



Full wwPDB X-ray Structure Validation Report ⓘ

Mar 9, 2026 – 02:07 AM UTC

PDB ID : 6RFK / pdb_00006rfk
Title : Crystal structure of EGRCK-inhibited Gla-domainless fIXa (K148Q, R150Q variant)
Authors : Huntington, J.A.; Sendall, T.J.
Deposited on : 2019-04-15
Resolution : 1.60 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 Phenix2.0
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

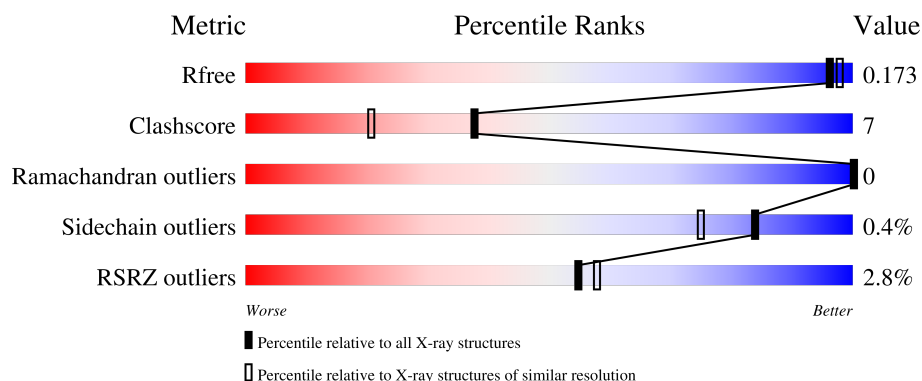
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 1.60 Å.

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



Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
R_{free}	180053	4673 (1.60-1.60)
Clashscore	190562	4931 (1.60-1.60)
Ramachandran outliers	187476	4831 (1.60-1.60)
Sidechain outliers	187428	4830 (1.60-1.60)
RSRZ outliers	180081	4672 (1.60-1.60)

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	E	62	6% 84% 13% .
2	S	235	% 84% 14% .
3	I	4	25% 50% 50%

The following table lists non-polymeric compounds, carbohydrate monomers and non-standard residues in protein, DNA, RNA chains that are outliers for geometric or electron-density-fit criteria:

Mol	Type	Chain	Res	Chirality	Geometry	Clashes	Electron density
6	GOL	S	305	-	X	-	-
6	GOL	S	306	-	-	X	-
6	GOL	S	309	-	X	-	-
6	GOL	S	310	-	X	-	-

2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 2625 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 Coagulation factor IX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	E	62	Total	C	N	O	S	61	0	0
			418	254	76	81	7			

There is a discrepancy between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
E	84	MET	LEU	conflict	UNP P00740

- Molecule 2 is a protein called Coagulation factor IX.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	S	235	Total	C	N	O	S	7	5	0
			1860	1185	316	350	9			

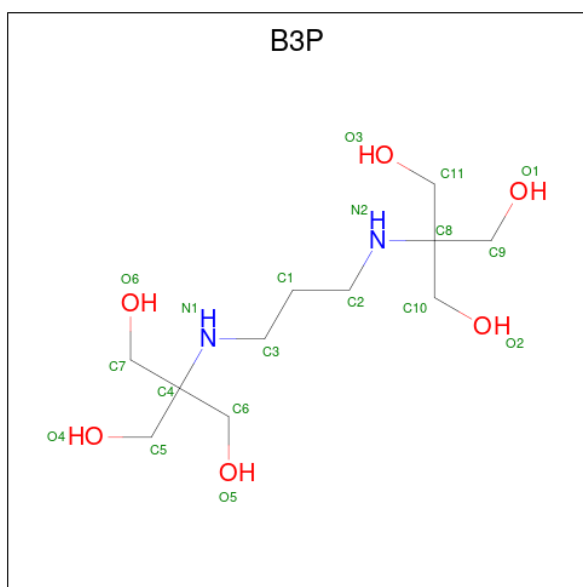
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
S	148	GLN	LYS	engineered mutation	UNP P00740
S	150	GLN	ARG	engineered mutation	UNP P00740

- Molecule 3 is a protein called GLU-GLY-AR7-0QE.

