



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 23, 2023 – 07:58 PM EDT

PDB ID : 2PGT
Title : CRYSTAL STRUCTURE OF HUMAN GLUTATHIONE S-TRANSFERASE P1-1[V104] COMPLEXED WITH (9R,10R)-9-(S-GLUTATHIONYL)-10-HYDROXY-9,10-DIHYDROPHENANTHRENE
Authors : Ji, X.
Deposited on : 1997-02-17
Resolution : 1.90 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 : 1.8.5 (274361), CSD as541be (2020)
Xtriage (Phenix) : 1.13
EDS : 2.35
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) : 2.35

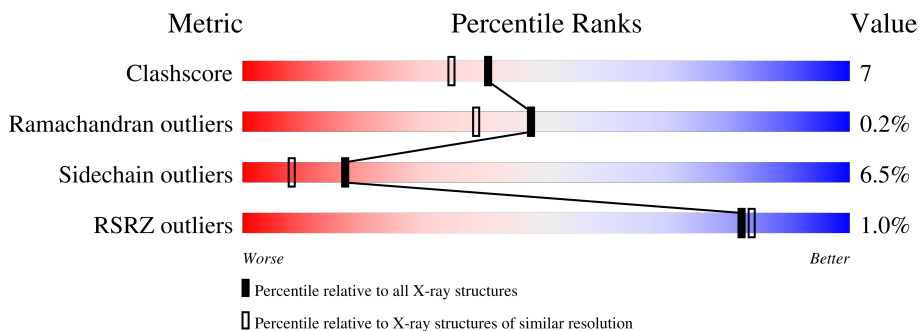
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.90 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	141614	6847 (1.90-1.90)
Ramachandran outliers	138981	6760 (1.90-1.90)
Sidechain outliers	138945	6760 (1.90-1.90)
RSRZ outliers	127900	6082 (1.90-1.90)

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	210	 77% 20%
1	B	210	 75% 21%

2 Entry composition [i](#)

There are 5 unique types of molecules in this entry. The entry contains 3731 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 GLUTATHIONE S-TRANSFERASE.

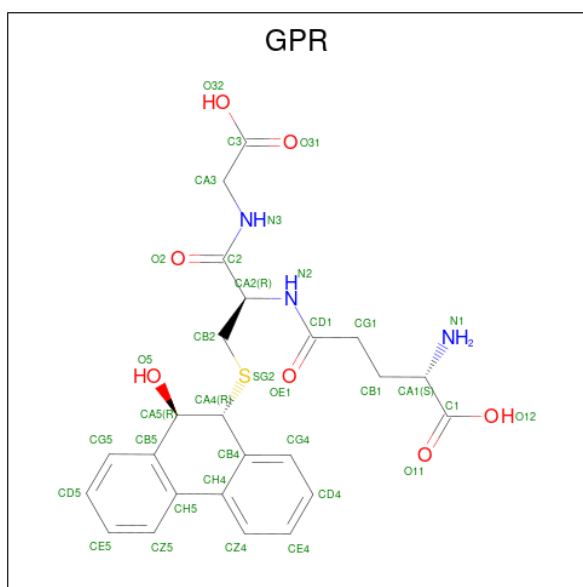
Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	210	Total 1645	C 1056	N 273	O 309	S 7	0	0	0
1	B	209	Total 1637	C 1051	N 272	O 308	S 6	0	0	0

- Molecule 2 is SULFATE ION (three-letter code: SO4) (formula: O₄S).



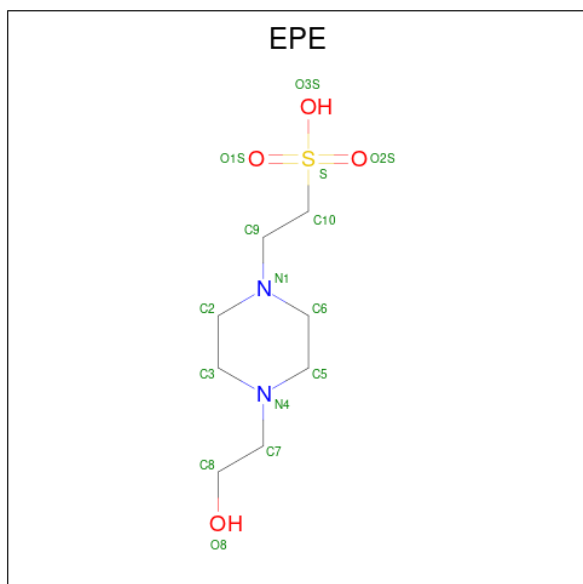
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
			Total	O	S		
2	A	1	Total 5	O 4	S 1	0	0

- Molecule 3 is (9R,10R)-9-(S-GLUTATHIONYL)-10-HYDROXY-9,10-DIHYDROPHENANTHRENE (three-letter code: GPR) (formula: C₂₄H₂₇N₃O₇S).



