



# Full wwPDB X-ray Structure Validation Report ⓘ

Jan 31, 2016 – 09:16 PM GMT

PDB ID : 1O5D  
Title : Dissecting and Designing Inhibitor Selectivity Determinants at the S1 site Using an Artificial Ala190 Protease (Ala190 uPA)  
Authors : Katz, B.A.; Luong, C.; Ho, J.D.; Somoza, J.R.; Gjerstad, E.; Tang, J.; Williams, S.R.; Verner, E.; Mackman, R.L.; Young, W.B.; Sprengeler, P.A.; Chan, H.; Mortara, K.; Janc, J.W.; McGrath, M.E.  
Deposited on : 2003-09-09  
Resolution : 2.05 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

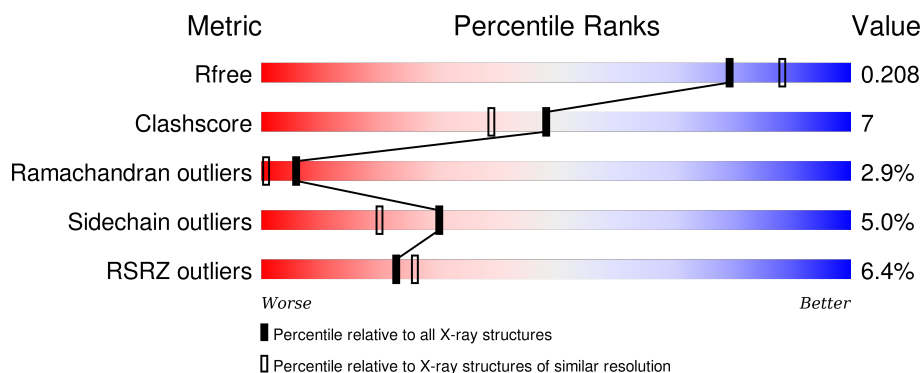
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

## *X-RAY DIFFRACTION*

The reported resolution of this entry is 2.05 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	1192 (2.04-2.04)
Clashscore	102246	1269 (2.04-2.04)
Ramachandran outliers	100387	1258 (2.04-2.04)
Sidechain outliers	100360	1258 (2.04-2.04)
RSRZ outliers	91569	1194 (2.04-2.04)

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	L	152	<div> <div>5%</div> <div>45%</div> <div>15%</div> <div>•</div> <div>37%</div> </div>
2	H	254	<div> <div>5%</div> <div>78%</div> <div>17%</div> <div>5%</div> </div>
3	T	218	<div> <div>6%</div> <div>51%</div> <div>15%</div> <div>••</div> <div>31%</div> </div>

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	CR9	H	258	X	-	-	-

## 2 Entry composition

There are 5 unique types of molecules in this entry. The entry contains 9593 atoms, of which 5038 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 VII.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
1	L	96	Total	C	H	N	O	S	0	2	0
			1395	439	668	126	149	13			

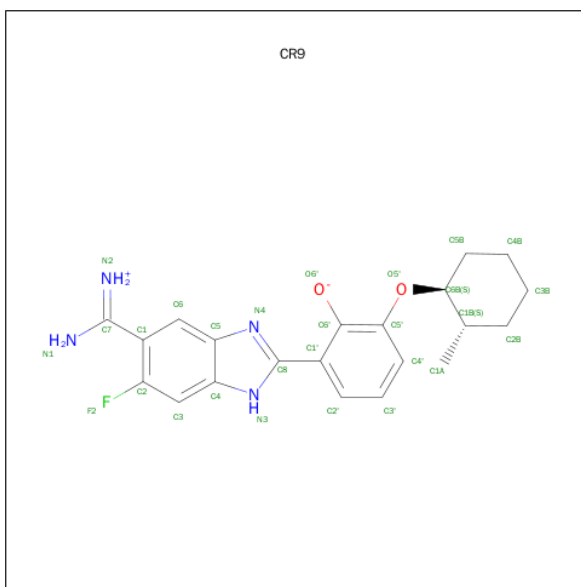
- Molecule 2 is a protein called Coagulation factor VII.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
2	H	254	Total	C	H	N	O	S	0	3	0
			3965	1263	1977	353	359	13			

