



wwPDB X-ray Structure Validation Summary Report ⓘ

Aug 15, 2023 – 01:00 AM EDT

PDB ID : 1QZX
Title : Crystal structure of the complete core of archaeal SRP and implications for inter-domain communication
Authors : Rosendal, K.R.; Wild, K.; Montoya, G.; Sinning, I.
Deposited on : 2003-09-18
Resolution : 4.00 Å (reported)

This is a wwPDB X-ray Structure 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/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) : 1.13
EDS : 2.35
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) : 2.35

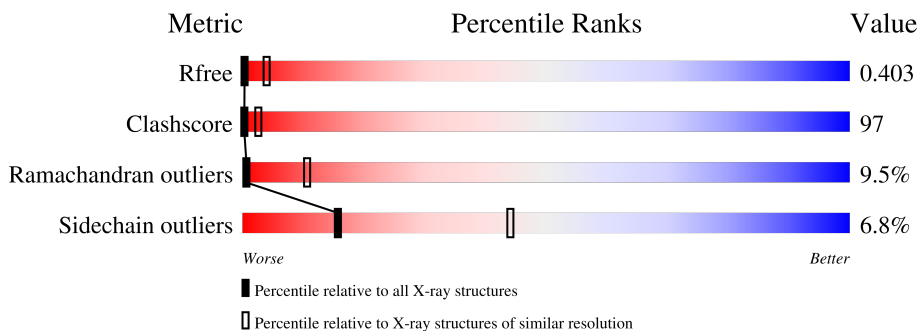
1 Overall quality at a glance

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	440	 21% 63% 11% ..
1	B	440	 22% 62% 11% ..

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 6698 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 Signal recognition 54 kDa protein.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	425	3349	2142	565	628	14	0	0	0
1	B	425	3349	2142	565	628	14	0	0	0

There are 16 discrepancies between the modelled and reference sequences:

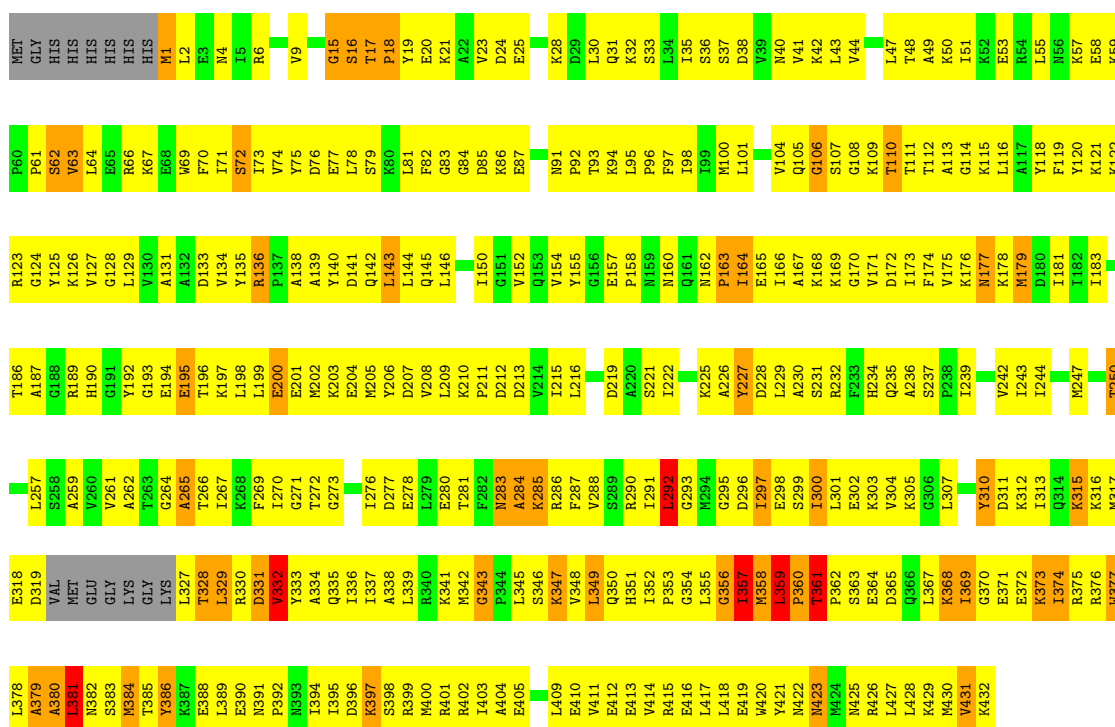
Chain	Residue	Modelled	Actual	Comment	Reference
A	-7	MET	-	expression tag	UNP Q97ZE7
A	-6	GLY	-	expression tag	UNP Q97ZE7
A	-5	HIS	-	expression tag	UNP Q97ZE7
A	-4	HIS	-	expression tag	UNP Q97ZE7
A	-3	HIS	-	expression tag	UNP Q97ZE7
A	-2	HIS	-	expression tag	UNP Q97ZE7
A	-1	HIS	-	expression tag	UNP Q97ZE7
A	0	HIS	-	expression tag	UNP Q97ZE7
B	-7	MET	-	expression tag	UNP Q97ZE7
B	-6	GLY	-	expression tag	UNP Q97ZE7
B	-5	HIS	-	expression tag	UNP Q97ZE7
B	-4	HIS	-	expression tag	UNP Q97ZE7
B	-3	HIS	-	expression tag	UNP Q97ZE7
B	-2	HIS	-	expression tag	UNP Q97ZE7
B	-1	HIS	-	expression tag	UNP Q97ZE7
B	0	HIS	-	expression tag	UNP Q97ZE7

