



Full wwPDB X-ray Structure Validation Report ⓘ

Jun 19, 2024 – 01:37 PM EDT

PDB ID : 4OM2
Title : Crystal structure of TLE1 N-terminal Q-domain residues 1-156
Authors : Chodaparambil, J.V.; Weis, W.I.
Deposited on : 2014-01-25
Resolution : 4.00 Å(reported)

This is a Full wwPDB X-ray Structure Validation Report for a publicly released PDB entry.

We welcome your comments at validation@mail.wwpdb.org

A user guide is available at

<https://www.wwpdb.org/validation/2017/XrayValidationReportHelp>

with specific help available everywhere you see the ⓘ symbol.

The types of validation reports are described at

<http://www.wwpdb.org/validation/2017/FAQs#types>.

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

MolProbity : 4.02b-467
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

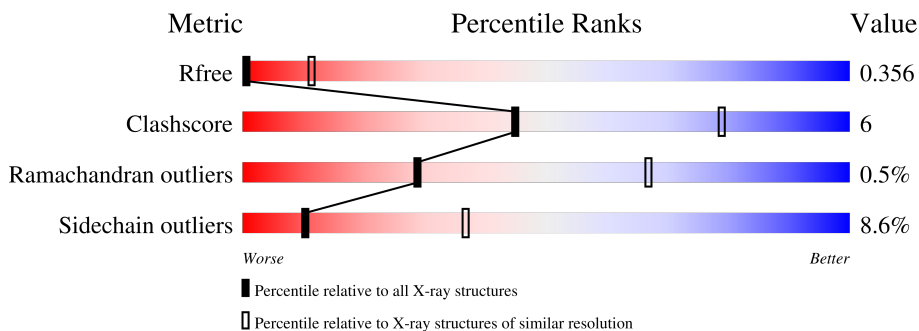
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

X-RAY DIFFRACTION

The reported resolution of this entry is 4.00 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	1087 (4.30-3.70)
Clashscore	141614	1148 (4.30-3.70)
Ramachandran outliers	138981	1108 (4.30-3.70)
Sidechain outliers	138945	1099 (4.30-3.70)

The table below summarises the geometric issues observed across the polymeric chains and their fit to the electron density. The red, orange, yellow and green segments of the lower bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria respectively. A grey segment represents the fraction of residues that are not modelled. The numeric value for each fraction is indicated below the corresponding segment, with a dot representing fractions $\leq 5\%$

Mol	Chain	Length	Quality of chain
1	A	163	
1	B	163	
1	C	163	
1	D	163	

2 Entry composition [i](#)

There is only 1 type of molecule in this entry. The entry contains 3512 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 Transducin-like enhancer protein 1.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	112	907	570	158	172	7	0	0	0
1	B	107	862	542	150	164	6	0	0	0
1	C	110	878	547	155	170	6	0	0	0
1	D	108	865	543	149	167	6	0	0	0

There are 28 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	-5	GLY	-	EXPRESSION TAG	UNP Q04724
A	-4	ALA	-	EXPRESSION TAG	UNP Q04724
A	-3	MET	-	EXPRESSION TAG	UNP Q04724
A	-2	GLY	-	EXPRESSION TAG	UNP Q04724
A	-1	SER	-	EXPRESSION TAG	UNP Q04724
A	0	GLY	-	EXPRESSION TAG	UNP Q04724
A	1	GLN	-	EXPRESSION TAG	UNP Q04724
B	-5	GLY	-	EXPRESSION TAG	UNP Q04724
B	-4	ALA	-	EXPRESSION TAG	UNP Q04724
B	-3	MET	-	EXPRESSION TAG	UNP Q04724
B	-2	GLY	-	EXPRESSION TAG	UNP Q04724
B	-1	SER	-	EXPRESSION TAG	UNP Q04724
B	0	GLY	-	EXPRESSION TAG	UNP Q04724
B	1	GLN	-	EXPRESSION TAG	UNP Q04724
C	-5	GLY	-	EXPRESSION TAG	UNP Q04724
C	-4	ALA	-	EXPRESSION TAG	UNP Q04724
C	-3	MET	-	EXPRESSION TAG	UNP Q04724
C	-2	GLY	-	EXPRESSION TAG	UNP Q04724
C	-1	SER	-	EXPRESSION TAG	UNP Q04724
C	0	GLY	-	EXPRESSION TAG	UNP Q04724
C	1	GLN	-	EXPRESSION TAG	UNP Q04724