- Molecule 3 is a protein called Tissue factor.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
3	T	151	Total	C	H	N	O	S	0	1	0
			2406	775	1186	198	245	2			

- Molecule 4 is 2-{5-[AMINO(IMINIO)METHYL]-6-FLUORO-1H-BENZIMIDAZOL-2-YL}-6-[(2-METHYLCYCLOHEXYL)OXY]BENZENOLATE (three-letter code: CR9) (formula: C<sub>21</sub>H<sub>23</sub>FN<sub>4</sub>O<sub>2</sub>).



Mol	Chain	Residues	Atoms						ZeroOcc	AltConf
4	H	1	Total	C	F	H	N	O	0	0
			51	21	1	23	4	2		

- Molecule 5 is water.

Mol	Chain	Residues	Atoms			ZeroOcc	AltConf
5	H	292	Total	H	O	0	3
			885	590	295		
5	L	110	Total	H	O	0	0
			330	220	110		
5	T	186	Total	H	O	0	1
			561	374	187		



## 4 Data and refinement statistics

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	78.54Å 69.03Å 79.12Å 90.00° 89.99° 90.00°	Depositor
Resolution (Å)	7.00 – 2.05 7.00 – 2.05	Depositor EDS
% Data completeness (in resolution range)	77.3 (7.00-2.05) 77.3 (7.00-2.05)	Depositor EDS
$R_{merge}$	0.05	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	3.90 (at 2.05Å)	Xtriage
Refinement program	X-PLOR 3.851	Depositor
R, $R_{free}$	0.226 , 0.262 0.213 , 0.208	Depositor DCC
$R_{free}$ test set	4073 reflections (11.30%)	DCC
Wilson B-factor (Å <sup>2</sup> )	24.7	Xtriage
Anisotropy	0.894	Xtriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.32 , 115.6	EDS
Estimated twinning fraction	0.003 for -l,k,h 0.028 for h,-k,-l 0.022 for -l,-k,-h	Xtriage
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.48$ , $\langle L^2 \rangle = 0.31$	Xtriage
Outliers	0 of 40130 reflections	Xtriage
$F_o, F_c$ correlation	0.94	EDS
Total number of atoms	9593	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	38.0	wwPDB-VP

Xtriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 6.49% 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 ⓘ

### 5.1 Standard geometry ⓘ

Bond lengths and bond angles in the following residue types are not validated in this section: CR9

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	L	1.33	0/748	1.40	4/1009 (0.4%)
2	H	1.44	5/2046 (0.2%)	1.63	41/2784 (1.5%)
3	T	1.29	0/1250	1.59	20/1701 (1.2%)
All	All	1.38	5/4044 (0.1%)	1.58	65/5494 (1.2%)

All (5) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	H	52	VAL	CA-CB	5.11	1.65	1.54
2	H	141	TRP	CG-CD2	-5.05	1.35	1.43
2	H	237	TRP	CG-CD2	-5.04	1.35	1.43
2	H	190[A]	SER	CA-CB	5.00	1.60	1.52
2	H	190[B]	SER	CA-CB	5.00	1.60	1.52

All (65) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	29	TRP	CD1-NE1-CE2	10.55	118.50	109.00
2	H	61	TRP	CD1-NE1-CE2	10.26	118.23	109.00
3	T	45	TRP	CD1-NE1-CE2	9.90	117.91	109.00
2	H	207	TRP	CD1-NE1-CE2	9.61	117.65	109.00
3	T	25	TRP	CD1-NE1-CE2	9.53	117.58	109.00
2	H	215	TRP	CD1-NE1-CE2	9.49	117.54	109.00
2	H	51	TRP	CD1-NE1-CE2	9.39	117.45	109.00
2	H	237	TRP	CD1-NE1-CE2	9.17	117.25	109.00
3	T	74	ARG	NE-CZ-NH2	-9.11	115.75	120.30
3	T	14	TRP	CD1-NE1-CE2	8.96	117.07	109.00
2	H	29	TRP	NE1-CE2-CZ2	8.81	140.09	130.40
2	H	141	TRP	CD1-NE1-CE2	8.79	116.91	109.00
1	L	123	ASP	CB-CG-OD2	-8.68	110.48	118.30