Mol	Chain	Residues	Atoms				ZeroOcc	AltConf	Trace
3	I	4	Total	C	N	O	0	1	1
			43	24	8	11			

- Molecule 4 is 2-[3-(2-HYDROXY-1,1-DIHYDROXYMETHYL-ETHYLAMINO)-PROPYLAMINO]-2-HYDROXYMETHYL-PROPANE-1,3-DIOL (CCD ID: B3P) (formula: C₁₁H₂₆N₂O₆).

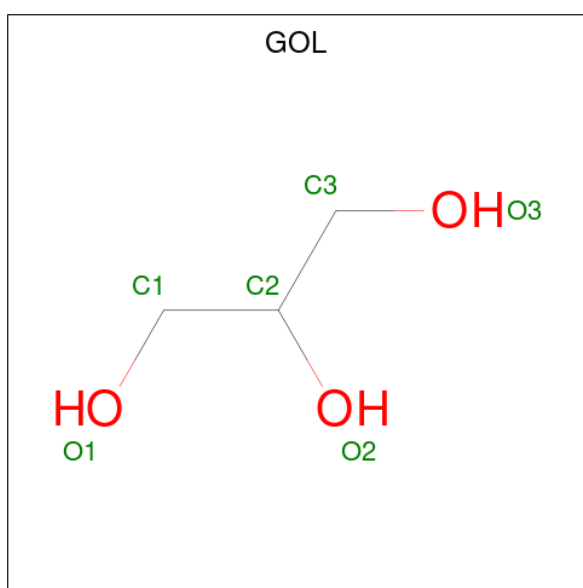


Mol	Chain	Residues	Atoms				ZeroOcc	AltConf
4	E	1	Total	C	N	O	0	0
			19	11	2	6		

- Molecule 5 is CALCIUM ION (CCD ID: CA) (formula: Ca).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
5	S	1	Total	Ca	0	0
			1	1		

- Molecule 6 is GLYCEROL (CCD ID: GOL) (formula: C₃H₈O₃).



Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0
6	S	1	Total C O 6 3 3	0	0

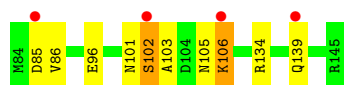
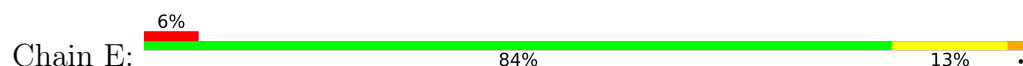
- Molecule 7 is water.

Mol	Chain	Residues	Atoms	ZeroOcc	AltConf
7	E	27	Total O 27 27	0	0
7	S	195	Total O 195 195	0	0
7	I	2	Total O 2 2	0	0

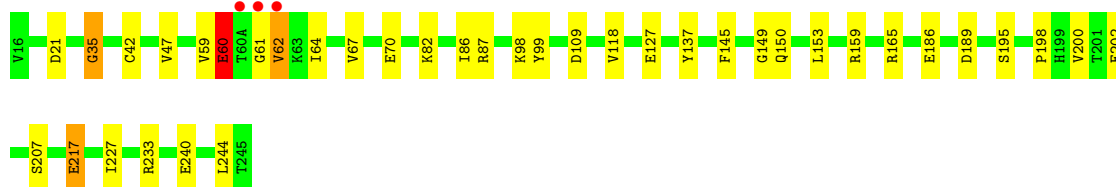
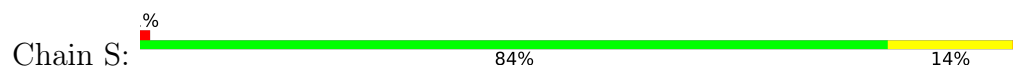
3 Residue-property plots

