



wwPDB/EMDatabank EM Map/Model Validation Summary Report ⓘ

Mar 2, 2017 – 12:43 pm GMT

PDB ID : 5J8V
EMDB ID: : EMD-8073
Title : Structure of rabbit ryanodine receptor RyR1 open state activated by calcium ion
Authors : Wang, X.; Wei, R.; Yin, C.; Sun, F.
Deposited on : 2016-04-08
Resolution : 4.90 Å(reported)
Based on PDB ID : 3J8H

This is a wwPDB/EMDatabank EM Map/Model Validation Summary Report for a publicly released PDB/EMDB entry.

We welcome your comments at validation@mail.wwpdb.org
A user guide is available at
<http://wwpdb.org/validation/2016/EMValidationReportHelp>
with specific help available everywhere you see the ⓘ symbol.

MolProbity : 4.02b-467
Percentile statistics : 20161228.v01 (using entries in the PDB archive December 28th 2016)
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et. al. (1996)
Validation Pipeline (wwPDB-VP) : recalc29047

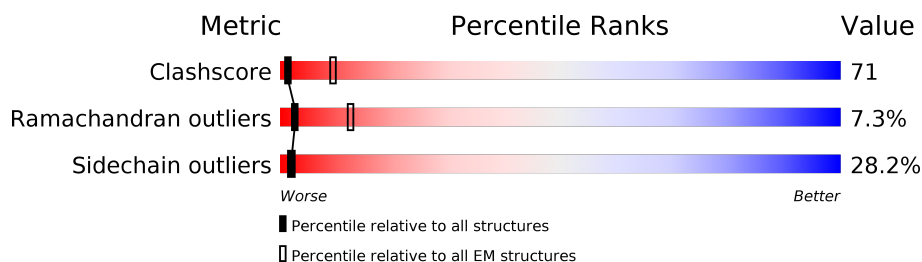
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 4.90 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	125131	1336
Ramachandran outliers	121729	1120
Sidechain outliers	121581	1026

The table below summarises the geometric issues observed across the polymeric chains. The red, orange, yellow and green segments on the bar indicate the fraction of residues that contain outliers for ≥ 3 , 2, 1 and 0 types of geometric quality criteria. 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	5037	
1	B	5037	
1	C	5037	
1	D	5037	

2 Entry composition

There is only 1 type of molecule in this entry. The entry contains 73616 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.

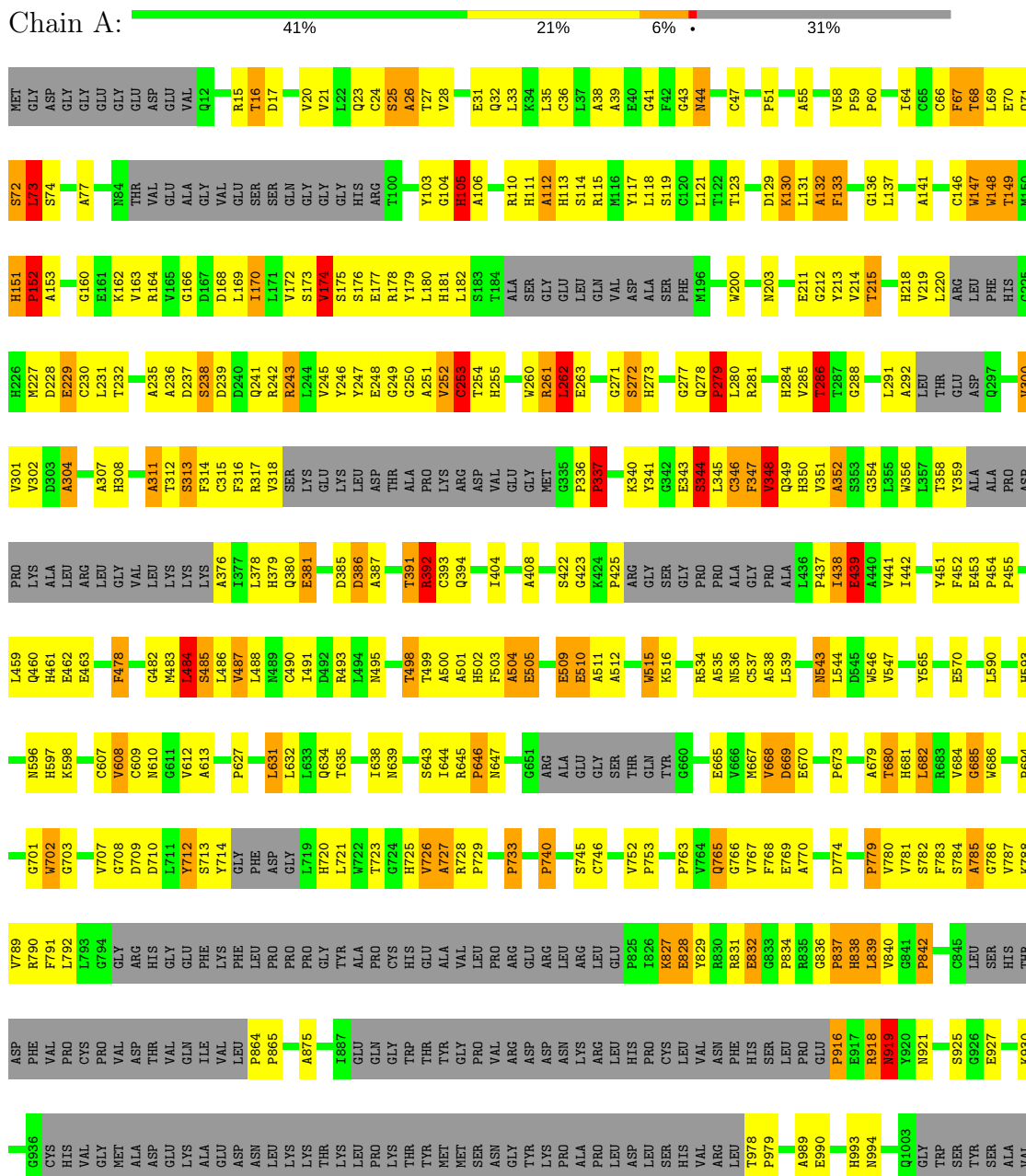
- Molecule 1 is a protein called Ryanodine receptor 1.