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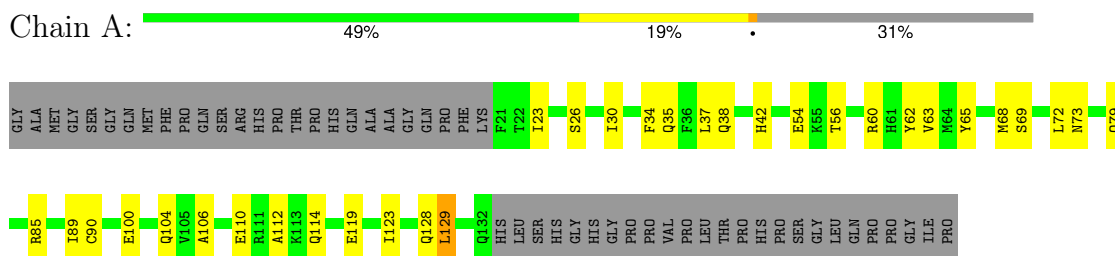
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Chain	Residue	Modelled	Actual	Comment	Reference
D	-5	GLY	-	EXPRESSION TAG	UNP Q04724
D	-4	ALA	-	EXPRESSION TAG	UNP Q04724
D	-3	MET	-	EXPRESSION TAG	UNP Q04724
D	-2	GLY	-	EXPRESSION TAG	UNP Q04724
D	-1	SER	-	EXPRESSION TAG	UNP Q04724
D	0	GLY	-	EXPRESSION TAG	UNP Q04724
D	1	GLN	-	EXPRESSION TAG	UNP Q04724

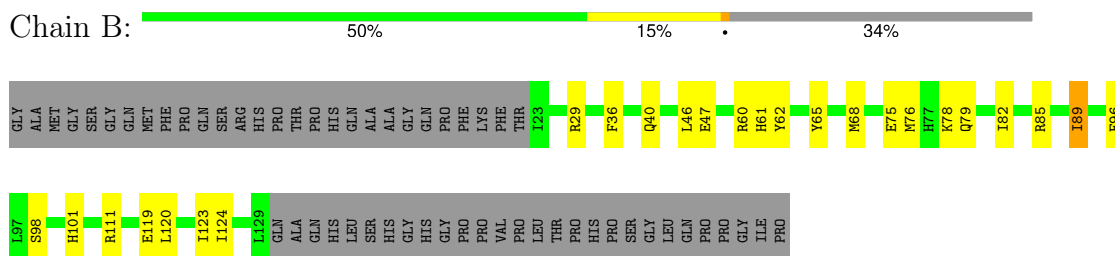
3 Residue-property plots [i](#)

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.

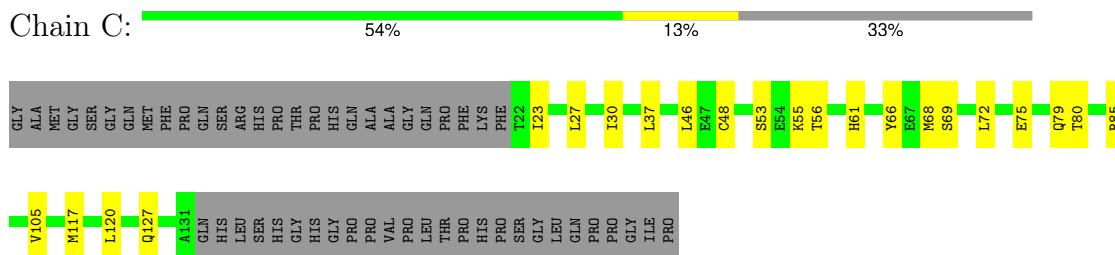
- Molecule 1: Transducin-like enhancer protein 1