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 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: Coagulation factor IX



- Molecule 2: Coagulation factor IX



- Molecule 3: GLU-GLY-AR7-0QE



4 Data and refinement statistics

Property	Value	Source
Space group	P 43 21 2	Depositor
Cell constants a, b, c, α , β , γ	100.16Å 100.16Å 91.50Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	70.82 – 1.60 70.82 – 1.60	Depositor EDS
% Data completeness (in resolution range)	99.8 (70.82-1.60) 99.8 (70.82-1.60)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.58 (at 1.60Å)	Xtriage
Refinement program	REFMAC 5.8.0155	Depositor
R, R_{free}	0.126 , 0.163 0.140 , 0.173	Depositor DCC
R_{free} test set	3114 reflections (5.04%)	wwPDB-VP
Wilson B-factor (Å ²)	24.5	Xtriage
Anisotropy	0.292	Xtriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.39 , 64.1	EDS
L-test for twinning ²	$\langle L \rangle = 0.49$, $\langle L^2 \rangle = 0.32$	Xtriage
Estimated twinning fraction	No twinning to report.	Xtriage
F_o, F_c correlation	0.98	EDS
Total number of atoms	2625	wwPDB-VP
Average B, all atoms (Å ²)	36.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% 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: B3P, 0QE, AR7, GOL, CA

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	E	1.90	9/423 (2.1%)	1.59	7/575 (1.2%)
2	S	1.90	27/1904 (1.4%)	1.52	18/2588 (0.7%)
3	I	1.07	0/30	0.48	0/38
All	All	1.89	36/2357 (1.5%)	1.53	25/3201 (0.8%)

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
2	S	0	1

All (36) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	S	165	ARG	CZ-NH2	22.09	1.62	1.33
2	S	60	GLU	C-O	15.95	1.44	1.24
2	S	165	ARG	CD-NE	-12.21	1.29	1.46
1	E	106	LYS	N-CA	10.38	1.59	1.45
1	E	103	ALA	C-N	-9.29	1.20	1.33
1	E	139	GLN	CA-C	-8.49	1.39	1.52
2	S	62	VAL	C-N	8.32	1.45	1.33
1	E	85	ASP	CA-C	-8.22	1.39	1.52
1	E	106	LYS	CA-C	7.96	1.63	1.52
2	S	159	ARG	CZ-NH2	7.32	1.43	1.33
2	S	240	GLU	CD-OE1	7.07	1.38	1.25
2	S	165	ARG	NE-CZ	7.03	1.40	1.33
2	S	195	SER	CA-C	-7.00	1.44	1.52
2	S	159	ARG	NE-CZ	6.97	1.40	1.33
2	S	145	PHE	C-N	6.79	1.43	1.33

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	S	118	VAL	N-CA	6.68	1.54	1.46
2	S	202	GLU	CD-OE1	6.65	1.38	1.25
1	E	134	ARG	CZ-NH2	6.63	1.42	1.33
2	S	137	TYR	CZ-OH	-6.17	1.25	1.38
2	S	189	ASP	N-CA	5.95	1.53	1.46
1	E	101	ASN	N-CA	5.94	1.53	1.46
2	S	150	GLN	CA-CB	5.84	1.62	1.53
2	S	227	ILE	C-O	5.71	1.29	1.24
2	S	42	CYS	CA-CB	5.65	1.63	1.53
2	S	47	VAL	CA-CB	5.55	1.61	1.54
2	S	82	LYS	C-O	5.43	1.30	1.24
1	E	139	GLN	CD-NE2	5.41	1.44	1.33
2	S	70	GLU	N-CA	-5.39	1.39	1.45
2	S	202	GLU	CA-C	5.32	1.59	1.52
1	E	102	SER	N-CA	-5.25	1.39	1.45
2	S	62	VAL	N-CA	5.24	1.52	1.46
2	S	82	LYS	CA-C	5.24	1.58	1.52
2	S	153	LEU	N-CA	-5.20	1.39	1.46
2	S	244	LEU	C-O	-5.17	1.16	1.23
2	S	98	LYS	C-O	5.10	1.30	1.24
2	S	67	VAL	CA-C	5.01	1.59	1.52