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

- Molecule 4 is 4-(2-HYDROXYETHYL)-1-PIPERAZINE ETHANESULFONIC ACID (three-letter code: EPE) (formula: C₈H₁₈N₂O₄S).



Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
4	A	1	15	8	2	4	1	0	0

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Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	N	O	S		
4	B	1	15	8	2	4	1	0	0

- Molecule 5 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	A	167	Total	O	0	0
			167	167		
5	B	177	Total	O	0	0
			177	177		

4 Data and refinement statistics

Property	Value	Source
Space group	C 1 2 1	Depositor
Cell constants a, b, c, α , β , γ	80.18Å 90.54Å 69.37Å 90.00° 98.45° 90.00°	Depositor
Resolution (Å)	6.00 – 1.90 16.66 – 1.80	Depositor EDS
% Data completeness (in resolution range)	83.0 (6.00-1.90) 89.2 (16.66-1.80)	Depositor EDS
R_{merge}	0.06	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.42 (at 1.80Å)	Xtrriage
Refinement program	GPRLSA, X-PLOR	Depositor
R, R_{free}	0.183 , (Not available) 0.183 , (Not available)	Depositor DCC
R_{free} test set	No test flags present.	wwPDB-VP
Wilson B-factor (Å ²)	19.5	Xtrriage
Anisotropy	0.361	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.36 , 79.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.96	EDS
Total number of atoms	3731	wwPDB-VP
Average B, all atoms (Å ²)	26.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 8.31% of the height of the origin peak. No significant pseudotranslation is detected.*

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: GPR, EPE, 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	0.79	0/1680	1.40	17/2279 (0.7%)
1	B	0.79	0/1672	1.43	16/2268 (0.7%)
All	All	0.79	0/3352	1.41	33/4547 (0.7%)

There are no bond length outliers.

All (33) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	186	ARG	NE-CZ-NH2	-11.90	114.35	120.30
1	B	70	ARG	NE-CZ-NH2	10.47	125.53	120.30
1	A	11	ARG	NE-CZ-NH2	-10.08	115.26	120.30
1	B	18	ARG	NE-CZ-NH1	9.81	125.21	120.30
1	A	18	ARG	NE-CZ-NH1	9.64	125.12	120.30
1	B	13	ARG	NE-CZ-NH2	-9.56	115.52	120.30
1	A	74	ARG	CD-NE-CZ	8.98	136.17	123.60
1	B	182	ARG	CD-NE-CZ	8.92	136.09	123.60
1	B	82	ASP	CB-CG-OD1	8.64	126.08	118.30
1	B	74	ARG	CD-NE-CZ	7.99	134.79	123.60
1	A	82	ASP	CB-CG-OD1	7.90	125.41	118.30
1	A	74	ARG	CA-CB-CG	7.47	129.83	113.40
1	B	11	ARG	NE-CZ-NH2	-7.22	116.69	120.30
1	B	100	ARG	NE-CZ-NH2	-7.10	116.75	120.30
1	A	0	MET	CG-SD-CE	6.11	109.97	100.20
1	A	179	TYR	CB-CG-CD2	-6.03	117.39	121.00
1	B	74	ARG	NE-CZ-NH1	6.00	123.30	120.30
1	A	186	ARG	NE-CZ-NH1	5.99	123.30	120.30
1	A	49	TYR	CB-CG-CD2	5.92	124.55	121.00
1	B	147	GLN	CB-CG-CD	5.88	126.88	111.60
1	A	15	ALA	O-C-N	-5.77	113.47	122.70
1	B	91	MET	CG-SD-CE	5.77	109.44	100.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	70	ARG	NH1-CZ-NH2	-5.61	113.23	119.40
1	B	90	ASP	CB-CG-OD2	5.58	123.32	118.30
1	A	70	ARG	NE-CZ-NH2	5.55	123.08	120.30
1	A	74	ARG	NE-CZ-NH2	-5.52	117.54	120.30
1	A	74	ARG	NE-CZ-NH1	5.27	122.94	120.30
1	A	198	TYR	CB-CG-CD1	-5.25	117.85	121.00
1	B	82	ASP	CB-CG-OD2	-5.25	113.58	118.30
1	B	182	ARG	NE-CZ-NH1	5.22	122.91	120.30
1	A	133	LEU	CA-CB-CG	5.20	127.26	115.30
1	A	94	ASP	CB-CG-OD1	5.06	122.85	118.30
1	B	146	ASP	CB-CG-OD1	5.00	122.80	118.30

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	1645	0	1650	21	0
1	B	1637	0	1641	26	0
2	A	5	0	0	1	0
3	A	35	0	25	3	0
3	B	35	0	25	1	0
4	A	15	0	18	2	0
4	B	15	0	18	2	0
5	A	167	0	0	2	0
5	B	177	0	0	4	0
All	All	3731	0	3377	49	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 7.