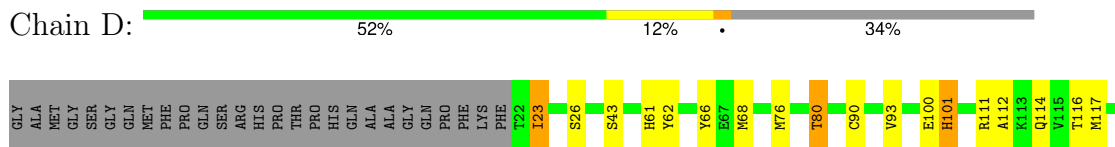
- Molecule 1: Transducin-like enhancer protein 1



- Molecule 1: Transducin-like enhancer protein 1



- Molecule 1: Transducin-like enhancer protein 1



L120	L121	L122	L123	L124	L125	L126	L127	L128	L129	L130	L131	L132	L133	L134	L135	L136	L137	L138	L139	L140	L141	L142	L143	L144	L145	L146	L147	L148	L149	L150	L151	L152	L153	L154	L155	L156	L157	L158	L159	L160	L161	L162	L163	L164	L165	L166	L167	L168	L169	L170	L171	L172	L173	L174	L175	L176	L177	L178	L179	L180	L181	L182	L183	L184	L185	L186	L187	L188	L189	L190	L191	L192	L193	L194	L195	L196	L197	L198	L199	L200	L201	L202	L203	L204	L205	L206	L207	L208	L209	L210	L211	L212	L213	L214	L215	L216	L217	L218	L219	L220	L221	L222	L223	L224	L225	L226	L227	L228	L229	L230	L231	L232	L233	L234	L235	L236	L237	L238	L239	L240	L241	L242	L243	L244	L245	L246	L247	L248	L249	L250	L251	L252	L253	L254	L255	L256	L257	L258	L259	L260	L261	L262	L263	L264	L265	L266	L267	L268	L269	L270	L271	L272	L273	L274	L275	L276	L277	L278	L279	L280	L281	L282	L283	L284	L285	L286	L287	L288	L289	L290	L291	L292	L293	L294	L295	L296	L297	L298	L299	L300	L301	L302	L303	L304	L305	L306	L307	L308	L309	L310	L311	L312	L313	L314	L315	L316	L317	L318	L319	L320	L321	L322	L323	L324	L325	L326	L327	L328	L329	L330	L331	L332	L333	L334	L335	L336	L337	L338	L339	L340	L341	L342	L343	L344	L345	L346	L347	L348	L349	L350	L351	L352	L353	L354	L355	L356	L357	L358	L359	L360	L361	L362	L363	L364	L365	L366	L367	L368	L369	L370	L371	L372	L373	L374	L375	L376	L377	L378	L379	L380	L381	L382	L383	L384	L385	L386	L387	L388	L389	L390	L391	L392	L393	L394	L395	L396	L397	L398	L399	L400	L401	L402	L403	L404	L405	L406	L407	L408	L409	L410	L411	L412	L413	L414	L415	L416	L417	L418	L419	L420	L421	L422	L423	L424	L425	L426	L427	L428	L429	L430	L431	L432	L433	L434	L435	L436	L437	L438	L439	L440	L441	L442	L443	L444	L445	L446	L447	L448	L449	L450	L451	L452	L453	L454	L455	L456	L457	L458	L459	L460	L461	L462	L463	L464	L465	L466	L467	L468	L469	L470	L471	L472	L473	L474	L475	L476	L477	L478	L479	L480	L481	L482	L483	L484	L485	L486	L487	L488	L489	L490	L491	L492	L493	L494	L495	L496	L497	L498	L499	L500	L501	L502	L503	L504	L505	L506	L507	L508	L509	L510	L511	L512	L513	L514	L515	L516	L517	L518	L519	L520	L521	L522	L523	L524	L525	L526	L527	L528	L529	L530	L531	L532	L533	L534	L535	L536	L537	L538	L539	L540	L541	L542	L543	L544	L545	L546	L547	L548	L549	L550	L551	L552	L553	L554	L555	L556	L557	L558	L559	L560	L561	L562	L563	L564	L565	L566	L567	L568	L569	L570	L571	L572	L573	L574	L575	L576	L577	L578	L579	L580	L581	L582	L583	L584	L585	L586	L587	L588	L589	L590	L591	L592	L593	L594	L595	L596	L597	L598	L599	L600	L601	L602	L603	L604	L605	L606	L607	L608	L609	L610	L611	L612	L613	L614	L615	L616	L617	L618	L619	L620	L621	L622	L623	L624	L625	L626	L627	L628	L629	L630	L631	L632	L633	L634	L635	L636	L637	L638	L639	L640	L641	L642	L643	L644	L645	L646	L647	L648	L649	L650	L651	L652	