Mol	Chain	Residues	Atoms					AltConf	Trace
1	A	3453	Total 18404	C 11343	N 3553	O 3501	S 7	0	0
1	B	3453	Total 18404	C 11343	N 3553	O 3501	S 7	0	0
1	C	3453	Total 18404	C 11343	N 3553	O 3501	S 7	0	0
1	D	3453	Total 18404	C 11343	N 3553	O 3501	S 7	0	0

3 Residue-property plots

These plots are drawn for all protein, RNA and DNA 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: Ryanodine receptor 1





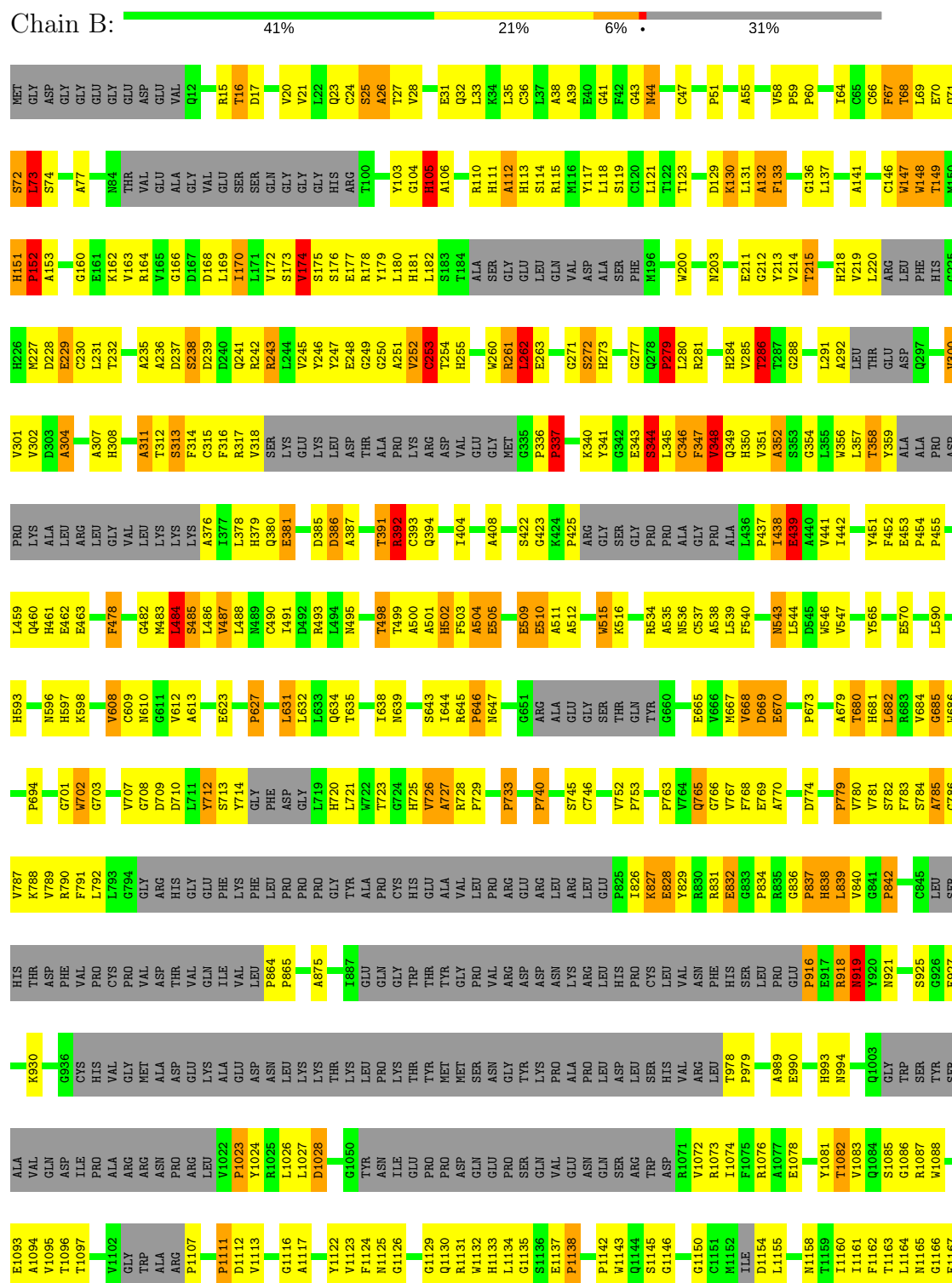









- Molecule 1: Ryanodine receptor 1






T3905	G3827	Y3725	MET	GLY	LYS	ARG	LEU	LEU	LEU	LYS	LYS	T2910	K2786	LYS	GLY
Q3906	F3828	H3734	THR	LEU	LYS	K3367	ALA	ALA	GLU	LEU	LYS	K2914	T2787	CYS	ALA
T3911	F3829	LEU	PRO	PRO	ARG	Q3378	GLU	GLU	GLU	ASN	LYS	E2694	H2788	P2567	VAL
T3912	T3912	GLU	TYR	ARG	GLY	L3379	GLY	GLY	GLY	HIS	GLU	A2917	P2789	T2572	GLN
N3914	A3833	GLU	ASN	GLU	ASP	R3380	ALA	ALA	ARG	GLN	GLU	R2920	M2790	R2575	PRO
I3915	L3835	GLY	LEU	GLU	ARG	L3381	ARG	ARG	THR	ILE	GLU	A2699	L2791	R2586	LYS
I3917	M3836	GLY	ASP	ASP	TYR	E3389	THR	THR	THR	LYS	ILE	A2923	R2792	R2587	MET
Y3922	T3838	GLU	R3648	ASP	SER	GLY	THR	THR	THR	GLY	LYS	V2937	P2793	Y2587	SER
F3933	C3839	GLY	K3658	ASP	GLN	GLU	MET	MET	GLU	PHE	PRO	L2710	R2591	Y2587	ALA
Y3934	S3840	ALA	GLU	GLU	THR	LEU	HIS	HIS	PRO	ALA	LYS	G2940	P2808	R2588	PHE
I3943	Q3850	GLU	V3661	LYS	LEU	VAL	VAL	VAL	VAL	ILE	ILE	LEU	E2830	L2595	V2495
M3935	L3862	GLU	L3662	ILE	ILE	ARG	ILE	ILE	VAL	LEU	LEU	LYS	GLU	R2590	P2496
Y3936	T3664	GLU	T3664	VAL	VAL	ASP	GLU	GLU	GLU	LEU	LYS	ASP	ARG	S2590	
Y3937	E3665	VAL	E3665	ARG	ARG	PHE	PHE	PHE	PHE	LEU	GLU	THR	THR	R2592	
S3938	D3666	VAL	D3666	VAL	VAL	VAL	VAL	VAL	VAL	ILE	LYS	SER	LYS	L2595	P2505
G3939	H3667	GLN	H3667	GLN	GLU	VAL	E3286	E3286	Y3213	ASN	ASN	SER	LYS	L2506	
V3942	S3668	GLU	S3668	GLU	GLU	LEU	LEU	LEU	VAL	THR	THR	THR	GLN	A2609	V2509
I3943	F3669	VAL	F3669	VAL	THR	ARG	ARG	ARG	VAL	TYR	TYR	ALA	ARG	LEU	Y2510
E3944	D3671	ALA	D3671	ALA	ASP	ASP	ASP	ASP	THR	PHE	PHE	SER	THR	CYS	GLY
E3945	K3679	GLY	K3679	GLY	GLN	L3405	GLY	GLY	THR	ASN	ASN	ILE	LYS	TYR	ILE
