



Full wwPDB X-ray Structure Validation Report ⓘ

Aug 5, 2025 – 06:05 PM EDT

PDB ID : 1P05 / pdb_00001p05
Title : STRUCTURE ANALYSIS OF SPECIFICITY. ALPHA-LYTIC PROTEASE
COMPLEXES WITH ANALOGUES OF REACTION INTERMEDIATES
Authors : Bone, R.; Agard, D.A.
Deposited on : 1989-04-24
Resolution : 2.10 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 : 4-5-2 with Phenix2.0rc1
Mogul : 2022.3.0, CSD as543be (2022)
Xtrriage (Phenix) : **NOT EXECUTED**
EDS : **NOT EXECUTED**
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.45.1

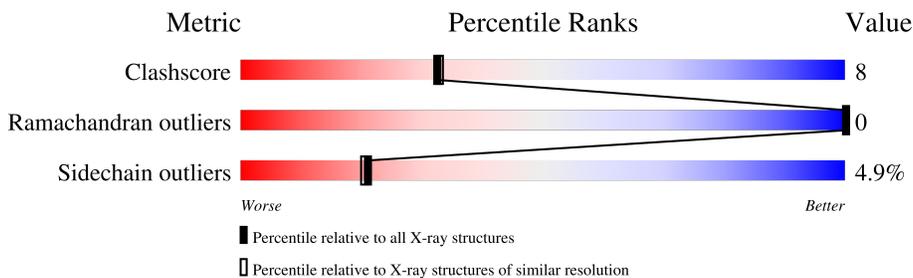
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 2.10 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	180529	6893 (2.10-2.10)
Ramachandran outliers	177936	6839 (2.10-2.10)
Sidechain outliers	177891	6840 (2.10-2.10)

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 $\leq 5\%$

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	198	
2	P	5	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 1596 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.

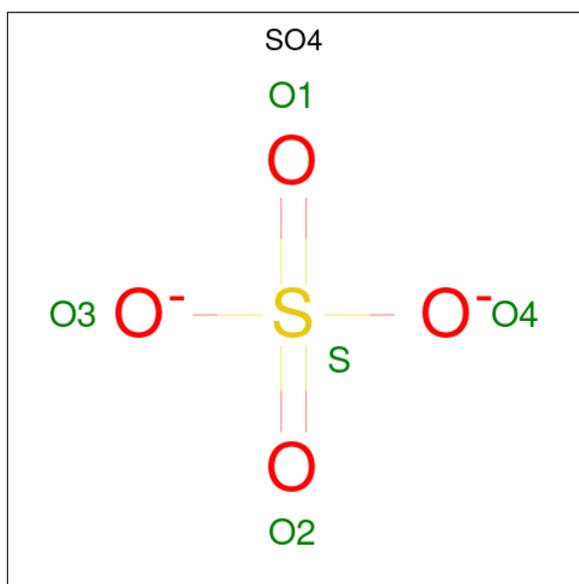
- Molecule 1 is a protein called ALPHA-LYTIC PROTEASE.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	198	1391	846	262	275	8	0	0	0

- Molecule 2 is a protein called METHOXYSUCCINYL-ALA-ALA-PRO-NORLEUCINE BORONIC ACID INHIBITOR.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	B	C	N	O			
2	P	4	26	1	16	4	5	0	0	0

- Molecule 3 is SULFATE ION (CCD ID: SO4) (formula: O₄S).



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

- Molecule 4 is water.