L653	L654	L655	L656	L657	L658	L659	L660	L661	L662	L663	L664	L665	L666	L667	L668	L669	L670	L671	L672	L673	L674	L675	L676	L677	L678	L679	L680	L681	L682	L683	L684	L685	L686	L687	L688	L689	L690	L691	L692	L693	L694	L695	L696	L697	L698	L699	L700	L701	L702	L703	L704	L705	L706	L707	L708	L709	L710	L711	L712	L713	L714	L715	L716	L717	L718	L719	L720	L721	L722	L723	L724	L725	L726	L727	L728	L729	L730	L731	L732	L733	L734	L735	L736	L737	L738	L739	L740	L741	L742	L743	L744	L745	L746	L747	L748	L749	L750	L751	L752	L753	L754	L755	L756	L757	L758	L759	L760	L761	L762	L763	L764	L765	L766	L767	L768	L769	L770	L771	L772	L773	L774	L775	L776	L777	L778	L779	L780	L781	L782	L783	L784	L785	L786	L787	L788	L789	L790	L791	L792	L793	L794	L795	L796	L797	L798	L799	L800	L801	L802	L803	L804	L805	L806	L807	L808	L809	L810	L811	L812	L813	L814	L815	L816	L817	L818	L819	L820	L821	L822	L823	L824	L825	L826	L827	L828	L829	L830	L831	L832	L833	L834	L835	L836	L837	L838	L839	L840	L841	L842	L843	L844	L845	L846	L847	L848	L849	L850	L851	L852	L853	L854	L855	L856	L857	L858	L859	L860	L861	L862	L863	L864	L865	L866	L867	L868	L869	L870	L871	L872	L873	L874	L875	L876	L877	L878	L879	L880	L881	L882	L883	L884	L885	L886	L887	L888	L889	L890	L891	L892	L893	L894	L895	L896	L897	L898	L899	L900	L901	L902	L903	L904	L905	L906	L907	L908	L909	L910	L911	L912	L913	L914	L915	L916	L917	L918	L919	L920	L921	L922	L923	L924	L925	L926	L927	L928	L929	L930	L931	L932	L933	L934	L935	L936	L937	L938	L939	L940	L941	L942	L943	L944	L945	L946	L947	L948	L949	L950	L951	L952	L953	L954	L955	L956	L957	L958	L959	L960	L961	L962	L963	L964	L965	L966	L967	L968	L969	L970	L971	L972	L973	L974	L975	L976	L977	L978	L979	L980	L981	L982	L983	L984	L985	L986	L987	L988	L989	L990	L991	L992	L993	L994	L995	L996	L997	L998	L999	L1000
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4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 2	Depositor
Cell constants a, b, c, α , β , γ	49.59Å 94.91Å 130.21Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	53.69 – 4.00 76.70 – 3.50	Depositor EDS
% Data completeness (in resolution range)	98.0 (53.69-4.00) 98.9 (76.70-3.50)	Depositor EDS
R_{merge}	0.12	Depositor
R_{sym}	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ ¹	1.62 (at 3.49Å)	Xtrriage
Refinement program	PHENIX 1.8.2_1309	Depositor
R, R_{free}	0.287 , 0.347 0.292 , 0.356	Depositor DCC
R_{free} test set	815 reflections (10.01%)	wwPDB-VP
Wilson B-factor (Å ²)	136.0	Xtrriage
Anisotropy	0.099	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.31 , 97.9	EDS
L-test for twinning ²	$\langle L \rangle = 0.41$, $\langle L^2 \rangle = 0.24$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
F_o, F_c correlation	0.92	EDS
Total number of atoms	3512	wwPDB-VP
Average B, all atoms (Å ²)	132.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 11.08% of the height of the origin peak. No significant pseudotranslation is detected.*