All (49) 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:A:35:VAL:O	1:A:39:GLN:HG2	1.88	0.72
1:B:110:ASN:OD1	1:B:113:ALA:HB3	1.91	0.70
1:B:115:LYS:O	1:B:119:VAL:HG23	1.95	0.66
1:A:52:LEU:HB3	1:A:53:PRO:HA	1.76	0.66
1:A:110:ASN:HD21	1:A:113:ALA:HB3	1.60	0.66
1:B:15:ALA:O	1:B:19:MET:HG3	2.02	0.60
1:A:112:GLU:OE1	1:A:208:LYS:NZ	2.36	0.59
1:B:131:THR:O	1:B:135:GLN:HG3	2.02	0.58
3:B:210:GPR:CH5	3:B:210:GPR:HB21	2.33	0.58
3:A:211:GPR:CH5	3:A:211:GPR:HB21	2.34	0.57
1:A:196:PRO:O	1:A:200:ASN:HB2	2.05	0.56
1:B:52:LEU:HB3	1:B:53:PRO:HA	1.88	0.56
1:A:44:LYS:NZ	1:A:50:GLY:O	2.39	0.56
1:B:30:GLU:CG	4:B:211:EPE:H72	2.36	0.56
1:B:137:GLN:NE2	1:B:146:ASP:OD1	2.38	0.55
1:A:110:ASN:ND2	1:A:113:ALA:HB3	2.23	0.53
1:A:186:ARG:NH1	2:A:210:SO4:O2	2.42	0.53
3:A:211:GPR:HB21	3:A:211:GPR:CH4	2.39	0.52
1:B:99:LEU:HD13	1:B:158:LEU:HD21	1.92	0.52
1:B:112:GLU:OE2	1:B:208:LYS:NZ	2.41	0.52
1:A:11:ARG:HB3	1:A:15:ALA:HB2	1.92	0.51
1:A:29:LYS:HA	4:A:212:EPE:H81	1.92	0.51
1:A:30:GLU:H	4:A:212:EPE:C8	2.24	0.51
1:A:63:TYR:O	1:A:64:GLN:HB2	2.11	0.50
1:B:169:CYS:SG	1:B:170:LEU:HD13	2.52	0.50
1:B:29:LYS:HA	4:B:211:EPE:H81	1.93	0.50
1:A:15:ALA:O	1:A:19:MET:HG3	2.13	0.48
1:B:147:GLN:NE2	5:B:765:HOH:O	2.47	0.48
1:B:84:GLN:NE2	5:B:928:HOH:O	2.47	0.47
1:B:63:TYR:O	1:B:64:GLN:HB2	2.14	0.47
1:B:106:LEU:HD22	1:B:118:TYR:CG	2.50	0.47
1:A:157:ASP:O	1:A:161:ILE:HG12	2.15	0.46
1:B:40:GLU:OE2	1:B:42:SER:N	2.48	0.45
1:B:112:GLU:CD	1:B:208:LYS:HZ3	2.20	0.44
1:A:188:LYS:NZ	5:A:879:HOH:O	2.49	0.44
1:B:46:SER:HB2	5:B:872:HOH:O	2.17	0.43
1:A:75:THR:HG22	1:B:83:GLN:NE2	2.33	0.43
1:B:81:LYS:NZ	1:B:85:GLU:OE2	2.51	0.43
1:A:13:ARG:HH11	1:A:13:ARG:HD3	1.68	0.42
1:A:206:ASN:ND2	1:A:208:LYS:HD2	2.35	0.42
1:B:147:GLN:HG3	5:B:735:HOH:O	2.20	0.42
1:B:122:LEU:N	1:B:123:PRO:CD	2.81	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:23:ASP:OD1	1:B:189:LEU:HB2	2.19	0.42
1:B:117:ASP:HA	1:B:120:LYS:HE2	2.01	0.41
1:A:122:LEU:N	1:A:123:PRO:HD2	2.35	0.41
1:B:81:LYS:HG2	1:B:85:GLU:CD	2.41	0.41
1:A:65:SER:N	3:A:211:GPR:O11	2.46	0.40
1:A:101:CYS:HB3	5:A:905:HOH:O	2.22	0.40
1:B:112:GLU:OE1	1:B:208:LYS:NZ	2.54	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	208/210 (99%)	204 (98%)	3 (1%)	1 (0%)	29	18
1	B	207/210 (99%)	197 (95%)	10 (5%)	0	100	100
All	All	415/420 (99%)	401 (97%)	13 (3%)	1 (0%)	47	38

