



# Full wwPDB X-ray Structure Validation Report ⓘ

Feb 1, 2016 – 10:32 PM GMT

PDB ID : 4Y5V  
Title : Diabody 305 complex with EpoR  
Authors : Moraga, I.; Guo, F.; Ozkan, E.; Jude, K.M.; Garcia, K.C.  
Deposited on : 2015-02-12  
Resolution : 2.60 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](mailto:validation@mail.wwpdb.org)  
A user guide is available at  
<http://wwpdb.org/validation/2016/XrayValidationReportHelp>  
with specific help available everywhere you see the ⓘ symbol.

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

MolProbity : 4.02b-467  
Mogul : 1.7 (RC4), CSD as536be (2015)  
Xtriage (Phenix) : 1.9-1692  
EDS : rb-20026688  
Percentile statistics : 20151230.v01 (using entries in the PDB archive December 30th 2015)  
Refmac : 5.8.0135  
CCP4 : 6.5.0  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : trunk26865

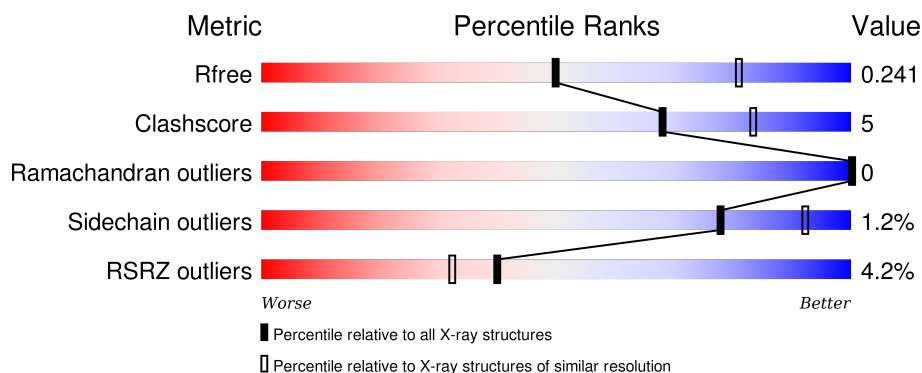
# 1 Overall quality at a glance ⓘ

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.60 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))
$R_{free}$	91344	2328 (2.60-2.60)
Clashscore	102246	2679 (2.60-2.60)
Ramachandran outliers	100387	2635 (2.60-2.60)
Sidechain outliers	100360	2635 (2.60-2.60)
RSRZ outliers	91569	2334 (2.60-2.60)

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 on the lower bar indicate the fraction of residues that contain outliers for  $\geq 3$ , 2, 1 and 0 types of geometric quality criteria. 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	130	<div> <div>84%</div> <div>9%</div> <div>7%</div> </div>
1	D	130	<div> <div>76%</div> <div>18%</div> <div>6%</div> </div>
1	G	130	<div> <div>82%</div> <div>9%</div> <div>8%</div> </div>
2	B	117	<div> <div>2%</div> <div>89%</div> <div>6%</div> <div>5%</div> </div>
2	E	117	<div> <div>3%</div> <div>86%</div> <div>9%</div> <div>.</div> </div>

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Mol	Chain	Length	Quality of chain
2	H	117	
3	C	229	
3	F	229	
3	I	229	

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
4	GOL	A	201	-	-	-	X
4	GOL	B	201	-	-	-	X
4	GOL	B	203	-	-	-	X
4	GOL	D	201	-	-	-	X
4	GOL	D	202	-	-	-	X
4	GOL	H	201	-	-	-	X
4	GOL	H	203	-	-	-	X
5	PGE	D	203	-	-	-	X
6	PEG	D	204	-	-	-	X

## 2 Entry composition

There are 7 unique types of molecules in this entry. The entry contains 10298 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 diabody 305 VH domain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	121	Total	C	N	O	S	0	1	0
			928	579	164	181	4			
1	D	122	Total	C	N	O	S	0	2	0
			938	584	166	184	4			
1	G	119	Total	C	N	O	S	0	1	0
			920	575	162	179	4			

- Molecule 2 is a protein called Diabody 305 VL domain.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
2	B	111	Total	C	N	O	S	0	0	0
			821	511	136	171	3			
2	E	112	Total	C	N	O	S	0	0	0
			822	512	136	171	3			
2	H	112	Total	C	N	O	S	0	0	0
			826	514	137	172	3			

- Molecule 3 is a protein called Erythropoietin receptor.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
3	C	206	Total	C	N	O	S	0	0	0
			1599	1024	279	289	7			
3	F	206	Total	C	N	O	S	0	0	0
			1592	1019	276	290	7			
3	I	191	Total	C	N	O	S	0	0	0
			1444	928	248	261	7			