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.

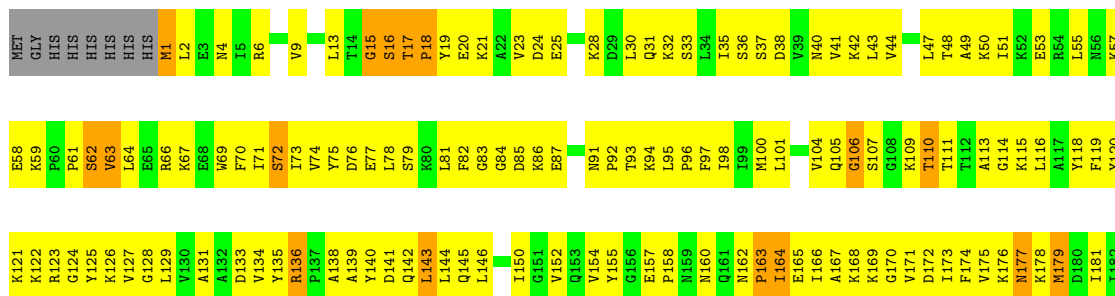
- Molecule 1: Signal recognition 54 kDa protein

Chain A: 



- Molecule 1: Signal recognition 54 kDa protein

Chain B: 



I183	T250	K316	L376
T186	L257	M317	M377
A187	L258	E318	L378
G188	S259	D319	A379
R189	A259	VAL	A380
H190	V260	MET	L381
G191	V261	GLU	N382
Y192	V262	GLY	S383
G193	T263	LYS	M384
E194	T264	LYS	T385
E195	A265	LYS	Y386
T196	T266	L327	K387
K197	T267	T328	E388
L198	I267	L329	L389
L199	R268	R330	E390
E200	F269	D331	N391
E201	I270	Y332	P392
M202	G271	Y333	N393
K203	T272	A334	I394
E204	G273	Q335	I395
M205	I276	I336	D396
Y206	D277	A338	K397
D207	D278	L339	S398
V208	E279	L340	R399
L209	E280	K341	M400
K210	T281	M342	R401
P211	F282	G343	R402
D212	N283	P344	I403
D213	A284	L345	A404
V214	K285	S346	E405
I215	R286	K347	L409
L216	F287	V348	E410
D219	V288	L349	V411
A220	S289	Q350	E412
S221	R290	H351	E413
I222	I291	I352	V414
K225	L292	P353	R415
A226	G293	G354	E416
Y227	M294	L355	L417
D228	G295	G356	L418
L229	D296	I357	M420
A230	I297	M358	Y421
S231	E298	L359	M422
R232	S299	P360	M423
H234	I300	T361	M424
Q235	L301	P362	M425
A236	E302	S363	R426
S237	K303	E364	L427
P238	V304	D365	L428
I239	K305	G366	K429
V242	G306	L367	M430
I243	L307	K368	V431
I244	L309	I369	K432
M247	Y310	G370	
	D311	E371	
	K312	E372	
	I313	K373	
	Q314	I374	
	K315	R375	