Q3946	ALA	VAL	ALA	VAL	ASP	ASP	ASP	ASP	THR	THR	THR	GLU	ILE	ILE	GLU
G3947	GLY	VAL	GLY	VAL	LEU	P3410	P3410	P3410	LYS	VAL	VAL	ARG	GLN	R2615	ASN
F3951	GLY	VAL	GLY	VAL	LEU	Y3415	Y3415	Y3415	PRO	ALA	ALA	ALA	ALA	R2624	ASP
F3962	GLY	VAL	GLY	VAL	LEU	M3419	M3419	M3419	GLU	THR	THR	GLY	GLN	R2634	L2518
N3963	GLY	VAL	GLY	VAL	LEU	W3423	W3423	W3423	ALA	ALA	ALA	LEU	GLN	GLU	L2522
S3964	GLY	VAL	GLY	VAL	LEU	P3427	P3427	P3427	ILE	ILE	ILE	GLN	GLN	PHE	
L3965	GLY	VAL	GLY	VAL	LEU	L3434	L3434	L3434	GLY	GLY	GLY	GLN	GLN	K2638	P2528
T3966	GLY	VAL	GLY	VAL	LEU	M3437	M3437	M3437	LEU	LEU	LEU	LEU	LEU	R2639	P2529
E3967	GLY	VAL	GLY	VAL	LEU	ARG	ARG	ARG	GLY	GLY	GLY	GLN	GLN	R2640	M2530
Q3970	GLY	VAL	GLY	VAL	LEU	P3455	P3455	P3455	LEU	LEU	LEU	TRP	TRP	P2646	R2531
S3983	GLY	VAL	GLY	VAL	LEU	F3458	F3458	F3458	ILE	ILE	ILE	ASP	ASP	N2646	A2532
L3985	GLY	VAL	GLY	VAL	LEU	L3470	L3470	L3470	VAL	VAL	VAL	MET	MET	C2656	A2533
M3986	GLY	VAL	GLY	VAL	LEU	THR	THR	THR	PHE	PHE	PHE	ASP	ASP	L2657	S2535
D3987	GLY	VAL	GLY	VAL	LEU	ASP	ASP	ASP	GLY	GLY	GLY	ILE	ILE	P2658	L2536
V3989	GLY	VAL	GLY	VAL	LEU	K3475	K3475	K3475	SER	SER	SER	SER	SER	T2659	D2537
H3998	GLY	VAL	GLY	VAL	LEU	G3488	G3488	G3488	ILE	ILE	ILE	GLN	GLN	L2755	T2538
K4002	GLY	VAL	GLY	VAL	LEU	SER	SER	SER	VAL	VAL	VAL	GLU	GLU	GLY	A2539
L4003	GLY	VAL	GLY	VAL	LEU	ASP	ASP	ASP	VAL	VAL	VAL	PHE	PHE	TRP	T2540
A4004	GLY	VAL	GLY	VAL	LEU	GLN	GLN	GLN	ALA	ALA	ALA	ILE	ILE	ALA	F2541
Q4005	GLY	VAL	GLY	VAL	LEU	THR	THR	THR	ASP	ASP	ASP	HIS	HIS	ASN	M2546
D4006	GLY	VAL	GLY	VAL	LEU	ARG	ARG	ARG	PRO	PRO	PRO	LEU	LEU	PHE	
S4007	GLY	VAL	GLY	VAL	LEU	G3488	G3488	G3488	ILE	ILE	ILE	GLU	GLU	GLY	A2549
S4008	GLY	VAL	GLY	VAL	LEU	ASP	ASP	ASP	VAL	VAL	VAL	ALA	ALA	VAL	L2550
Q4009	GLY	VAL	GLY	VAL	LEU	GLN	GLN	GLN	GLN	GLN	GLN	VAL	VAL	K2677	L2556
L4023	GLY	VAL	GLY	VAL	LEU	THR	THR	THR	THR	THR	THR	SER	SER	GLY	A2557
												GLY	GLY	G2681	
												GLY	GLY	L2686	P2560
												GLY	GLY	ALA	L2561
												GLY	GLY	ALA	L2562
												GLY	GLY	THR	

