Full wwPDB X-ray Structure Validation Report (i)

Aug 2, 2023 – 02:04 AM EDT

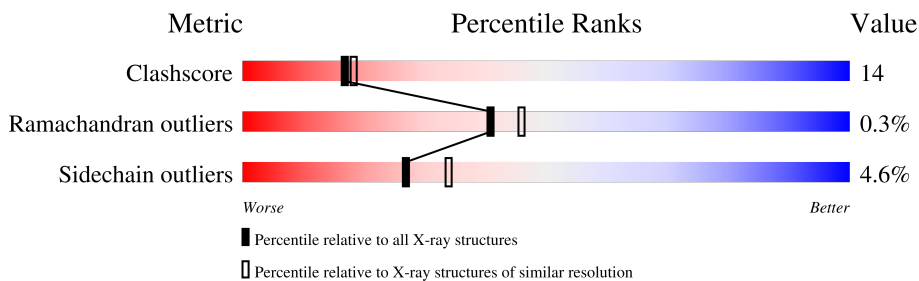|		
PDB ID	:	1BP5
Title	:	HUMAN SERUM TRANSFERRIN, RECOMBINANT N-TERMINAL LOBE, APO FORM
Authors	:	Jeffrey, P.D.; Bewley, M.C.; Macgillivray, R.T.A.; Mason, A.B.; Woodworth, R.C.; Baker, E.N.
Deposited on	:	1998-08-12
Resolution	:	2.20 Å(reported)

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 2.20 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	Percentile Ranks	Value
Clashscore		14
Ramachandran outliers		0.3%
Sidechain outliers		4.6%

Worse   *Better*

■ Percentile relative to all X-ray structures

▯ Percentile relative to X-ray structures of similar resolution

Metric	Whole archive (#Entries)	Similar resolution (#Entries, resolution range(Å))
Clashscore	141614	5594 (2.20-2.20)
Ramachandran outliers	138981	5503 (2.20-2.20)
Sidechain outliers	138945	5504 (2.20-2.20)

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 <=5%

Note EDS was not executed.

Mol	Chain	Length	Quality of chain
1	A	337	65% · 31% · ·
1	B	337	66% · 28% · ·
1	C	337	69% · 28% · ·
1	D	337	70% · 28% · ·

2 Entry composition (i)

There are 2 unique types of molecules in this entry. The entry contains 10810 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 PROTEIN (SERUM TRANSFERRIN).

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
1	A	328	Total	C	N	O	S	0	0	0
			2542	1608	436	477	21			
1	B	328	Total	C	N	O	S	0	0	0
			2542	1608	436	477	21			
1	C	334	Total	C	N	O	S	0	0	0
			2586	1634	442	489	21			
1	D	334	Total	C	N	O	S	0	0	0
			2586	1634	442	489	21			

- Molecule 2 is water.

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
2	A	136	Total	O	0	0
			136	136		
2	B	121	Total	O	0	0
			121	121		
2	C	158	Total	O	0	0
			158	158		
2	D	139	Total	O	0	0
			139	139		

WORLDWIDE PDB
PROTEIN DATA BANK

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: PROTEIN (SERUM TRANSFERRIN)
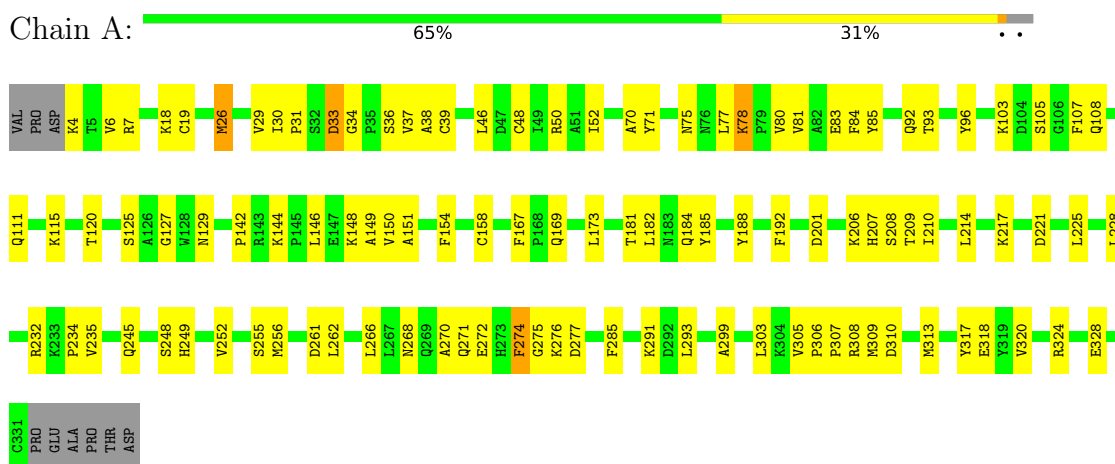
• Molecule 1: PROTEIN (SERUM TRANSFERRIN)