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	H	207	TRP	NE1-CE2-CZ2	8.51	139.76	130.40
2	H	237	TRP	NE1-CE2-CZ2	8.28	139.51	130.40
2	H	29	TRP	CG-CD1-NE1	-8.14	101.96	110.10
2	H	61	TRP	CG-CD1-NE1	-7.99	102.11	110.10
2	H	199	HIS	N-CA-C	-7.74	90.11	111.00
3	T	25	TRP	CG-CD1-NE1	-7.55	102.55	110.10
3	T	45	TRP	NE1-CE2-CZ2	7.50	138.65	130.40
3	T	14	TRP	NE1-CE2-CZ2	7.48	138.63	130.40
2	H	207	TRP	CG-CD1-NE1	-7.45	102.65	110.10
2	H	141	TRP	NE1-CE2-CZ2	7.41	138.55	130.40
2	H	243	ARG	NE-CZ-NH2	-7.33	116.64	120.30
2	H	129(G)	VAL	N-CA-C	-7.27	91.37	111.00
3	T	45	TRP	CG-CD1-NE1	-7.25	102.86	110.10
2	H	237	TRP	CG-CD1-NE1	-7.18	102.92	110.10
2	H	215	TRP	CG-CD1-NE1	-7.06	103.04	110.10
2	H	51	TRP	CG-CD1-NE1	-7.04	103.06	110.10
3	T	157	TYR	N-CA-C	-6.99	92.12	111.00
2	H	29	TRP	NE1-CE2-CD2	-6.98	100.32	107.30
2	H	134	ARG	NE-CZ-NH2	-6.91	116.84	120.30
2	H	253	ARG	NE-CZ-NH2	-6.91	116.84	120.30
3	T	14	TRP	CG-CD1-NE1	-6.79	103.31	110.10
2	H	61	TRP	NE1-CE2-CZ2	6.71	137.78	130.40
1	L	104	ASP	CB-CG-OD2	-6.68	112.29	118.30
2	H	141	TRP	CG-CD1-NE1	-6.66	103.44	110.10
2	H	237	TRP	NE1-CE2-CD2	-6.57	100.73	107.30
2	H	215	TRP	NE1-CE2-CZ2	6.47	137.51	130.40
3	T	40	THR	N-CA-C	-6.47	93.54	111.00
2	H	207	TRP	NE1-CE2-CD2	-6.45	100.85	107.30
2	H	147	ARG	NE-CZ-NH2	-6.41	117.09	120.30
3	T	25	TRP	NE1-CE2-CZ2	6.36	137.39	130.40
2	H	61	TRP	NE1-CE2-CD2	-6.16	101.14	107.30
2	H	141	TRP	NE1-CE2-CD2	-6.09	101.21	107.30
3	T	196	ARG	NE-CZ-NH2	-6.06	117.27	120.30
2	H	215	TRP	NE1-CE2-CD2	-6.02	101.28	107.30
3	T	136	ARG	NE-CZ-NH2	-5.91	117.35	120.30
3	T	28	LYS	N-CA-C	-5.79	95.36	111.00
3	T	45	TRP	NE1-CE2-CD2	-5.79	101.51	107.30
3	T	14	TRP	NE1-CE2-CD2	-5.78	101.53	107.30
2	H	129(B)	ARG	NE-CZ-NH2	-5.70	117.45	120.30
2	H	51	TRP	NE1-CE2-CD2	-5.67	101.63	107.30
2	H	170(D)	LYS	N-CA-C	5.66	126.28	111.00
2	H	29	TRP	CG-CD2-CE3	-5.66	128.81	133.90

