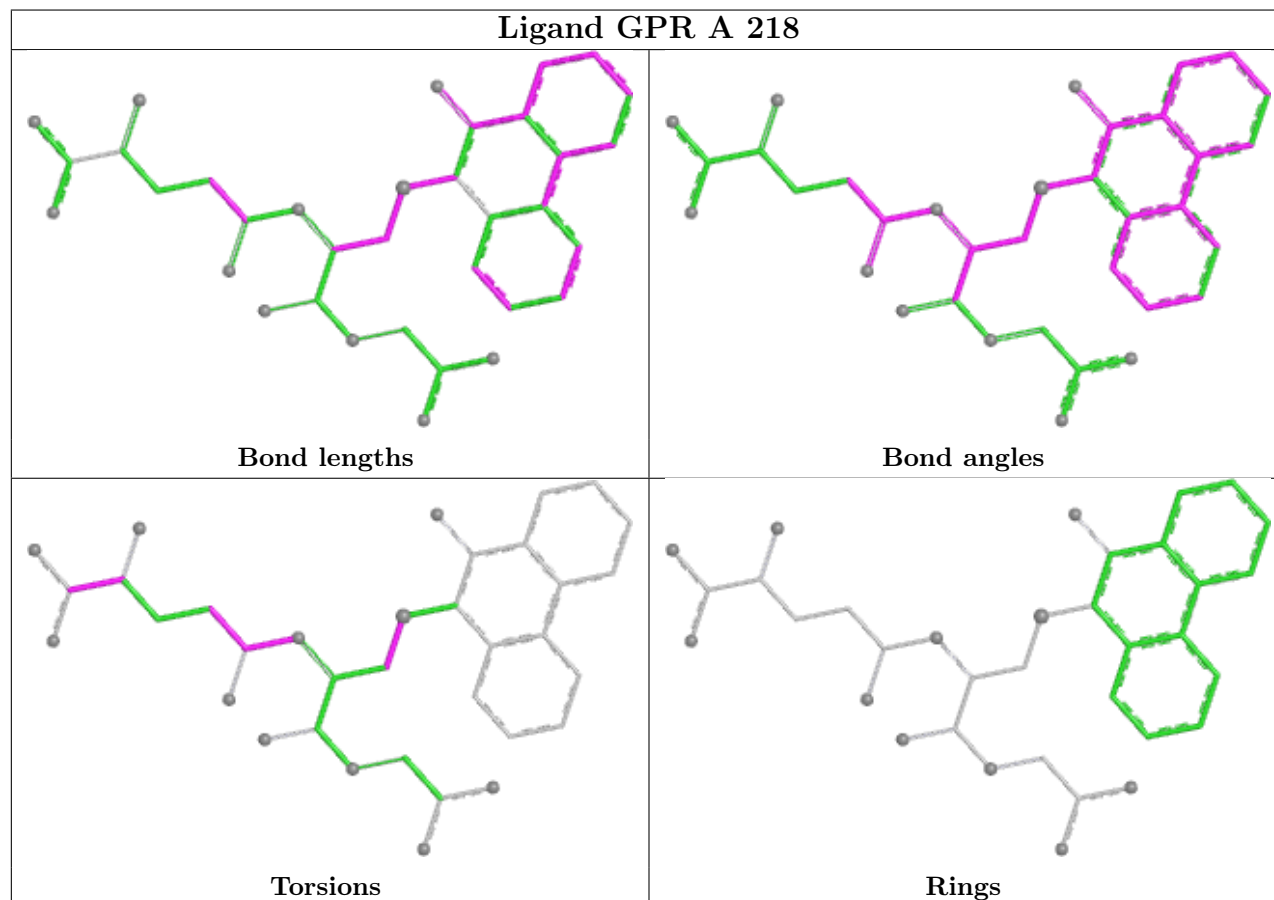
There are no ring outliers.

