



# Full wwPDB X-ray Structure Validation Report ⓘ

Jun 17, 2024 – 11:26 AM EDT

PDB ID : 3RIU  
Title : Crystal structure of Drosophila hexameric C3PO formed by truncated Translin and Trax  
Authors : Tian, Y.; Simanshu, D.K.; Patel, D.J.  
Deposited on : 2011-04-14  
Resolution : 3.40 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

<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>.

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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 : 2022.3.0, CSD as543be (2022)  
Xtriage (Phenix) : 1.20.1  
EDS : 2.37.1  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
Refmac : 5.8.0158  
CCP4 : 7.0.044 (Gargrove)  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.37.1

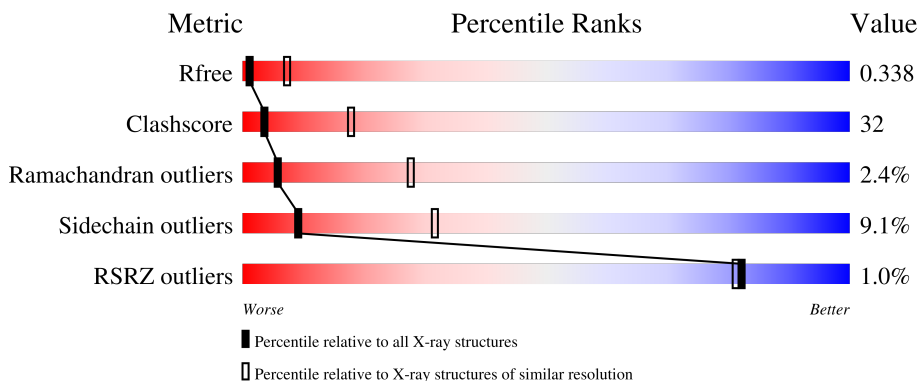
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.40 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))
$R_{free}$	130704	1026 (3.48-3.32)
Clashscore	141614	1055 (3.48-3.32)
Ramachandran outliers	138981	1038 (3.48-3.32)
Sidechain outliers	138945	1038 (3.48-3.32)
RSRZ outliers	127900	2173 (3.50-3.30)

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  $\geq 3$ , 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	A	218	
1	B	218	
2	C	269	

## 2 Entry composition

There are 2 unique types of molecules in this entry. The entry contains 4722 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 Translin.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
1	A	206	1610	1030	270	306	2	2	0	0	0
1	B	203	1611	1032	268	307	2	2	0	0	0

There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	0	SER	-	EXPRESSION TAG	UNP Q7JVK6
B	0	SER	-	EXPRESSION TAG	UNP Q7JVK6

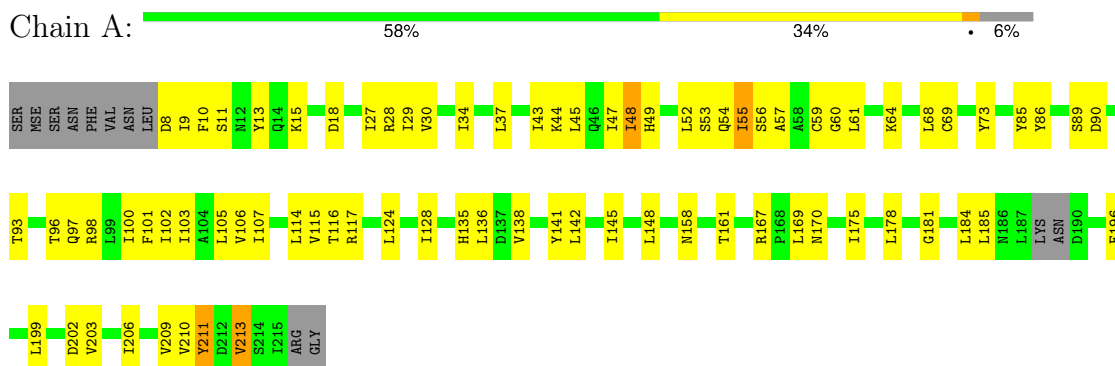
- Molecule 2 is a protein called Translin associated factor X, isoform B.