There are 39 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
C	3	PHE	-	expression tag	UNP P19235
C	4	ALA	-	expression tag	UNP P19235

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Chain	Residue	Modelled	Actual	Comment	Reference
C	5	GLY	-	expression tag	UNP P19235
C	6	SER	-	expression tag	UNP P19235
C	7	ALA	-	expression tag	UNP P19235
C	52	GLN	ASN	engineered mutation	UNP P19235
C	164	GLN	ASN	engineered mutation	UNP P19235
C	226	LYS	-	expression tag	UNP P19235
C	227	GLU	-	expression tag	UNP P19235
C	228	LYS	-	expression tag	UNP P19235
C	229	ALA	-	expression tag	UNP P19235
C	230	ALA	-	expression tag	UNP P19235
C	231	ALA	-	expression tag	UNP P19235
F	3	PHE	-	expression tag	UNP P19235
F	4	ALA	-	expression tag	UNP P19235
F	5	GLY	-	expression tag	UNP P19235
F	6	SER	-	expression tag	UNP P19235
F	7	ALA	-	expression tag	UNP P19235
F	52	GLN	ASN	engineered mutation	UNP P19235
F	164	GLN	ASN	engineered mutation	UNP P19235
F	226	LYS	-	expression tag	UNP P19235
F	227	GLU	-	expression tag	UNP P19235
F	228	LYS	-	expression tag	UNP P19235
F	229	ALA	-	expression tag	UNP P19235
F	230	ALA	-	expression tag	UNP P19235
F	231	ALA	-	expression tag	UNP P19235
I	3	PHE	-	expression tag	UNP P19235
I	4	ALA	-	expression tag	UNP P19235
I	5	GLY	-	expression tag	UNP P19235
I	6	SER	-	expression tag	UNP P19235
I	7	ALA	-	expression tag	UNP P19235
I	52	GLN	ASN	engineered mutation	UNP P19235
I	164	GLN	ASN	engineered mutation	UNP P19235
I	226	LYS	-	expression tag	UNP P19235
I	227	GLU	-	expression tag	UNP P19235
I	228	LYS	-	expression tag	UNP P19235
I	229	ALA	-	expression tag	UNP P19235
I	230	ALA	-	expression tag	UNP P19235
I	231	ALA	-	expression tag	UNP P19235

- Molecule 4 is GLYCEROL (three-letter code: GOL) (formula: C<sub>3</sub>H<sub>8</sub>O<sub>3</sub>).



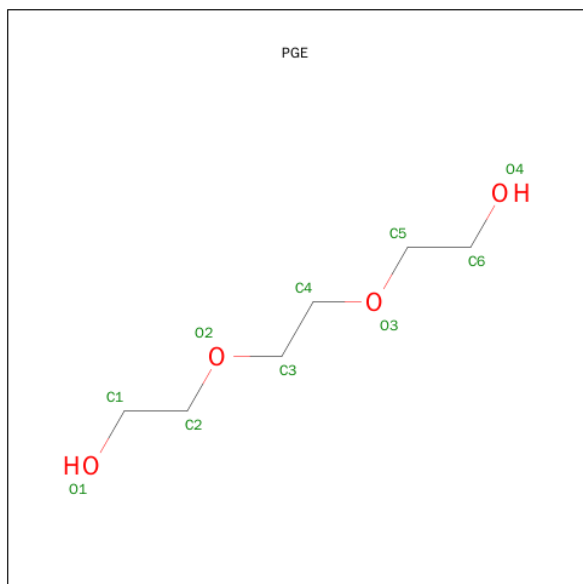
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	A	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	B	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		
4	D	1	Total	C	O	0	0
			6	3	3		
4	E	1	Total	C	O	0	0
			6	3	3		
4	E	1	Total	C	O	0	0
			6	3	3		
4	E	1	Total	C	O	0	0
			6	3	3		
4	F	1	Total	C	O	0	0
			6	3	3		
4	G	1	Total	C	O	0	0
			6	3	3		
4	G	1	Total	C	O	0	0
			6	3	3		
4	H	1	Total	C	O	0	0
			6	3	3		
4	H	1	Total	C	O	0	0
			6	3	3		