¹Intensities estimated from amplitudes.

²Theoretical values of $\langle |L| \rangle$, $\langle L^2 \rangle$ for acentric reflections are 0.5, 0.333 respectively for untwinned datasets, and 0.375, 0.2 for perfectly twinned datasets.

5 Model quality [i](#)

5.1 Standard geometry [i](#)

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	0.26	0/921	0.41	0/1238
1	B	0.26	0/875	0.44	0/1178
1	C	0.26	0/890	0.42	0/1199
1	D	0.26	0/878	0.43	0/1184
All	All	0.26	0/3564	0.42	0/4799

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	907	0	887	17	0
1	B	862	0	840	17	0
1	C	878	0	851	13	0
1	D	865	0	834	15	0
All	All	3512	0	3412	45	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 6.

All (45) 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:D:117:MET:O	1:D:121:ASN:ND2	2.24	0.69
1:B:96:PHE:HD2	1:D:101:HIS:HE2	1.41	0.69
1:A:54:GLU:OE1	1:C:55:LYS:NZ	2.28	0.65
1:C:117:MET:HA	1:C:120:LEU:HD12	1.80	0.61
1:A:128:GLN:HG3	1:A:129:LEU:HD13	1.83	0.61
1:D:76:MET:O	1:D:80:THR:OG1	2.21	0.58
1:A:65:TYR:HA	1:A:68:MET:HG2	1.85	0.58
1:B:96:PHE:HD2	1:D:101:HIS:NE2	2.00	0.58
1:A:119:GLU:OE2	1:C:85:ARG:NH1	2.37	0.57
1:A:112:ALA:O	1:C:85:ARG:NH2	2.33	0.56
1:A:35:GLN:HA	1:A:38:GLN:HG2	1.88	0.55
1:B:120:LEU:O	1:B:124:ILE:HG12	2.08	0.54
1:D:125:GLY:HA2	1:D:128:GLN:HG2	1.91	0.53
1:A:73:ASN:HB2	1:C:72:LEU:HD13	1.94	0.50
1:C:75:GLU:O	1:C:79:GLN:HG2	2.12	0.49
1:B:85:ARG:HD3	1:D:112:ALA:HA	1.95	0.48
1:B:85:ARG:O	1:B:89:ILE:HG12	2.13	0.48
1:B:65:TYR:HA	1:B:68:MET:HB2	1.95	0.48
1:A:26:SER:HB2	1:B:29:ARG:NH2	2.29	0.48
1:D:120:LEU:O	1:D:124:ILE:HG12	2.15	0.47
1:A:62:TYR:CD1	1:C:61:HIS:HB3	2.51	0.46
1:A:106:ALA:O	1:A:110:GLU:HG2	2.15	0.46
1:A:112:ALA:HA	1:C:85:ARG:HD3	1.96	0.46
1:B:75:GLU:O	1:B:79:GLN:HG2	2.15	0.46
1:B:119:GLU:O	1:B:123:ILE:HG12	2.15	0.46
1:B:98:SER:HB3	1:B:101:HIS:HB2	1.98	0.46
1:D:90:CYS:HA	1:D:93:VAL:HG12	1.98	0.45
1:A:85:ARG:O	1:A:89:ILE:HG12	2.15	0.45
1:A:37:LEU:HD13	1:C:37:LEU:HD22	1.98	0.45
1:A:119:GLU:O	1:A:123:ILE:HG12	2.16	0.44
1:C:27:LEU:HA	1:C:30:ILE:HD12	1.98	0.44
1:A:65:TYR:HD2	1:C:66:TYR:HA	1.83	0.44
1:B:36:PHE:O	1:B:40:GLN:HG2	2.18	0.43
1:C:53:SER:O	1:C:56:THR:OG1	2.34	0.42
1:D:117:MET:HA	1:D:120:LEU:HB2	2.00	0.42
1:B:65:TYR:CD2	1:D:66:TYR:HB2	2.55	0.42
1:B:78:LYS:O	1:B:82:ILE:HG13	2.20	0.42
1:D:120:LEU:HD12	1:D:120:LEU:HA	1.81	0.42
1:A:34:PHE:CE1	1:D:23:ILE:HG21	2.55	0.41
1:A:69:SER:HB2	1:C:68:MET:HG2	2.03	0.41
1:B:89:ILE:HG12	1:B:89:ILE:H	1.44	0.41
1:B:61:HIS:HB3	1:D:62:TYR:CE1	2.56	0.41