Mol	Chain	Residues	Atoms						ZeroOcc	AltConf	Trace
			Total	C	N	O	S	Se			
2	C	190	1501	955	265	270	6	5	0	0	0

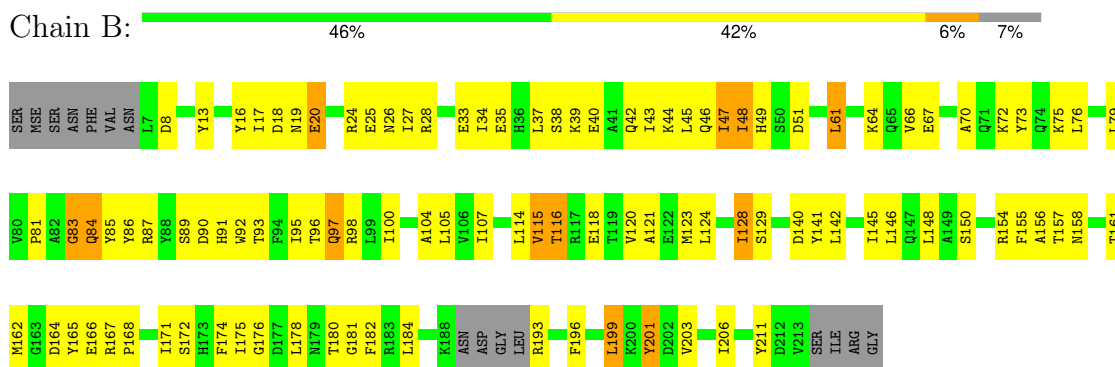
### 3 Residue-property plots

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.

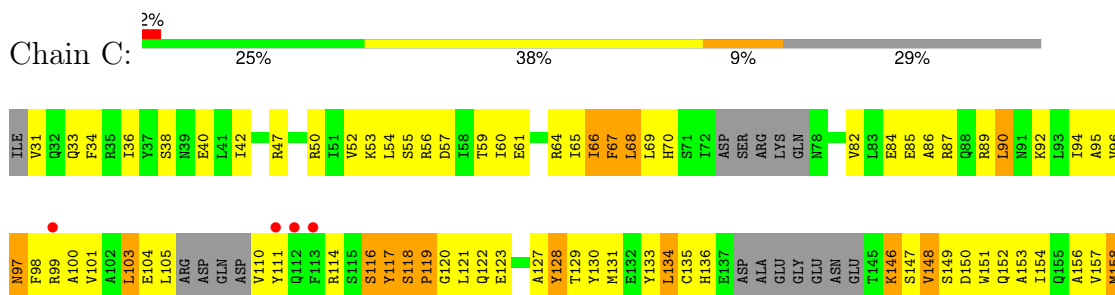
#### • Molecule 1: Translin



#### • Molecule 1: Translin



#### • Molecule 2: Translin associated factor X, isoform B



Q159	F160	E161	GLU	SER	SER	GLN	PRO	PRO	LYS	GLU	GLU	PRO	THR	GLU	GLY	GLU	ASP	VAL	GLN	ALA	ALA	ILE	ALA	GLN	VAL	GLU	SER	PRO	LYS	LYS	PHE	GLN	F191	F192	V193	D194	P195	T196	E197	Y198	I199	L200	S203	E204	L205	T206	G207	E208	L209	M210	R211	R212	C213	I214	N215	S216	L217	GLY	SER
GLY	ASP	THR	D223	T224	C225	T228	C229	L232	Y236	S237	G238	Y239	I240	S241	L242	N243	C244	GLN	ARG	ALA	ARG	E249	L250	W251	K252	K253	I254	T255	T256	K257	K258	Q259	S260	V261	L262	K263	A264	V267	C268	Y269	K270	V271	K272	V273	ARG	GLY	GLY	GLU	ALA	ALA	LYS	TRP	GLY	ALA	THR				
PHE	ASP	GLN	LYS	PRO	ALA	ASP	GLU	VAL	ASP	GLU	GLY	PHE	THR																																														

## 4 Data and refinement statistics

Property	Value	Source
Space group	P 61 2 2	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	196.03Å 196.03Å 155.19Å 90.00° 90.00° 120.00°	Depositor
Resolution (Å)	19.88 – 3.40 40.94 – 3.21	Depositor EDS
% Data completeness (in resolution range)	79.7 (19.88-3.40) 68.1 (40.94-3.21)	Depositor EDS
$R_{merge}$	0.21	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	2.66 (at 3.18Å)	Xtrriage
Refinement program	PHENIX 1.6.2_432	Depositor
R, $R_{free}$	0.271 , 0.338 0.268 , 0.338	Depositor DCC
$R_{free}$ test set	1021 reflections (5.09%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	53.6	Xtrriage
Anisotropy	0.053	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.23 , 54.4	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.35$ , $\langle L^2 \rangle = 0.18$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.80	EDS
Total number of atoms	4722	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	96.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.36% 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, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

## 5 Model quality (i)

### 5.1 Standard geometry (i)

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	0.25	0/1634	0.41	0/2212
1	B	0.35	0/1636	0.53	0/2213
2	C	0.29	0/1512	0.46	0/2022
All	All	0.30	0/4782	0.47	0/6447

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	1610	0	1551	68	0
1	B	1611	0	1555	94	0
2	C	1501	0	1497	147	0
All	All	4722	0	4603	296	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 32.