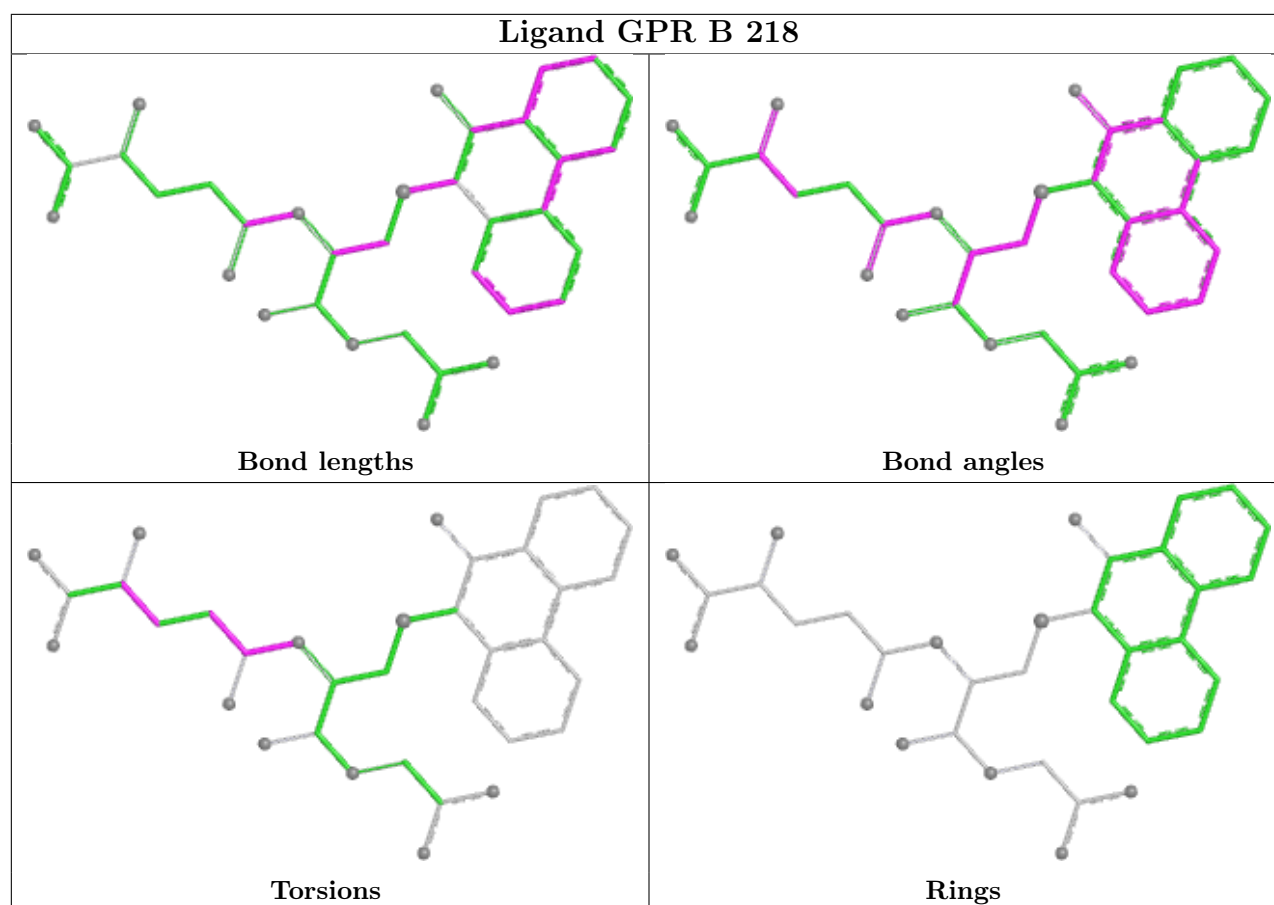
2 monomers are involved in 13 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	218	GPR	6	0
2	B	218	GPR	7	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 [i](#)

There are no chain breaks in this entry.

## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

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, 95<sup>th</sup> 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 <sup>2</sup> )	Q<0.9
1	A	213/217 (98%)	0.22	6 (2%) 55 54	17, 30, 56, 70	0
1	B	213/217 (98%)	0.27	8 (3%) 44 43	15, 29, 59, 82	0
All	All	426/434 (98%)	0.24	14 (3%) 49 48	15, 30, 58, 82	0

All (14) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	191	LYS	4.4
1	B	212	ALA	4.3
1	B	37	ALA	2.9
1	B	215	SER	2.8
1	B	35	GLY	2.7
1	A	212	ALA	2.4
1	A	8	ASN	2.4
1	A	111	ILE	2.3
1	B	40	TYR	2.2
1	B	122	GLN	2.1
1	B	211	LEU	2.1
1	A	112	MET	2.0
1	A	208	PHE	2.0
1	A	216	ASN	2.0

### 6.2 Non-standard residues in protein, DNA, RNA chains [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, 95<sup>th</sup> 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( $\text{\AA}^2$ )	Q<0.9
1	FTR	A	214	15/16	0.93	0.11	23,34,100,100	0
1	FTR	A	7	15/16	0.94	0.12	17,35,80,100	0
1	FTR	B	214	15/16	0.94	0.09	15,38,60,64	0
1	FTR	A	45	15/16	0.95	0.07	12,20,30,36	0
1	FTR	B	45	15/16	0.95	0.07	14,20,38,40	0
1	FTR	B	146	15/16	0.95	0.08	15,22,33,43	0
1	FTR	A	146	15/16	0.95	0.09	16,27,74,83	0
1	FTR	B	7	15/16	0.97	0.07	12,25,71,79	0

### 6.3 Carbohydrates [i](#)

There are no oligosaccharides 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, 95<sup>th</sup> 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.