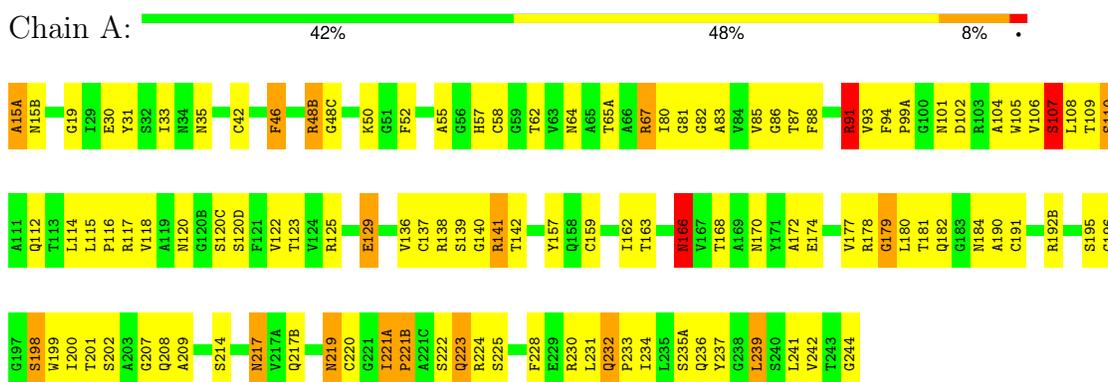
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
4	A	171	Total 171	O 171	0	0
4	P	3	Total 3	O 3	0	0

3 Residue-property plots

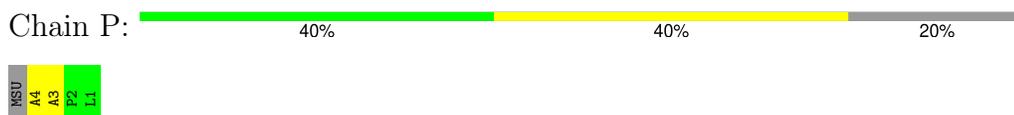
These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded 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. 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.

Note EDS was not executed.

- Molecule 1: ALPHA-LYTIC PROTEASE



- Molecule 2: METHOXYSUCCINYL-ALA-ALA-PRO-NORLEUCINE BORONIC ACID INHIBITOR



4 Data and refinement statistics

Xtrriage (Phenix) and EDS were not executed - this section is therefore incomplete.

Property	Value	Source
Space group	P 32 2 1	Depositor
Cell constants a, b, c, α , β , γ	66.32Å 66.32Å 80.35Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	(Not available) – 2.10	Depositor
% Data completeness (in resolution range)	(Not available) ((Not available)-2.10)	Depositor
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	PROLSQ	Depositor
R, R_{free}	0.139 , (Not available)	Depositor
Estimated twinning fraction	No twinning to report.	Xtrriage
Total number of atoms	1596	wwPDB-VP
Average B, all atoms (Å ²)	9.0	wwPDB-VP

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: BNO, 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	1.78	15/1409 (1.1%)	3.05	161/1909 (8.4%)
2	P	1.30	0/17	3.82	3/23 (13.0%)
All	All	1.78	15/1426 (1.1%)	3.06	164/1932 (8.5%)

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

Mol	Chain	#Chirality outliers	#Planarity outliers
1	A	0	1

All (15) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	57	HIS	ND1-CE1	7.36	1.40	1.32
1	A	178	ARG	NE-CZ	6.34	1.40	1.33
1	A	168	THR	CA-CB	6.00	1.62	1.53
1	A	190	ALA	C-O	5.95	1.31	1.23
1	A	140	GLY	N-CA	5.77	1.52	1.45
1	A	48(B)	ARG	CD-NE	-5.50	1.38	1.46
1	A	65(A)	THR	CA-CB	5.29	1.60	1.53
1	A	239	LEU	C-O	5.28	1.30	1.23
1	A	117	ARG	CD-NE	5.28	1.53	1.46
1	A	80	ILE	C-O	-5.22	1.18	1.24
1	A	224	ARG	C-N	-5.22	1.26	1.33
1	A	231	LEU	CA-CB	5.20	1.61	1.53
1	A	58	CYS	C-O	5.18	1.30	1.24
1	A	139	SER	C-O	5.15	1.30	1.23
1	A	48(B)	ARG	NE-CZ	-5.08	1.27	1.33