All (296) 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:C:114:ARG:HG2	2:C:117:TYR:CE2	1.60	1.36

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:118:SER:CB	2:C:119:PRO:CD	2.30	1.10
2:C:147:SER:HA	2:C:148:VAL:HG23	1.37	1.04
2:C:118:SER:CB	2:C:119:PRO:HD2	1.91	1.00
2:C:114:ARG:CG	2:C:117:TYR:CE2	2.45	0.99
1:B:51:ASP:HA	1:B:162:MSE:HE1	1.48	0.92
2:C:114:ARG:HG2	2:C:117:TYR:HE2	1.08	0.90
2:C:98:PHE:HD1	2:C:161:VAL:HG13	1.36	0.89
1:B:92:TRP:O	1:B:96:THR:HG23	1.72	0.88
1:A:45:LEU:HD13	1:A:105:LEU:HD23	1.55	0.87
1:B:27:ILE:HG23	1:B:76:LEU:HD11	1.56	0.86
2:C:195:PRO:HD2	2:C:197:GLU:HG2	1.59	0.83
1:B:73:TYR:OH	1:B:96:THR:HG22	1.76	0.83
1:B:49:HIS:CE1	1:B:154:ARG:HG2	2.13	0.82
1:A:100:ILE:HD13	1:A:141:TYR:HA	1.61	0.81
2:C:131:MSE:O	2:C:135:CYS:HB2	1.79	0.80
2:C:50:ARG:HD2	2:C:103:LEU:HD13	1.64	0.80
1:B:44:LYS:O	1:B:47:ILE:HG22	1.82	0.79
1:B:45:LEU:HA	1:B:48:ILE:HG23	1.65	0.78
2:C:146:LYS:HB2	2:C:148:VAL:HA	1.66	0.76
2:C:118:SER:CB	2:C:119:PRO:HD3	2.14	0.76
1:B:100:ILE:HD13	1:B:141:TYR:HA	1.68	0.75
2:C:98:PHE:CD1	2:C:161:VAL:HG13	2.23	0.74
1:A:117:ARG:HD2	1:A:128:ILE:HG23	1.68	0.73
1:B:193:ARG:HA	1:B:196:PHE:CE2	2.23	0.73
2:C:52:VAL:O	2:C:56:ARG:HG3	1.89	0.73
1:A:141:TYR:HD2	1:A:142:LEU:HD23	1.53	0.73
1:B:114:LEU:HD23	1:B:114:LEU:H	1.54	0.73
1:A:107:ILE:HD13	1:A:114:LEU:HA	1.71	0.71
2:C:111:TYR:HA	2:C:114:ARG:HG3	1.73	0.70
2:C:116:SER:C	2:C:118:SER:H	1.95	0.70
2:C:33:GLN:O	2:C:36:ILE:HG22	1.90	0.70
2:C:114:ARG:CG	2:C:117:TYR:HE2	1.94	0.69
1:B:49:HIS:CE1	1:B:155:PHE:HA	2.28	0.68
2:C:97:ASN:O	2:C:101:VAL:HG12	1.94	0.68
2:C:84:GLU:O	2:C:87:ARG:HG2	1.94	0.68
2:C:239:TYR:CD1	2:C:257:MSE:HE1	2.28	0.68
2:C:203:SER:HA	2:C:206:THR:HG23	1.77	0.67
1:B:193:ARG:HA	1:B:196:PHE:HE2	1.60	0.67
1:B:45:LEU:O	1:B:48:ILE:HG12	1.93	0.67
1:B:45:LEU:HD23	1:B:105:LEU:HD12	1.75	0.66
1:A:37:LEU:HD21	1:A:68:LEU:HD23	1.77	0.66