C5018	D4953	C4882	I4816	GLU	L4677	GLY	MET	GLY	ASP	TRP	GLY	ALA	E4232	V4154	G4033
W5019	M4954	Y4883	A4917	ILE	L4677	TRP	GLU	VAL	GLY	GLY	GLY	ALA	L4233	P4155	G4034
D5020	E4955	L4884	M4818	THR	L4682	GLY	F4540	ASP	ASP	GLY	ASP	ALA	V4234	M4156	V4035
F5021	T4956	F4885	G4819	ALA	E4682	GLY	E4545	GLY	GLY	GLY	GLY	ALA	V4235	D4157	V4036
F5022	K4957	M4886	V4820	HIS	F4683	ALA	E4545	GLY	GLY	GLY	GLY	ALA	S4236	R4158	R4159
F5023	C4958	M4887	K4821	ASN	D4684	ALA	V4549	GLY	VAL	VAL	VAL	ALA	F4237	R4159	M4047
A5024	C4959	Y4888	T4822	GLU	G4685	GLY	V4549	GLY	ALA	ALA	ALA	LEU	C4238	L4160	M4047
G5025	L4960	V4889	L4823	ARG	G4686	GLU	L4562	GLY	GLY	GLY	GLY	ARG	E4239	R4161	I4068
D5026	C4961	G4890	R4824	LYS	Y4687	GLU	N4553	LEU	HIS	LEU	LEU	GLY	D4240	E4168	I4068
C5027	R4891	T4825	T4825	PRO	T4688	ALA	Y4554	VAL	GLU	VAL	VAL	LEU	I4241	E4168	F4061
G4964	R4892	T4825	T4825	ASP	T4688	ALA	Y4554	VAL	GLU	VAL	VAL	LEU	I4242	E4168	F4062
S4965	R4893	T4825	T4825	PRO	T4689	GLY	L4555	GLY	GLY	GLY	GLY	ALA	F4243	E4171	F4062
D4966	C4894	T4825	T4825	PRO	P4692	GLU	R4557	PRO	PRO	PRO	PRO	ALA	E4251	E4172	L4087
F4968	P4904	T4825	T4825	GLY	D4696	ASP	N4558	PRO	GLY	GLY	GLY	LEU	S4252	Y4173	I4088
D4969	E4908	G4834	G4834	LEU	D4696	GLU	F4559	GLY	ALA	VAL	VAL	ARG	GLU	R4174	S4089
T4970	K4835	L4836	L4836	LEU	Y4697	ASN	Y4560	PRO	GLY	GLY	GLY	ARG	PRO	F4175	K4090
P4971	L4837	L4837	L4837	THR	K4698	MET	T4561	GLY	GLY	VAL	VAL	ARG	GLY	Y4176	K4091
L4911	V4838	L4837	L4837	TRP	G4699	GLY	L4562	PRO	VAL	VAL	VAL	VAL	GLY	L4178	D4092
V4914	M4839	V4838	V4838	L4768	Q4700	GLY	L4562	GLY	VAL	VAL	VAL	ARG	GLY	G4179	F4093
V4915	T4840	T4840	T4840	M4769	W4701	GLY	A4570	PRO	ALA	ALA	ALA	ARG	PRO	R4180	Q4102
F4916	L4841	L4841	L4841	S4770	W4701	GLY	F4571	GLY	VAL	VAL	VAL	LEU	GLY	I4181	E4103
D4917	L4844	L4844	L4844	W4773	L4706	GLY	A4572	LYS	ALA	ALA	ALA	ALA	ALA	E4182	T4104
I4918	A4845	A4845	A4845	K4774	L4706	GLY	L4573	ALA	ASP	ASP	ASP	GLY	ASP	T4104	G4105
T4919	V4846	V4846	V4846	Y4775	M4707	GLY	F4575	GLY	GLY	GLY	GLY	THR	ASP	P4106	P4106
F4920	V4847	V4847	V4847	Q4776	F4711	GLY	I4576	PRO	PRO	PRO	PRO	ALA	GLY	E4107	E4107
F4921	V4848	V4848	V4848	L4777	W4714	GLY	L4577	ASN	PHE	PHE	PHE	ARG	GLY	I4108	I4108
F4922	L4849	L4849	L4849	W4778	Y4715	GLY	F4578	GLY	ARG	ARG	ARG	GLY	GLY	Q4109	Q4109
F4923	L4850	L4850	L4850	K4779	Y4716	GLY	F4579	GLY	PRO	PRO	PRO	ALA	GLY	E4191	E4191
F4924	L4851	L4851	L4851	F4780	W4716	GLY	TYR	LYS	GLY	GLY	GLY	ALA	GLY	R4192	R4192
L4986	Y4851	Y4851	Y4851	G4781	D4717	GLY	LYS	GLY	GLY	GLY	GLY	ALA	ALA	I4193	I4193
D4987	T4825	T4825	T4825	W4782	K4718	GLY	VAL	GLY	GLY	GLY	GLY	ALA	ALA	Y4194	Y4194
Y4988	V4853	V4853	V4853	L4783	F4719	GLY	SER	VAL	GLY	GLY	GLY	LEU	ALA	E4195	E4195
E4989	A4855	A4855	A4855	F4784	V4720	GLY	ASP	PRO	GLY	GLY	GLY	ALA	ALA	E4196	E4196
F4990	F4856	F4856	F4856	L4789	W4720	GLY	SER	GLY	LEU	LEU	LEU	ALA	ALA	M4122	M4122
F4991	M4857	M4857	M4857	K4721	K4721	GLY	PRO	ALA	ALA	ALA	ALA	GLY	ALA	I4123	I4123
Y4994	F4858	F4858	F4858	L4790	V4724	GLY	PRO	PRO	ASP	ASP	ASP	ALA	GLY	N4124	N4124
L4996	F4859	F4859	F4859	Y4791	L4725	GLY	GLY	PRO	MET	MET	MET	ALA	GLY	E4206	E4206
M4997	K4860	K4860	K4860	W4794	K4727	GLY	A4854	GLY	GLY	GLY	GLY	ALA	GLY	F4125	F4125
K4998	L4861	L4861	L4861	Y4795	H4728	GLY	F4655	ASP	ASP	ASP	ASP	VAL	ALA	E4127	E4127
D4999	F4862	F4862	F4862	M4796	H4728	GLY	L4656	PRO	THR	THR	THR	VAL	ALA	Q4209	Q4209
E5000	Y4863	Y4863	Y4863	W4797	G4729	GLY	C4657	LYS	THR	THR	THR	GLY	GLY	V4210	V4210
T5001	D4938	D4938	D4938	M4798	D4730	GLY	GLY	ALA	ALA	ALA	ALA	ARG	ALA	R4131	R4131
E5002	A4939	A4939	A4939	S4799	I4731	GLY	SER	PRO	GLY	GLY	GLY	ALA	GLY	F4132	F4132
H5003	E4867	E4867	E4867	L4800	F4732	GLY	ALA	PRO	PRO	PRO	PRO	ALA	ALA	P4135	P4135
Q5006	D4868	D4868	D4868	L4801	G4733	GLY	ALA	SER	THR	THR	THR	ALA	ALA	I4218	I4218
E5007	GLU	GLU	GLU	G4802	I4737	GLY	ASP	PRO	PRO	PRO	PRO	GLY	GLY	G4140	G4140
S5008	ASP	ASP	ASP	H4803	A4738	LEU	LEU	ALA	GLY	GLY	GLY	ALA	THR	F4141	F4141
Y5009	GLU	GLU	GLU	Y4804	E4739	GLY	K4665	ALA	GLY	GLY	GLY	ALA	VAL	V4221	V4221
V5010	D4945	D4945	D4945	M4805	L4740	GLY	Y4666	LYS	GLY	GLY	GLY	ALA	VAL	V4222	V4222
W5011	ASP	ASP	ASP	N4806	L4741	GLY	P4667	GLY	SER	SER	SER	ALA	ALA	N4223	N4223
Y5014	GLU	GLU	GLU	F4807	G4742	GLY	L4668	GLY	PRO	PRO	PRO	GLY	GLY	E4224	E4224
Q5015	LYS	LYS	LYS	M4810	H4743	GLY	V4669	GLY	ILE	ILE	ILE	ALA	ALA	GLY	GLY
E5016	CYS	CYS	CYS	A4810	ASP	GLY	I4670	GLY	ALA	ALA	ALA	LEU	THR	GLY	GLY
R5017	D4877	D4877	D4877	A4811	LEU	GLY	F4671	GLY	LYS	LYS	LYS	ALA	ALA	ALA	ALA
	T4881	T4881	T4881	H4812	ALA	GLY	R4672	GLY	ARG	ARG	ARG	LEU	ARG	E4229	E4229
				L4813	SER	GLY	R4673	GLY	LYS	LYS	LYS	LEU	LEU	K4230	K4230
					LEU	GLY		GLY	LEU	LEU	LEU	ALA	ALA	M4231	M4231