All (1) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	64	GLN

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	177/177 (100%)	164 (93%)	13 (7%)	14 6
1	B	176/177 (99%)	166 (94%)	10 (6%)	20 11
All	All	353/354 (100%)	330 (94%)	23 (6%)	17 8

All (23) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	27	SER
1	A	72	LEU
1	A	74	ARG
1	A	79	TYR
1	A	83	GLN
1	A	99	LEU
1	A	110	ASN
1	A	122	LEU
1	A	133	LEU
1	A	146	ASP
1	A	176	LEU
1	A	183	LEU
1	A	201	LEU
1	B	29	LYS
1	B	40	GLU
1	B	72	LEU
1	B	79	TYR
1	B	99	LEU
1	B	122	LEU
1	B	133	LEU
1	B	147	GLN
1	B	170	LEU
1	B	176	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (6) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	84	GLN
1	A	110	ASN
1	A	137	GLN
1	B	83	GLN
1	B	125	GLN
1	B	135	GLN

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](#)

5 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
4	EPE	A	212	-	15,15,15	2.11	2 (13%)	18,20,20	2.33	7 (38%)
3	GPR	B	210	-	36,37,37	2.10	6 (16%)	42,51,51	1.65	8 (19%)
4	EPE	B	211	-	15,15,15	1.92	2 (13%)	18,20,20	2.63	3 (16%)
3	GPR	A	211	-	36,37,37	2.01	7 (19%)	42,51,51	1.75	7 (16%)
2	SO4	A	210	-	4,4,4	0.95	0	6,6,6	0.54	0

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
4	EPE	A	212	-	-	7/9/19/19	0/1/1/1
3	GPR	A	211	-	-	2/27/43/43	0/3/3/3
3	GPR	B	210	-	-	4/27/43/43	0/3/3/3

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	EPE	B	211	-	-	5/9/19/19	0/1/1/1

All (17) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	B	210	GPR	CA4-SG2	-7.06	1.65	1.84
3	A	211	GPR	CA4-SG2	-6.42	1.67	1.84
4	A	212	EPE	O3S-S	6.29	1.69	1.47
4	B	211	EPE	O3S-S	5.43	1.66	1.47
3	B	210	GPR	CB2-SG2	-5.29	1.76	1.82
3	B	210	GPR	CH5-CH4	4.29	1.51	1.43
3	A	211	GPR	CH5-CH4	4.19	1.51	1.43
3	A	211	GPR	CB2-SG2	-3.72	1.78	1.82
4	B	211	EPE	C10-S	3.64	1.82	1.77
3	A	211	GPR	CG4-CB4	3.34	1.43	1.37
3	A	211	GPR	CB5-CH5	-2.95	1.38	1.43
3	B	210	GPR	O5-CA5	2.84	1.48	1.42
4	A	212	EPE	C10-S	2.76	1.81	1.77
3	B	210	GPR	CB5-CH5	-2.76	1.38	1.43
3	B	210	GPR	CG4-CB4	2.39	1.41	1.37
3	A	211	GPR	C2-N3	-2.35	1.28	1.33
3	A	211	GPR	O5-CA5	2.33	1.47	1.42

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	B	211	EPE	C5-N4-C3	7.45	125.59	108.83
4	B	211	EPE	O2S-S-C10	5.95	114.08	106.92
3	B	210	GPR	O5-CA5-CB5	-5.61	99.37	110.47
3	A	211	GPR	O5-CA5-CB5	-5.25	100.07	110.47
4	A	212	EPE	O1S-S-C10	4.80	112.69	106.92
4	A	212	EPE	C5-N4-C3	4.60	119.19	108.83
3	A	211	GPR	CB4-CA4-SG2	3.77	120.83	111.17
3	B	210	GPR	CB4-CA4-SG2	3.70	120.65	111.17
4	B	211	EPE	O3S-S-O2S	-3.66	102.33	111.27
3	A	211	GPR	O32-C3-O31	-3.61	114.30	123.30
3	A	211	GPR	OE1-CD1-CG1	-3.59	115.46	122.02
4	A	212	EPE	O3S-S-O1S	-3.47	102.80	111.27
3	A	211	GPR	CG5-CB5-CH5	3.30	122.67	118.72
3	B	210	GPR	CG5-CB5-CH5	2.95	122.25	118.72
3	B	210	GPR	OE1-CD1-CG1	-2.73	117.02	122.02
3	B	210	GPR	CB4-CH4-CH5	-2.68	117.83	119.75

