



wwPDB EM Validation Summary Report ⓘ

Nov 4, 2024 – 01:57 am GMT

PDB ID : 8RRV
EMDB ID : EMD-19466
Title : Structure of RyR1 in detergent in close state in complex with FKBP and Nb9657.
Authors : Li, C.; Efremov, R.G.
Deposited on : 2024-01-23
Resolution : 3.20 Å(reported)

This is a wwPDB EM Validation Summary Report for a publicly released PDB entry.

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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 : 0.0.1.dev113
MolProbity : 4.02b-467
Percentile statistics : 20231227.v01 (using entries in the PDB archive December 27th 2023)
MapQ : 1.9.13
Ideal geometry (proteins) : Engh & Huber (2001)
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)
Validation Pipeline (wwPDB-VP) : 2.39

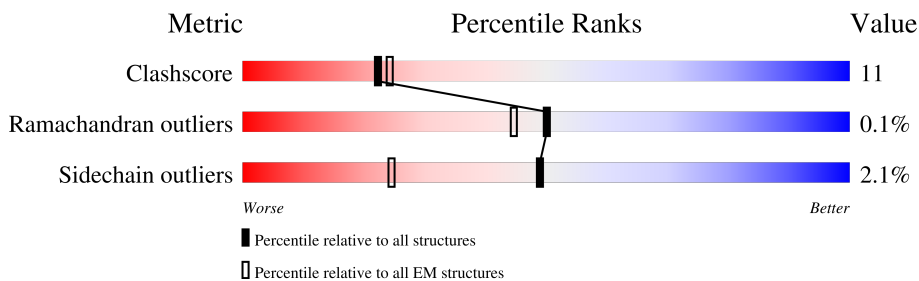
1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

ELECTRON MICROSCOPY

The reported resolution of this entry is 3.20 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.



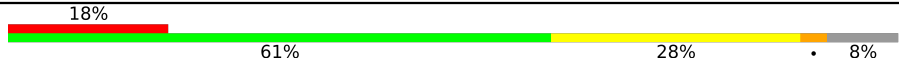

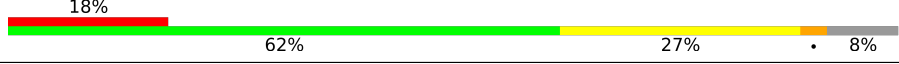
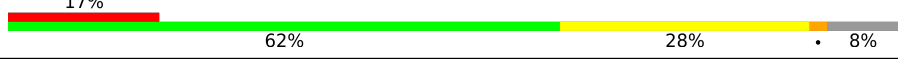
Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	210492	15764
Ramachandran outliers	207382	16835
Sidechain outliers	206894	16415

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 $\leq 5\%$. The upper red bar (where present) indicates the fraction of residues that have poor fit to the EM map (all-atom inclusion $< 40\%$). The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	B	5037	
1	E	5037	
1	G	5037	
1	J	5037	
2	A	107	
2	D	107	
2	H	107	
2	I	107	

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Mol	Chain	Length	Quality of chain
3	C	137	
3	F	137	
3	K	137	
3	M	137	

2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 142968 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
			Total	C	N	O	S		
1	B	4290	33956	21639	5852	6236	229	1	0
1	E	4290	33956	21639	5852	6236	229	1	0
1	G	4290	33956	21639	5852	6236	229	1	0
1	J	4290	33956	21639	5852	6236	229	1	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
B	3221	SER	THR	conflict	UNP P11716
E	3221	SER	THR	conflict	UNP P11716
G	3221	SER	THR	conflict	UNP P11716
J	3221	SER	THR	conflict	UNP P11716

- Molecule 2 is a protein called Peptidyl-prolyl cis-trans isomerase FKBP1B.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	A	107	818	516	144	154	4	0	0
2	D	107	818	516	144	154	4	0	0
2	H	107	818	516	144	154	4	0	0
2	I	107	818	516	144	154	4	0	0

There are 4 discrepancies between the modelled and reference sequences:

Chain	Residue	Modelled	Actual	Comment	Reference
A	100	ASP	GLY	conflict	UNP Q8HYX6

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Chain	Residue	Modelled	Actual	Comment	Reference
D	100	ASP	GLY	conflict	UNP Q8HYX6
H	100	ASP	GLY	conflict	UNP Q8HYX6
I	100	ASP	GLY	conflict	UNP Q8HYX6

- Molecule 3 is a protein called nanobody9657.