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:141:TYR:CD2	1:A:142:LEU:HD23	2.30	0.66
1:B:35:GLU:HG2	1:B:39:LYS:HE3	1.77	0.65
1:B:42:GLN:NE2	2:C:240:ILE:HD11	2.10	0.65
2:C:147:SER:CA	2:C:148:VAL:HG23	2.20	0.65
1:B:13:TYR:O	1:B:17:ILE:HG23	1.96	0.65
2:C:116:SER:O	2:C:118:SER:N	2.30	0.65
2:C:66:ILE:HG22	2:C:127:ALA:HB2	1.79	0.64
2:C:89:ARG:O	2:C:92:LYS:HG2	1.97	0.64
2:C:114:ARG:HB3	2:C:117:TYR:CD2	2.32	0.64
2:C:129:THR:CG2	2:C:205:LEU:HG	2.27	0.64
1:B:34:ILE:HD11	1:B:72:LYS:HB3	1.79	0.64
2:C:118:SER:O	2:C:120:GLY:N	2.30	0.64
1:A:116:THR:HA	1:A:141:TYR:OH	1.98	0.64
1:A:98:ARG:O	1:A:102:ILE:HG12	1.98	0.64
1:B:174:PHE:CD2	1:B:175:ILE:HD12	2.33	0.63
1:B:199:LEU:C	1:B:199:LEU:HD12	2.20	0.63
1:B:49:HIS:HE1	1:B:155:PHE:HA	1.63	0.63
2:C:67:PHE:HA	2:C:70:HIS:HD2	1.64	0.62
1:A:10:PHE:HA	1:A:13:TYR:CD2	2.34	0.62
2:C:65:ILE:CD1	2:C:90:LEU:HD12	2.30	0.62
2:C:114:ARG:CB	2:C:117:TYR:CD2	2.82	0.62
1:A:184:LEU:HD21	2:C:34:PHE:HB2	1.81	0.62
2:C:158:MSE:HA	2:C:158:MSE:HE2	1.80	0.62
2:C:60:ILE:O	2:C:64:ARG:HG3	2.00	0.62
2:C:129:THR:HG22	2:C:205:LEU:HG	1.82	0.61
1:B:199:LEU:O	1:B:203:VAL:HG23	1.99	0.61
1:B:96:THR:O	1:B:100:ILE:HG13	2.00	0.61
2:C:57:ASP:O	2:C:61:GLU:HB2	1.99	0.61
2:C:94:ILE:HG23	2:C:158:MSE:CE	2.30	0.61
2:C:130:TYR:CZ	2:C:134:LEU:HD23	2.34	0.61
1:A:44:LYS:O	1:A:47:ILE:HB	2.01	0.60
1:A:184:LEU:HD11	2:C:34:PHE:HB3	1.83	0.60
1:B:174:PHE:HD2	1:B:175:ILE:HD12	1.64	0.60
2:C:111:TYR:HA	2:C:114:ARG:CG	2.31	0.60
1:B:17:ILE:HG13	1:B:18:ASP:N	2.16	0.60
2:C:65:ILE:HD12	2:C:90:LEU:HD12	1.83	0.60
1:A:8:ASP:OD1	2:C:146:LYS:HA	2.01	0.60
1:B:49:HIS:CD2	1:B:154:ARG:HE	2.18	0.60
1:B:66:VAL:HG11	1:B:123:MSE:HE2	1.83	0.60
2:C:90:LEU:HD21	2:C:128:TYR:HA	1.84	0.60
2:C:101:VAL:HG21	2:C:191:PHE:O	2.01	0.59

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:B:43:ILE:O	1:B:46:GLN:HB2	2.02	0.59
1:A:181:GLY:O	2:C:34:PHE:HD1	1.84	0.59
1:A:211:TYR:HD1	1:A:211:TYR:O	1.84	0.59
1:A:103:ILE:O	1:A:107:ILE:HG13	2.03	0.59
2:C:259:GLN:O	2:C:263:LYS:HG3	2.03	0.58
2:C:68:LEU:HD23	2:C:69:LEU:N	2.19	0.58
1:B:83:GLY:O	1:B:85:TYR:N	2.36	0.58
2:C:130:TYR:OH	2:C:212:ARG:HB2	2.04	0.58
1:B:20:GLU:OE2	1:B:87:ARG:HD2	2.05	0.57
1:B:39:LYS:O	1:B:43:ILE:HG23	2.04	0.57
1:A:49:HIS:HB3	1:A:158:ASN:ND2	2.20	0.57
1:A:60:GLY:O	1:A:64:LYS:HB2	2.05	0.57
2:C:111:TYR:HD1	2:C:114:ARG:HD2	1.70	0.57
1:A:211:TYR:HD1	1:A:211:TYR:C	2.08	0.56
1:A:206:ILE:O	1:A:210:VAL:HG23	2.06	0.56
1:B:39:LYS:NZ	2:C:243:ASN:HA	2.20	0.56
2:C:213:CYS:HB2	2:C:228:THR:HG21	1.87	0.56
2:C:31:VAL:HG23	2:C:33:GLN:H	1.70	0.56
2:C:263:LYS:O	2:C:267:VAL:HG13	2.05	0.56
2:C:114:ARG:CB	2:C:117:TYR:CE2	2.88	0.56
1:A:57:ALA:O	1:A:61:LEU:HD13	2.05	0.56
1:B:171:ILE:HG22	1:B:206:ILE:HD13	1.87	0.56
1:B:25:GLU:HA	1:B:28:ARG:HD2	1.86	0.56
1:B:142:LEU:HD22	1:B:182:PHE:CE1	2.41	0.55
2:C:119:PRO:O	2:C:123:GLU:N	2.33	0.55
1:A:100:ILE:HD11	1:A:136:LEU:HD11	1.87	0.55
1:B:39:LYS:HZ1	2:C:243:ASN:HA	1.70	0.55
1:A:185:LEU:HD23	2:C:38:SER:HB2	1.88	0.55
2:C:118:SER:O	2:C:119:PRO:C	2.45	0.55
2:C:130:TYR:HA	2:C:205:LEU:HD21	1.87	0.55
1:B:45:LEU:CD2	1:B:105:LEU:HD12	2.36	0.55
2:C:38:SER:O	2:C:42:ILE:HG13	2.06	0.55
1:A:181:GLY:O	1:A:184:LEU:HG	2.07	0.55
2:C:232:LEU:HB3	2:C:261:VAL:HG22	1.88	0.55
2:C:104:GLU:C	2:C:105:LEU:HD12	2.28	0.55
2:C:207:GLY:O	2:C:211:ARG:HG3	2.07	0.55
2:C:237:SER:O	2:C:241:SER:HB3	2.07	0.55
1:B:73:TYR:CZ	1:B:96:THR:HG22	2.41	0.54
1:B:81:PRO:HG2	1:B:84:GLN:HG3	1.88	0.54
1:A:27:ILE:HD12	1:A:28:ARG:N	2.23	0.54
2:C:84:GLU:HA	2:C:87:ARG:CD	2.37	0.54