• Molecule 1: PROTEIN (SERUM TRANSFERRIN)

K116 G121 L122 W128 P131 P142 R143 K144 P145 K148 G156 S157 C158 A159 P160 C161 F167 L173 Y188 V205 K206 H207 I210 L214 K217 R220 L225 L228 R232 V235 Y238 C241 V246 P247 S248 H249 T250 S255

M256 G257 G258 K259 E260 D261 L262 E265 L266 Q269 E272 H273 F274 G275 K276 D277 K278 S279 K280 E281 F282 Q283 L284 S287 P288 H289 G290 K291 K296 A299 H300 G301 F302 L303 K304 V305 R308 M309 D310 M313 I323 R327 D337
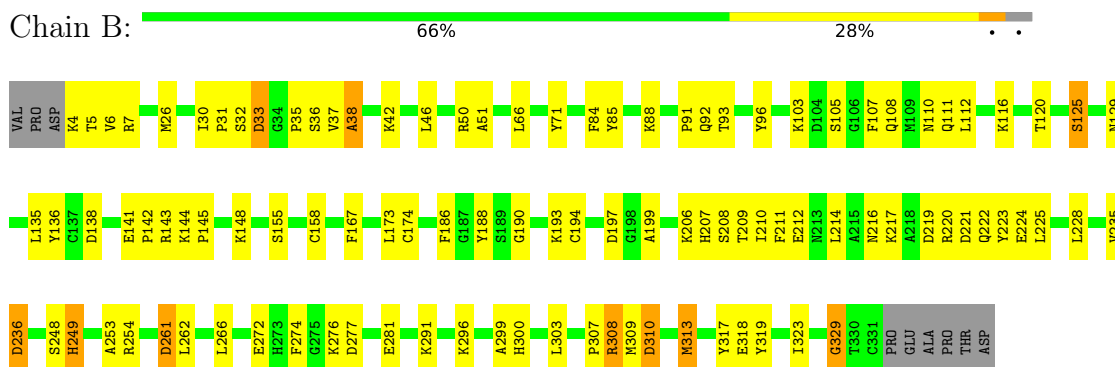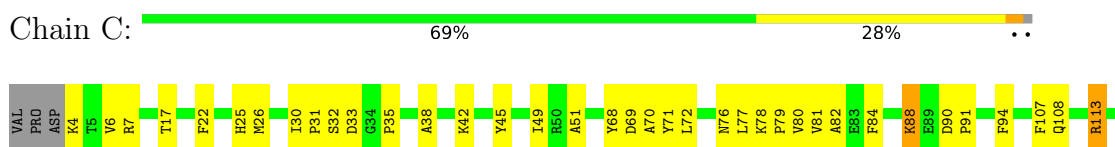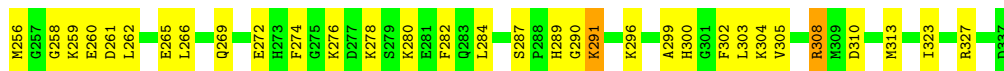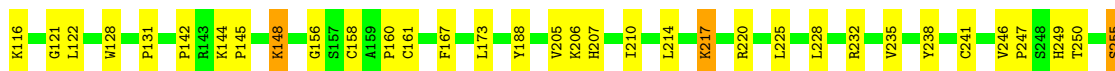
• Molecule 1: PROTEIN (SERUM TRANSFERRIN)

Chain D:

VAL PRO ASP K4 T5 V6 R7 F22 H25 M26 K27 S28 V29 I30 P31 G34 P35 S36 V37 A38 C48 I52 E56 A64 V67 Y68 D69 A70 Y71 N76 L77 G86 S87 K88 F94 A99 K103 D104 S105 G106 F107 Q108 M109 N110 Q111 K115

K116 S117 C118 G121 S125 P145 K148 A151 S155 C158 A159 P160 D163 F167 P168 Q169 L173 L182 N183 F186 L195 A203 I210 L214 R220 E224 L225 L226 R232 K233 P234 V235 D236 C241 V246 P247 S248 H249

R254 G258 D261 L262 L266 L267 N268 Q269 E272 H273 F274 K278 F282 L293 L294 H300 V305 P306 P307 R308 M309 D310 A311 K312 M313 G316 V320 I323 R324 E328 T336 D337

4　Data and refinement statistics　ⓘ

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

Property	Value	Source
Space group	P 1 21 1	Depositor
Cell constants a, b, c, α, β, γ	83.50Å　　77.30Å　　107.50Å 90.00°　　98.30°　　90.00°	Depositor
Resolution (Å)	6.00　　–　　2.20	Depositor
% Data completeness (in resolution range)	80.0 (6.00-2.20)	Depositor
R_{merge}	0.05	Depositor
R_{sym}	(Not available)	Depositor
Refinement program	X-PLOR 3.1	Depositor
R, R_{free}	0.203　　,　　0.292	Depositor
Estimated twinning fraction	No twinning to report.	Xtriage
Total number of atoms	10810	wwPDB-VP
Average B, all atoms (Å^2)	40.0	wwPDB-VP