All (164) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	48(B)	ARG	CD-NE-CZ	37.44	176.81	124.40
1	A	91	ARG	NE-CZ-NH2	14.87	132.58	119.20
1	A	48(B)	ARG	NE-CZ-NH1	-12.84	108.66	121.50
1	A	106	VAL	CA-C-O	-12.23	107.52	120.48
2	P	3	ALA	O-C-N	11.94	130.36	121.88
1	A	170	ASN	CA-CB-CG	-11.26	101.34	112.60
1	A	242	VAL	N-CA-CB	-10.39	96.22	110.56
1	A	110	SER	CA-CB-OG	-10.20	90.71	111.10
1	A	217	ASN	OD1-CG-ND2	-10.16	112.44	122.60
1	A	120(D)	SER	N-CA-CB	-9.62	93.60	110.14
1	A	125	ARG	NH1-CZ-NH2	9.59	131.77	119.30
1	A	241	LEU	CA-C-O	-9.55	110.46	121.16
1	A	180	LEU	CA-C-O	-9.31	110.76	121.47
1	A	91	ARG	NH1-CZ-NH2	-9.31	107.20	119.30
1	A	184	ASN	OD1-CG-ND2	-9.22	113.38	122.60
1	A	170	ASN	CA-C-O	-8.95	112.08	122.37
1	A	82	GLY	CA-C-O	-8.90	110.14	118.95
1	A	192(B)	ARG	CD-NE-CZ	-8.86	112.00	124.40
1	A	107	SER	CA-CB-OG	-8.50	94.09	111.10
1	A	200	ILE	CA-C-O	-8.42	113.03	121.45
1	A	184	ASN	CA-C-O	-8.38	109.80	119.95
1	A	139	SER	CA-CB-OG	-8.35	94.41	111.10
1	A	64	ASN	CB-CG-ND2	8.28	128.82	116.40
1	A	228	PHE	CA-CB-CG	8.26	122.06	113.80
1	A	48(B)	ARG	NH1-CZ-NH2	8.19	129.94	119.30
1	A	180	LEU	O-C-N	8.14	132.16	122.96
1	A	106	VAL	CA-C-N	-8.08	110.61	122.65
1	A	106	VAL	C-N-CA	-8.08	110.61	122.65
1	A	125	ARG	NE-CZ-NH1	-8.06	113.44	121.50
1	A	91	ARG	CD-NE-CZ	8.05	135.67	124.40
2	P	4	ALA	N-CA-CB	7.87	122.20	110.40
1	A	139	SER	N-CA-CB	-7.86	96.77	111.00
1	A	177	VAL	N-CA-CB	7.86	121.80	111.90
1	A	174	GLU	CG-CD-OE2	-7.56	101.01	118.40
1	A	123	THR	CA-CB-OG1	-7.55	98.27	109.60
1	A	230	ARG	NE-CZ-NH1	7.44	128.94	121.50
1	A	184	ASN	CA-CB-CG	-7.42	105.18	112.60
1	A	221(A)	ILE	N-CA-CB	7.40	121.57	111.21
1	A	110	SER	CB-CA-C	-7.39	96.95	110.63
1	A	120(D)	SER	CA-CB-OG	-7.35	96.39	111.10
1	A	67	ARG	NE-CZ-NH1	7.32	128.82	121.50
1	A	235(A)	SER	CA-C-O	-7.32	112.12	120.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	48(B)	ARG	CB-CG-CD	-7.27	94.57	111.30
1	A	207	GLY	O-C-N	7.15	130.82	122.45
1	A	221(B)	PRO	CA-C-O	-7.14	112.95	121.67
1	A	170	ASN	CB-CG-ND2	-7.14	105.69	116.40
1	A	123	THR	CA-C-O	-7.13	112.56	120.69
1	A	88	PHE	CA-C-O	-7.09	112.66	120.81
1	A	125	ARG	CD-NE-CZ	7.09	134.32	124.40
1	A	122	VAL	N-CA-CB	7.07	120.36	111.46
1	A	48(C)	GLY	N-CA-C	-6.91	99.17	112.02
1	A	129	GLU	CA-C-O	-6.88	112.84	120.69
1	A	86	GLY	CA-C-O	-6.86	114.18	121.38
1	A	62	THR	CA-CB-OG1	-6.84	99.34	109.60
1	A	93	VAL	O-C-N	6.80	130.26	123.18
1	A	33	ILE	CA-C-O	-6.75	113.37	120.39
1	A	35	ASN	N-CA-CB	-6.71	101.95	112.08
1	A	182	GLN	CA-C-N	6.69	128.42	122.47
1	A	182	GLN	C-N-CA	6.69	128.42	122.47
1	A	178	ARG	CD-NE-CZ	-6.66	115.08	124.40
1	A	87	THR	CA-CB-OG1	-6.60	99.70	109.60
1	A	230	ARG	CD-NE-CZ	-6.59	115.17	124.40
1	A	225	SER	CA-CB-OG	-6.57	97.97	111.10
1	A	195	SER	O-C-N	6.50	130.91	122.97
1	A	136	VAL	N-CA-CB	-6.50	98.68	112.00
1	A	224	ARG	CA-C-O	-6.48	113.47	120.92
1	A	209	ALA	N-CA-CB	-6.46	100.23	109.85
1	A	199	TRP	CA-C-O	-6.43	113.41	120.30
1	A	109	THR	CA-CB-OG1	-6.38	100.03	109.60
1	A	220	CYS	CA-C-O	-6.37	110.96	119.11
1	A	139	SER	CA-C-O	-6.35	113.35	120.66
1	A	196	GLY	N-CA-C	-6.35	107.52	115.08
1	A	120(C)	SER	CB-CA-C	-6.35	98.58	110.01
1	A	166	ASN	CA-CB-CG	-6.35	106.25	112.60
1	A	168	THR	CA-CB-OG1	-6.31	100.13	109.60
1	A	179	GLY	O-C-N	6.27	128.56	122.41
1	A	57	HIS	CA-C-O	-6.22	111.73	119.38
1	A	108	LEU	N-CA-CB	-6.21	100.88	110.56
1	A	120	ASN	CA-CB-CG	-6.20	106.40	112.60
1	A	117	ARG	NE-CZ-NH2	6.19	124.77	119.20
1	A	208	GLN	CG-CD-NE2	-6.19	107.11	116.40
1	A	108	LEU	CA-C-O	-6.18	114.12	121.66
1	A	190	ALA	N-CA-C	-6.18	101.79	110.50
1	A	141	ARG	CA-CB-CG	6.17	126.44	114.10