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:34:ILE:HD13	1:A:73:TYR:CE1	2.43	0.54
1:A:103:ILE:HG22	1:A:115:VAL:HG21	1.89	0.54
1:B:114:LEU:H	1:B:114:LEU:CD2	2.19	0.54
1:B:40:GLU:O	1:B:43:ILE:HG12	2.07	0.54
1:B:104:ALA:HA	1:B:115:VAL:HG22	1.90	0.54
2:C:116:SER:C	2:C:118:SER:N	2.60	0.54
1:A:211:TYR:C	1:A:211:TYR:CD1	2.79	0.54
2:C:111:TYR:CD1	2:C:114:ARG:HD2	2.43	0.53
2:C:36:ILE:O	2:C:40:GLU:HB2	2.09	0.53
2:C:119:PRO:O	2:C:123:GLU:HB2	2.09	0.53
1:A:59:CYS:SG	1:A:106:VAL:HG13	2.49	0.53
1:B:145:ILE:O	1:B:148:LEU:HB3	2.09	0.53
1:B:34:ILE:HD11	1:B:72:LYS:CB	2.38	0.53
1:B:61:LEU:O	1:B:64:LYS:HG2	2.09	0.53
1:B:97:GLN:NE2	1:B:140:ASP:HA	2.23	0.53
2:C:130:TYR:O	2:C:134:LEU:HG	2.08	0.53
1:B:142:LEU:HD23	1:B:145:ILE:HD11	1.91	0.52
2:C:211:ARG:O	2:C:214:ILE:HG22	2.08	0.52
1:A:175:ILE:HG23	1:A:203:VAL:HG22	1.92	0.52
2:C:47:ARG:HH22	2:C:105:LEU:HD13	1.74	0.52
2:C:212:ARG:O	2:C:215:ASN:HB2	2.10	0.52
1:A:107:ILE:CD1	1:A:114:LEU:HA	2.37	0.52
2:C:50:ARG:O	2:C:53:LYS:HB2	2.09	0.52
1:B:128:ILE:HD13	1:B:128:ILE:C	2.30	0.52
1:A:184:LEU:HD12	1:A:184:LEU:C	2.30	0.52
1:B:83:GLY:C	1:B:85:TYR:H	2.12	0.52
2:C:95:ALA:O	2:C:98:PHE:HB3	2.10	0.52
1:A:145:ILE:O	1:A:148:LEU:HB3	2.11	0.51
2:C:114:ARG:O	2:C:117:TYR:HB2	2.10	0.51
1:A:10:PHE:CD1	1:A:13:TYR:HD2	2.29	0.51
1:B:95:ILE:O	1:B:98:ARG:HB3	2.10	0.51
1:B:34:ILE:HG21	1:B:73:TYR:HE1	1.75	0.51
1:B:35:GLU:HB2	1:B:95:ILE:HD11	1.92	0.51
1:B:100:ILE:HD13	1:B:141:TYR:CA	2.40	0.51
1:A:114:LEU:HD13	1:A:178:LEU:HD21	1.93	0.51
1:B:73:TYR:OH	1:B:96:THR:CG2	2.54	0.51
1:B:33:GLU:O	1:B:37:LEU:HD13	2.11	0.51
2:C:103:LEU:HD23	2:C:103:LEU:H	1.76	0.51
1:B:193:ARG:HA	1:B:196:PHE:CD2	2.46	0.50
2:C:131:MSE:O	2:C:135:CYS:CB	2.56	0.50
1:B:86:TYR:HA	1:B:89:SER:HB2	1.93	0.50

