



wwPDB EM Validation Summary Report ⓘ

Jul 16, 2025 – 01:33 AM JST

PDB ID : 8Y1O / pdb_00008y1o
EMDB ID : EMD-38841
Title : Cryo-EM structure of human ABCA7 in the apo state
Authors : Fang, S.C.
Deposited on : 2024-01-25
Resolution : 3.92 Å(reported)

This is a wwPDB EM Validation Summary 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/EMValidationReportHelp>

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:

EMDB validation analysis : **FAILED**
MolProbity : 4-5-2 with Phenix2.0rc1
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : **FAILED**
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.44

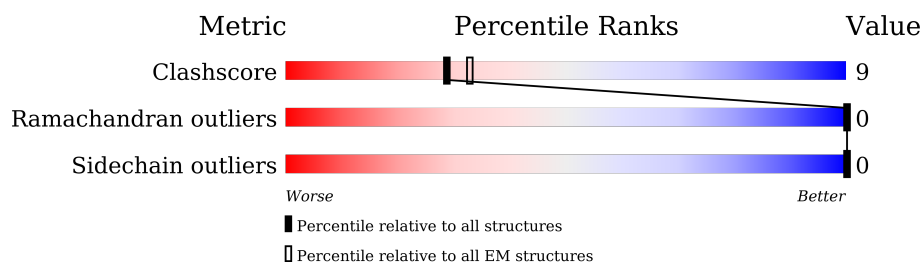
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.92 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)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

The table below summarises the geometric issues observed across the polymeric chains and their fit to the map. The red, orange, yellow and green segments of the 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	2146	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 14226 atoms, of which 0 are hydrogens and 0 are deuteriums.

In the tables below, 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 Phospholipid-transporting ATPase ABCA7.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	1844	Total	C	N	O	S	0	0
			14226	9155	2511	2496	64		

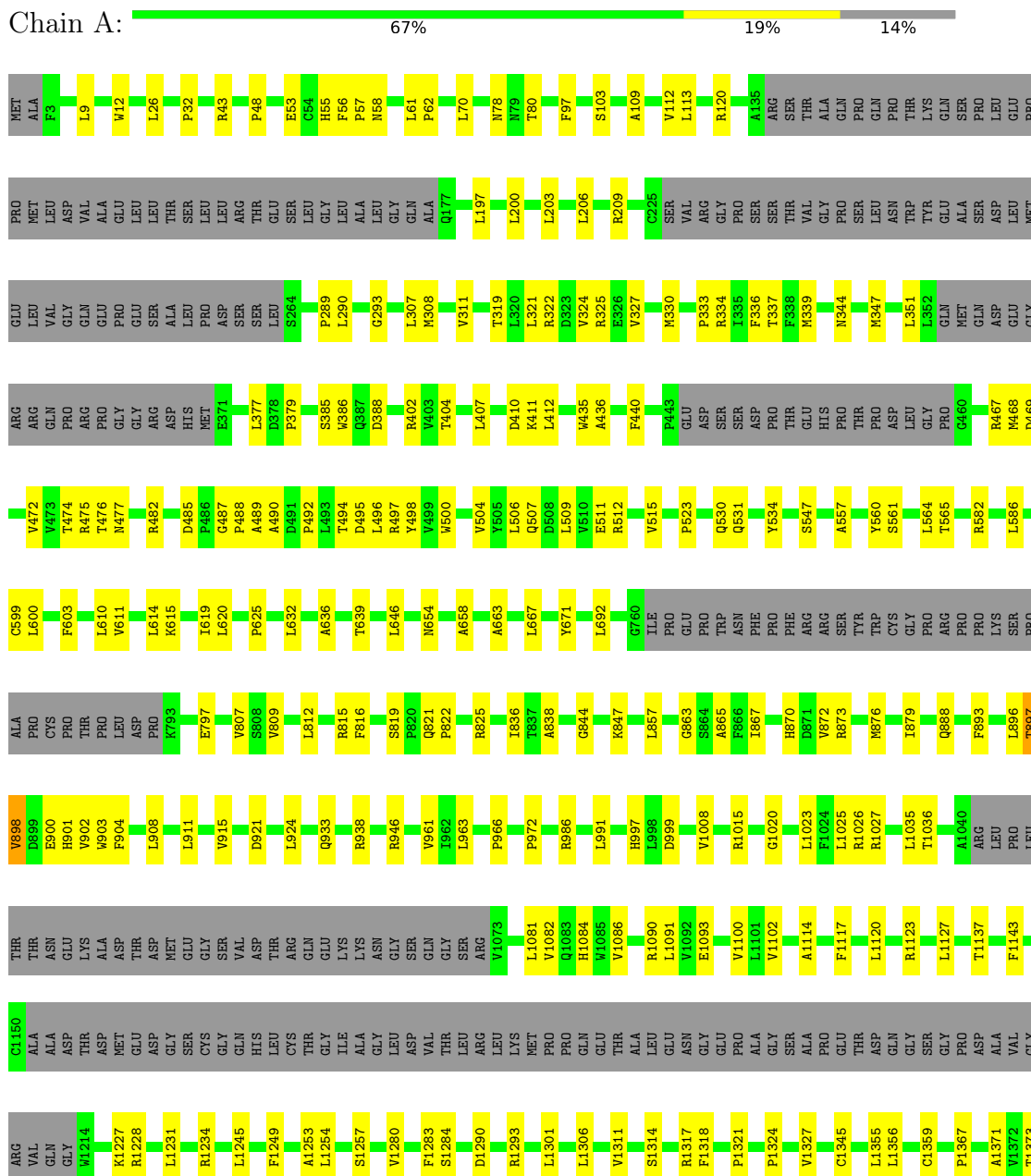
There are 2 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	965	GLN	GLU	conflict	UNP Q8IZY2
A	1951	GLN	GLU	conflict	UNP Q8IZY2

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.