All (25) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	S	165	ARG	NE-CZ-NH1	-16.55	104.95	121.50
1	E	85	ASP	CA-C-O	-14.97	101.18	119.59
2	S	165	ARG	NE-CZ-NH2	12.05	130.05	119.20
2	S	62	VAL	CA-C-O	-11.39	107.62	120.84
2	S	159	ARG	NE-CZ-NH2	11.01	129.11	119.20
1	E	85	ASP	N-CA-C	-9.35	102.46	112.93
2	S	35	GLY	O-C-N	-8.08	112.19	122.70
2	S	159	ARG	NE-CZ-NH1	-7.25	114.25	121.50
2	S	60	GLU	O-C-N	6.97	133.86	122.70
2	S	61	GLY	N-CA-C	6.63	124.47	115.32
1	E	86	VAL	N-CA-C	5.98	117.19	108.58
2	S	165	ARG	CG-CD-NE	-5.98	98.84	112.00
2	S	87	ARG	NE-CZ-NH2	-5.96	113.84	119.20
1	E	85	ASP	CB-CA-C	5.86	120.94	110.81
2	S	42	CYS	CA-CB-SG	-5.75	101.16	114.40
2	S	145	PHE	O-C-N	-5.73	116.24	123.17
2	S	60	GLU	CA-C-N	-5.65	104.76	117.20

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	S	149	GLY	CA-C-N	5.61	128.83	120.87
2	S	149	GLY	C-N-CA	5.61	128.83	120.87
2	S	62	VAL	O-C-N	5.59	128.86	122.93
1	E	105	ASN	CA-C-N	5.27	131.08	122.07
1	E	105	ASN	C-N-CA	5.27	131.08	122.07
2	S	217	GLU	O-C-N	-5.22	116.84	123.05
1	E	139	GLN	N-CA-CB	-5.08	103.11	110.47
2	S	186	GLU	CG-CD-OE2	-5.04	106.80	118.40

There are no chirality outliers.