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:101:VAL:O	2:C:104:GLU:HB2	2.11	0.50
2:C:117:TYR:O	2:C:118:SER:O	2.30	0.50
2:C:31:VAL:HG23	2:C:33:GLN:HB2	1.93	0.50
1:B:172:SER:HB2	1:B:206:ILE:HG22	1.94	0.50
2:C:151:TRP:HB3	2:C:198:TYR:CB	2.42	0.50
2:C:271:VAL:O	2:C:273:VAL:N	2.45	0.49
1:B:107:ILE:HG12	1:B:115:VAL:CG1	2.42	0.49
2:C:82:VAL:O	2:C:86:ALA:CB	2.60	0.49
1:A:48:ILE:HG13	1:A:48:ILE:O	2.12	0.49
1:A:199:LEU:O	1:A:203:VAL:HG23	2.12	0.49
1:B:167:ARG:HB2	1:B:168:PRO:HD3	1.94	0.49
1:A:101:PHE:HE1	1:A:148:LEU:HA	1.78	0.49
2:C:55:SER:O	2:C:59:THR:HG22	2.12	0.49
1:B:8:ASP:OD1	1:B:8:ASP:N	2.45	0.49
2:C:128:TYR:O	2:C:131:MSE:HB3	2.13	0.49
2:C:114:ARG:HA	2:C:117:TYR:CD2	2.49	0.48
1:A:107:ILE:HG12	1:A:115:VAL:HG13	1.95	0.48
1:A:85:TYR:O	1:A:89:SER:HB3	2.13	0.48
1:B:89:SER:O	1:B:93:THR:HG23	2.13	0.48
2:C:94:ILE:HG23	2:C:158:MSE:HE1	1.95	0.48
2:C:34:PHE:N	2:C:34:PHE:CD2	2.81	0.48
2:C:52:VAL:HG12	2:C:56:ARG:HE	1.77	0.48
1:B:156:ALA:HB2	1:B:171:ILE:HD12	1.95	0.48
1:A:209:VAL:O	1:A:213:VAL:HG23	2.14	0.48
1:B:92:TRP:O	1:B:96:THR:CG2	2.54	0.48
1:B:105:LEU:HA	1:B:148:LEU:HD13	1.96	0.48
2:C:130:TYR:CE1	2:C:134:LEU:HD23	2.48	0.48
1:B:16:TYR:O	1:B:19:ASN:HB3	2.14	0.47
1:B:176:GLY:O	1:B:180:THR:HG23	2.14	0.47
1:A:29:ILE:HG13	1:A:30:VAL:N	2.30	0.47
1:A:10:PHE:CE2	2:C:238:GLY:HA3	2.50	0.47
2:C:34:PHE:N	2:C:34:PHE:HD2	2.12	0.47
2:C:111:TYR:HA	2:C:114:ARG:CD	2.44	0.47
1:B:73:TYR:CE2	1:B:96:THR:HG22	2.49	0.47
1:B:158:ASN:HA	1:B:161:THR:HB	1.97	0.47
1:A:138:VAL:O	1:A:141:TYR:HB3	2.15	0.47
2:C:54:LEU:HD13	2:C:100:ALA:CA	2.45	0.47
1:A:37:LEU:HD13	1:A:69:CYS:HA	1.97	0.46
1:A:86:TYR:O	2:C:111:TYR:HB3	2.15	0.46
1:B:107:ILE:HG12	1:B:115:VAL:HG13	1.97	0.46
2:C:134:LEU:HD12	2:C:135:CYS:N	2.30	0.46