● Molecule 1: Ryanodine receptor 1









GLU A4229 K4230 M4231 M4232 L4233 F4234 V4235 S4236 F4237 C4238 E4239 D4240 I4241 I4242 F4243	M4149 L4150 H4153 V4154 P4155 M4034 H4156 D4157 P4158 R4159 L4160 R4161 E4168	S4008 Q4009 M4023 G4033 M4034 V4035 V4036 M4047 I4058 F4061 F4062 L4087 I4088 F4174 R4175 M4089 K4090 Y4177 L4178 D4092 F4093	Y3902 L3903 R3904 T3905 Q3906 T3911 T3912 I3913 N3914 I3915 I3916 I3917 Y3922 F3933 Y3934 M3935 Y3936 Y3937 S3938 G3939 V3942 I3943 E3944 I4104 G4105 P4106 I4107 I4108 Q4109 F4110 S4115 M4120 E4121 M4122 N4124 F4125 E4126 F4128 R4131 F4132 P4135 G4140 F4141 V4221 V4222 M4223 E4224 GLY	K3824 E3825 V3826 G3827 F3828 F3829 Q3830 Q3833 A3834 Q3837 T3838 C3839 S3840 Q3850 A3853 GLY GLY LEU MET VAL ASN GLU K3758 E3759 K3760 Q3761 R3762 I3763 I3764 Y3765 Q3766 R3769 R3773 A3785 C3786 K3787 A3792 M3793 S3794 S3795 S3796 L3805 N3806 G3807 G3808 N3809 A3810 E3811 Y3819 K3823	CYS PHE ARG MET THR PRO LEU TYR ASN LEU P3645 R3648 K3659 W3661 I3662 E3665 D3666 H3667 S3668 F3669 E3670 D3671 K3679 ALA GLY GLY GLN GLU VAL E3757 M3758 E3759 K3760 Q3761 R3762 I3763 I3764 Y3765 Q3766 R3769 R3773 A3785 C3786 K3787 A3792 M3793 S3794 S3795 S3796 L3805 N3806 G3807 G3808 N3809 A3810 E3811 Y3819 K3823	LEU TYR ARG GLY PRO GLY ARG GLY ASP ALA ASP PRO GLY LYS ILE VAL ARG ARG VAL ALA T3613 P3519 P3527 THR GLN ASP LEU TYR ALA LYS LYS LYS LYS ALA VAL TRP HIS LYS LEU LEU SER LYS T3708 A3709 L3710 D3717 E3718 D3719 Y3720	ARG THR LYS LYS ARG ARG GLY ASP ARG TYR SER VAL GLN THR MET HIS VAL ILE GLU ILE T3273 E3286 P3289 P3292 P3293 P3294 P3297 P3301 P3302 P3303 W3313 SER LEU LEU GLY ASP GLY ASN ILE LEU R3321 A3339 VAL PHE ALA ASP SER PRO ILE G3565 S3566 P3567 Q3572 MET ALA	G3363 ARG LEU ARG K3367 Q3378 L3379 R3380 L3381 E3389 GLY GLU LEU VAL ARG ASP GLU PHE SER VAL GLN THR MET HIS VAL ILE GLU ILE T3273 E3286 P3289 P3292 P3293 P3294 P3297 P3301 P3302 P3303 W3313 SER LEU LEU GLY ASP GLY ASN ILE LEU R3321 A3339 VAL PHE ALA ASP SER PRO ILE G3565 S3566 P3567 Q3572 MET ALA	ASP ILE GLY GLY LEU ALA SER GLY SER GLY ALA TYR THR GLU MET HIS VAL ILE GLU ILE T3273 E3286 P3289 P3292 P3293 P3294 P3297 P3301 P3302 P3303 W3313 SER LEU LEU GLY ASP GLY ASN ILE LEU R3321 A3339 VAL PHE ALA ASP SER PRO ILE G3565 S3566 P3567 Q3572 MET ALA	L3169 S3174 T3178 LYS ASN THR TYR V3183 L3186 L3190 A3200 MET PRO VAL A3204 P3208 Y3213 S3217 VAL TYR THR THR LYS SER PRO ARG GLU ARG ALA ILE LEU GLY LEU PRO GLY ASP GLY ASN ILE LEU R3132 TYR VAL MET CYS PRO ASP GLY ASP PRO VAL ILE G3152 F3152 GLY ASP VAL LEU ASP ARG MET ALA	A3072 R3073 P3085 E3086 I3087 A3090 GLY LEU ARG SER PHE PHE GLU S3098 I3103 E3104 K3105 M3106 V3107 E3108 N3109 L3110 R3111 L3112 G3113 K3114 VAL SER GLN ALA PRO GLU ARG THR GLN VAL ILE LEU GLY LEU GLY ASP GLY ASN ILE LEU R3132 TYR VAL MET CYS PRO ASP GLY ASP PRO VAL ILE G3152 F3152 GLY ASP VAL LEU ASP ARG MET ALA	GLY ARG VAL GLU LYS SER PRO HIS GLY GLN ILE GLU ASN GLN TYR SER PHE THR PHE GLN LEU ILE PRO LEU ILE ASN GLN TYR SER PHE THR ALA PHE GLY PHE S3032 LEU GLN GLN THR VAL GLY LEU LEU SER TRP ASP ILE SER GLN PHE PHE H2883 N2884 G2887 R2888 K2897 H2902 P2903 L2904	L2905 V2906 P2907 T2910 K2914 A2917 R2920 A2923 V2937 G2940 LEU LYS ASP MET GLU LEU ASP ASN THR SER SER ILE GLY LYS SER ARG PHE ALA ALA PHE PHE S3032 LEU GLN GLN THR VAL GLY LEU LEU SER TRP ASP ILE SER GLN PHE PHE H2883 N2884 G2887 R2888 K2897 H2902 P2903 L2904	S2776 Y2777 G2778 E2779 K2786 T2787 H2788 P2789 M2790 L2791 R2792 P2793 P2809 E2830 GLU GLY ARG THR LYS LYS GLU LYS LYS THR THR ARG ILE SER GLN THR ALA ALA GLN THR Y2849 R2852 E2853 G2854 Y2855 N2856 P2857 Q2858 P2859 P2860 L2867 H2883 N2884 G2887 R2888 K2897 H2902 P2903 L2904
--	---	---	--	--	--	---	---	---	---	--	--	--	--	---