All (1) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	S	35	GLY	Mainchain

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	E	418	0	352	2	0
2	S	1860	0	1774	21	0
3	I	43	0	39	4	0
4	E	19	0	25	2	0
5	S	1	0	0	0	0
6	S	60	0	76	14	0
7	E	27	0	0	0	0
7	I	2	0	0	0	0
7	S	195	0	0	5	0
All	All	2625	0	2266	31	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 (31) 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)
6:S:306:GOL:C1	6:S:306:GOL:O1	1.64	1.43
6:S:311:GOL:O1	7:S:401:HOH:O	2.08	0.71
6:S:308:GOL:H2	7:S:489:HOH:O	1.91	0.70
2:S:99:TYR:OH	3:I:2:GLY:N	2.26	0.68
6:S:311:GOL:C1	7:S:401:HOH:O	2.42	0.67
2:S:233:ARG:HH11	6:S:310:GOL:H12	1.60	0.66
2:S:127:GLU:OE2	6:S:302:GOL:O2	2.14	0.66
6:S:306:GOL:C1	6:S:306:GOL:HO1	2.08	0.63
6:S:306:GOL:O1	6:S:306:GOL:C2	2.49	0.59
2:S:62:VAL:CG1	6:S:304:GOL:H12	2.32	0.59
2:S:198:PRO:HB2	2:S:200[B]:VAL:HG23	1.85	0.58
2:S:99:TYR:OH	3:I:2:GLY:CA	2.53	0.57
2:S:62:VAL:HG11	6:S:304:GOL:H12	1.87	0.56
2:S:99:TYR:OH	3:I:2:GLY:HA3	2.05	0.56
2:S:59:VAL:O	2:S:60:GLU:HG3	2.07	0.54
2:S:21:ASP:OD1	6:S:307:GOL:H11	2.11	0.50
2:S:59:VAL:C	2:S:60:GLU:HG3	2.37	0.49
1:E:96:GLU:HB2	4:E:201:B3P:H102	1.94	0.49
2:S:86[A]:ILE:HG23	2:S:109:ASP:HB2	1.96	0.47
2:S:99:TYR:CZ	3:I:2:GLY:CA	2.98	0.47
2:S:200[B]:VAL:HG11	2:S:207:SER:HB3	1.97	0.46
2:S:198:PRO:HB2	2:S:200[A]:VAL:HG13	1.97	0.46
2:S:59:VAL:O	2:S:60:GLU:CG	2.65	0.44
6:S:308:GOL:C2	7:S:489:HOH:O	2.58	0.43
2:S:64:ILE:HG21	2:S:64:ILE:HD13	1.83	0.43
2:S:200[B]:VAL:CG1	2:S:207:SER:HB3	2.48	0.42
2:S:86[A]:ILE:HG21	2:S:86[A]:ILE:HD13	1.80	0.42
2:S:217:GLU:OE1	6:S:306:GOL:O3	2.18	0.42
4:E:201:B3P:H51	7:S:402:HOH:O	2.20	0.41
1:E:102:SER:N	1:E:106:LYS:O	2.48	0.41
2:S:62:VAL:HG11	6:S:304:GOL:C1	2.51	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	E	60/62 (97%)	59 (98%)	1 (2%)	0	100	100
2	S	238/235 (101%)	230 (97%)	8 (3%)	0	100	100
3	I	1/4 (25%)	1 (100%)	0	0	100	100
All	All	299/301 (99%)	290 (97%)	9 (3%)	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	E	39/56 (70%)	39 (100%)	0	100	100
2	S	196/198 (99%)	195 (100%)	1 (0%)	81	70
3	I	3/1 (300%)	3 (100%)	0	100	100
All	All	238/255 (93%)	237 (100%)	1 (0%)	84	75

All (1) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	S	60	GLU

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

5.3.3 RNA ⓘ

There are no RNA molecules in this entry.

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

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	$\# Z > 2$
3	AR7	I	3	3,2	10,10,11	2.69	2 (20%)	9,11,13	2.49	4 (44%)

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	AR7	I	3	3,2	-	2/9/9/11	-

All (2) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	I	3	AR7	CA-N	-7.45	1.22	1.46
3	I	3	AR7	CZ-NE	2.20	1.37	1.33

All (4) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	I	3	AR7	CB-CA-C	5.71	120.07	112.25
3	I	3	AR7	CG-CD-NE	-3.10	103.50	112.20
3	I	3	AR7	CB-CA-N	2.63	117.15	109.16
3	I	3	AR7	NE-CZ-NH1	-2.09	117.09	120.67

There are no chirality outliers.

All (2) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
3	I	3	AR7	O-C-CA-N
3	I	3	AR7	N-CA-CB-CG

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](#)

Of 12 ligands modelled in this entry, 1 is monoatomic - leaving 11 for Mogul analysis.

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
6	GOL	S	311	-	5,5,5	0.79	0	5,5,5	0.88	0
6	GOL	S	308	5	5,5,5	0.37	0	5,5,5	0.46	0
6	GOL	S	305	-	5,5,5	1.65	1 (20%)	5,5,5	3.43	2 (40%)
6	GOL	S	306	-	5,5,5	3.27	3 (60%)	5,5,5	1.66	1 (20%)
6	GOL	S	309	-	5,5,5	1.45	1 (20%)	5,5,5	1.86	2 (40%)
6	GOL	S	307	-	5,5,5	1.35	0	5,5,5	1.15	0
6	GOL	S	310	-	5,5,5	1.35	1 (20%)	5,5,5	2.28	3 (60%)
6	GOL	S	302	-	5,5,5	0.56	0	5,5,5	1.28	1 (20%)
6	GOL	S	303	-	5,5,5	1.66	1 (20%)	5,5,5	2.71	2 (40%)
4	B3P	E	201	-	18,18,18	1.32	4 (22%)	23,23,23	2.21	8 (34%)
6	GOL	S	304	-	5,5,5	1.73	1 (20%)	5,5,5	1.70	2 (40%)