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	162	ILE	N-CA-CB	-6.17	103.81	110.53
1	A	182	GLN	CB-CG-CD	-6.16	102.12	112.60
1	A	93	VAL	CA-C-O	-6.14	114.07	120.27
1	A	46	PHE	CA-C-N	6.13	129.54	120.95
1	A	46	PHE	C-N-CA	6.13	129.54	120.95
1	A	15(B)	ASN	CB-CG-ND2	6.09	125.53	116.40
1	A	214	SER	CA-CB-OG	-6.07	98.97	111.10
1	A	65(A)	THR	CA-CB-OG1	-6.06	100.51	109.60
1	A	114	LEU	CA-C-O	-6.04	114.16	121.05
1	A	228	PHE	O-C-N	6.00	130.62	123.24
1	A	219	ASN	CA-CB-CG	6.00	118.60	112.60
1	A	35	ASN	OD1-CG-ND2	5.99	128.59	122.60
1	A	192(B)	ARG	CG-CD-NE	-5.99	98.83	112.00
1	A	157	TYR	N-CA-CB	-5.98	100.67	110.42
1	A	19	GLY	O-C-N	5.93	129.35	122.65
1	A	201	THR	CA-CB-OG1	-5.89	100.76	109.60
1	A	166	ASN	CB-CG-ND2	5.88	125.22	116.40
1	A	230	ARG	CA-C-O	-5.88	114.72	121.19
1	A	30	GLU	CB-CG-CD	-5.86	102.64	112.60
1	A	50	LYS	O-C-N	5.85	129.62	123.06
1	A	81	GLY	O-C-N	5.84	130.30	122.70
1	A	123	THR	O-C-N	5.84	129.87	123.04
1	A	184	ASN	N-CA-C	-5.83	104.84	112.41
1	A	118	VAL	O-C-N	5.82	129.48	123.20
1	A	94	PHE	CA-C-O	-5.79	112.22	120.16
1	A	236	GLN	CA-CB-CG	-5.79	102.52	114.10
1	A	237	TYR	CA-C-O	-5.79	112.58	119.35
1	A	136	VAL	CB-CA-C	5.73	120.79	110.48
1	A	181	THR	CA-CB-OG1	-5.73	101.01	109.60
1	A	85	VAL	CA-C-O	-5.69	113.67	120.78
1	A	142	THR	OG1-CB-CG2	5.64	120.58	109.30
1	A	163	THR	N-CA-CB	-5.63	102.85	110.67
1	A	172	ALA	CA-C-O	-5.62	114.59	120.55
1	A	116	PRO	CA-C-O	-5.57	117.19	121.31
1	A	219	ASN	OD1-CG-ND2	-5.56	117.04	122.60
1	A	64	ASN	OD1-CG-ND2	-5.56	117.04	122.60
1	A	168	THR	N-CA-CB	5.54	119.47	110.43
1	A	33	ILE	N-CA-CB	-5.54	104.44	111.64
1	A	15(A)	ALA	O-C-N	5.48	131.47	122.70
1	A	235(A)	SER	O-C-N	5.46	129.33	122.23
1	A	200	ILE	O-C-N	5.46	128.77	122.82
1	A	195	SER	CA-C-O	-5.45	115.15	121.15