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
3	T	156	TYR	N-CA-C	-5.62	95.83	111.00
2	H	51	TRP	NE1-CE2-CZ2	5.53	136.48	130.40
1	L	113	ARG	NE-CZ-NH2	-5.43	117.58	120.30
3	T	25	TRP	NE1-CE2-CD2	-5.43	101.87	107.30
2	H	134	ARG	CA-CB-CG	-5.41	101.49	113.40
1	L	101	TYR	CB-CG-CD1	5.35	124.21	121.00
2	H	170(F)	GLY	N-CA-C	-5.24	100.00	113.10
2	H	79	ASP	N-CA-C	5.14	124.89	111.00
3	T	86	THR	N-CA-CB	-5.13	100.56	110.30
2	H	62	ARG	NE-CZ-NH2	-5.03	117.79	120.30

There are no chirality outliers.

There are no planarity outliers.

## 5.2 Too-close contacts ⓘ

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

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	L	727	668	663	15	1
2	H	1988	1977	1967	26	0
3	T	1220	1186	1182	18	0
4	H	28	23	23	2	0
5	H	295	590	0	1	0
5	L	110	220	0	0	0
5	T	187	374	0	0	1
All	All	4555	5038	3835	56	1

The all-atom clashscore is defined as the number of clashes found per 1000 atoms (including hydrogen atoms). The all-atom clashscore for this structure is 7.

All (56) 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:H:195:SER:OG	4:H:258:CR9:O6'	2.07	0.71
1:L:61:CYS:SG	1:L:68:TYR:HB2	2.36	0.65
1:L:71:PHE:CE2	3:T:131:ARG:HD3	2.31	0.65

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:H:236:GLU:CD	2:H:236:GLU:H	2.02	0.62
2:H:143:GLN:HE22	2:H:147:ARG:H	1.50	0.59
1:L:65:LEU:HD12	1:L:65:LEU:N	2.17	0.59
2:H:136:SER:CB	2:H:199:HIS:CE1	2.90	0.55
2:H:136:SER:HB2	2:H:199:HIS:CE1	2.44	0.53
1:L:49:GLN:O	1:L:51:ALA:N	2.42	0.52
1:L:65:LEU:CD1	1:L:65:LEU:N	2.74	0.51
3:T:155:LEU:O	3:T:188:SER:N	2.43	0.51
2:H:228:TYR:N	2:H:228:TYR:CD1	2.78	0.51
3:T:87:GLY:O	3:T:89:ALA:N	2.43	0.51
3:T:51:TYR:CE1	3:T:83:VAL:HG13	2.46	0.49
2:H:50:ILE:HG13	2:H:51:TRP:CD1	2.48	0.48
2:H:135:PHE:HB3	2:H:159:ASN:ND2	2.28	0.48
2:H:124:PRO:O	2:H:235:ILE:HD13	2.13	0.47
3:T:194:PRO:HA	3:T:200:ARG:NH1	2.28	0.47
1:L:121[B]:LEU:HD11	1:L:128:THR:HB	1.95	0.47
4:H:258:CR9:N3	4:H:258:CR9:O6'	2.46	0.47
1:L:49:GLN:OE1	1:L:49:GLN:N	2.49	0.46
2:H:180:MET:HE1	5:H:440:HOH:O	2.15	0.46
3:T:108:LEU:HB2	3:T:202:SER:HB3	1.96	0.46
1:L:62:LYS:O	1:L:68:TYR:HA	2.16	0.46
2:H:45:THR:OG1	2:H:198:PRO:HB3	2.17	0.45
1:L:71:PHE:CE2	3:T:131:ARG:CD	3.00	0.44
2:H:143:GLN:HE22	2:H:147:ARG:N	2.14	0.44
2:H:245:GLU:O	2:H:247:ARG:CD	2.66	0.43
2:H:27:CYS:N	2:H:28:PRO:CD	2.81	0.43
3:T:45:TRP:CE2	3:T:74:ARG:NH2	2.86	0.43
3:T:150:ASP:O	3:T:193:ILE:HA	2.19	0.43
1:L:65:LEU:HD11	3:T:203:THR:HG21	2.01	0.43
2:H:91:PRO:O	2:H:253:ARG:NH2	2.52	0.43
3:T:51:TYR:CD1	3:T:83:VAL:HG22	2.53	0.42
3:T:154:THR:O	3:T:189:VAL:HA	2.19	0.42
2:H:92:SER:OG	2:H:255:PRO:HA	2.19	0.42
1:L:90:ILE:HD12	1:L:92:VAL:HG12	2.02	0.42
2:H:161:PRO:O	2:H:183:ALA:HA	2.20	0.41
3:T:135:ARG:HA	3:T:139:THR:O	2.20	0.41
2:H:127:THR:O	2:H:129(B):ARG:HB3	2.21	0.41
1:L:61:CYS:SG	1:L:68:TYR:CB	3.06	0.41
2:H:245:GLU:O	2:H:247:ARG:HD3	2.19	0.41
3:T:144:ARG:HD2	3:T:148:GLY:O	2.20	0.41
2:H:121:LEU:HD11	2:H:207:TRP:HB3	2.03	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:129:PRO:HB3	1:L:134:PRO:HB3	2.02	0.41
2:H:76:HIS:ND1	2:H:77:ASP:O	2.54	0.41
2:H:166:GLN:HB2	3:T:94:TYR:OH	2.21	0.41
2:H:239:GLN:O	2:H:243:ARG:HG3	2.21	0.41
2:H:245:GLU:CD	2:H:245:GLU:N	2.74	0.41
1:L:65:LEU:H	1:L:65:LEU:CD1	2.34	0.40
3:T:51:TYR:CD1	3:T:83:VAL:CG2	3.05	0.40
3:T:142:SER:O	3:T:145:ASP:N	2.54	0.40
2:H:215:TRP:CE2	2:H:227:VAL:HG11	2.56	0.40
3:T:86:THR:OG1	3:T:90:GLY:C	2.60	0.40