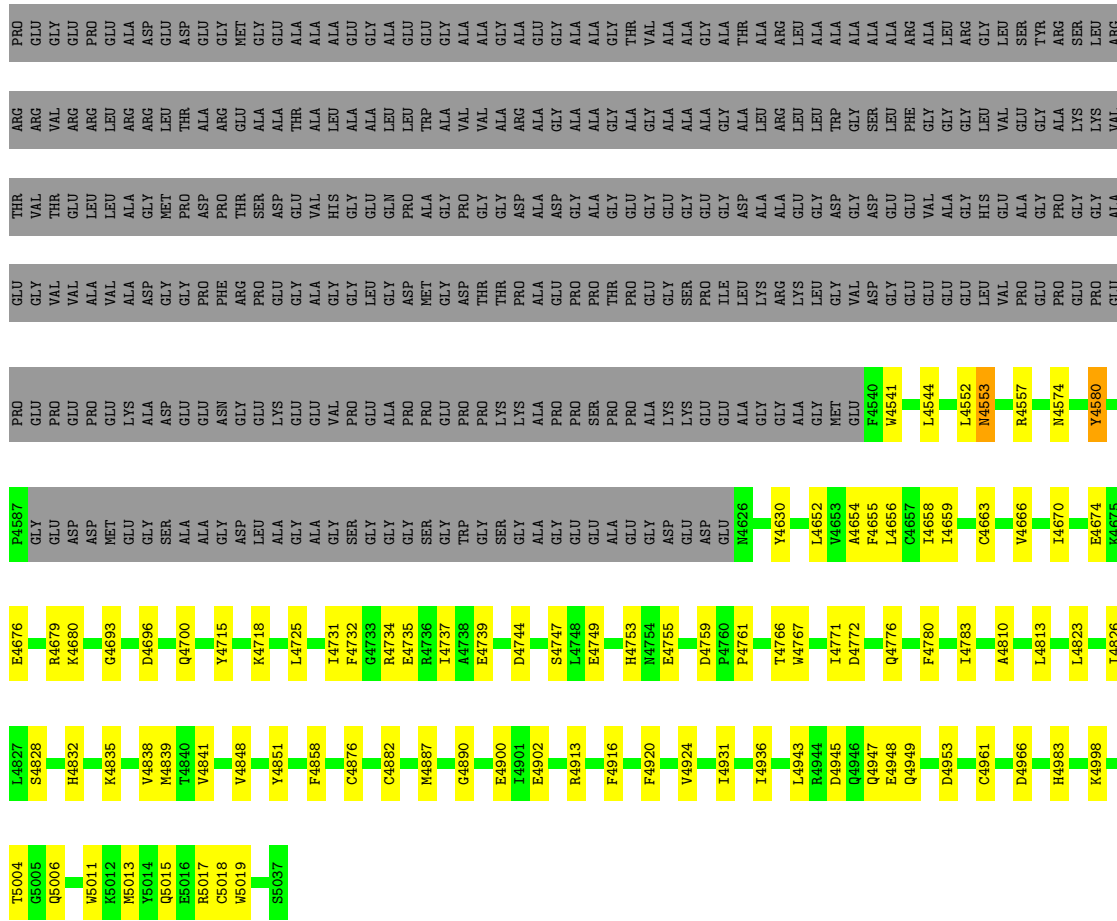
Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	C	126	967	597	170	195	5	0	0
3	F	126	967	597	170	195	5	0	0
3	K	126	967	597	170	195	5	0	0
3	M	126	967	597	170	195	5	0	0

- Molecule 4 is ZINC ION (three-letter code: ZN) (formula: Zn).

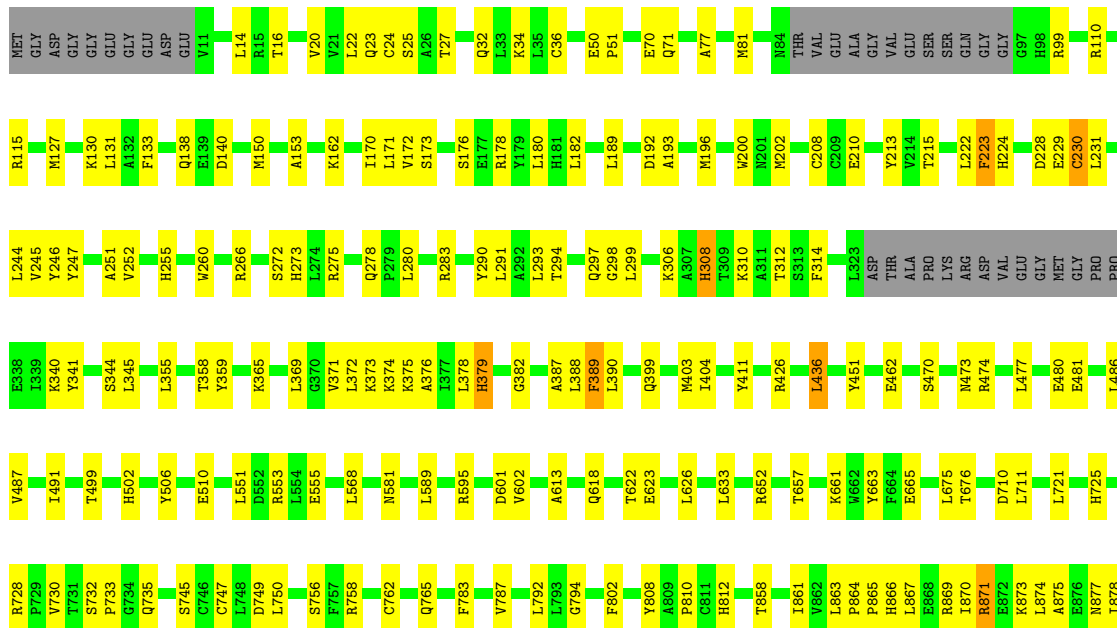
Mol	Chain	Residues	Atoms		AltConf
			Total	Zn	
4	B	1	1	1	0
4	E	1	1	1	0
4	G	1	1	1	0
4	J	1	1	1	0