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	168	THR	CA-C-N	-5.43	115.50	123.00
1	A	168	THR	C-N-CA	-5.43	115.50	123.00
1	A	199	TRP	N-CA-CB	5.43	119.13	110.65
1	A	201	THR	CA-C-N	5.39	128.04	120.28
1	A	201	THR	C-N-CA	5.39	128.04	120.28
1	A	237	TYR	O-C-N	5.38	129.06	122.34
2	P	3	ALA	CA-C-O	-5.37	114.75	120.28
1	A	225	SER	CA-C-N	5.35	130.55	123.00
1	A	225	SER	C-N-CA	5.35	130.55	123.00
1	A	157	TYR	CA-C-O	-5.31	114.68	120.36
1	A	129	GLU	CG-CD-OE2	-5.28	106.25	118.40
1	A	107	SER	CA-C-O	-5.26	114.96	120.80
1	A	223	GLN	CA-C-N	-5.25	114.32	122.09
1	A	223	GLN	C-N-CA	-5.25	114.32	122.09
1	A	42	CYS	CA-C-O	-5.25	115.58	121.40
1	A	224	ARG	CD-NE-CZ	-5.24	117.07	124.40
1	A	115	LEU	CB-CA-C	5.22	116.97	108.87
1	A	102	ASP	CA-CB-CG	-5.22	107.38	112.60
1	A	105	TRP	O-C-N	-5.22	117.02	123.33
1	A	120(D)	SER	CA-C-O	-5.20	114.55	121.46
1	A	112	GLN	CA-C-N	5.20	130.49	123.11
1	A	112	GLN	C-N-CA	5.20	130.49	123.11
1	A	55	ALA	N-CA-CB	5.19	117.90	110.06
1	A	234	ILE	CB-CA-C	-5.19	105.06	112.22
1	A	222	SER	CA-C-O	-5.17	113.23	119.49
1	A	232	GLN	OE1-CD-NE2	-5.14	117.45	122.60
1	A	120(C)	SER	CA-CB-OG	-5.13	100.83	111.10
1	A	174	GLU	N-CA-C	5.12	118.78	112.54
1	A	231	LEU	N-CA-CB	-5.12	102.58	110.20
1	A	221(B)	PRO	O-C-N	5.10	130.85	122.70
1	A	174	GLU	CG-CD-OE1	5.09	130.10	118.40
1	A	31	TYR	N-CA-C	-5.07	101.38	109.23
1	A	241	LEU	N-CA-CB	-5.07	102.52	109.97
1	A	172	ALA	N-CA-C	-5.06	105.77	111.28
1	A	15(B)	ASN	CA-CB-CG	-5.04	107.56	112.60
1	A	191	CYS	O-C-N	5.03	128.57	122.68
1	A	101	ASN	CA-C-O	-5.03	114.78	121.46
1	A	202	SER	O-C-N	5.02	128.09	122.22

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	91	ARG	Sidechain

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	1391	0	1360	22	0
2	P	26	0	28	0	0
3	A	5	0	0	1	0
4	A	171	0	0	9	0
4	P	3	0	0	0	0
All	All	1596	0	1388	22	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 8.