• Molecule 1: Phospholipid-transporting ATPase ABCA7



SER	R2069	M1956	L1795	T1666	S1525	V1378
GLN	V2070	D1957	L1798	E1679	E1526	V1378
PHE	F2071	P1958			V1534	L1398
LEU	G2072		D1811	R1682	V1538	V1408
ASP	E2073	R1961	R1812	I1683	V1542	R1413
ASP	L2074	R1962	G1832	L1684	E1560	Y1414
PRO	A2075	V1965	T1836	K1685	R1561	G1415
SER	V2076	L1968		Q1686		
THR	H2077		T1841	V1687		R1422
ALA		M1979		I1701	Q1569	
GLU	E2080		V1852	N1706	L1570	S1428
THR		H1983	L1853		M1571	G1429
VAL	E2084	S1984	A1854	M1709	G1572	Q1430
LEU	F2086	M1985	S1857	R1715	L1574	E1431
		E1986			S1575	L1432
	S2089	E1987	H1866	R1726	P1576	G1433
	Q2090	L1991	C1872		T1577	V1436
	Q2091	R1994	F1879	V1729	L1578	E1437
	L2092		E1880	V1730		E1438
	L2093	C2005	L1881	G1741	L1581	L1442
	E2094	L2006	L1882	P1742	F1684	
	E2095		T1883	L1743	D1587	G1449
	PRO	P2009	G1884	F1744	M1588	D1452
	V2096	K2013	R1885	L1745		
	F2097	G2014		L1746	Y1591	K1456
	L2098	R2015	L1888	F1747		
	Y2099	F2016	E1889	T1748	Q1606	T1459
	F2100	A2017		L1751	V1611	L1465
	S2101	G2018	R1893	Q1752	D1466	A1467
	K2102	H2020	L1894	H1753	L1622	Q1468
	D2103	T2021	R1895			
		L2022		Q1756	Y1626	
	GLN	T2023	Q1901	LEU	G1627	W1474
	GLY	L2024	Q1904	LEU	W1628	
	LYS	R2025		PRO	S1629	N1477
		S2031	L1910	PRO	I1630	K1478
	ALA	V2038	L1915	PRO	T1631	
	GLY	F2042	P1922	VAL	P1632	S1491
	VAL		G1929	ARG	Y1635	L1499
	VAL	R2048		LEU	P1636	
	ASP	L2055	R1932	LEU	F1641	A1504
	PRO	R2056	V1946	LEU	R1505	R1505
	ALA	F2057	V1947	GLY	H1506	A1507
	GLY	Q2058	F1948	GLU	S1645	L1517
	LEU	L2059	L1949	GLU	T1646	L1517
	GLN	P2060		ASP	V1649	N1518
	HIS	P2061		E1774	L1656	L1519
	PRO		P1952			T1520
	LYS	A2066	T1953	V1792	Q1523	Q1523
	ARG			L1793	L1524	L1524
	VAL			V1794		

4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	44853	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	55	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor

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	0/14567	0.57	8/19812 (0.0%)

There are no bond length outliers.

The worst 5 of 8 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	1979	MET	CB-CG-SD	9.48	141.16	112.70
1	A	898	VAL	N-CA-C	8.51	120.27	111.00
1	A	506	LEU	N-CA-C	-6.68	103.69	110.97
1	A	897	THR	CB-CA-C	6.08	122.52	110.42
1	A	70	LEU	N-CA-C	-5.96	104.47	110.97

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	14226	0	14439	264	0
All	All	14226	0	14439	264	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 9.

The worst 5 of 264 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:1245:LEU:O	1:A:1249:PHE:HB2	1.65	0.95
1:A:1280:VAL:HG12	1:A:1378:VAL:HB	1.69	0.73
1:A:897:THR:O	1:A:901:HIS:HB2	1.88	0.72
1:A:815:ARG:HD2	1:A:822:PRO:HA	1.72	0.72
1:A:1636:PRO:HB3	1:A:1751:LEU:HD21	1.72	0.71

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 PDB entries followed by that with respect to all EM entries.

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	1826/2146 (85%)	1722 (94%)	104 (6%)	0	100	100

There are no Ramachandran outliers to report.

5.3.2 Protein sidechains [i](#)

In the following table, the Percentiles column shows the percent sidechain outliers of the chain as a percentile score with respect to all PDB entries followed by that with respect to all EM entries.

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	1505/1764 (85%)	1505 (100%)	0	100	100

There are no protein residues with a non-rotameric sidechain to report.

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 16 such sidechains are listed below:

Mol	Chain	Res	Type
1	A	1901	GLN
1	A	1805	GLN
1	A	1488	ASN
1	A	1785	GLN
1	A	1316	HIS

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 oligosaccharides 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.