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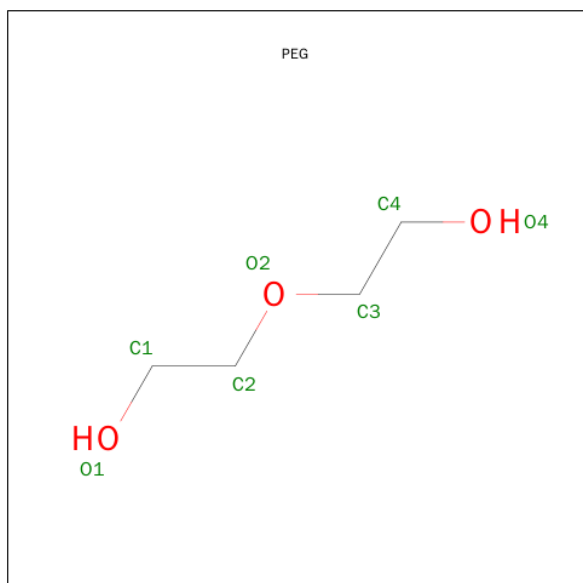
Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
4	H	1	Total	C	O	0	0
			6	3	3		

- Molecule 5 is TRIETHYLENE GLYCOL (three-letter code: PGE) (formula:  $C_6H_{14}O_4$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	D	1	Total	C	O	0	0
			10	6	4		

- Molecule 6 is DI(HYDROXYETHYL)ETHER (three-letter code: PEG) (formula:  $C_4H_{10}O_3$ ).



Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
6	D	1	Total	C	O	0	0
			7	4	3		

- Molecule 7 is water.

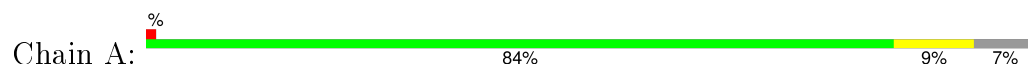
Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
7	A	50	Total	O	0	0
			50	50		
7	B	35	Total	O	0	0
			35	35		
7	C	31	Total	O	0	0
			31	31		
7	D	47	Total	O	0	0
			47	47		
7	E	17	Total	O	0	0
			17	17		
7	F	29	Total	O	0	0
			29	29		
7	G	48	Total	O	0	0
			48	48		
7	H	34	Total	O	0	0
			34	34		
7	I	10	Total	O	0	0
			10	10		



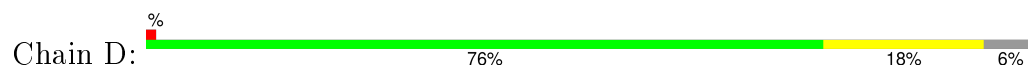
### 3 Residue-property plots [i](#)

These plots are drawn for all protein, RNA and DNA chains in the entry. The first graphic for a chain summarises the proportions of errors 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.

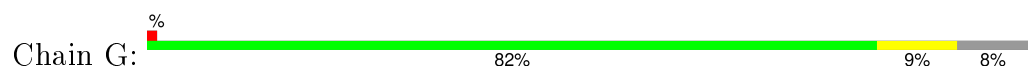
- Molecule 1: diabody 305 VH domain



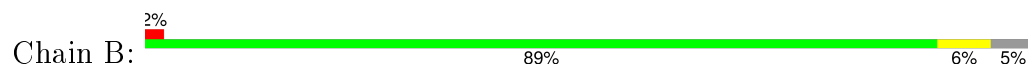
- Molecule 1: diabody 305 VH domain



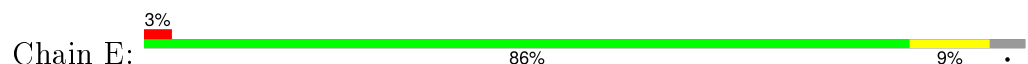
- Molecule 1: diabody 305 VH domain



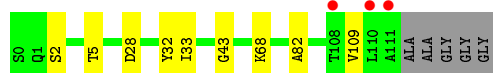
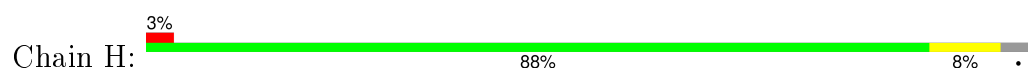
- Molecule 2: Diabody 305 VL domain



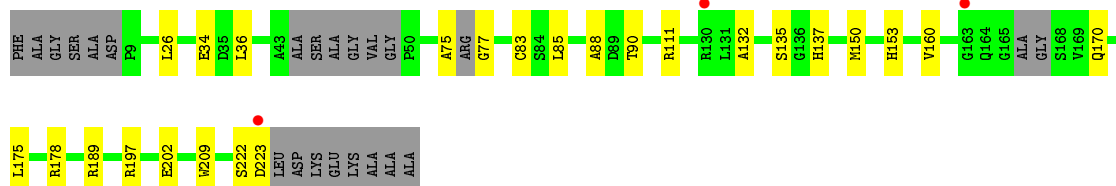
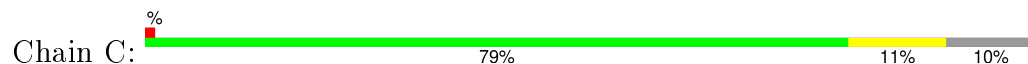
- Molecule 2: Diabody 305 VL domain