Y5014	E4948	LYS	A4810	ASP	L4670	SER	ALA	LEU	ASP	VAL	GLY	ALA	LEU	ASP	ALA	THR
Q5015	Q4949	CYS	A4811	LEU	F4671	GLY	GLY	LEU	ARG	ALA	GLY	ARG	LEU	ALA	ARG	ARG
E5016	Y4950	DYS	L4813	ALA	F4672	GLY	ALA	LEU	GLY	ALA	GLY	ARG	LEU	GLY	ALA	ARG
R5017	E4952	T	T4881	LEU	R4673	SER	SER	LEU	SER	GLY	GLY	LEU	LEU	GLY	LEU	ALA
D4953	D4953	Y	I4816	GLU	L4677	GLY	GLY	GLU	GLY	GLY	GLY	TRP	GLY	ASP	TRP	ALA
Y5018	E4954	Y	A4837	ILE		TRP	TRP	ILE	TRP	L4681	GLY	GLY	VAL	GLY	GLY	ALA
D5020	E4955	L	L4818	THR	L4681	TRP	GLY	THR	GLY	F4640	ASP	ASP	VAL	ASP	SER	ALA
F5021	T4956	L	A4819	ALA	F4682	SER	SER	ALA	SER	E4545	GLY	GLY	GLY	GLY	GLY	ARG
F5022	K4957	H	H4886	HIS	F4683	GLY	GLY	HIS	GLY	E4545	GLY	GLY	GLY	GLY	GLY	ARG
F5023	C4958	C	A4821	ASN	D4684	ALA	ALA	ASN	ALA	Y4649	GLY	VAL	VAL	VAL	GLY	ALA
A5024	F4959	Y	H4887	GLU	C4685	GLY	GLY	GLU	GLY	Y4649	GLY	GLY	GLY	ALA	GLY	ALA
G5025	I4960	Y	L4823	ARG	L4686	GLU	GLU	ARG	GLY	L4552	GLY	GLY	GLY	GLY	GLY	ARG
D5026	C4961	T	R4824	LYS	F4687	GLU	GLU	LYS	LEU	N4553	VAL	VAL	LEU	HIS	GLY	GLY
C5027	F4962	L	L4825	PRO	T4688	ASP	ALA	PRO	PRO	Y4554	VAL	VAL	LEU	GLY	GLY	GLY
F5028	G4963	R	A4832	PRO	E4690	GLY	GLY	ASP	GLY	L4555	GLY	GLY	GLY	GLY	GLY	TYR
R5029	S4965	C	S4829	PRO	Q4691	ASP	ASP	PRO	PRO	S4556	PRO	PRO	ALA	PRO	ALA	ARG
K5030	G4966	G	H4832	PRO	F4692	GLU	GLU	PRO	GLY	R4557	GLY	GLY	LYS	GLY	SER	ARG
Y5032	F4968	Y	N4833	GLY	D4696	ASP	GLY	GLY	ASP	N4558	PRO	GLY	LYS	GLY	LEU	LEU
E5033	D4969	L	G4834	LEU	F4697	LEU	LEU	LEU	GLY	F4559	GLY	GLY	VAL	GLY	VAL	ARG
T4970	E4908	E	K4835	LEU	Y4697	ASN	ASN	LEU	ASN	Y4560	PRO	GLY	THR	GLY	ARG	ARG
T4971	Y4909	Y	Q4836	THR	R4698	MET	MET	THR	MET	T4561	GLY	GLY	VAL	VAL	ARG	VAL
P4972	E4910	T	L4837	TEP	G4699			TEP		L4562	PRO	VAL	THR	VAL	ARG	VAL
H4973	H4973	L	V4838		Q4700						GLY	VAL	GLY	VAL	ARG	ARG
G4974	G4974	C	M4839		W4701						PRO	ALA	LEU	ALA	LEU	LEU
F4975	V4914	C	T4840		W4701						PRO	ALA	LEU	VAL	VAL	ARG
F4976	F4975	L			S4770						LYS	VAL	LEU	ALA	ALA	ARG
E4977	F4976	L									ALA	ALA	ALA	ASP	GLY	ARG
H4978	T4977	G	L4843		L4706						ALA	ASP	GLY	GLY	GLY	LEU
T4979	D4917	D	L4844		W4707						ASP	MET	PRO	GLY	GLY	THR
	I4918	T	A4845								GLY	GLY	GLY	GLY	GLY	THR
	T4919	T	V4846		F4711						GLY	GLY	GLY	GLY	GLY	THR
	F4920	L			L4777						GLY	GLY	GLY	GLY	GLY	THR
E4982	H4983	F	G4847		L4778						ASN	PHG	PRO	PHG	PRO	ARG
H4983	H4983	F	V4848		L4778						ASN	PHG	PRO	PHG	PRO	ARG
N4984	N4984	F	Y4849		K4779						GLY	ARG	THR	GLY	GLY	GLY
L4985	L4985	F	L4850		F4780						GLY	ARG	THR	GLY	GLY	GLY
A4986	A4986	F	L4851		G4781						GLY	ARG	THR	GLY	GLY	GLY
N4987	N4987	F	L4852		F4782						GLY	ARG	THR	GLY	GLY	GLY
Y4988	Y4988	F	V4853		L4783						GLY	ARG	THR	GLY	GLY	GLY
M4989	M4989	F	L4854		F4784						GLY	ARG	THR	GLY	GLY	GLY
F4990	F4990	F	A4855		L4927						GLY	ARG	THR	GLY	GLY	GLY
F4991	F4991	F	F4856		L4929						GLY	ARG	THR	GLY	GLY	GLY
											GLY	ARG	THR	GLY	GLY	GLY
Y4994	Y4994	F	A4857		F4789						GLY	ARG	THR	GLY	GLY	GLY
L4995	L4995	F	F4858		L4790						GLY	ARG	THR	GLY	GLY	GLY
I4996	I4996	F	F4859		Y4791						GLY	ARG	THR	GLY	GLY	GLY
N4997	N4997	F	Q4933								GLY	ARG	THR	GLY	GLY	GLY
N4998	N4998	F	Q4933		Y4794						GLY	ARG	THR	GLY	GLY	GLY
N4998	N4998	F	K4861		Y4795						GLY	ARG	THR	GLY	GLY	GLY
N4999	N4999	F	K4862		Y4796						GLY	ARG	THR	GLY	GLY	GLY
E5000	E5000	F	F4863		Y4797						GLY	ARG	THR	GLY	GLY	GLY
T5001	T5001	F	N4864		N4798						GLY	ARG	THR	GLY	GLY	GLY
E5002	E5002	F	K4865		S4799						GLY	ARG	THR	GLY	GLY	GLY
H5003	H5003	F	S4866		L4800						GLY	ARG	THR	GLY	GLY	GLY
			E4867		L4801						GLY	ARG	THR	GLY	GLY	GLY
			D4868		G4802						GLY	ARG	THR	GLY	GLY	GLY
Q5006	Q5006	L	GLU		H4803						GLY	ARG	THR	GLY	GLY	GLY
E5007	E5007	F	ASP		L4738						GLY	ARG	THR	GLY	GLY	GLY
S5008	S5008	F	GLU		E4739						GLY	ARG	THR	GLY	GLY	GLY
Y5009	Y5009	F	N4805		N4805						GLY	ARG	THR	GLY	GLY	GLY
D4945	D4945	P	N4806		L4741						GLY	ARG	THR	GLY	GLY	GLY
Q4946	Q4946	F	F4807		G4742						GLY	ARG	THR	GLY	GLY	GLY
H5011	H5011	F	MET		W4743						GLY	ARG	THR	GLY	GLY	GLY