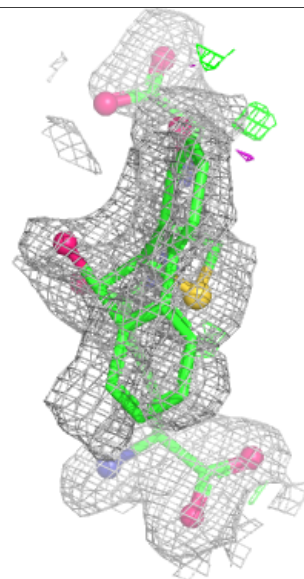
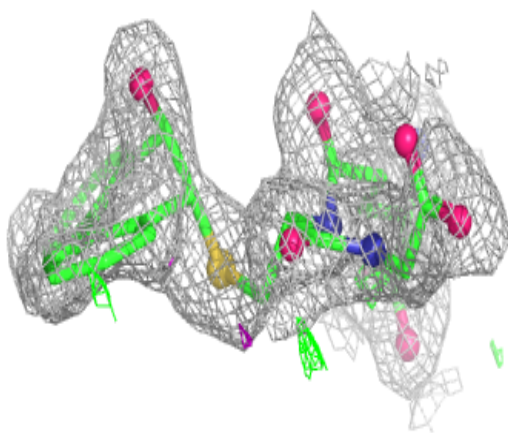
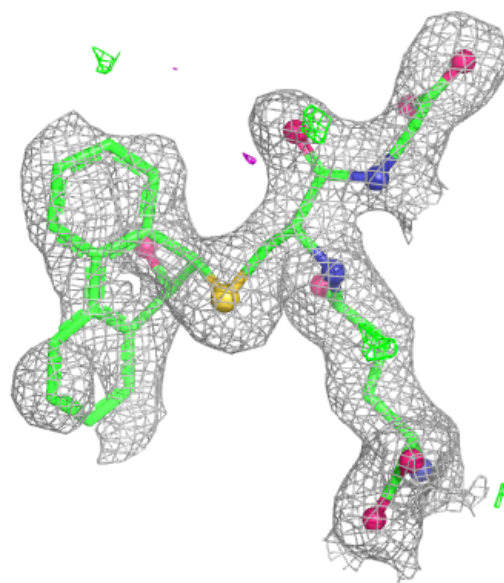
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors( $\text{\AA}^2$ )	Q<0.9
2	GPR	A	218	35/35	0.94	0.12	19,39,100,100	0
2	GPR	B	218	35/35	0.95	0.11	17,34,100,100	0

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.



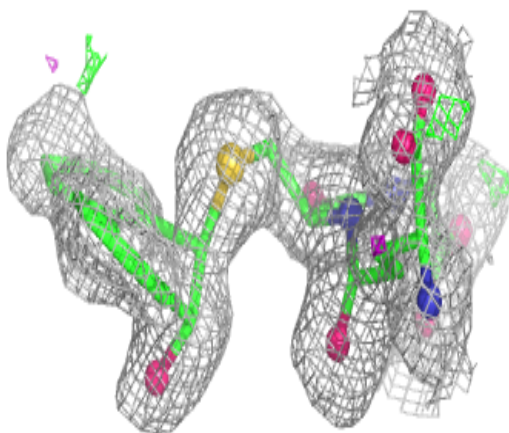
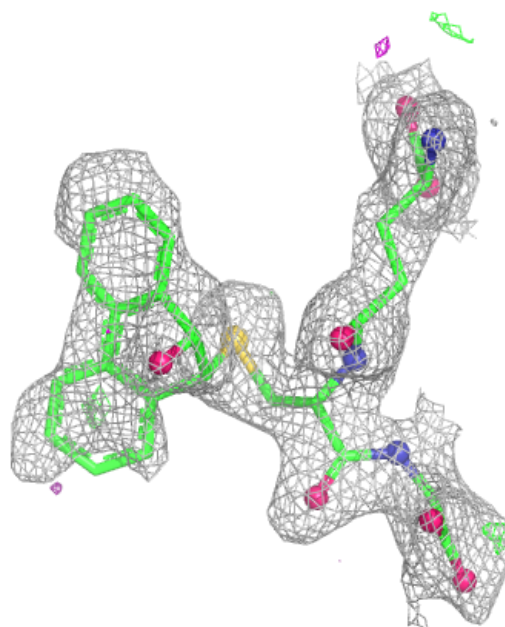
**Electron density around GPR A 218:**

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



**Electron density around GPR B 218:**

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



## 6.5 Other polymers ⓘ

There are no such residues in this entry.