5 Model quality ⓘ

5.1 Standard geometry ⓘ

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	0.62	0/2603	0.78	1/3519 (0.0%)
1	B	0.60	0/2603	0.77	1/3519 (0.0%)
1	C	0.61	0/2649	0.78	0/3583
1	D	0.61	0/2649	0.77	1/3583 (0.0%)
All	All	0.61	0/10504	0.78	3/14204 (0.0%)

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	C	0	1
1	D	0	1
All	All	0	2

There are no bond length outliers.

All (3) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(^{o})	Ideal(^{o})
1	D	163	ASP	CB-CG-OD1	5.08	122.87	118.30
1	A	26	MET	CG-SD-CE	5.05	108.28	100.20
1	B	38	ALA	N-CA-C	-5.00	97.50	111.00

There are no chirality outliers.

All (2) planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	C	68	TYR	Sidechain
1	D	107	PHE	Mainchain

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	2542	0	2465	71	0
1	B	2542	0	2465	76	0
1	C	2586	0	2501	69	0
1	D	2586	0	2501	67	0
2	A	136	0	0	5	0
2	B	121	0	0	6	0
2	C	158	0	0	4	0
2	D	139	0	0	1	0
All	All	10810	0	9932	283	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 14.

All (283) 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:78:LYS:HD2	1:A:255:SER:HA	1.54	0.89
1:A:310:ASP:HB3	1:A:313:MET:SD	2.15	0.87
1:D:110:ASN:ND2	1:D:111:GLN:HG3	1.91	0.84
1:B:220:ARG:HH22	1:B:236:ASP:HB3	1.43	0.83
1:D:168:PRO:HD2	1:D:169:GLN:OE1	1.79	0.81
1:B:103:LYS:HD2	1:B:224:GLU:HG3	1.61	0.80
1:D:310:ASP:H	1:D:313:MET:HE3	1.49	0.77
1:A:268:ASN:O	1:A:272:GLU:HG2	1.84	0.77
1:A:26:MET:SD	1:A:274:PHE:HE1	2.09	0.75
1:B:217:LYS:HG2	1:B:220:ARG:NH1	2.02	0.73
1:A:268:ASN:HA	1:A:271:GLN:HE21	1.54	0.72
1:D:88:LYS:NZ	1:D:300:HIS:HD2	1.87	0.72
1:A:188:TYR:OH	1:A:206:LYS:HE3	1.90	0.71
1:B:307:PRO:HB2	1:B:308:ARG:HE	1.54	0.71
1:D:68:TYR:O	1:D:71:TYR:HB3	1.90	0.71
1:B:93:THR:CG2	1:B:303:LEU:HD12	2.22	0.70
1:B:210:ILE:HD11	1:B:214:LEU:HD12	1.75	0.69
1:D:88:LYS:HE3	1:D:300:HIS:HB3	1.76	0.68
1:B:261:ASP:HB3	2:B:399:HOH:O	1.93	0.68