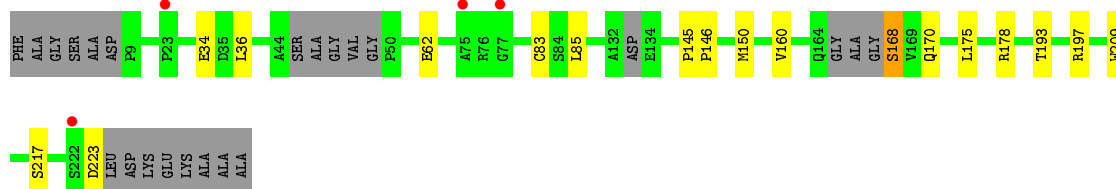
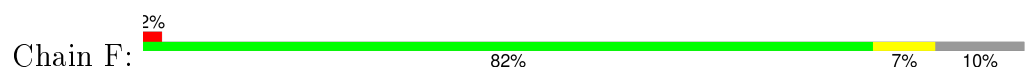
- Molecule 2: Diabody 305 VL domain



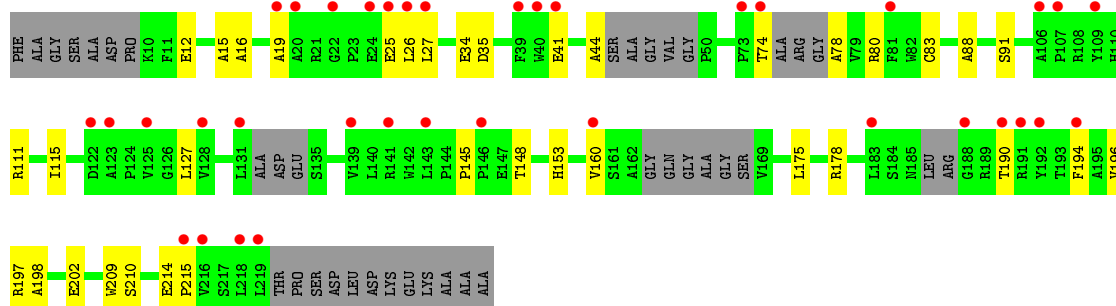
- Molecule 3: Erythropoietin receptor



- Molecule 3: Erythropoietin receptor



- Molecule 3: Erythropoietin receptor



## 4 Data and refinement statistics

Property	Value	Source
Space group	C 2 2 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	125.73Å 215.02Å 171.91Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	45.58 – 2.60 45.89 – 2.60	Depositor EDS
% Data completeness (in resolution range)	95.8 (45.58-2.60) 95.8 (45.89-2.60)	Depositor EDS
$R_{merge}$	0.14	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.37 (at 2.61Å)	Xtriage
Refinement program	PHENIX (phenix.refine: dev_1839)	Depositor
R, $R_{free}$	0.187 , 0.229 0.202 , 0.241	Depositor DCC
$R_{free}$ test set	3460 reflections (5.33%)	DCC
Wilson B-factor (Å <sup>2</sup> )	44.0	Xtriage
Anisotropy	0.971	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.34 , 58.4	EDS
Estimated twinning fraction	0.207 for 1/2*h-1/2*k,-3/2*h-1/2*k,-l 0.147 for 1/2*h+1/2*k,3/2*h-1/2*k,-l	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.49$ , $\langle L^2 \rangle = 0.32$	Xtriage
Outliers	3 of 68359 reflections (0.004%)	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	10298	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	64.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 3.70% 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, 0.375 respectively for untwinned datasets, and 0.333, 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: GOL, PEG, PGE

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	0.21	0/948	0.37	0/1281
1	D	0.22	0/958	0.37	0/1294
1	G	0.22	0/940	0.37	0/1271
2	B	0.21	0/839	0.40	0/1141
2	E	0.21	0/840	0.39	0/1143
2	H	0.21	0/844	0.38	0/1148
3	C	0.21	0/1642	0.39	0/2237
3	F	0.21	0/1635	0.40	0/2231
3	I	0.21	0/1483	0.44	0/2025
All	All	0.21	0/10129	0.40	0/13771

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no planarity outliers.