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	B	210	GPR	O32-C3-O31	-2.67	116.64	123.30
4	A	212	EPE	O3S-S-C10	-2.63	101.51	105.77
4	A	212	EPE	C6-N1-C2	2.56	114.59	108.83
4	A	212	EPE	C5-C6-N1	-2.54	105.44	110.64
3	A	211	GPR	O12-C1-O11	-2.25	118.97	124.09
3	B	210	GPR	O2-C2-N3	2.21	127.73	122.99
4	A	212	EPE	O2S-S-O1S	2.18	121.49	113.95
3	B	210	GPR	CG1-CB1-CA1	-2.07	109.00	113.84
3	A	211	GPR	CB4-CH4-CH5	-2.02	118.31	119.75

There are no chirality outliers.

All (18) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	A	212	EPE	C10-C9-N1-C2
4	A	212	EPE	C9-C10-S-O3S
4	B	211	EPE	C9-C10-S-O3S
4	B	211	EPE	C10-C9-N1-C2
3	A	211	GPR	O11-C1-CA1-N1
4	A	212	EPE	C8-C7-N4-C3
4	A	212	EPE	C9-C10-S-O1S
4	A	212	EPE	C9-C10-S-O2S
4	B	211	EPE	C9-C10-S-O1S
4	B	211	EPE	C9-C10-S-O2S
3	A	211	GPR	CA2-CB2-SG2-CA4
4	A	212	EPE	C10-C9-N1-C6
4	B	211	EPE	C10-C9-N1-C6
3	B	210	GPR	O2-C2-N3-CA3
3	B	210	GPR	O12-C1-CA1-N1
4	A	212	EPE	C8-C7-N4-C5
3	B	210	GPR	CA2-C2-N3-CA3
3	B	210	GPR	CA2-CB2-SG2-CA4

There are no ring outliers.

5 monomers are involved in 9 short contacts:

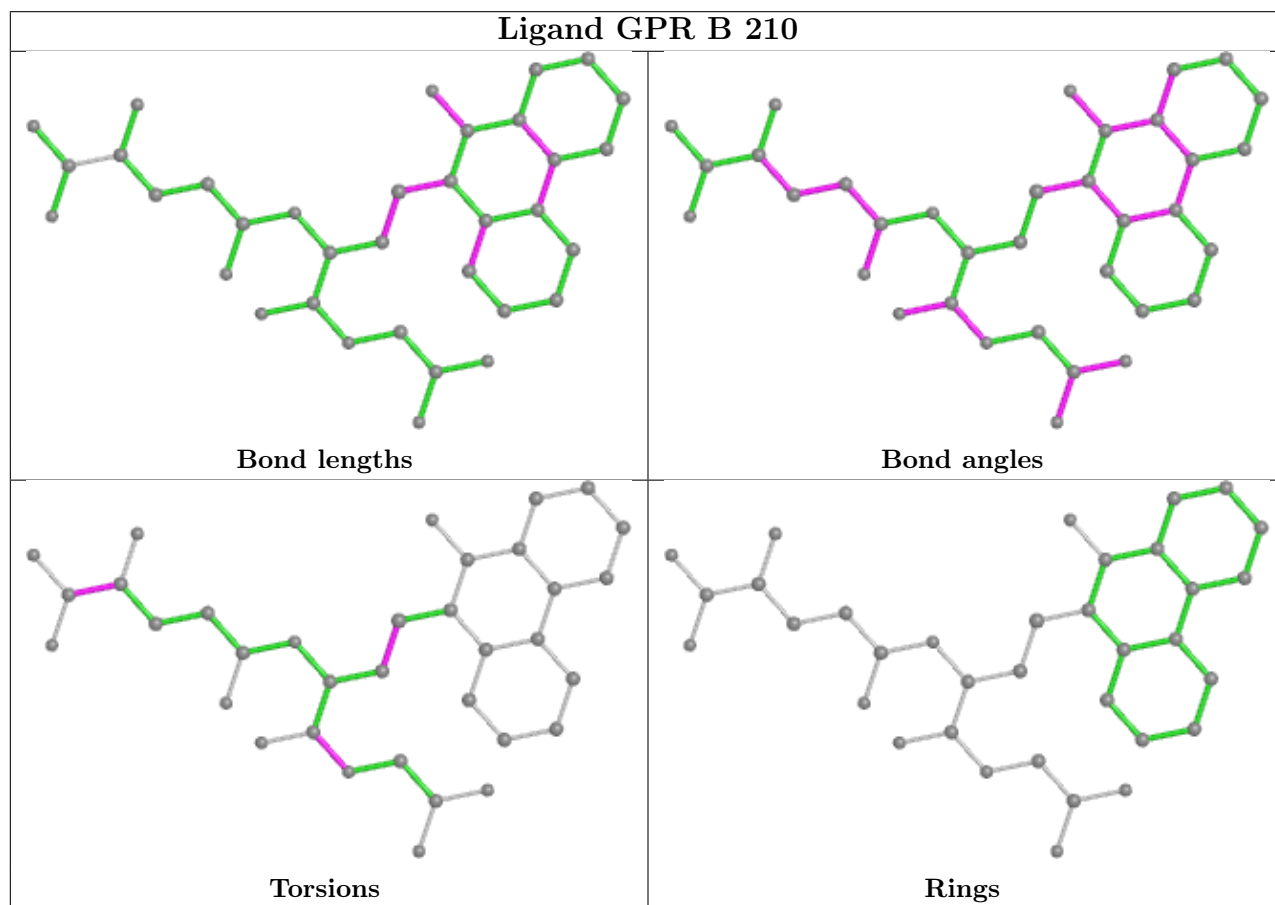
Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	A	212	EPE	2	0
3	B	210	GPR	1	0
4	B	211	EPE	2	0
3	A	211	GPR	3	0