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
6	GOL	S	311	-	-	1/4/4/4	-
6	GOL	S	308	5	-	0/4/4/4	-

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
6	GOL	S	305	-	-	3/4/4/4	-
6	GOL	S	306	-	-	0/4/4/4	-
6	GOL	S	309	-	-	3/4/4/4	-
6	GOL	S	307	-	-	2/4/4/4	-
6	GOL	S	310	-	-	3/4/4/4	-
6	GOL	S	302	-	-	2/4/4/4	-
6	GOL	S	303	-	-	2/4/4/4	-
4	B3P	E	201	-	-	10/28/28/28	-
6	GOL	S	304	-	-	2/4/4/4	-

All (12) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
6	S	306	GOL	O1-C1	5.27	1.64	1.42
6	S	306	GOL	O2-C2	4.05	1.55	1.43
6	S	303	GOL	O2-C2	3.52	1.53	1.43
6	S	305	GOL	O2-C2	-2.96	1.34	1.43
6	S	310	GOL	O3-C3	-2.75	1.30	1.42
6	S	309	GOL	O3-C3	2.54	1.53	1.42
4	E	201	B3P	C3-N1	-2.52	1.43	1.46
6	S	306	GOL	O3-C3	2.34	1.52	1.42
6	S	304	GOL	O2-C2	2.34	1.50	1.43
4	E	201	B3P	C11-C8	2.30	1.56	1.53
4	E	201	B3P	O5-C6	2.17	1.49	1.42
4	E	201	B3P	O6-C7	-2.00	1.35	1.42

All (21) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	S	305	GOL	O2-C2-C3	6.58	136.44	109.18
6	S	303	GOL	C3-C2-C1	-4.95	93.65	111.80
4	E	201	B3P	C7-C4-C6	-4.79	99.52	110.02
4	E	201	B3P	C6-C4-N1	4.76	123.21	109.02
4	E	201	B3P	C3-N1-C4	3.88	121.84	116.17
6	S	310	GOL	C3-C2-C1	-3.28	99.76	111.80
6	S	305	GOL	O1-C1-C2	-3.19	96.02	110.38
6	S	303	GOL	O2-C2-C1	2.94	121.37	109.18
6	S	309	GOL	O1-C1-C2	2.92	123.53	110.38
6	S	304	GOL	O1-C1-C2	2.69	122.47	110.38
6	S	306	GOL	O2-C2-C3	2.59	119.91	109.18

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
6	S	310	GOL	O3-C3-C2	2.54	121.82	110.38
4	E	201	B3P	C10-C8-N2	-2.51	101.53	109.02
4	E	201	B3P	O6-C7-C4	2.50	116.77	111.68
4	E	201	B3P	C7-C4-C5	2.49	115.48	110.02
4	E	201	B3P	O3-C11-C8	2.43	116.63	111.68
6	S	309	GOL	O2-C2-C1	2.43	119.24	109.18
6	S	302	GOL	O2-C2-C3	-2.32	99.57	109.18
4	E	201	B3P	C1-C2-N2	2.32	116.59	110.98
6	S	310	GOL	O2-C2-C3	2.22	118.37	109.18
6	S	304	GOL	O3-C3-C2	2.17	120.12	110.38

There are no chirality outliers.