- Molecule 1: Ryanodine receptor 1

Chain D:  41% 21% 6% 31%

H151	S72	MET
P152	L73	GLY
A153	S74	ASP
		GLY
G160	A77	GLY
F161		GLU
K162		GLY
V163	R84	GLU
R164	THR	ASP
V165	VAL	GLU
G166	GLU	ASP
D167	ALA	VAL
D168	GLY	Q12
L169	VAL	
L170	GLU	R15
L171	SER	T16
V172	SER	D17
S173	GLN	
V174	GLY	V20
S175	GLY	V21
E176	GLY	L22
S177	HIS	Q23
E178	ARG	C24
R178	T100	S25
V179		A26
L180	Y103	T27
H181	G104	V28
L182	H105	
S183	A106	E31
T184		Q32
ALA	R110	L33
GLY	H111	R34
SER	A112	L35
GLU	H113	C36
LEU	H114	L37
GLN	R115	A38
VAL	H116	A39
ASP	Y117	E40
ALA	L118	G41
SER	S119	F42
LEU	G120	G43
PHE	L121	N44
M196	T122	
	T123	C47
W200		
	D129	P51
N203	K130	
	L131	A55
E211	A132	
G212	F133	V58
T213		P59
V214	G136	P60
T215	L137	
		I64
H218	A141	C65
V219		C66
L220		F67
ARG	C146	T68
LEU	W147	L69
PHE	W148	T149
HIS	W150	O71
C226		




K2914	K2786	Y2691	ALA	GLN	GLU	ALA	G2202	GLN	ASN	GLU	L1815	E1741	T1635	V1561																																																																																																																																																																																																																																																																
															HIS	PRO	LYS	E2205	S2093	MET	ASP	T1636																																																																																																																																																																																																																																																								
															GLN	PRO	GLY	T2206	V2102	LEU	GLU	A1818																																																																																																																																																																																																																																																								
															GLN	GLU	TYR			GLU	ALA	F1564																																																																																																																																																																																																																																																								
															ILE	GLU	PRO			GLU	GLU	E1565																																																																																																																																																																																																																																																								
															ILE	ASN	ASP			GLU	GLU	LEU																																																																																																																																																																																																																																																								
															GLN	ARG	ILE			GLU	GLU	GLY																																																																																																																																																																																																																																																								
															PRO	VAL	GLY			GLU	GLU	GLY																																																																																																																																																																																																																																																								
															PRO	LEU	GLY			GLU	GLU	GLN																																																																																																																																																																																																																																																								
															ASP	LEU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2920	P2789	A2699	Y2575	ALA	SER	G2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2923	P2793	L2710	V2586	GLU	HIS	S2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2937	P2808	V2937	G2540	GLU	HIS	S2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2940	P2793	L2710	V2586	GLU	HIS	S2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2943	P2793	L2710	V2586	GLU	HIS	S2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K2946	P2793	L2710	V2586	GLU	HIS	S2501	GLY	Q2111	ASP	PRO	D1827	G1751	N1645	LVS																																																																																																																																																																																																																																																																
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
															GLN	GLU	ASN			GLU	GLU	ASN																																																																																																																																																																																																																																																								
K3060	A3061	A3063	V3064	VAL	D3060	A3061	P3062	A3072	L3071	R3073	P3085	E3086	F3087	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032	I3039	R3039	S3032	G3029	S3032

[illegible]