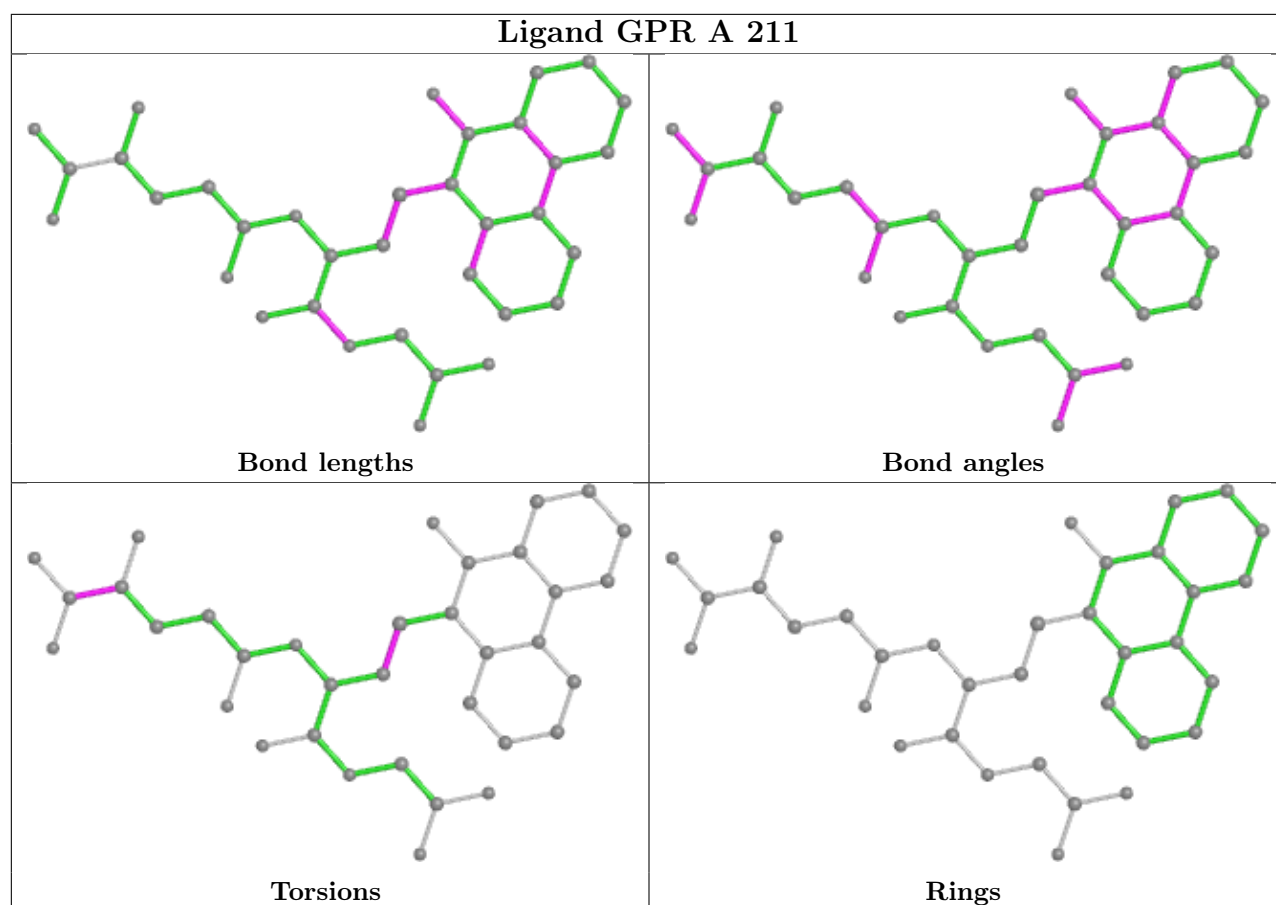
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Mol	Chain	Res	Type	Clashes	Symm-Clashes
2	A	210	SO4	1	0