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:153:ALA:O	2:C:156:ALA:HB3	2.14	0.46
1:A:11:SER:O	1:A:15:LYS:HB2	2.16	0.46
1:B:118:GLU:O	1:B:121:ALA:HB3	2.15	0.46
2:C:53:LYS:HD2	2:C:56:ARG:CZ	2.45	0.46
2:C:114:ARG:HA	2:C:117:TYR:CE2	2.49	0.46
2:C:207:GLY:O	2:C:210:MSE:HB3	2.16	0.46
1:B:72:LYS:O	1:B:75:LYS:HB3	2.16	0.46
2:C:200:LEU:HD13	2:C:250:LEU:HD22	1.97	0.46
1:A:52:LEU:C	1:A:54:GLN:H	2.19	0.46
1:A:93:THR:O	1:A:97:GLN:HG3	2.15	0.46
1:A:103:ILE:HD11	1:A:124:LEU:HD21	1.98	0.46
1:B:67:GLU:O	1:B:70:ALA:HB3	2.16	0.46
2:C:92:LYS:O	2:C:95:ALA:HB3	2.16	0.45
1:B:178:LEU:HD21	1:B:182:PHE:HE2	1.80	0.45
2:C:82:VAL:O	2:C:86:ALA:HB2	2.15	0.45
2:C:147:SER:N	2:C:148:VAL:HA	2.31	0.45
1:A:101:PHE:CE1	1:A:148:LEU:HA	2.50	0.45
2:C:158:MSE:HA	2:C:158:MSE:CE	2.47	0.45
1:B:165:TYR:N	1:B:165:TYR:CD2	2.84	0.45
1:A:107:ILE:HG12	1:A:115:VAL:HG22	1.98	0.44
1:B:161:THR:OG1	2:C:269:TYR:HB2	2.17	0.44
1:A:96:THR:O	1:A:100:ILE:HG13	2.16	0.44
2:C:65:ILE:HD11	2:C:89:ARG:HG2	1.99	0.44
2:C:253:LYS:O	2:C:256:THR:HG22	2.16	0.44
1:A:86:TYR:HB2	2:C:110:VAL:HG12	1.99	0.44
1:A:213:VAL:HG12	1:A:213:VAL:O	2.18	0.44
2:C:67:PHE:HA	2:C:67:PHE:HD1	1.66	0.44
1:A:107:ILE:C	1:A:107:ILE:HD12	2.38	0.44
1:B:201:TYR:CD2	1:B:201:TYR:C	2.91	0.44
2:C:267:VAL:CG2	2:C:268:CYS:N	2.80	0.44
1:A:10:PHE:CG	1:A:13:TYR:HD2	2.36	0.44
1:B:178:LEU:O	1:B:181:GLY:N	2.51	0.43
2:C:200:LEU:CD1	2:C:250:LEU:HD22	2.48	0.43
1:A:141:TYR:O	1:A:145:ILE:HG12	2.18	0.43
1:A:161:THR:HG22	1:A:161:THR:O	2.18	0.43
1:A:202:ASP:O	1:A:206:ILE:HG13	2.17	0.43
2:C:68:LEU:HD21	2:C:86:ALA:HB2	1.99	0.43
2:C:251:TRP:O	2:C:255:THR:HG23	2.17	0.43
1:B:49:HIS:HE1	1:B:155:PHE:CA	2.30	0.43
2:C:54:LEU:HD13	2:C:100:ALA:HA	2.00	0.43
2:C:128:TYR:CD1	2:C:128:TYR:C	2.92	0.43

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
2:C:209:LEU:HB2	2:C:232:LEU:HD11	2.00	0.43
2:C:133:TYR:CB	2:C:147:SER:HB3	2.49	0.43
1:B:107:ILE:HD12	1:B:107:ILE:N	2.34	0.43
2:C:50:ARG:HD2	2:C:103:LEU:CD1	2.42	0.43
2:C:56:ARG:O	2:C:59:THR:HG22	2.18	0.43
2:C:205:LEU:HD13	2:C:205:LEU:C	2.38	0.43
1:B:158:ASN:O	1:B:162:MSE:HG2	2.19	0.43
2:C:114:ARG:CA	2:C:117:TYR:CD2	3.02	0.43
2:C:205:LEU:HD13	2:C:205:LEU:O	2.19	0.43
2:C:213:CYS:SG	2:C:225:CYS:HB2	2.58	0.43
1:A:43:ILE:CG2	1:A:44:LYS:N	2.81	0.42
1:B:24:ARG:C	1:B:26:ASN:H	2.21	0.42
1:B:45:LEU:CD1	1:B:45:LEU:N	2.82	0.42
1:B:37:LEU:O	1:B:38:SER:C	2.58	0.42
2:C:65:ILE:HD13	2:C:90:LEU:HD12	2.01	0.42
2:C:203:SER:CA	2:C:206:THR:HG23	2.47	0.42
1:B:116:THR:O	1:B:120:VAL:HG23	2.19	0.42
2:C:96:VAL:O	2:C:99:ARG:HB2	2.19	0.42
2:C:146:LYS:H	2:C:146:LYS:HG3	1.57	0.42
2:C:134:LEU:CD1	2:C:134:LEU:C	2.87	0.42
2:C:236:TYR:OH	2:C:258:LYS:HD2	2.19	0.42
1:A:175:ILE:CG2	1:A:203:VAL:HG22	2.48	0.42
1:B:178:LEU:HD21	1:B:182:PHE:CE2	2.55	0.42
1:B:79:LEU:HD23	1:B:79:LEU:HA	1.94	0.42
2:C:208:GLU:HA	2:C:211:ARG:CD	2.50	0.42
2:C:68:LEU:CD2	2:C:86:ALA:HB2	2.50	0.42
2:C:236:TYR:CE1	2:C:258:LYS:HG3	2.54	0.42
2:C:193:VAL:HG12	2:C:195:PRO:HD3	2.02	0.42
1:B:123:MSE:HE2	1:B:123:MSE:HB3	1.95	0.41
2:C:134:LEU:HD12	2:C:134:LEU:C	2.40	0.41
1:A:142:LEU:O	1:A:145:ILE:HB	2.20	0.41
1:B:70:ALA:HB2	1:B:124:LEU:HA	2.03	0.41
1:B:35:GLU:HB2	1:B:95:ILE:CD1	2.50	0.41
1:B:42:GLN:HE21	2:C:240:ILE:HD11	1.85	0.41
2:C:67:PHE:O	2:C:70:HIS:HB2	2.20	0.41
1:B:164:ASP:OD1	1:B:166:GLU:HB3	2.20	0.41
2:C:84:GLU:HA	2:C:87:ARG:HD3	2.03	0.41
1:B:128:ILE:HG23	1:B:129:SER:N	2.36	0.41
2:C:31:VAL:CG2	2:C:33:GLN:HB2	2.51	0.41
1:A:15:LYS:HA	1:A:18:ASP:HB2	2.02	0.41
1:A:55:ILE:O	1:A:56:SER:C	2.59	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:A:196:PHE:O	1:A:199:LEU:HB3	2.20	0.41
2:C:66:ILE:HG22	2:C:127:ALA:CB	2.49	0.41
2:C:65:ILE:HG21	2:C:90:LEU:HD13	2.02	0.40
1:A:169:LEU:O	1:A:170:ASN:C	2.60	0.40
2:C:149:SER:O	2:C:150:ASP:CB	2.68	0.40
2:C:264:ALA:O	2:C:267:VAL:HG22	2.21	0.40
2:C:154:ILE:O	2:C:157:VAL:HG22	2.22	0.40
1:B:104:ALA:HB1	1:B:148:LEU:HD22	2.02	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	202/218 (93%)	176 (87%)	21 (10%)	5 (2%)	5	26
1	B	199/218 (91%)	176 (88%)	21 (11%)	2 (1%)	15	46
2	C	176/269 (65%)	153 (87%)	16 (9%)	7 (4%)	3	18
All	All	577/705 (82%)	505 (88%)	58 (10%)	14 (2%)	6	28