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Atom-1	Atom-2	Interatomic distance (Å)	Clash overlap (Å)
1:D:111:ARG:HA	1:D:114:GLN:HG2	2.02	0.40
1:B:62:TYR:CE2	1:D:61:HIS:HB3	2.55	0.40
1:B:111:ARG:HA	1:B:111:ARG:HD2	1.88	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	110/163 (68%)	108 (98%)	2 (2%)	0	100	100
1	B	105/163 (64%)	102 (97%)	3 (3%)	0	100	100
1	C	108/163 (66%)	103 (95%)	4 (4%)	1 (1%)	17	55
1	D	106/163 (65%)	102 (96%)	3 (3%)	1 (1%)	17	55
All	All	429/652 (66%)	415 (97%)	12 (3%)	2 (0%)	29	67

All (2) Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	C	23	ILE
1	D	23	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	96/140 (69%)	83 (86%)	13 (14%)	4	21
1	B	91/140 (65%)	86 (94%)	5 (6%)	21	50
1	C	92/140 (66%)	86 (94%)	6 (6%)	17	45
1	D	91/140 (65%)	83 (91%)	8 (9%)	10	35
All	All	370/560 (66%)	338 (91%)	32 (9%)	10	37

All (32) residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	A	23	ILE
1	A	30	ILE
1	A	42	HIS
1	A	56	THR
1	A	60	ARG
1	A	63	VAL
1	A	72	LEU
1	A	79	GLN
1	A	90	CYS
1	A	100	GLU
1	A	104	GLN
1	A	114	GLN
1	A	129	LEU
1	B	46	LEU
1	B	47	GLU
1	B	60	ARG
1	B	76	MET
1	B	89	ILE
1	C	46	LEU
1	C	48	CYS
1	C	69	SER
1	C	80	THR
1	C	105	VAL
1	C	127	GLN
1	D	26	SER
1	D	43	SER
1	D	68	MET
1	D	80	THR
1	D	100	GLU
1	D	101	HIS
1	D	116	THR
1	D	120	LEU

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

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](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

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

Unable to reproduce the depositors R factor - this section is therefore empty.

6.3 Carbohydrates [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.4 Ligands [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.

6.5 Other polymers [i](#)

Unable to reproduce the depositors R factor - this section is therefore empty.