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:92:GLN:HA	2:B:419:HOH:O	1.94	0.67
1:D:110:ASN:HD21	1:D:111:GLN:HG3	1.59	0.67
1:C:304:LYS:HD3	1:C:305:VAL:N	2.11	0.66
1:B:103:LYS:HD3	1:B:221:ASP:O	1.96	0.65
1:B:188:TYR:OH	1:B:206:LYS:HE3	1.96	0.65
1:C:78:LYS:HD3	1:C:255:SER:HA	1.78	0.65
1:D:254:ARG:HB2	1:D:258:GLY:HA2	1.80	0.64
1:A:210:ILE:HG12	1:A:214:LEU:HD12	1.78	0.64
1:B:93:THR:HG21	1:B:303:LEU:HD12	1.79	0.64
1:D:30:ILE:CG2	1:D:34:GLY:HA3	2.27	0.64
1:B:210:ILE:HD11	1:B:214:LEU:CD1	2.28	0.64
1:A:93:THR:HG21	1:A:303:LEU:HD12	1.80	0.63
1:A:29:VAL:HG23	1:A:30:ILE:HG13	1.81	0.62
1:C:276:LYS:HG3	1:C:300:HIS:HA	1.80	0.62
1:A:158:CYS:HB2	1:A:173:LEU:HB2	1.81	0.62
1:C:108:GLN:HE22	1:C:232:ARG:HG3	1.65	0.62
1:A:18:LYS:HD2	1:A:293:LEU:HB2	1.83	0.61
1:A:46:LEU:HD21	1:A:50:ARG:NH2	2.14	0.61
1:B:235:VAL:HG22	2:B:446:HOH:O	2.00	0.61
1:A:188:TYR:CE1	1:A:206:LYS:HG2	2.35	0.61
1:D:148:LYS:HE3	1:D:167:PHE:HE1	1.67	0.60
1:B:220:ARG:NH2	1:B:236:ASP:HB3	2.13	0.60
1:A:276:LYS:HE3	1:A:299:ALA:O	2.02	0.59
1:D:306:PRO:HB2	1:D:309:MET:SD	2.42	0.59
1:B:214:LEU:HD13	1:B:220:ARG:HA	1.85	0.59
1:C:78:LYS:CD	1:C:255:SER:HA	2.33	0.58
1:A:142:PRO:HD2	2:A:440:HOH:O	2.04	0.58
1:B:136:TYR:CE2	1:B:329:GLY:HA2	2.38	0.58
1:D:233:LYS:HD2	1:D:241:CYS:HB2	1.85	0.58
1:C:35:PRO:HD3	1:C:265:GLU:OE2	2.04	0.57
1:B:211:PHE:HE1	1:B:220:ARG:HH21	1.52	0.57
1:B:108:GLN:HB2	1:B:110:ASN:OD1	2.03	0.57
1:B:158:CYS:HB2	1:B:173:LEU:HB2	1.86	0.57
1:D:116:LYS:HE3	1:D:155:SER:OG	2.04	0.57
1:D:6:VAL:HG23	1:D:262:LEU:HG	1.87	0.57
1:D:310:ASP:N	1:D:313:MET:HE3	2.17	0.56
1:B:42:LYS:HE3	1:B:51:ALA:HB2	1.88	0.56
1:D:111:GLN:O	1:D:115:LYS:HE2	2.05	0.56
1:D:64:ALA:O	1:D:67:VAL:HB	2.05	0.56
1:D:88:LYS:NZ	1:D:300:HIS:CD2	2.72	0.56
1:D:71:TYR:O	1:D:76:ASN:HA	2.05	0.56