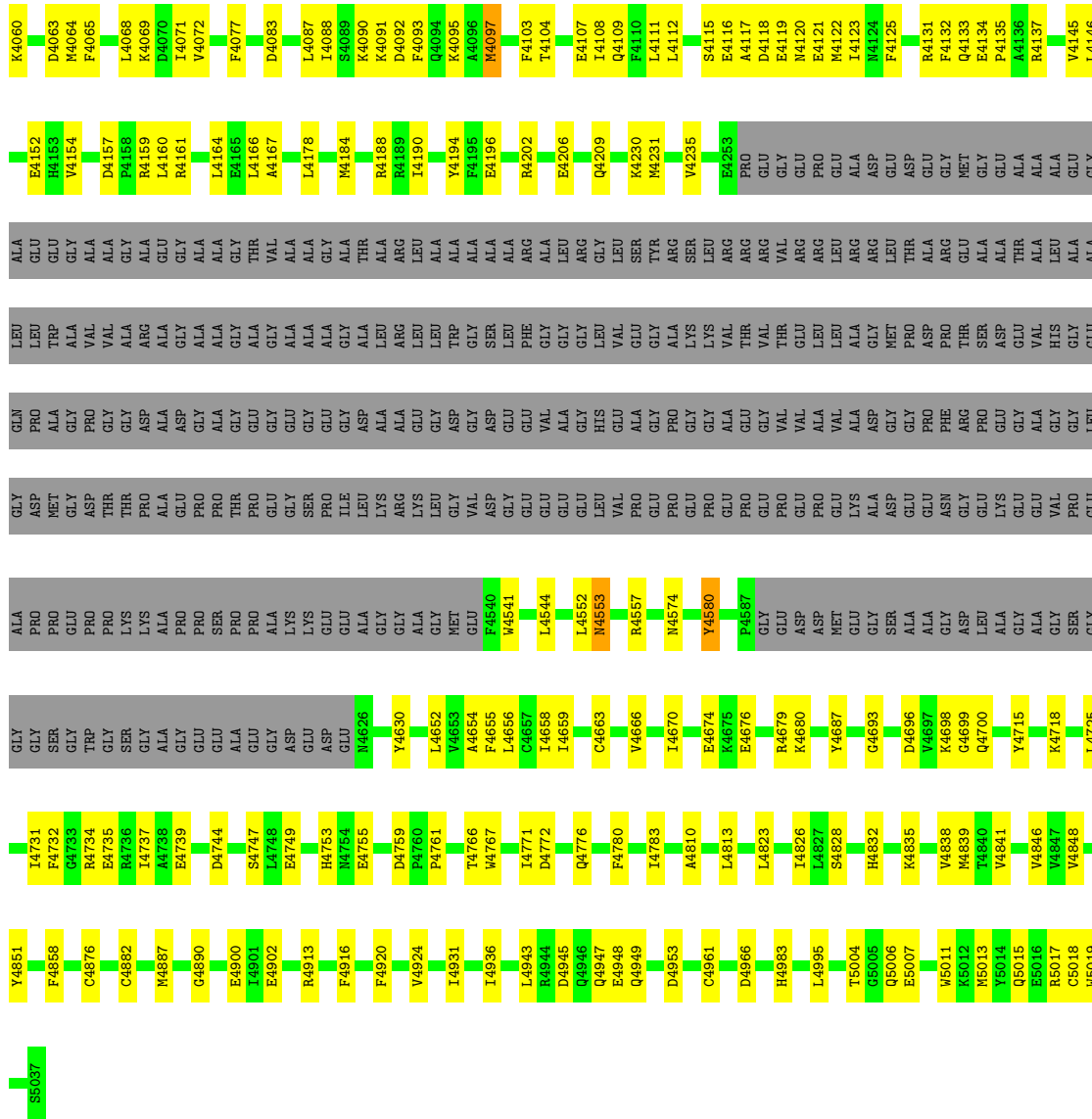
F2973	L2974	A2975	E2976	S2977	P2978	T2979	H2980	R2981	K2982	E2983	D2984	N2985	Q2986	F2987	Y2988	M2989	I2990	V2991	L2992	P2993	S2994	T2995	H2996	R2997	K2998	E2999	D3000	N3001	Q3002	F3003	Y3004	M3005	I3006	V3007	L3008	P3009	S3010	T3011	C3012	L3013	A3014	F3015	Y3016	M3017	I3018	H3019	N3020	K3021	E3022	D3023	N3024	Q3025	F3026	Y3027	M3028	I3029	V3030	L3031	P3032	S3033	T3034	H3035	R3036	K3037	E3038	D3039	N3040	Q3041	F3042	Y3043	M3044	I3045	V3046	L3047	P3048	S3049	T3050	H3051	R3052	K3053	E3054	D3055	N3056	Q3057	F3058	Y3059	M3060	I3061	V3062	L3063	P3064	S3065	T3066	H3067	R3068	K3069	E3070	D3071	N3072	Q3073	F3074	Y3075	M3076	I3077	V3078	L3079	P3080	S3081	T3082	H3083	R3084	K3085	E3086	D3087	N3088	Q3089	F3090	Y3091	M3092	I3093	V3094	L3095	P3096	S3097	T3098	H3099	R3100	K3101	E3102	D3103	N3104	Q3105	F3106	Y3107	M3108	I3109	V3110	L3111	P3112	S3113	T3114	H3115	R3116	K3117	E3118	D3119	N3120	Q3121	F3122	Y3123	M3124	I3125	V3126	L3127	P3128	S3129	T3130	H3131	R3132	K3133	E3134	D3135	N3136	Q3137	F3138	Y3139	M3140	I3141	V3142	L3143	P3144	S3145	T3146	H3147	R3148	K3149	E3150	D3151	N3152	Q3153	F3154	Y3155	M3156	I3157	V3158	L3159	P3160	S3161	T3162	H3163	R3164	K3165	E3166	D3167	N3168	Q3169	F3170	Y3171	M3172	I3173	V3174	L3175	P3176	S3177	T3178	H3179	R3180	K3181	E3182	D3183	N3184	Q3185	F3186	Y3187	M3188	I3189	V3190	L3191	P3192	S3193	T3194	H3195	R3196	K3197	E3198	D3199	N3200	Q3201	F3202	Y3203	M3204	I3205	V3206	L3207	P3208	S3209	T3210	H3211	R3212	K3213	E3214	D3215	N3216	Q3217	F3218	Y3219	M3220	I3221	V3222	L3223	P3224	S3225	T3226	H3227	R3228	K3229	E3230	D3231	N3232	Q3233	F3234	Y3235	M3236	I3237	V3238	L3239	P3240	S3241	T3242	H3243	R3244	K3245	E3246	D3247	N3248	Q3249	F3250	Y3251	M3252	I3253	V3254	L3255	P3256	S3257	T3258	H3259	R3260	K3261	E3262	D3263	N3264	Q3265	F3266	Y3267	M3268	I3269	V3270	L3271	P3272	S3273	T3274	H3275	R3276	K3277	E3278	D3279	N3280	Q3281	F3282	Y3283	M3284	I3285	V3286	L3287	P3288	S3289	T3290	H3291	R3292	K3293	E3294	D3295	N3296	Q3297	F3298	Y3299	M3300	I3301	V3302	L3303	P3304	S3305	T3306	H3307	R3308	K3309	E3310	D3311	N3312	Q3313	F3314	Y3315	M3316	I3317	V3318	L3319	P3320	S3321	T3322	H3323	R3324	K3325	E3326	D3327	N3328	Q3329	F3330	Y3331	M3332	I3333	V3334	L3335	P3336	S3337	T3338	H3339	R3340	K3341	E3342	D3343	