All (28) torsion outliers are listed below:

Mol	Chain	Res	Type	Atoms
4	E	201	B3P	C5-C4-N1-C3
4	E	201	B3P	C6-C4-N1-C3
4	E	201	B3P	C7-C4-N1-C3
4	E	201	B3P	O3-C11-C8-C9
6	S	303	GOL	O1-C1-C2-C3
6	S	309	GOL	O1-C1-C2-C3
6	S	310	GOL	O1-C1-C2-C3
6	S	305	GOL	O2-C2-C3-O3
6	S	302	GOL	O1-C1-C2-C3
6	S	304	GOL	O1-C1-C2-C3
6	S	305	GOL	O1-C1-C2-C3
6	S	307	GOL	O1-C1-C2-C3
6	S	311	GOL	O1-C1-C2-C3
6	S	304	GOL	O1-C1-C2-O2
6	S	305	GOL	O1-C1-C2-O2
6	S	309	GOL	O1-C1-C2-O2
6	S	310	GOL	O1-C1-C2-O2
6	S	302	GOL	O1-C1-C2-O2
6	S	309	GOL	O2-C2-C3-O3
4	E	201	B3P	O3-C11-C8-C10
6	S	303	GOL	O1-C1-C2-O2
6	S	307	GOL	O1-C1-C2-O2
6	S	310	GOL	O2-C2-C3-O3
4	E	201	B3P	C9-C8-N2-C2
4	E	201	B3P	O2-C10-C8-N2
4	E	201	B3P	O2-C10-C8-C11
4	E	201	B3P	C10-C8-N2-C2

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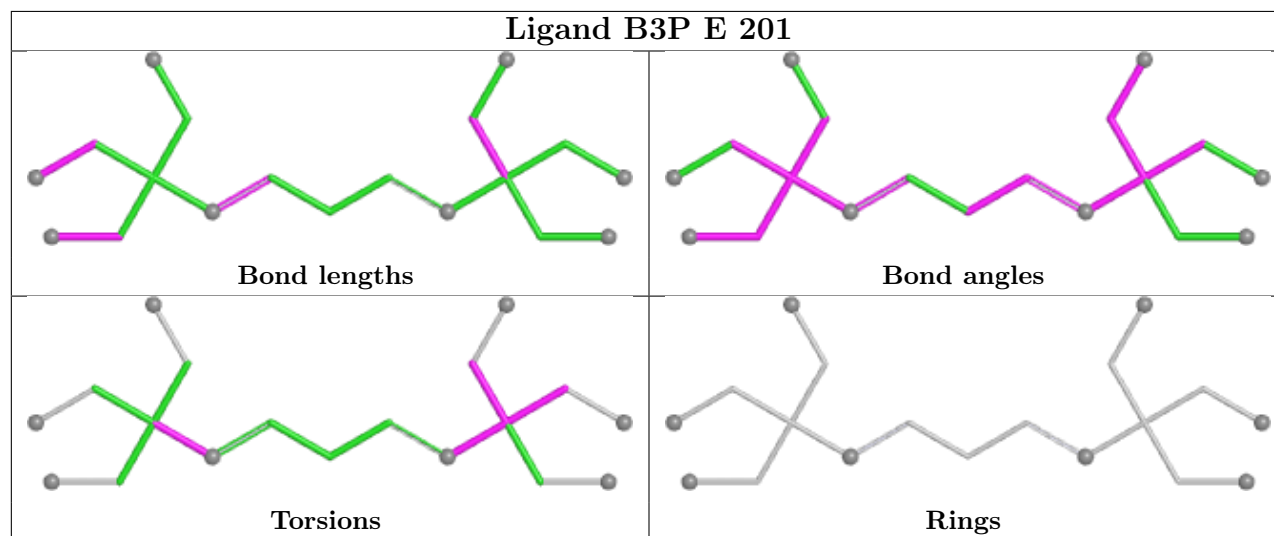
Mol	Chain	Res	Type	Atoms
4	E	201	B3P	O3-C11-C8-N2

There are no ring outliers.