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:276:LYS:HE3	1:B:299:ALA:O	2.06	0.56
1:C:116:LYS:HA	1:C:156:GLY:O	2.05	0.56
1:B:217:LYS:HG2	1:B:220:ARG:HH11	1.67	0.55
1:D:310:ASP:OD1	1:D:313:MET:HG3	2.06	0.55
1:D:269:GLN:OE1	1:D:273:HIS:CE1	2.59	0.55
1:B:214:LEU:CD1	1:B:220:ARG:HA	2.37	0.55
1:D:6:VAL:HB	1:D:266:LEU:HD22	1.89	0.55
1:B:216:ASN:HB2	1:B:219:ASP:CG	2.27	0.54
1:D:88:LYS:HZ1	1:D:300:HIS:HD2	1.56	0.54
1:B:310:ASP:OD2	1:B:313:MET:SD	2.65	0.54
1:C:308:ARG:N	1:C:308:ARG:HH11	2.06	0.54
1:A:108:GLN:HE22	1:A:232:ARG:HG3	1.71	0.54
1:A:146:LEU:O	1:A:150:VAL:HG23	2.08	0.54
1:A:306:PRO:O	1:A:309:MET:HB2	2.08	0.53
1:A:305:VAL:HG13	1:A:306:PRO:HD2	1.91	0.53
1:C:287:SER:HB3	1:C:290:GLY:O	2.09	0.53
1:B:224:GLU:O	1:B:225:LEU:HD23	2.09	0.53
1:B:307:PRO:O	1:B:308:ARG:HB2	2.09	0.53
1:D:145:PRO:HG2	1:D:148:LYS:CB	2.39	0.53
1:B:214:LEU:HD11	1:B:223:TYR:CD1	2.44	0.52
1:D:121:GLY:HA2	1:D:160:PRO:HD2	1.90	0.52
1:A:30:ILE:HG23	1:A:31:PRO:HD2	1.91	0.52
1:A:148:LYS:HB2	1:A:167:PHE:CE1	2.45	0.52
1:C:276:LYS:NZ	1:C:299:ALA:O	2.41	0.52
1:D:108:GLN:H	1:D:111:GLN:HB2	1.73	0.52
1:C:70:ALA:HB1	1:C:77:LEU:HB2	1.91	0.52
1:B:125:SER:HA	1:B:129:ASN:HB2	1.92	0.52
1:C:6:VAL:CG2	1:C:262:LEU:HG	2.40	0.52
1:A:275:GLY:HA3	2:A:404:HOH:O	2.09	0.52
1:C:217:LYS:HG2	1:C:220:ARG:NH2	2.25	0.52
1:D:70:ALA:HB1	1:D:77:LEU:HD12	1.92	0.52
1:A:310:ASP:HB3	1:A:313:MET:CG	2.39	0.51
1:C:84:PHE:CD2	1:C:303:LEU:HG	2.46	0.51
1:C:42:LYS:HE3	1:C:51:ALA:HB2	1.92	0.51
1:C:94:PHE:CE2	1:C:247:PRO:HD3	2.46	0.51
1:A:125:SER:HA	1:A:129:ASN:HB2	1.93	0.51
1:D:94:PHE:HA	1:D:246:VAL:O	2.10	0.51
1:D:210:ILE:HD13	1:D:235:VAL:HG11	1.91	0.51
1:A:80:VAL:HG23	1:A:81:VAL:HG23	1.92	0.51
1:A:103:LYS:HE3	1:A:221:ASP:O	2.11	0.51
1:C:78:LYS:CE	1:C:255:SER:HA	2.41	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:C:49:ILE:HG21	1:C:70:ALA:HA	1.92	0.50
1:C:158:CYS:HB2	1:C:173:LEU:HB2	1.92	0.50
1:C:80:VAL:HG11	1:C:260:GLU:HB3	1.94	0.50
1:A:7:ARG:HG2	1:A:38:ALA:HB3	1.94	0.50
1:D:48:CYS:O	1:D:52:ILE:HG13	2.12	0.50
1:D:145:PRO:HG2	1:D:148:LYS:HB2	1.94	0.50
1:C:145:PRO:HG2	1:C:148:LYS:HB3	1.93	0.49
1:D:30:ILE:HG22	1:D:31:PRO:O	2.12	0.49
1:D:68:TYR:CD2	1:D:323:ILE:HD13	2.47	0.49
1:D:293:LEU:O	1:D:294:LEU:HB2	2.12	0.49
1:B:4:LYS:HD2	1:B:33:ASP:O	2.11	0.49
1:B:143:ARG:O	1:B:144:LYS:HD3	2.12	0.49
1:C:94:PHE:HA	1:C:246:VAL:O	2.13	0.49
1:C:261:ASP:HB3	2:C:493:HOH:O	2.11	0.49
1:C:113:ARG:CG	1:C:113:ARG:HH11	2.25	0.49
1:D:70:ALA:HB1	1:D:77:LEU:HB2	1.95	0.49
1:D:272:GLU:O	1:D:278:LYS:HD2	2.13	0.49
1:A:192:PHE:CE1	1:A:210:ILE:HG13	2.48	0.49
1:B:116:LYS:NZ	1:B:155:SER:O	2.45	0.49
1:B:254:ARG:HG2	2:B:429:HOH:O	2.13	0.49
1:C:304:LYS:HD3	1:C:305:VAL:H	1.78	0.49
1:C:310:ASP:OD1	1:C:313:MET:HG3	2.12	0.49
1:D:195:LEU:HB2	1:D:203:ALA:HB2	1.94	0.48
1:C:148:LYS:HB2	1:C:167:PHE:CE1	2.49	0.48
1:B:6:VAL:HB	1:B:266:LEU:HD22	1.95	0.48
1:C:210:ILE:HD13	1:C:235:VAL:HG11	1.96	0.48
1:B:37:VAL:HG22	1:B:266:LEU:HD21	1.96	0.48
1:C:207:HIS:HB2	1:C:238:TYR:CG	2.49	0.48
1:B:120:THR:HG22	1:B:188:TYR:HA	1.96	0.48
1:B:84:PHE:HB2	1:B:91:PRO:HB2	1.97	0.47
1:B:249:HIS:CG	1:B:296:LYS:HE2	2.48	0.47
1:D:29:VAL:HG21	1:D:274:PHE:CZ	2.50	0.47
1:B:96:TYR:HB2	1:B:207:HIS:HB3	1.96	0.47
1:D:7:ARG:HA	1:D:38:ALA:HB3	1.96	0.47
1:D:26:MET:CE	1:D:266:LEU:HD12	2.44	0.47
1:D:107:PHE:H	1:D:232:ARG:NH2	2.12	0.47
1:C:4:LYS:C	1:C:262:LEU:HD21	2.34	0.47
1:C:188:TYR:CE1	1:C:206:LYS:HG2	2.50	0.47
1:C:265:GLU:O	1:C:269:GLN:HG2	2.13	0.47
1:C:274:PHE:CD1	1:C:282:PHE:HB3	2.49	0.47
1:D:5:THR:CG2	1:D:38:ALA:HB2	2.44	0.47