4 Data and refinement statistics i

Property	Value	Source
Space group	I 4	Depositor
Cell constants a, b, c, α , β , γ	197.91Å 197.91Å 64.31Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	40.00 – 4.00 38.81 – 4.00	Depositor EDS
% Data completeness (in resolution range)	89.0 (40.00-4.00) 97.9 (38.81-4.00)	Depositor EDS
R_{merge}	(Not available)	Depositor
R_{sym}	0.08	Depositor
$\langle I/\sigma(I) \rangle$ ¹	2.70 (at 3.99Å)	Xtrriage
Refinement program	CNS 1.1	Depositor
R, R_{free}	0.313 , 0.383 0.404 , 0.403	Depositor DCC
R_{free} test set	725 reflections (6.88%)	wwPDB-VP
Wilson B-factor (Å ²)	171.1	Xtrriage
Anisotropy	0.085	Xtrriage
Bulk solvent k_{sol} (e/Å ³), B_{sol} (Å ²)	0.34 , 26.6	EDS
L-test for twinning ²	$\langle L \rangle = 0.45$, $\langle L^2 \rangle = 0.28$	Xtrriage
Estimated twinning fraction	0.428 for -k,-h,-l	Xtrriage
F_o, F_c correlation	0.82	EDS
Total number of atoms	6698	wwPDB-VP
Average B, all atoms (Å ²)	84.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 4.28% 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

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	0.71	5/3399 (0.1%)	0.88	4/4569 (0.1%)
1	B	0.71	5/3399 (0.1%)	0.88	4/4569 (0.1%)
All	All	0.71	10/6798 (0.1%)	0.88	8/9138 (0.1%)

The worst 5 of 10 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	361	THR	CB-CG2	-6.78	1.29	1.52
1	B	361	THR	CB-CG2	-6.78	1.29	1.52
1	B	227	TYR	CD2-CE2	-5.99	1.30	1.39
1	A	227	TYR	CD2-CE2	-5.96	1.30	1.39
1	A	361	THR	CA-CB	5.92	1.68	1.53

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

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	292	LEU	CA-CB-CG	-5.79	101.99	115.30
1	B	292	LEU	CA-CB-CG	-5.77	102.03	115.30
1	B	361	THR	N-CA-CB	5.21	120.20	110.30
1	A	361	THR	N-CA-CB	5.20	120.19	110.30
1	B	332	VAL	N-CA-C	-5.16	97.06	111.00

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	A	3349	0	3486	713	43
1	B	3349	0	3486	708	43
All	All	6698	0	6972	1324	43

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 97.

The worst 5 of 1324 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:B:362:PRO:HD3	1:B:367:LEU:CD2	1.43	1.47
1:B:190:HIS:CD2	1:B:197:LYS:HD2	1.49	1.45
1:A:190:HIS:CD2	1:A:197:LYS:HD2	1.49	1.44
1:A:362:PRO:HD3	1:A:367:LEU:CD2	1.43	1.43
1:B:359:LEU:CG	1:B:360:PRO:HD3	1.49	1.42

The worst 5 of 43 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:A:360:PRO:CB	1:B:362:PRO:CA[8_454]	1.18	1.02
1:A:362:PRO:CA	1:B:360:PRO:CB[8_454]	1.24	0.96
1:A:200:GLU:CB	1:B:203:LYS:CB[6_555]	1.41	0.79
1:A:203:LYS:CB	1:B:200:GLU:CB[6_555]	1.45	0.75
1:A:360:PRO:CB	1:B:362:PRO:CB[8_454]	1.57	0.63

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	421/440 (96%)	294 (70%)	87 (21%)	40 (10%)	0 10
1	B	421/440 (96%)	293 (70%)	88 (21%)	40 (10%)	0 10

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles
All	All	842/880 (96%)	587 (70%)	175 (21%)	80 (10%)	0 10

5 of 80 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	63	VAL
1	A	236	ALA
1	A	265	ALA
1	A	332	VAL
1	A	343	GLY

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	365/377 (97%)	340 (93%)	25 (7%)	16 44
1	B	365/377 (97%)	340 (93%)	25 (7%)	16 44
All	All	730/754 (97%)	680 (93%)	50 (7%)	16 44

5 of 50 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	59	LYS
1	B	297	ILE
1	B	423	ASN
1	B	72	SER
1	B	200	GLU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 26 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	31	GLN
1	B	148	ASN
1	B	350	GLN

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Mol	Chain	Res	Type
1	B	91	ASN
1	B	160	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 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

6.1 Protein, DNA and RNA chains

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

6.2 Non-standard residues in protein, DNA, RNA chains

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

6.3 Carbohydrates

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

6.4 Ligands

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

6.5 Other polymers

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