### 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	928	0	892	9	0
1	D	938	0	899	15	0
1	G	920	0	886	10	0
2	B	821	0	788	5	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
2	E	822	0	787	11	0
2	H	826	0	793	6	0
3	C	1599	0	1554	15	0
3	F	1592	0	1536	13	0
3	I	1444	0	1329	22	0
4	A	6	0	8	0	0
4	B	18	0	24	2	0
4	D	12	0	16	0	0
4	E	18	0	24	3	0
4	F	6	0	8	0	0
4	G	12	0	16	0	0
4	H	18	0	24	1	0
5	D	10	0	14	2	0
6	D	7	0	9	0	0
7	A	50	0	0	0	0
7	B	35	0	0	0	0
7	C	31	0	0	0	0
7	D	47	0	0	0	0
7	E	17	0	0	0	0
7	F	29	0	0	0	0
7	G	48	0	0	2	0
7	H	34	0	0	0	0
7	I	10	0	0	0	0
All	All	10298	0	9607	93	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 5.

All (93) 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)
2:E:32:TYR:O	2:E:68:LYS:NZ	2.14	0.80
2:B:32:TYR:O	2:B:68:LYS:NZ	2.22	0.73
2:E:82:ALA:HA	2:E:109:VAL:HG21	1.70	0.71
3:F:160:VAL:HB	3:F:170:GLN:HB3	1.72	0.71
3:I:160:VAL:HG13	3:I:194:PHE:HE1	1.61	0.66
2:H:32:TYR:O	2:H:68:LYS:NZ	2.28	0.66
3:C:175:LEU:HD12	3:C:178:ARG:NH1	2.11	0.65
3:C:160:VAL:HB	3:C:170:GLN:HB3	1.79	0.65
2:E:85:GLU:HG3	2:E:109:VAL:HG22	1.80	0.64
1:D:64:VAL:HG13	1:D:68:PHE:HB2	1.79	0.63

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:I:26:LEU:O	3:I:111:ARG:NH1	2.29	0.63
3:I:44:ALA:HB2	3:I:78:ALA:HA	1.81	0.62
1:A:101:ARG:NH2	3:C:88:ALA:O	2.32	0.62
1:G:101:ARG:NH2	3:I:88:ALA:O	2.32	0.62
3:C:132:ALA:HB3	3:C:135:SER:HB3	1.80	0.62
1:G:52:LYS:NZ	7:G:301:HOH:O	2.33	0.61
3:I:12:GLU:O	3:I:16:ALA:N	2.28	0.60
2:B:52:ASP:OD2	4:B:202:GOL:H12	2.00	0.60
3:C:135:SER:HG	3:C:137:HIS:HD1	1.50	0.58
3:C:135:SER:OG	3:C:137:HIS:ND1	2.31	0.58
2:E:33:ILE:HG21	3:F:34:GLU:OE2	2.04	0.58
2:H:82:ALA:HA	2:H:109:VAL:HG21	1.86	0.57
2:E:55:ARG:HE	4:E:202:GOL:H11	1.69	0.56
2:H:33:ILE:HD13	3:I:34:GLU:HG2	1.87	0.56
1:D:0:SER:OG	1:D:1:GLU:OE1	2.21	0.56
3:F:178:ARG:NH2	2:H:5:THR:OG1	2.39	0.56
3:I:41:GLU:HG3	3:I:80:ARG:HE	1.70	0.56
1:A:83:MET:HE2	1:A:86:LEU:HD21	1.88	0.55
1:G:83:MET:HB3	1:G:86:LEU:HD21	1.87	0.55
1:G:52:LYS:HG2	1:G:53:PRO:HD2	1.88	0.55
2:E:55:ARG:HH21	4:E:202:GOL:H31	1.71	0.55
1:D:33:TRP:HB2	1:D:99:VAL:HB	1.90	0.54
1:A:52:LYS:HG2	1:A:53:PRO:HD2	1.88	0.54
2:E:2:SER:HB3	3:I:175:LEU:HD13	1.90	0.54
1:A:33:TRP:HB2	1:A:99:VAL:HB	1.91	0.53
1:D:52:LYS:HG2	1:D:53:PRO:HD2	1.90	0.53
1:A:83:MET:HB3	1:A:86:LEU:HD21	1.92	0.52
3:C:189:ARG:HG3	3:C:222:SER:HB3	1.92	0.51
3:I:197:ARG:HD2	3:I:209:TRP:HB3	1.93	0.51
2:B:33:ILE:HD13	3:C:34:GLU:HG2	1.91	0.51
1:G:83:MET:HE2	1:G:86:LEU:HD21	1.93	0.51
3:C:75:ALA:HA	3:C:77:GLY:HA2	1.93	0.51
3:I:160:VAL:HG13	3:I:194:PHE:CE1	2.44	0.51
3:I:145:PRO:O	3:I:148:THR:HG22	2.12	0.50
3:I:127:LEU:HD12	3:I:196:VAL:HG12	1.94	0.50
2:H:43:GLY:H	4:H:201:GOL:H12	1.77	0.50
1:D:100:SER:OG	1:D:101:ARG:N	2.43	0.50
3:C:26:LEU:O	3:C:111:ARG:NH1	2.45	0.50
1:A:100:SER:OG	1:A:101:ARG:N	2.44	0.49
1:G:100:SER:OG	1:G:101:ARG:N	2.44	0.49
3:F:197:ARG:HD2	3:F:209:TRP:HB3	1.94	0.48