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:46:LEU:O	1:B:50:ARG:HG3	2.14	0.47
1:B:85:TYR:CE1	1:B:248:SER:OG	2.65	0.47
1:B:211:PHE:HE1	1:B:220:ARG:NH2	2.12	0.47
1:C:88:LYS:HD3	1:C:88:LYS:N	2.30	0.47
1:D:22:PHE:HA	1:D:282:PHE:CZ	2.50	0.47
1:C:6:VAL:HB	1:C:266:LEU:HD22	1.97	0.46
1:D:86:GLY:O	1:D:300:HIS:NE2	2.48	0.46
1:A:207:HIS:CG	1:A:208:SER:N	2.83	0.46
1:B:217:LYS:HA	1:B:220:ARG:HD3	1.97	0.46
1:C:79:PRO:HB3	1:C:250:THR:HG21	1.98	0.46
1:D:4:LYS:HD2	1:D:34:GLY:O	2.15	0.46
1:B:26:MET:SD	1:B:274:PHE:HE2	2.38	0.46
1:A:324:ARG:HD2	1:A:328:GLU:OE2	2.15	0.46
1:B:93:THR:HG23	1:B:303:LEU:HD12	1.97	0.46
1:B:307:PRO:HB2	1:B:308:ARG:NE	2.28	0.46
1:C:84:PHE:HD2	1:C:303:LEU:HG	1.79	0.46
1:B:141:GLU:OE1	1:B:142:PRO:HA	2.16	0.46
1:C:188:TYR:CZ	1:C:206:LYS:HG2	2.50	0.46
1:A:181:THR:HG22	2:A:425:HOH:O	2.15	0.45
1:A:26:MET:SD	1:A:274:PHE:CE1	2.99	0.45
1:A:225:LEU:HG	1:A:235:VAL:HA	1.98	0.45
1:A:310:ASP:HB3	1:A:313:MET:HG3	1.97	0.45
1:C:71:TYR:HD1	2:C:408:HOH:O	1.99	0.45
1:A:46:LEU:HG	1:A:50:ARG:NH1	2.30	0.45
1:A:83:GLU:OE1	1:A:299:ALA:HB2	2.15	0.45
1:A:268:ASN:HA	1:A:271:GLN:HG2	1.99	0.45
1:B:194:CYS:O	1:B:199:ALA:HB3	2.16	0.45
1:B:6:VAL:HG23	1:B:262:LEU:HG	1.99	0.45
1:B:317:TYR:CE1	1:B:318:GLU:HG3	2.52	0.45
1:C:291:LYS:HE2	1:C:291:LYS:HB3	1.65	0.45
1:D:71:TYR:OH	1:D:312:LYS:HD3	2.17	0.45
1:D:30:ILE:HG23	1:D:31:PRO:HD2	1.98	0.45
1:A:154:PHE:O	1:A:169:GLN:NE2	2.49	0.45
1:B:144:LYS:HA	1:B:145:PRO:C	2.37	0.45
1:B:85:TYR:N	1:B:85:TYR:CD1	2.84	0.44
1:B:253:ALA:HB1	2:B:345:HOH:O	2.16	0.44
1:A:85:TYR:HE1	1:A:248:SER:HG	1.58	0.44
1:A:96:TYR:CE2	1:A:245:GLN:HG3	2.52	0.44
1:A:46:LEU:HG	1:A:50:ARG:CZ	2.47	0.44
1:B:85:TYR:O	1:B:91:PRO:HA	2.18	0.44
1:B:276:LYS:HG3	1:B:300:HIS:HA	1.99	0.44

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:268:ASN:HA	1:A:271:GLN:NE2	2.28	0.44
1:B:107:PHE:HA	1:B:111:GLN:OE1	2.17	0.44
1:A:320:VAL:O	1:A:324:ARG:HG3	2.18	0.44
1:C:81:VAL:HG12	1:C:82:ALA:N	2.33	0.44
1:A:37:VAL:HG22	1:A:266:LEU:HD21	1.99	0.44
1:C:7:ARG:HA	1:C:38:ALA:HB3	1.99	0.44
1:C:128:TRP:O	1:C:131:PRO:HG2	2.17	0.44
1:C:258:GLY:O	1:C:259:LYS:HB2	2.18	0.44
1:B:319:TYR:CE2	1:B:323:ILE:HD11	2.53	0.43
1:A:70:ALA:O	1:A:75:ASN:HB2	2.18	0.43
1:B:310:ASP:N	1:B:313:MET:SD	2.86	0.43
1:D:71:TYR:HB2	1:D:311:ALA:CB	2.48	0.43
1:D:99:ALA:HB3	1:D:226:LEU:HB2	2.00	0.43
1:A:70:ALA:HB1	1:A:77:LEU:HB2	1.99	0.43
1:A:120:THR:OG1	1:A:127:GLY:HA3	2.19	0.43
1:A:228:LEU:HD12	2:A:411:HOH:O	2.18	0.43
1:D:324:ARG:HD2	1:D:328:GLU:OE2	2.18	0.43
1:B:188:TYR:CD1	1:B:209:THR:OG1	2.71	0.43
1:A:4:LYS:HB3	1:A:34:GLY:O	2.18	0.43
1:B:5:THR:HA	1:B:36:SER:O	2.17	0.43
1:B:208:SER:O	1:B:212:GLU:HG3	2.19	0.43
1:C:121:GLY:HA2	1:C:160:PRO:HD2	1.99	0.43
1:D:88:LYS:HZ2	1:D:300:HIS:CD2	2.37	0.43
1:A:188:TYR:HD1	1:A:209:THR:HG1	1.64	0.43
1:B:30:ILE:HG23	1:B:31:PRO:HD2	2.00	0.43
1:B:112:LEU:HD23	1:B:112:LEU:HA	1.90	0.43
1:C:22:PHE:O	1:C:26:MET:HG2	2.19	0.43
1:D:183:ASN:HB3	1:D:186:PHE:HB2	1.99	0.43
1:B:7:ARG:HA	1:B:38:ALA:HB3	2.00	0.43
1:A:105:SER:H	1:A:232:ARG:HH12	1.67	0.43
1:D:158:CYS:HB2	1:D:173:LEU:HB2	2.01	0.43
1:A:6:VAL:N	1:A:36:SER:O	2.42	0.42
1:C:69:ASP:HA	1:C:72:LEU:HD12	2.01	0.42
1:C:142:PRO:HA	2:C:434:HOH:O	2.18	0.42
1:C:323:ILE:O	1:C:327:ARG:HG3	2.18	0.42
1:D:94:PHE:CE2	1:D:247:PRO:HD3	2.54	0.42
1:D:118:CYS:HB2	1:D:203:ALA:HA	2.00	0.42
1:D:214:LEU:O	1:D:220:ARG:NH1	2.52	0.42
1:B:35:PRO:HB3	1:B:262:LEU:CD1	2.50	0.42
1:C:25:HIS:HB3	1:C:274:PHE:CZ	2.55	0.42
1:A:31:PRO:HB2	1:A:33:ASP:OD2	2.20	0.42