N3344	Q3345	F3346	Y3347	M3348	I3349	V3350	L3351	P3352	S3353	T3354	H3355	R3356	K3357	E3358	D3359	N3360	Q3361	F3362	Y3363	M3364	I3365	V3366	L3367	P3368	S3369	T3370	H3371	R3372	K3373	E3374	D3375	N3376	Q3377	F3378	Y3379	M3380	I3381	V3382	L3383	P3384	S3385	T3386	H3387	R3388	K3389	E3390	D3391	N3392	Q3393	F3394	Y3395	M3396	I3397	V3398	L3399	P3400	S3401	T3402	H3403	R3404	K3405	E3406	D3407	N3408	Q3409	F3410	Y3411	M3412	I3413	V3414	L3415	P3416	S3417	T3418	H3419	R3420	K3421	E3422	D3423	N3424	Q3425	F3426	Y3427	M3428	I3429	V3430	L3431	P3432	S3433	T3434	H3435	R3436	K3437	E3438	D3439	N3440	Q3441	F3442	Y3443	M3444	I3445	V3446	L3447	P3448	S3449	T3450	H3451	R3452	K3453	E3454	D3455	N3456	Q3457	F3458	Y3459	M3460	I3461	V3462	L3463	P3464	S3465	T3466	H3467	R3468	K3469	E3470	D3471	N3472	Q3473	F3474	Y3475	M3476	I3477	V3478	L3479	P3480	S3481	T3482	H3483	R3484	K3485	E3486	D3487	N3488	Q3489	F3490	Y3491	M3492	I3493	V3494	L3495	P3496	S3497	T3498	H3499	R3500	K3501	E3502	D3503	N3504	Q3505	F3506	Y3507	M3508	I3509	V3510	L3511	P3512	S3513	T3514	H3515	R3516	K3517	E3518	D3519	N3520	Q3521	F3522	Y3523	M3524	I3525	V3526	L3527	P3528	S3529	T3530	H3531	R3532	K3533	E3534	D3535	N3536	Q3537	F3538	Y3539	M3540	I3541	V3542	L3543	P3544	S3545	T3546	H3547	R3548	K3549	E3550	D3551	N3552	Q3553	F3554	Y3555	M3556	I3557	V3558	L3559	P3560	S3561	T3562	H3563	R3564	K3565	E3566	D3567	N3568	Q3569	F3570	Y3571	M3572	I3573	V3574	L3575	P3576	S3577	T3578	H3579	R3580	K3581	E3582	D3583	N3584	Q3585	F3586	Y3587	M3588	I3589	V3590	L3591	P3592	S3593	T3594	H3595	R3596	K3597	E3598	D3599	N3600	Q3601	F3602	Y3603	M3604	I3605	V3606	L3607	P3608	S3609	T3610	H3611	R3612	K3613	E3614	D3615	N3616	Q3617	F3618	Y3619	M3620	I3621	V3622	L3623	P3624	S3625	T3626	H3627	R3628	K3629	E3630	D3631	N3632	Q3633	F3634	Y3635	M3636	I3637	V3638	L3639	P3640	S3641	T3642	H3643	R3644	K3645	E3646	D3647	N3648	Q3649	F3650	Y3651	M3652	I3653	V3654	L3655	P3656	S3657	T3658	H3659	R3660	K3661	E3662	D3663	N3664	Q3665	F3666	Y3667	M3668	I3669	V3670	L3671	P3672	S3673	T3674	H3675	R3676	K3677	E3678	D3679	N3680	Q3681	F3682	Y3683	M3684	I3685	V3686	L3687	P3688	S3689	T3690	H3691	R3692	K3693	E3694	D3695	N3696	Q3697	F3698	Y3699	M3700	I3701	V3702	L3703	P3704	S3705	T3706	H3707	R3708	K3709	E3710	D3711	N3712	Q3713	F3714	Y3715	M3716	I3717	V3718	L3719	P3720	S3721	