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
3:C:36:LEU:HD23	3:C:85:LEU:HD12	1.96	0.47
1:D:58:LYS:HZ3	5:D:203:PGE:H2	1.78	0.47
3:I:175:LEU:HD12	3:I:178:ARG:NH1	2.30	0.47
3:I:153:HIS:HB3	3:I:202:GLU:HB2	1.97	0.47
3:F:175:LEU:HD13	2:H:2:SER:HB3	1.96	0.46
1:G:19:ARG:NH2	7:G:303:HOH:O	2.48	0.46
3:I:15:ALA:O	3:I:19:ALA:N	2.48	0.45
1:A:53:PRO:HA	1:A:72:ARG:NH1	2.31	0.45
3:I:19:ALA:HB2	3:I:80:ARG:HH22	1.82	0.44
2:B:32:TYR:CZ	3:C:150:MET:HG3	2.52	0.44
1:A:91:THR:HG23	1:A:115:THR:HA	2.00	0.44
3:F:168:SER:O	3:F:168:SER:OG	2.35	0.44
3:C:197:ARG:HD2	3:C:209:TRP:HB3	1.99	0.43
1:G:33:TRP:HB2	1:G:99:VAL:HG22	2.00	0.43
2:E:43:GLY:H	4:E:201:GOL:H31	1.82	0.43
2:B:37:TRP:CD2	2:B:75:LEU:HB2	2.54	0.43
2:E:33:ILE:HD13	3:F:34:GLU:HG2	1.99	0.43
1:D:105:TYR:H	2:E:38:TYR:HH	1.63	0.43
3:C:153:HIS:HB3	3:C:202:GLU:HB2	2.01	0.43
2:E:32:TYR:CZ	3:F:150:MET:HG3	2.55	0.42
1:D:101:ARG:HH21	3:F:62:GLU:HG3	1.84	0.42
1:D:53:PRO:HA	1:D:72:ARG:NH1	2.34	0.42
3:I:91:SER:O	3:I:115:ILE:HD13	2.19	0.42
1:D:12:VAL:HG12	1:D:13:GLN:O	2.19	0.42
1:D:83:MET:HB3	1:D:86:LEU:HD21	2.02	0.42
1:D:58:LYS:HZ2	5:D:203:PGE:H3	1.85	0.42
1:G:53:PRO:HA	1:G:72:ARG:NH1	2.35	0.41
3:I:198:ALA:H	3:I:210:SER:HB3	1.85	0.41
3:I:74:THR:N	3:I:78:ALA:O	2.35	0.41
1:A:33:TRP:CZ2	1:A:52:LYS:HG3	2.56	0.41
1:D:91:THR:HG23	1:D:115:THR:HA	2.03	0.41
4:B:202:GOL:O2	3:C:90:THR:OG1	2.32	0.41
3:F:36:LEU:HD23	3:F:85:LEU:HD12	2.03	0.41
1:D:6:GLU:OE2	1:D:109:GLY:HA3	2.20	0.41
3:F:160:VAL:O	3:F:170:GLN:N	2.53	0.41
3:I:145:PRO:HG2	3:I:148:THR:HG21	2.03	0.40
3:I:214:GLU:HA	3:I:215:PRO:HD3	1.86	0.40
1:D:67:ARG:NH1	1:D:87[B]:ARG:HG3	2.35	0.40
3:F:193:THR:HG22	3:F:217:SER:OG	2.22	0.40
3:I:35:ASP:N	3:I:35:ASP:OD1	2.54	0.40
3:F:145:PRO:HA	3:F:146:PRO:HD3	1.83	0.40