All (14) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
2	C	117	TYR
2	C	118	SER
2	C	195	PRO
1	A	55	ILE
1	B	83	GLY
2	C	148	VAL
2	C	272	LYS
1	A	53	SER
1	B	84	GLN

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Mol	Chain	Res	Type
2	C	119	PRO
1	A	213	VAL
1	A	90	ASP
2	C	271	VAL
1	A	9	ILE

### 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	166/191 (87%)	162 (98%)	4 (2%)	49 74
1	B	168/191 (88%)	151 (90%)	17 (10%)	7 27
2	C	161/235 (68%)	137 (85%)	24 (15%)	3 12
All	All	495/617 (80%)	450 (91%)	45 (9%)	9 32

All (45) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	48	ILE
1	A	135	HIS
1	A	167	ARG
1	A	211	TYR
1	B	20	GLU
1	B	47	ILE
1	B	48	ILE
1	B	61	LEU
1	B	90	ASP
1	B	91	HIS
1	B	97	GLN
1	B	115	VAL
1	B	116	THR
1	B	128	ILE
1	B	146	LEU
1	B	150	SER
1	B	157	THR

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Mol	Chain	Res	Type
1	B	184	LEU
1	B	199	LEU
1	B	201	TYR
1	B	211	TYR
2	C	66	ILE
2	C	67	PHE
2	C	68	LEU
2	C	85	GLU
2	C	90	LEU
2	C	97	ASN
2	C	103	LEU
2	C	116	SER
2	C	121	LEU
2	C	122	GLN
2	C	128	TYR
2	C	134	LEU
2	C	136	HIS
2	C	146	LYS
2	C	152	GLN
2	C	158	MSE
2	C	197	GLU
2	C	200	LEU
2	C	228	THR
2	C	229	CYS
2	C	236	TYR
2	C	242	LEU
2	C	253	LYS
2	C	267	VAL

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. All (10) such sidechains are listed below:

Mol	Chain	Res	Type
1	A	21	GLN
1	A	91	HIS
1	A	97	GLN
1	A	135	HIS
1	A	158	ASN
1	B	49	HIS
1	B	97	GLN
2	C	70	HIS
2	C	97	ASN
2	C	112	GLN

### 5.3.3 RNA [i](#)

There are no RNA molecules in this entry.

### 5.4 Non-standard residues in protein, DNA, RNA chains [i](#)

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

### 5.5 Carbohydrates [i](#)

There are no monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 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, 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	204/218 (93%)	-0.28	0	100 100	45, 96, 190, 239	0
1	B	201/218 (92%)	-0.46	0	100 100	27, 58, 146, 228	0
2	C	185/269 (68%)	-0.13	6 (3%)	47 46	26, 95, 205, 313	0
All	All	590/705 (83%)	-0.30	6 (1%)	82 81	26, 84, 188, 313	0

All (6) RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
2	C	112	GLN	3.3
2	C	111	TYR	2.6
2	C	99	ARG	2.2
2	C	160	TYR	2.2
2	C	113	PHE	2.1
2	C	244	CYS	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 monosaccharides in this entry.

### 6.4 Ligands [i](#)

There are no ligands in this entry.

## 6.5 Other polymers [i](#)

There are no such residues in this entry.