T3722	H3723	R3724	K3725	E3726	D3727	N3728	Q3729	F3730	Y3731	M3732	I3733	V3734	L3735	P3736	S3737	T3738	H3739	R3740	K3741	E3742	D3743	N3744	Q3745	F3746	Y3747	M3748	I3749	V3750	L3751	P3752	S3753	T3754	H3755	R3756	K3757	E3758	D3759	N3760	Q3761	F3762	Y3763	M3764	I3765	V3766	L3767	P3768	S3769	T3770	H3771	R3772	K3773	E3774	D3775	N3776	Q3777	F3778	Y3779	M3780	I3781	V3782	L3783	P3784	S3785	T3786	H3787	R3788	K3789	E3790	D3791	N3792	Q3793	F3794	Y3795	M3796	I3797	V3798	L3799	P3799	S3800	T3800	H3801	R3802	K3803	E3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A4117	D4022	M3875	S3752	T3471	ALA	D3310	A3228	L3129	A3048	Q2962	H2886
D4118	M4023	D3878	F3753	S3474	GLU	H3311	I3229	L3137	L3049	L2963	L2963
E4119	E3754	E3878	L3542	S3474	GLU	L3312	L3230	L3138	V3050	L2964	L2964
M4120	E3755	E3878	D3544	L3542	GLY	M3313	G3231	R3051	R3051	R2965	R2889
E4121	Q3882	Q3882	F3545	S3474	ARG	S3314	L3232	V3139	H3052	V2967	K2891
M4122	E3757	E3878	D3546	S3474	ARG	L3315	P3233	L3140	R3053	M2967	L2894
L4123	M3758	E3878	E3547	M3758	MET	M3316	M3234	T3141	V3054	D2968	L2894
M4124	E3759	E3878	E3548	ALA	ALA	M3318	S3235	T3142	S3055	I2969	L2901
F4125	K3760	F3899	V3549	L3549	LYS	I3319	E3238	L3143	L3056	S2970	T2901
R4131	K3761	F3899	R3550	L3549	LYS	L3320	E3238	F3144	F3057	Q2971	H2902
F4132	Q3761	F3899	E3551	GLY	GLY	R3321	M3239	Q3145	A2975	E2972	H2903
Q4133	R3762	F3899	F3552	ASP	ASP	I3322	I3243	H3146	D3060	F2973	D2909
E4134	L3763	F3899	L3553	ALA	ALA	A3323	L3243	H3147	A3061	T2974	D2909
E4135	Q3765	F3899	Q3554	GLN	GLN	M3325	I3243	A3148	F3062	A2975	T2910
F4135	M3765	F3899	M3554	GLN	GLN	M3326	L3246	A3149	A3063	L2912	T2910
R4136	H3658	H3658	L3408	GLY	GLY	L3327	D3247	V3064	V3064	T2912	L2912
R4137	L3659	L3659	L3408	GLY	GLY	R3328	R3248	H3150	V3065	E2978	T2912
M4145	H3659	H3659	L3411	ASP	ASP	I3329	R3248	H3150	V3065	E2978	T2912
L4146	Y3642	Y3642	L3411	ASP	ASP	D3330	A3261	D3154	V3065	E2978	T2912
V4154	M3651	M3651	Y3416	GLN	GLN	E3331	R3262	V3163	L3068	S2989	A2913
D4157	E3655	E3655	D3417	ARG	ARG	A3332	R3262	V3163	H3069	P2990	K2914
M4064	S3656	S3656	R3420	THR	THR	V3333	Y3263	R3167	L3070	P2990	K2914
F4065	M3782	M3782	A3421	LYS	LYS	V3334	T3264	T3168	A3072	E2915	E2915
L4068	R3787	R3787	H3422	LYS	LYS	R3337	P3267	L3169	R3074	K2916	K2916
K4069	K3787	K3787	H3422	LYS	LYS	L3338	H3268	G3176	S3074	A2917	A2917