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:G:6:GLU:OE2	1:G:109:GLY:HA3	2.21	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	120/130 (92%)	119 (99%)	1 (1%)	0	100	100
1	D	122/130 (94%)	120 (98%)	2 (2%)	0	100	100
1	G	118/130 (91%)	117 (99%)	1 (1%)	0	100	100
2	B	109/117 (93%)	106 (97%)	3 (3%)	0	100	100
2	E	110/117 (94%)	107 (97%)	3 (3%)	0	100	100
2	H	110/117 (94%)	107 (97%)	3 (3%)	0	100	100
3	C	198/229 (86%)	192 (97%)	6 (3%)	0	100	100
3	F	198/229 (86%)	191 (96%)	7 (4%)	0	100	100
3	I	179/229 (78%)	172 (96%)	7 (4%)	0	100	100
All	All	1264/1428 (88%)	1231 (97%)	33 (3%)	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	98/101 (97%)	97 (99%)	1 (1%)	82	94
1	D	99/101 (98%)	99 (100%)	0	100	100
1	G	98/101 (97%)	98 (100%)	0	100	100
2	B	92/92 (100%)	91 (99%)	1 (1%)	80	93
2	E	91/92 (99%)	90 (99%)	1 (1%)	80	93
2	H	92/92 (100%)	91 (99%)	1 (1%)	80	93
3	C	168/185 (91%)	166 (99%)	2 (1%)	78	92
3	F	167/185 (90%)	164 (98%)	3 (2%)	66	87
3	I	141/185 (76%)	137 (97%)	4 (3%)	51	78
All	All	1046/1134 (92%)	1033 (99%)	13 (1%)	78	92

All (13) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	118	SER
2	B	28	ASP
3	C	83	CYS
3	C	223	ASP
2	E	28	ASP
3	F	83	CYS
3	F	168	SER
3	F	223	ASP
2	H	28	ASP
3	I	25	GLU
3	I	27	LEU
3	I	83	CYS
3	I	190	THR

Some 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 ⓘ

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

## 5.5 Carbohydrates

There are no carbohydrates in this entry.

## 5.6 Ligand geometry

17 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	GOL	A	201	-	5,5,5	0.31	0	5,5,5	0.27	0
4	GOL	B	201	-	5,5,5	0.35	0	5,5,5	0.26	0
4	GOL	B	202	-	5,5,5	0.34	0	5,5,5	0.18	0
4	GOL	B	203	-	5,5,5	0.35	0	5,5,5	0.24	0
4	GOL	D	201	-	5,5,5	0.34	0	5,5,5	0.27	0
4	GOL	D	202	-	5,5,5	0.34	0	5,5,5	0.24	0
5	PGE	D	203	-	9,9,9	0.33	0	8,8,8	0.22	0
6	PEG	D	204	-	6,6,6	0.58	0	5,5,5	0.27	0
4	GOL	E	201	-	5,5,5	0.35	0	5,5,5	0.21	0
4	GOL	E	202	-	5,5,5	0.36	0	5,5,5	0.24	0
4	GOL	E	203	-	5,5,5	0.35	0	5,5,5	0.26	0
4	GOL	F	301	-	5,5,5	0.34	0	5,5,5	0.25	0
4	GOL	G	201	-	5,5,5	0.35	0	5,5,5	0.24	0
4	GOL	G	202	-	5,5,5	0.34	0	5,5,5	0.26	0
4	GOL	H	201	-	5,5,5	0.35	0	5,5,5	0.25	0
4	GOL	H	202	-	5,5,5	0.36	0	5,5,5	0.22	0
4	GOL	H	203	-	5,5,5	0.32	0	5,5,5	0.26	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	GOL	A	201	-	-	0/4/4/4	0/0/0/0
4	GOL	B	201	-	-	0/4/4/4	0/0/0/0
4	GOL	B	202	-	-	0/4/4/4	0/0/0/0

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Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
4	GOL	B	203	-	-	0/4/4/4	0/0/0/0
4	GOL	D	201	-	-	0/4/4/4	0/0/0/0
4	GOL	D	202	-	-	0/4/4/4	0/0/0/0
5	PGE	D	203	-	-	0/7/7/7	0/0/0/0
6	PEG	D	204	-	-	0/4/4/4	0/0/0/0
4	GOL	E	201	-	-	0/4/4/4	0/0/0/0
4	GOL	E	202	-	-	0/4/4/4	0/0/0/0
4	GOL	E	203	-	-	0/4/4/4	0/0/0/0
4	GOL	F	301	-	-	0/4/4/4	0/0/0/0
4	GOL	G	201	-	-	0/4/4/4	0/0/0/0
4	GOL	G	202	-	-	0/4/4/4	0/0/0/0
4	GOL	H	201	-	-	0/4/4/4	0/0/0/0
4	GOL	H	202	-	-	0/4/4/4	0/0/0/0
4	GOL	H	203	-	-	0/4/4/4	0/0/0/0

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.