All (22) 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:244:GLY:O	4:A:367:HOH:O	2.15	0.64
1:A:166:ASN:HD22	1:A:179:GLY:HA2	1.61	0.63
1:A:217(B):GLN:HG3	4:A:369:HOH:O	2.00	0.60
1:A:15(A):ALA:N	4:A:346:HOH:O	2.35	0.59
1:A:137:CYS:HA	1:A:159:CYS:HA	1.85	0.58
1:A:217:ASN:HB3	4:A:409:HOH:O	2.05	0.56
1:A:217:ASN:HA	4:A:406:HOH:O	2.08	0.54
1:A:217:ASN:O	1:A:219:ASN:HB3	2.08	0.53
1:A:48(B):ARG:HD2	4:A:354:HOH:O	2.09	0.52
1:A:48(B):ARG:HG3	1:A:239:LEU:HD23	1.93	0.51
1:A:46:PHE:O	1:A:52:PHE:HA	2.12	0.50
1:A:232:GLN:N	1:A:233:PRO:HD2	2.28	0.49
1:A:48(B):ARG:CZ	4:A:379:HOH:O	2.61	0.47
1:A:91:ARG:HB3	1:A:104:ALA:HB2	1.96	0.47
1:A:48(B):ARG:CG	1:A:239:LEU:HD23	2.45	0.46
1:A:129:GLU:HG3	4:A:363:HOH:O	2.15	0.46
1:A:107:SER:HB2	4:A:384:HOH:O	2.16	0.45
1:A:221(A):ILE:HB	1:A:221(B):PRO:HD2	2.00	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:233:PRO:HB3	3:A:1:SO4:O4	2.19	0.43
1:A:138:ARG:HA	1:A:198:SER:O	2.20	0.42
1:A:67:ARG:HA	1:A:83:ALA:O	2.20	0.41
1:A:221(B):PRO:HG2	1:A:223:GLN:NE2	2.35	0.41

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	196/198 (99%)	189 (96%)	7 (4%)	0	100	100
2	P	2/5 (40%)	2 (100%)	0	0	100	100
All	All	198/203 (98%)	191 (96%)	7 (4%)	0	100	100

There are no Ramachandran outliers to report.

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	142/142 (100%)	135 (95%)	7 (5%)	21	20
2	P	1/1 (100%)	1 (100%)	0	100	100
All	All	143/143 (100%)	136 (95%)	7 (5%)	21	20

All (7) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	91	ARG
1	A	99(A)	PRO
1	A	107	SER
1	A	110	SER
1	A	141	ARG
1	A	166	ASN
1	A	198	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (5) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	101	ASN
1	A	158	GLN
1	A	166	ASN
1	A	182	GLN
1	A	223	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](#)

1 non-standard protein/DNA/RNA residue is 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	BNO	P	1	1,2	3,8,8	0.46	0	2,9,9	1.09	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
2	BNO	P	1	1,2	-	2/4/8/8	-

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
2	P	1	BNO	CA-CB-CG-CD
2	P	1	BNO	CE-CD-CG-CB

There are no ring outliers.

No monomer is involved in short contacts.

5.5 Carbohydrates [i](#)

There are no oligosaccharides in this entry.

5.6 Ligand geometry [i](#)

1 ligand is 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	$\# Z > 2$
3	SO4	A	1	-	4,4,4	0.59	0	6,6,6	1.30	0

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 1 short contact:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
3	A	1	SO4	1	0

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

6.1 Protein, DNA and RNA chains

EDS was not executed - this section is therefore empty.

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

EDS was not executed - this section is therefore empty.

6.3 Carbohydrates

EDS was not executed - this section is therefore empty.

6.4 Ligands

EDS was not executed - this section is therefore empty.

6.5 Other polymers

EDS was not executed - this section is therefore empty.