D4070	E3687	E3687	F3427	ARG	ARG	A3339	V3269	A3176	R3076	E2921	E2921
L4071	E3688	E3688	F3435	GLY	GLY	V3340	I3270	K3179	A3077	Q2924	Q2924
V4072	E3691	E3691	R3436	ASP	ASP	F3341	L3270	R3078	L3002	L2927	L2927
F4077	K3692	K3692	K3437	ARG	ARG	A3342	I3272	V3183	P3004	L2928	L2928
L4083	K3694	K3694	K3437	ARG	ARG	Q3343	T3273	E3184	L3005	K2928	K2928
L4087	D3696	D3696	L3441	TYR	TYR	R3350	L3274	K3185	L3006	L2931	L2931
E4088	H3704	H3704	F3442	ARG	ARG	P3351	F3275	L3186	R3007	H2932	H2932
S4089	H3704	H3704	F3442	ARG	ARG	F3352	L3276	R3187	R3008	H2932	H2932
R4188	L3842	L3842	L3444	GLY	GLY	L3353	L3277	C3193	F3010	H2933	H2933
R4189	D3843	D3843	V3445	GLY	GLY	L3353	G3278	L3194	F3010	H2933	H2933
I4190	L3844	L3844	V3445	GLY	GLY	L3354	S3279	A3195	T3011	G2934	G2934
D4092	Q3850	Q3850	S3446	L3509	L3509	H3355	Y3280	A3195	L3018	Y2935	Y2935
F4093	Q3850	Q3850	S3446	L3509	L3509	H3355	Y3280	A3195	L3018	Y2935	Y2935
Y4194	Q3850	Q3850	S3446	L3509	L3509	H3355	Y3280	A3195	L3018	Y2935	Y2935
F4195	Q3850	Q3850	S3446	L3509	L3509	H3355	Y3280	A3195	L3018	Y2935	Y2935
E4196	M3858	M3858	E3454	L3518	L3518	R3364	E3286	R3287	H3030	L2936	L2936
K4095	VAL	VAL	E3455	P3519	P3519	L3365	R3287	R3287	H3030	L2936	L2936
M4097	ASN	ASN	E3456	P3519	P3519	R3366	R3287	R3287	H3030	L2936	L2936
R4202	GLU	GLU	Q3457	A3526	A3526	K3367	E3290	E3290	N3033	L2937	L2937
E4206	ASP	ASP	M3458	A3526	A3526	R3368	A3291	A3291	N3033	L2937	L2937
T4104	GLY	GLY	F3459	A3526	A3526	A3369	P3292	P3292	K3034	L2937	L2937
Q4209	THR	THR	V3459	D3529	D3529	V3372	P3293	P3293	E3035	L2937	L2937
E4107	VAL	VAL	R3462	Q3530	Q3530	E3376	P3294	P3294	E3037	L2937	L2937
I4108	ILE	ILE	E3463	Q3530	Q3530	E3376	A3295	A3295	M3038	L2937	L2937
Q4109	ASN	ASN	E3463	Q3530	Q3530	E3376	L3296	L3296	I3039	L2937	L2937
F4110	GLY	GLY	L3464	M3534	M3534	L3381	L3296	L3296	T3040	S2950	S2950
K4230	ARG	ARG	M3465	M3534	M3534	L3381	L3296	L3296	S3041	L2951	L2951
M4231	ALA	ALA	M3466	M3534	M3534	L3381	L3296	L3296	L3042	E2952	E2952
L4112	GLU	GLU	H3467	T3537	T3537	ALA	P3301	P3301	F3043	K2953	K2953
V4235	GLU	GLU	H3467	T3537	T3537	ALA	P3301	P3301	R2954	R2954	R2954
S4115	HIS	HIS	S3468	Y3540	Y3540	LYS	A3306	A3306	L3046	F2955	F2955
E4253	LYS	LYS	F3469	Y3540	Y3540	LYS	V3307	V3307	L3046	F2955	F2955
E4253	LEU	LEU	L3470	A3541	A3541	GLU	V3307	V3307	A3047	F2957	F2957