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

Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:L:118:TYR:O	5:T:303:HOH:H1[2_646]	1.53	0.07

## 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	L	96/152 (63%)	81 (84%)	9 (9%)	6 (6%)	2	0
2	H	255/254 (100%)	228 (89%)	23 (9%)	4 (2%)	12	3
3	T	146/218 (67%)	125 (86%)	17 (12%)	4 (3%)	6	1
All	All	497/624 (80%)	434 (87%)	49 (10%)	14 (3%)	6	1

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	L	50	CYS
2	H	79	ASP

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Mol	Chain	Res	Type
3	T	88	SER
3	T	148	GLY
1	L	57	ASN
2	H	49	THR
3	T	156	TYR
1	L	66	GLN
1	L	51	ALA
2	H	170(I)	PRO
3	T	137	ASN
1	L	81	CYS
2	H	255	PRO
1	L	74	PRO

### 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	L	85/132 (64%)	78 (92%)	7 (8%)	14	6
2	H	219/216 (101%)	210 (96%)	9 (4%)	37	28
3	T	140/199 (70%)	134 (96%)	6 (4%)	35	27
All	All	444/547 (81%)	422 (95%)	22 (5%)	30	20

All (22) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	L	49	GLN
1	L	65	LEU
1	L	83	THR
1	L	88	GLN
1	L	92	VAL
1	L	103	SER
1	L	110	ARG
2	H	68	LEU
2	H	75	GLU
2	H	84	ARG

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Mol	Chain	Res	Type
2	H	92	SER
2	H	100	ASN
2	H	159	ASN
2	H	233	GLN
2	H	236	GLU
2	H	255	PRO
3	T	83	VAL
3	T	85	SER
3	T	86	THR
3	T	131	ARG
3	T	156	TYR
3	T	195	SER

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (4) such sidechains are listed below:

Mol	Chain	Res	Type
1	L	64	GLN
2	H	100	ASN
2	H	143	GLN
2	H	159	ASN

### 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 carbohydrates 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	$\# Z  > 2$
4	CR9	H	258	-	30,31,31	2.07	11 (36%)	36,45,45	1.98	12 (33%)