5 monomers are involved in 8 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	B	202	GOL	2	0
5	D	203	PGE	2	0
4	E	201	GOL	1	0
4	E	202	GOL	2	0
4	H	201	GOL	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 ⓘ

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	121/130 (93%)	-0.33	1 (0%) 87 85	28, 43, 64, 117	0
1	D	122/130 (93%)	-0.26	1 (0%) 87 85	31, 44, 65, 122	0
1	G	119/130 (91%)	-0.25	1 (0%) 87 85	29, 45, 67, 114	0
2	B	111/117 (94%)	-0.00	2 (1%) 71 66	36, 51, 80, 95	0
2	E	112/117 (95%)	0.10	3 (2%) 58 51	37, 60, 85, 110	0
2	H	112/117 (95%)	0.04	3 (2%) 58 51	40, 56, 79, 100	0
3	C	206/229 (89%)	0.08	3 (1%) 76 71	42, 67, 106, 136	0
3	F	206/229 (89%)	0.06	4 (1%) 70 64	44, 66, 119, 164	0
3	I	191/229 (83%)	0.84	36 (18%) 2 1	54, 99, 141, 160	0
All	All	1300/1428 (91%)	0.08	54 (4%) 40 32	28, 60, 118, 164	0

All (54) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
3	I	39	PHE	6.1
3	I	40	TRP	4.0
3	I	27	LEU	4.0
2	E	111	ALA	4.0
3	I	194	PHE	3.9
2	H	111	ALA	3.9
3	I	106	ALA	3.9
2	B	12	GLY	3.8
3	I	123	ALA	3.8
2	H	110	LEU	3.8
3	I	131	LEU	3.6
3	I	125	VAL	3.6
3	I	218	LEU	3.6
3	I	24	GLU	3.4
3	I	160	VAL	3.3

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Mol	Chain	Res	Type	RSRZ
3	F	77	GLY	3.3
3	I	128	VAL	3.2
3	I	219	LEU	3.2
3	I	139	VAL	3.2
3	I	26	LEU	3.2
3	I	141	ARG	3.2
2	E	110	LEU	3.1
3	C	223	ASP	3.1
2	B	108	THR	3.0
3	I	107	PRO	3.0
3	C	130	ARG	2.9
3	I	74	THR	2.9
3	I	41	GLU	2.9
3	I	183	LEU	2.8
3	I	25	GLU	2.8
3	I	81	PHE	2.7
1	D	120	GLY	2.7
3	I	146	PRO	2.6
3	I	216	VAL	2.6
3	I	190	THR	2.6
3	I	19	ALA	2.6
3	F	23	PRO	2.5
2	H	108	THR	2.5
3	I	192	TYR	2.5
2	E	18	ILE	2.5
3	I	22	GLY	2.4
3	I	143	LEU	2.4
3	I	188	GLY	2.4
3	I	191	ARG	2.4
3	I	122	ASP	2.3
3	F	222	SER	2.3
3	C	163	GLY	2.3
1	A	0	SER	2.2
3	I	73	PRO	2.2
3	F	75	ALA	2.2
3	I	215	PRO	2.2
1	G	0	SER	2.1
3	I	20	ALA	2.1
3	I	109	TYR	2.1

## 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 carbohydrates 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. LLDF column lists the quality of electron density of the group with respect to its neighbouring residues in protein, DNA or RNA chains. 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	LLDF	B-factors(Å <sup>2</sup> )	Q<0.9
4	GOL	A	201	6/6	0.77	0.69	24.91	84,86,87,94	0
4	GOL	H	203	6/6	0.78	0.49	14.71	84,91,94,97	0
4	GOL	D	201	6/6	0.76	0.34	9.44	78,91,99,110	0
5	PGE	D	203	10/10	0.49	0.37	9.03	60,82,99,100	0
4	GOL	H	201	6/6	0.80	0.35	3.90	63,77,86,92	0
6	PEG	D	204	7/7	0.92	0.20	3.05	29,62,79,81	0
4	GOL	D	202	6/6	0.91	0.22	2.90	33,61,72,76	0
4	GOL	B	201	6/6	0.88	0.25	2.69	66,80,83,88	0
4	GOL	B	203	6/6	0.87	0.35	2.64	84,87,95,106	0
4	GOL	H	202	6/6	0.91	0.28	1.73	83,87,92,100	0
4	GOL	E	203	6/6	0.94	0.28	1.68	70,78,90,96	0
4	GOL	G	201	6/6	0.86	0.22	1.66	70,85,87,91	0
4	GOL	B	202	6/6	0.86	0.21	1.56	63,69,74,87	0
4	GOL	E	202	6/6	0.86	0.20	1.52	67,71,75,83	0
4	GOL	G	202	6/6	0.85	0.18	0.61	73,79,92,95	0
4	GOL	E	201	6/6	0.93	0.18	0.56	67,71,78,80	0
4	GOL	F	301	6/6	0.89	0.16	-0.45	83,88,94,98	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.