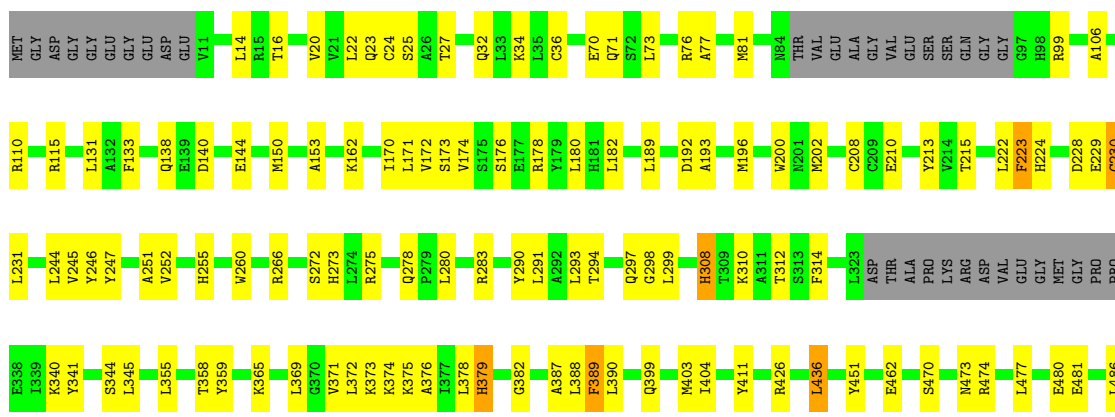


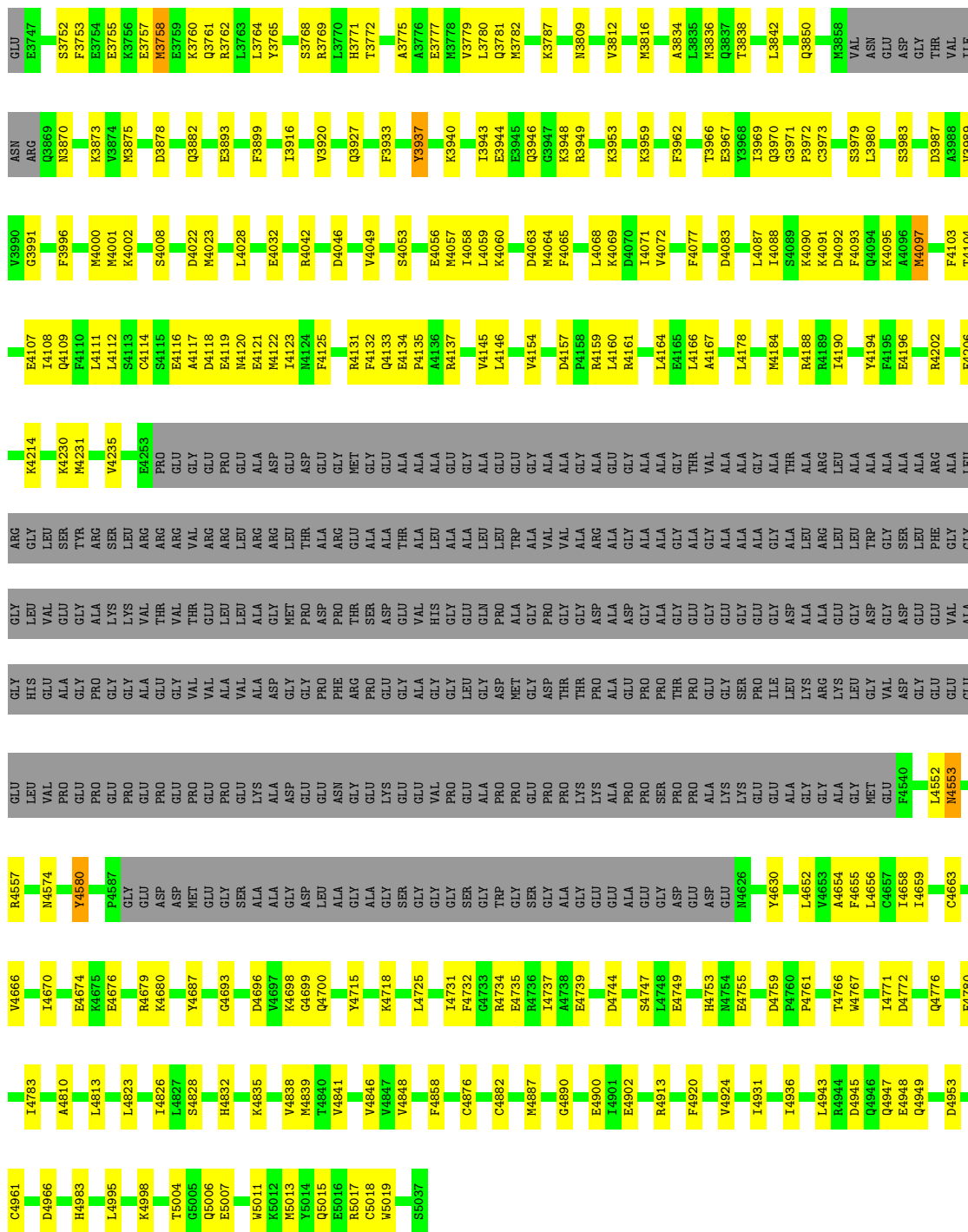
● Molecule 1: Ryanodine receptor 1



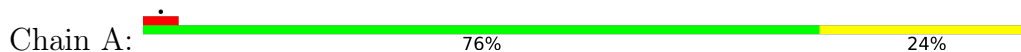


• Molecule 1: Ryanodine receptor 1

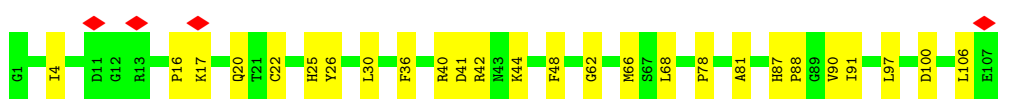
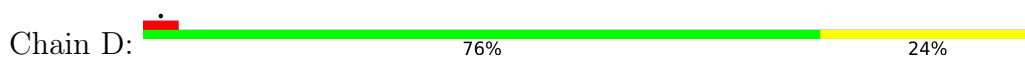