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:103:LYS:CE	1:A:221:ASP:O	2.67	0.42
1:B:103:LYS:HD2	1:B:224:GLU:CG	2.42	0.42
1:B:228:LEU:HD12	2:B:400:HOH:O	2.20	0.42
1:C:31:PRO:HB2	1:C:33:ASP:OD2	2.19	0.42
1:C:71:TYR:O	1:C:76:ASN:HA	2.18	0.42
1:D:103:LYS:HA	1:D:224:GLU:OE1	2.18	0.42
1:A:6:VAL:CG2	1:A:262:LEU:HG	2.49	0.42
1:A:144:LYS:HD3	1:A:144:LYS:HA	1.67	0.42
1:B:148:LYS:HB2	1:B:167:PHE:CE1	2.54	0.42
1:D:316:GLY:O	1:D:320:VAL:HG23	2.20	0.42
1:D:25:HIS:CD2	1:D:282:PHE:HB2	2.55	0.42
1:C:45:TYR:O	1:C:49:ILE:HG13	2.20	0.42
1:A:48:CYS:O	1:A:52:ILE:HG13	2.20	0.42
1:A:149:ALA:HA	2:A:380:HOH:O	2.19	0.42
1:C:78:LYS:HE2	1:C:255:SER:HA	2.02	0.42
1:C:160:PRO:C	1:C:161:CYS:SG	2.98	0.42
1:D:268:ASN:O	1:D:272:GLU:HG2	2.20	0.42
1:A:317:TYR:CZ	1:A:318:GLU:HG3	2.54	0.41
1:D:27:LYS:NZ	1:D:36:SER:HB3	2.35	0.41
1:D:232:ARG:O	1:D:233:LYS:HG3	2.20	0.41
1:A:19:CYS:C	1:A:39:CYS:SG	2.98	0.41
1:A:184:GLN:HG3	1:A:185:TYR:CD1	2.55	0.41
1:A:266:LEU:O	1:A:270:ALA:HB2	2.20	0.41
1:A:276:LYS:O	1:A:277:ASP:HB2	2.19	0.41
1:C:108:GLN:HA	1:C:108:GLN:HE21	1.85	0.41
1:C:214:LEU:HD23	1:C:214:LEU:HA	1.86	0.41
1:A:285:PHE:CD1	1:A:299:ALA:HB3	2.55	0.41
1:B:135:LEU:O	1:B:138:ASP:HB2	2.20	0.41
1:D:110:ASN:ND2	1:D:110:ASN:C	2.74	0.41
1:A:107:PHE:HA	1:A:111:GLN:OE1	2.21	0.41
1:A:210:ILE:CG1	1:A:214:LEU:HD12	2.49	0.41
1:C:26:MET:O	1:C:30:ILE:HG12	2.21	0.41
1:C:228:LEU:HD23	1:C:228:LEU:HA	1.77	0.41
1:A:84:PHE:HA	1:A:92:GLN:O	2.20	0.41
1:C:107:PHE:H	1:C:232:ARG:NH2	2.19	0.41
1:D:151:ALA:HA	2:D:433:HOH:O	2.19	0.41
1:D:305:VAL:HG13	1:D:306:PRO:HD2	2.00	0.41
1:B:145:PRO:HD2	1:B:148:LYS:HE2	2.03	0.41
1:B:186:PHE:O	1:B:190:GLY:HA3	2.20	0.41
1:C:296:LYS:NZ	2:C:435:HOH:O	2.52	0.41
1:B:174:CYS:SG	1:B:174:CYS:O	2.78	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:306:PRO:HA	1:A:307:PRO:HD3	1.74	0.41
1:C:17:THR:HG22	1:C:289:HIS:CE1	2.56	0.41
1:C:304:LYS:HD3	1:C:305:VAL:O	2.21	0.41
1:D:105:SER:OG	1:D:232:ARG:NH2	2.51	0.41
1:D:145:PRO:HG2	1:D:148:LYS:HB3	2.02	0.41
1:A:115:LYS:HB3	1:A:201:ASP:OD2	2.20	0.41
1:B:219:ASP:HA	1:B:222:GLN:OE1	2.21	0.41
1:C:108:GLN:HA	1:C:108:GLN:NE2	2.36	0.41
1:A:268:ASN:O	1:A:271:GLN:HG2	2.20	0.40
1:B:193:LYS:NZ	1:B:197:ASP:OD2	2.51	0.40
1:B:217:LYS:HA	1:B:220:ARG:HB2	2.03	0.40
1:C:144:LYS:HA	1:C:145:PRO:C	2.40	0.40
1:C:272:GLU:O	1:C:278:LYS:HE2	2.21	0.40
1:B:110:ASN:OD1	1:B:111:GLN:HG3	2.21	0.40
1:A:151:ALA:O	1:A:169:GLN:NE2	2.55	0.40
1:C:82:ALA:O	1:C:302:PHE:HA	2.21	0.40
1:C:90:ASP:N	1:C:91:PRO:CD	2.85	0.40
1:C:225:LEU:HB2	1:C:241:CYS:SG	2.62	0.40