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	CR9	H	258	-	2/2/3/3	0/9/23/23	0/4/4/4

All (11) bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
4	H	258	CR9	C1-C7	-4.25	1.39	1.48
4	H	258	CR9	C1'-C8	-3.18	1.40	1.48
4	H	258	CR9	C6-C5	-3.06	1.37	1.41
4	H	258	CR9	C5'-C6'	-2.54	1.40	1.43
4	H	258	CR9	C8-N3	-2.01	1.30	1.34
4	H	258	CR9	C5B-C6B	2.61	1.57	1.52
4	H	258	CR9	C4B-C5B	2.65	1.60	1.53
4	H	258	CR9	O6'-C6'	2.76	1.38	1.27
4	H	258	CR9	C6-C1	2.97	1.41	1.37
4	H	258	CR9	C1-C2	3.85	1.44	1.38
4	H	258	CR9	C3-C2	3.90	1.39	1.35

All (12) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	258	CR9	C4'-C5'-C6'	-4.94	118.98	121.10
4	H	258	CR9	C1-C6-C5	-3.86	118.16	121.52
4	H	258	CR9	C1A-C1B-C6B	-3.15	108.11	112.72
4	H	258	CR9	C8-N4-C5	-3.13	97.89	103.89
4	H	258	CR9	F2-C2-C3	-2.73	116.10	119.74
4	H	258	CR9	O6'-C6'-C5'	-2.61	119.13	121.36
4	H	258	CR9	C3B-C2B-C1B	-2.17	109.97	112.60
4	H	258	CR9	C3-C2-C1	-2.07	121.64	124.24

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Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
4	H	258	CR9	C6-C5-N4	-2.01	124.73	130.70
4	H	258	CR9	O5'-C5'-C6'	2.16	117.06	113.63
4	H	258	CR9	C4-C5-N4	2.57	113.60	108.20
4	H	258	CR9	C3-C4-C5	4.05	124.39	120.55

All (2) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
4	H	258	CR9	C1B
4	H	258	CR9	C6B

There are no torsion outliers.

There are no ring outliers.

1 monomer is involved in 2 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
4	H	258	CR9	2	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	L	96/152 (63%)	0.06	8 (8%) 14 16	12, 34, 59, 66	17 (17%)
2	H	254/254 (100%)	-0.38	12 (4%) 35 41	8, 26, 64, 92	21 (8%)
3	T	151/218 (69%)	0.19	12 (7%) 15 18	12, 37, 76, 92	21 (13%)
All	All	501/624 (80%)	-0.12	32 (6%) 23 26	8, 30, 69, 92	59 (11%)

All (32) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
1	L	66	GLN	12.1
3	T	138	ASN	10.9
3	T	137	ASN	9.4
2	H	170(G)	ASP	7.1
2	H	170(H)	SER	6.1
3	T	157	TYR	5.9
1	L	65	LEU	5.9
3	T	156	TYR	5.7
3	T	188	SER	4.8
2	H	170(F)	GLY	4.8
2	H	170(E)	VAL	4.2
1	L	48	ASP	4.0
3	T	109	GLY	3.9
3	T	88	SER	3.6
2	H	60(C)	LYS	3.5
1	L	50	CYS	3.4
1	L	49	GLN	3.3
2	H	248	PRO	3.2
2	H	61	TRP	2.9
1	L	67	SER	2.9
2	H	170(D)	LYS	2.9
3	T	155	LEU	2.6
2	H	60(B)	ILE	2.6

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Mol	Chain	Res	Type	RSRZ
1	L	53	SER	2.5
2	H	247	ARG	2.4
3	T	205	SER	2.4
2	H	63	ASN	2.4
1	L	51	ALA	2.2
3	T	129	ASP	2.2
2	H	62	ARG	2.1
3	T	149	LYS	2.0
3	T	87	GLY	2.0

## 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	CR9	H	258	28/28	0.95	0.11	0.71	22,44,47,49	0

## 6.5 Other polymers [i](#)

There are no such residues in this entry.