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 [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, 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	210/210 (100%)	-0.34	2 (0%) 82 84	13, 25, 37, 40	0
1	B	209/210 (99%)	-0.28	2 (0%) 82 84	12, 25, 37, 40	0
All	All	419/420 (99%)	-0.31	4 (0%) 82 84	12, 25, 37, 40	0

All (4) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	B	1	PRO	4.8
1	A	0	MET	2.7
1	A	36	GLU	2.4
1	B	36	GLU	2.3

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.

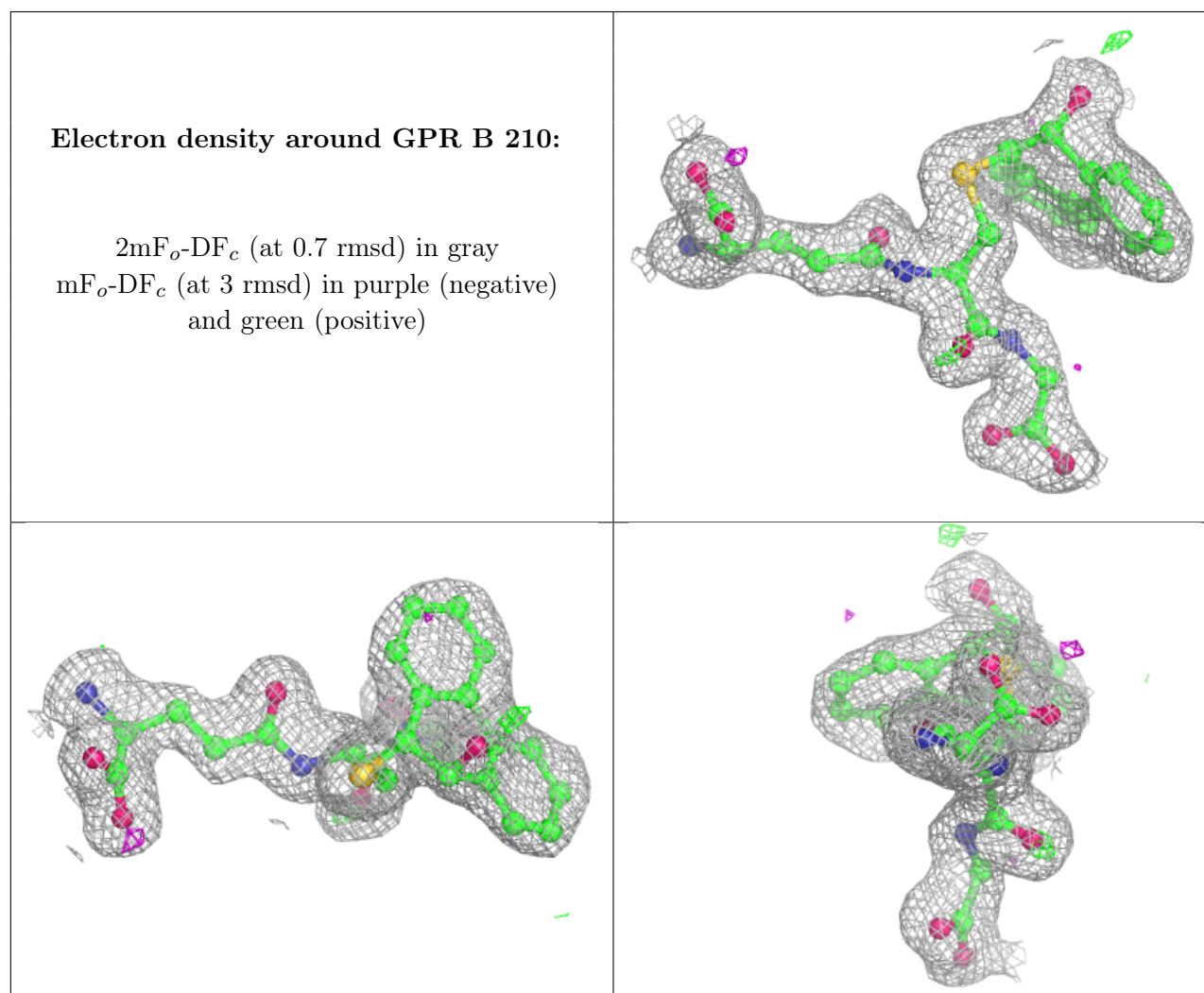
Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
4	EPE	A	212	15/15	0.90	0.22	35,35,40,40	0