8 monomers are involved in 16 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
6	S	311	GOL	2	0
6	S	308	GOL	2	0
6	S	306	GOL	4	0
6	S	307	GOL	1	0
6	S	310	GOL	1	0
6	S	302	GOL	1	0
4	E	201	B3P	2	0
6	S	304	GOL	3	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	E	52/62 (83%)	0.59	4 (7%) 19 20	15, 40, 61, 67	4 (7%)
2	S	235/235 (100%)	-0.28	3 (1%) 75 79	6, 28, 48, 89	6 (2%)
3	I	2/4 (50%)	3.16	1 (50%) 0 0	18, 18, 18, 39	1 (50%)
All	All	289/301 (96%)	-0.10	8 (2%) 55 58	6, 30, 57, 89	11 (3%)

All (8) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	I	1[A]	GLU	5.1
1	E	139	GLN	5.1
1	E	106	LYS	4.8
2	S	60(A)	THR	4.7
1	E	85	ASP	4.6
2	S	61	GLY	4.2
2	S	62	VAL	2.8
1	E	102	SER	2.4

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, 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
3	AR7	I	3	11/12	0.98	0.06	23,25,32,37	0

6.3 Carbohydrates ⓘ

There are no oligosaccharides in this entry.

6.4 Ligands ⓘ

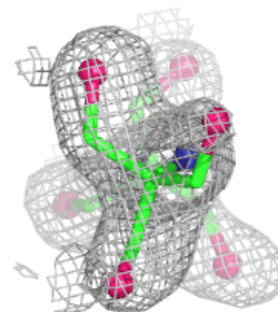
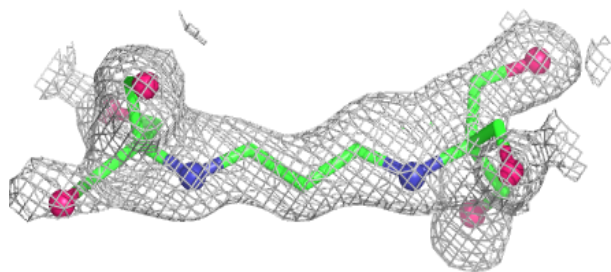
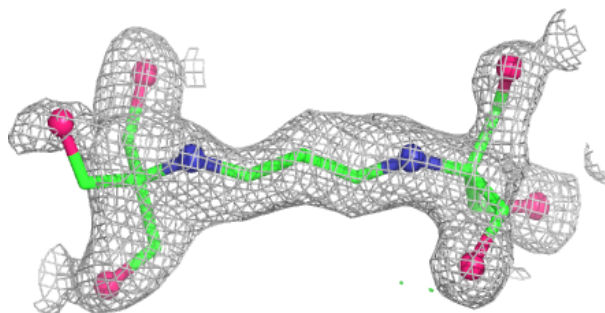
In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95th percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists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

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å ²)	Q<0.9
6	GOL	S	302	6/6	0.89	0.16	63,74,79,86	0
6	GOL	S	303	6/6	0.90	0.16	48,60,73,73	0
6	GOL	S	307	6/6	0.91	0.13	47,62,73,78	0
6	GOL	S	311	6/6	0.91	0.11	38,43,48,63	6
6	GOL	S	309	6/6	0.93	0.11	42,58,60,66	0
6	GOL	S	304	6/6	0.94	0.13	48,61,64,73	0
4	B3P	E	201	19/19	0.94	0.11	41,60,82,85	0
6	GOL	S	310	6/6	0.95	0.10	35,41,82,90	0
6	GOL	S	308	6/6	0.96	0.07	31,44,56,59	0
6	GOL	S	306	6/6	0.96	0.09	26,33,37,48	0
6	GOL	S	305	6/6	0.98	0.06	32,38,41,46	0
5	CA	S	301	1/1	1.00	0.01	29,29,29,29	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 B3P E 201:

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



6.5 Other polymers [i](#)

There are no such residues in this entry.