There are no symmetry-related clashes.

5.3 Torsion angles ⓘ

5.3.1 Protein backbone ⓘ

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	326/337 (97%)	307 (94%)	19 (6%)	0	100	100
1	B	326/337 (97%)	305 (94%)	19 (6%)	2 (1%)	25	26
1	C	332/337 (98%)	319 (96%)	12 (4%)	1 (0%)	41	46
1	D	332/337 (98%)	313 (94%)	18 (5%)	1 (0%)	41	46
All	All	1316/1348 (98%)	1244 (94%)	68 (5%)	4 (0%)	41	46

All (4) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	D	125	SER
1	B	125	SER
1	B	329	GLY
1	C	205	VAL

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	A	273/281 (97%)	260 (95%)	13 (5%)	25	32
1	B	273/281 (97%)	256 (94%)	17 (6%)	18	21
1	C	278/281 (99%)	265 (95%)	13 (5%)	26	33
1	D	278/281 (99%)	270 (97%)	8 (3%)	42	54
All	All	1102/1124 (98%)	1051 (95%)	51 (5%)	27	34

All (51) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	33	ASP
1	A	71	TYR
1	A	78	LYS
1	A	182	LEU
1	A	217	LYS
1	A	234	PRO
1	A	249	HIS
1	A	252	VAL
1	A	256	MET
1	A	261	ASP
1	A	274	PHE
1	A	291	LYS
1	A	308	ARG
1	B	32	SER
1	B	33	ASP
1	B	66	LEU
1	B	71	TYR
1	B	88	LYS

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Mol	Chain	Res	Type
1	B	105	SER
1	B	236	ASP
1	B	249	HIS
1	B	261	ASP
1	B	272	GLU
1	B	277	ASP
1	B	281	GLU
1	B	291	LYS
1	B	308	ARG
1	B	309	MET
1	B	310	ASP
1	B	313	MET
1	C	32	SER
1	C	88	LYS
1	C	113	ARG
1	C	122	LEU
1	C	148	LYS
1	C	217	LYS
1	C	249	HIS
1	C	255	SER
1	C	256	MET
1	C	280	LYS
1	C	284	LEU
1	C	291	LYS
1	C	308	ARG
1	D	56	GLU
1	D	169	GLN
1	D	182	LEU
1	D	236	ASP
1	D	249	HIS
1	D	261	ASP
1	D	308	ARG
1	D	336	THR

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (15) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	92	GLN
1	A	108	GLN
1	A	169	GLN
1	B	76	ASN
1	B	108	GLN

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Mol	Chain	Res	Type
1	B	213	ASN
1	B	283	GLN
1	C	108	GLN
1	D	75	ASN
1	D	92	GLN
1	D	108	GLN
1	D	110	ASN
1	D	273	HIS
1	D	283	GLN
1	D	300	HIS

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 monosaccharides in this entry.

5.6 Ligand geometry ⓘ

There are no ligands in this entry.

5.7 Other polymers ⓘ

There are no such residues in this entry.

5.8 Polymer linkage issues ⓘ

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.