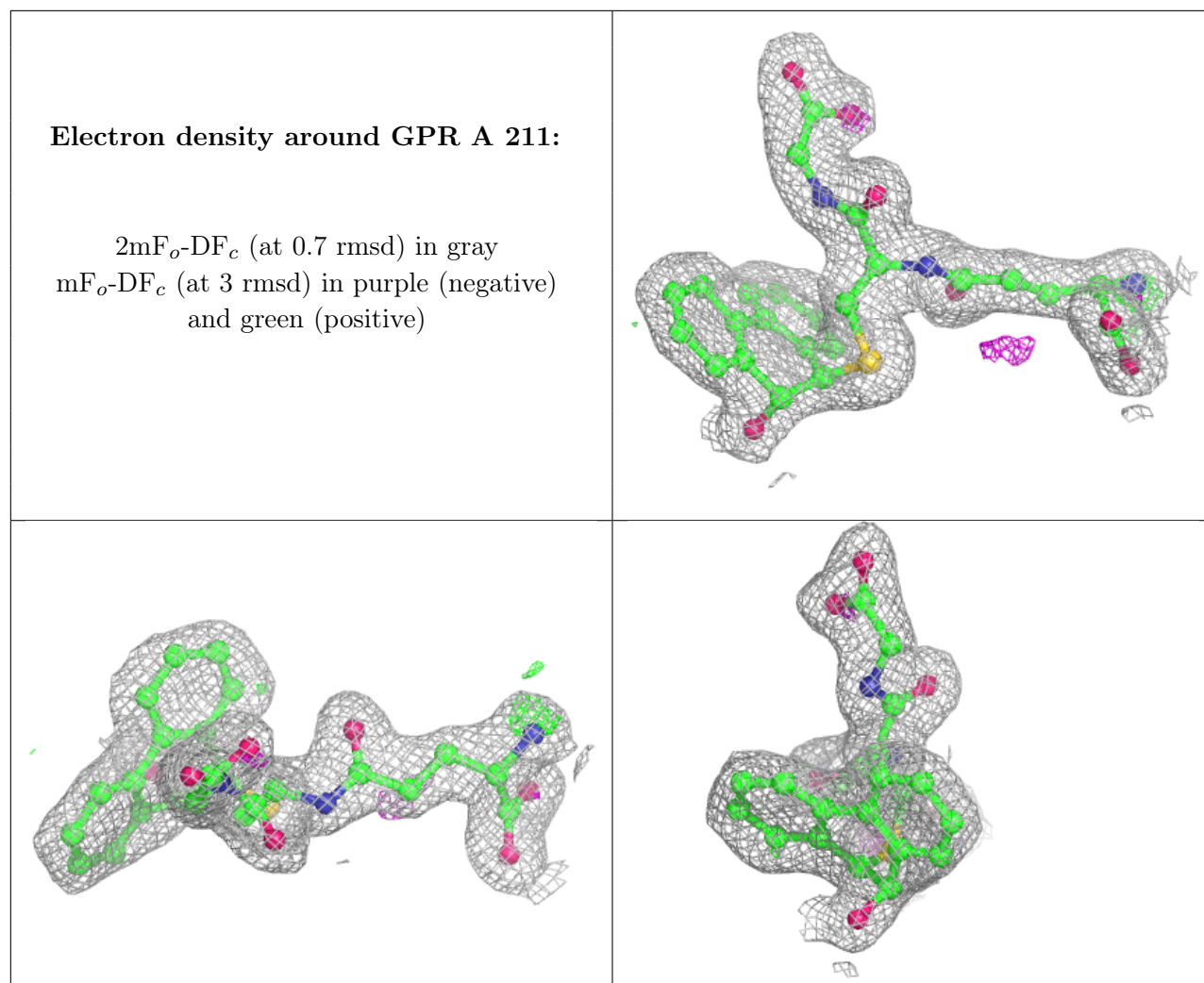
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Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(\AA^2)	Q<0.9
2	SO4	A	210	5/5	0.91	0.42	46,46,46,47	0
3	GPR	B	210	35/35	0.92	0.11	27,34,35,36	0
3	GPR	A	211	35/35	0.94	0.09	27,30,32,32	0
4	EPE	B	211	15/15	0.94	0.18	34,35,39,39	0

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.





6.5 Other polymers [i](#)

There are no such residues in this entry.