M5019	M4954	Y4883	M4817	ILE	E4682	SER	E4545	GLY	GLY
	D5020	F4885	M4818	THR	F4683	GLY		GLY	
F5021	T4956	F4886	G4819	ALA	D4684	ALA	V4549	GLU	GLU
F5022	K4957	M4886	V4820	HIS	G4685	GLY		GLU	GLU
P5023	C4958	M4887	K4821	ASN	L4686	GLU	L4552	VAL	LEU
	A5024	Y4888	T4822	GLU	Y4687	GLU		M4553	VAL
G5025	F4959	V4889	L4823	ARG	L4688	ALA	L4554	PRO	PRO
D5026	C4961	G4890	R4824	LYS	T4689	GLU	L4555	GLY	GLY
C5027	G4891	V4891	T4825	PRO	E4690	GLY	S4556	PRO	PRO
	G4964	R4892		ASP	Q4691	ASP	R4557	GLU	GLU
F5028	S4965		S4829	PRO	P4692	GLU	N4558	PRO	PRO
R5029	D4966	C4894		PRO		GLU	F4559	GLU	GLU
K5030			H4832	PRO	D4696	GLY	F4560	GLY	GLY
Q5031	Y4967		M4833	GLY	Y4697	ASN	T4561	GLY	GLY
Y5032	F4968		G4834	LEU	K4698	MET	L4562	PRO	PRO
D5033	D4969		K4835	LEU	G4699			GLY	GLY
E5034	T4970		Q4836	THR	Q4700			GLY	GLY
ASP	T4971		L4837	TRP	W4701			GLY	GLY
	P4972		V4838	T4768				GLY	GLY
GLN	H4973		M4839	M4769	V4705			GLY	GLY
LEU	L4911		L4840	S4770	M4707			GLY	GLY
SER	G4974							LYS	LYS
	F4975	V4914						ASP	ASP
GLU	E4976	V4915						GLY	GLY
	T4977	F4916	L4843	V4773	T4708			VAL	VAL
H4978	H4978	D4917	L4844	K4774	P4709			GLY	GLY
T4979		I4918	A4845	Y4775	S4710			GLY	GLY
		T4919	E4846	Q4776	F4711			ASN	ASN
		F4920	V4847	I4777				GLY	GLY
E4982		F4921	V4848	I4778	M4714			GLY	GLY
H4983		F4922	Y4849	K4779	Y4715			LYS	LYS
N4984		F4923	L4850	F4780	D4716			GLY	GLY
L4985		V4924	Y4851	Q4781	M4717			VAL	VAL
A4986		N4987	T4852	V4782	K4718			SER	SER
N4987		I4925	V4853	I4783	F4719			ASP	ASP
Y4988		V4926	V4854	F4784	V4720			GLY	GLY
E4989		I4927	L4854		K4721			PRO	PRO
F4990		L4928	A4855	F4789				ALA	ALA
F4991		L4929	F4856	L4790	L4725			PRO	PRO
		A4930	N4857	L4791	L4726			GLY	GLY
Y4994		I4931	F4858	Y4791				GLY	GLY
L4995		I4932	F4859					ASP	ASP
I4996		Q4933	R4860	W4794	D4726			PRO	PRO
N4997		G4934	K4861	Y4795	K4728			LYS	LYS
K4998		L4935	F4862	M4796	H4729			GLY	GLY
D4999		I4936	Y4863	V4797	D4730			ALA	ALA
E5000		I4937	M4864	M4798	I4731			SER	SER
T5001		D4938	K4865	S4799	F4732			ALA	ALA
E5002		A4939	S4866	L4800	G4733			SER	SER
H5003		F4940	E4867	L4801				PRO	PRO
		G4941	D4868	G4802				ASP	ASP
Q5006		E4942	GLU	H4803	T4737			ALA	ALA
E5007		L4943	ASP	Y4804	A4738			LYS	LYS
S5008		R4944		M4805	E4739			GLY	GLY
Y5009		D4945	GLU	N4806	L4740			GLY	GLY
V5010		Q4946	PRO	M4806	L4741			ALA	ALA
W5011		Q4947	ASP	F4807	G4742			SER	SER
		E4948	MET	LYS	M4743			GLY	GLY
Y5014		Q4949	LYS	A4810	ASP			GLY	GLY
Q5015		V4950	CYS	A4811	K4672			ALA	ALA
E5016		K4951	D4877	H4812	B4673			SER	SER
R5017		E4952		L4813				GLY	GLY
C5018		C4882	T4881	I4816				TRP	TRP
								GLY	GLY
								ALA	ALA
								VAL	VAL
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY
								GLY	GLY

4 Experimental information

Property	Value	Source
Reconstruction method	Not provided	Depositor
Imposed symmetry	POINT, Not provided	Depositor
Number of images used	41743	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	Not provided	Depositor
Microscope	FEI TITAN KRIOS	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	Not provided	Depositor
Minimum defocus (nm)	1000	Depositor
Maximum defocus (nm)	4000	Depositor
Magnification	100286	Depositor
Image detector	Not provided	Depositor

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	$\# Z > 2$	RMSZ	$\# Z > 2$
1	A	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	B	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	C	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
1	D	1.17	51/18508 (0.3%)	1.21	262/25601 (1.0%)
All	All	1.17	204/74032 (0.3%)	1.21	1048/102404 (1.0%)

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	A	1	3
1	B	1	3
1	C	1	3
1	D	1	3
All	All	4	12

The worst 5 of 204 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	A	4859	PHE	CA-CB	-43.48	0.58	1.53
1	B	4859	PHE	CA-CB	-43.48	0.58	1.53
1	C	4859	PHE	CA-CB	-43.48	0.58	1.53
1	D	4859	PHE	CA-CB	-43.48	0.58	1.53
1	A	4691	GLN	CA-CB	-40.95	0.63	1.53

The worst 5 of 1048 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	A	2047	GLU	N-CA-CB	-38.23	41.78	110.60
1	C	2047	GLU	N-CA-CB	-38.23	41.78	110.60
1	D	2047	GLU	N-CA-CB	-38.23	41.78	110.60

Continued on next page...

Continued from previous page...

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
1	B	2047	GLU	N-CA-CB	-38.22	41.80	110.60
1	A	4168	GLU	N-CA-CB	-30.53	55.64	110.60

All (4) chirality outliers are listed below:

Mol	Chain	Res	Type	Atom
1	A	4691	GLN	CA
1	B	4691	GLN	CA
1	C	4691	GLN	CA
1	D	4691	GLN	CA

5 of 12 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	A	2192	TYR	Mainchain
1	A	2586	VAL	Peptide
1	A	4091	LYS	Peptide
1	B	2192	TYR	Mainchain
1	B	2586	VAL	Peptide

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	18404	0	9770	2060	0
1	B	18404	0	9770	2067	0
1	C	18404	0	9770	2068	0
1	D	18404	0	9770	2069	0
All	All	73616	0	39080	8025	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 71.

The worst 5 of 8025 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:4978:HIS:HE2	1:D:4983:HIS:CD2	1.11	1.67
1:A:4235:VAL:HG21	1:A:5019:TRP:CZ3	1.15	1.67
1:C:4115:SER:HA	1:C:4128:PHE:CZ	1.23	1.66
1:A:4978:HIS:HE2	1:A:4983:HIS:CD2	1.11	1.66
1:B:4978:HIS:HE2	1:B:4983:HIS:CD2	1.11	1.65

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	3311/5037 (66%)	2865 (86%)	203 (6%)	243 (7%)	1	19
1	B	3311/5037 (66%)	2865 (86%)	204 (6%)	242 (7%)	1	19
1	C	3311/5037 (66%)	2865 (86%)	203 (6%)	243 (7%)	1	19
1	D	3311/5037 (66%)	2864 (86%)	205 (6%)	242 (7%)	1	19
All	All	13244/20148 (66%)	11459 (86%)	815 (6%)	970 (7%)	2	19

5 of 970 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	16	THR
1	A	25	SER
1	A	26	ALA
1	A	44	ASN
1	A	67	PHE

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	317/4276 (7%)	225 (71%)	92 (29%)	0	3
1	B	317/4276 (7%)	229 (72%)	88 (28%)	0	4
1	C	317/4276 (7%)	229 (72%)	88 (28%)	0	4
1	D	317/4276 (7%)	228 (72%)	89 (28%)	0	3
All	All	1268/17104 (7%)	911 (72%)	357 (28%)	2	3

5 of 357 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	B	4931	ILE
1	C	4108	ILE
1	D	4916	PHE
1	B	4948	GLU
1	C	478	PHE

Some sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 44 such sidechains are listed below:

Mol	Chain	Res	Type
1	B	4833	ASN
1	C	3833	GLN
1	D	4806	ASN
1	B	4857	ASN
1	C	1702	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 carbohydrates 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.