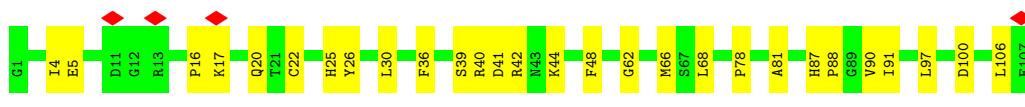
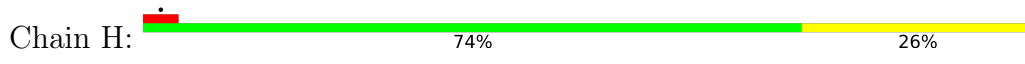
- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



- Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



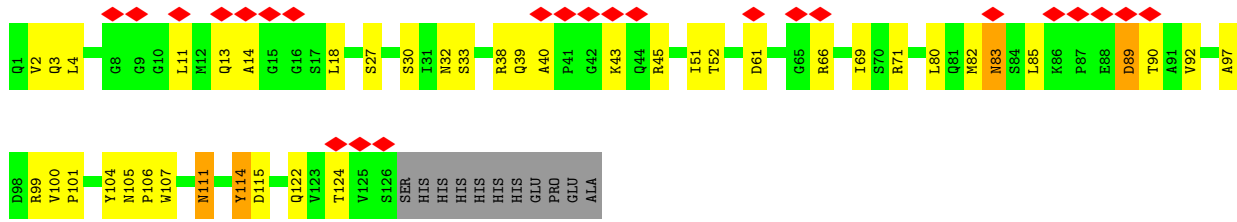
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



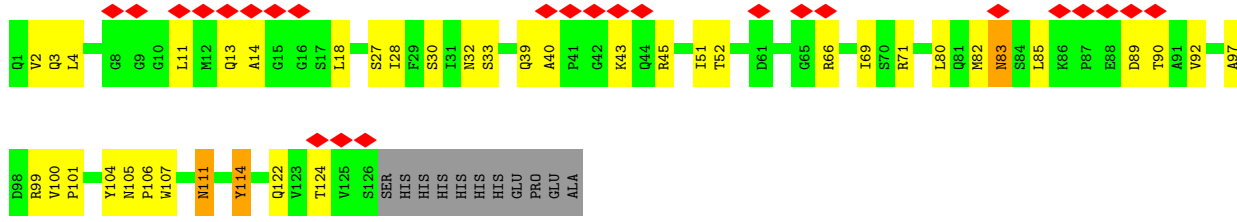
• Molecule 2: Peptidyl-prolyl cis-trans isomerase FKBP1B



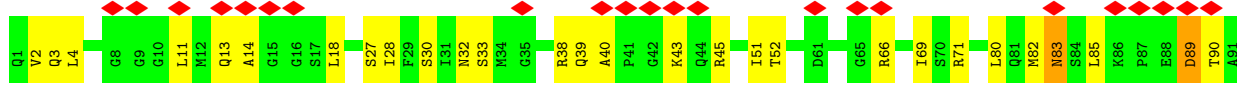
• Molecule 3: nanobody9657

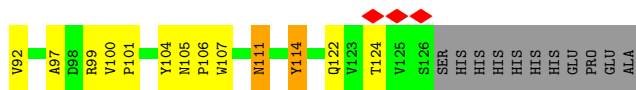


• Molecule 3: nanobody9657

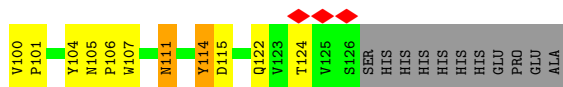
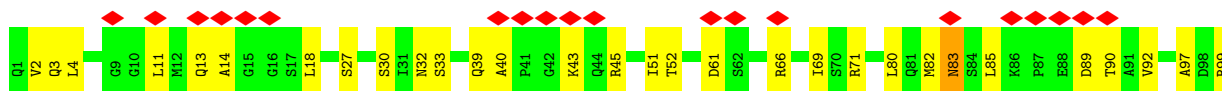


• Molecule 3: nanobody9657





• Molecule 3: nanobody9657



4 Experimental information

Property	Value	Source
EM reconstruction method	SINGLE PARTICLE	Depositor
Imposed symmetry	POINT, Not provided	
Number of particles used	171023	Depositor
Resolution determination method	FSC 0.143 CUT-OFF	Depositor
CTF correction method	PHASE FLIPPING AND AMPLITUDE CORRECTION	Depositor
Microscope	JEOL CRYO ARM 300	Depositor
Voltage (kV)	300	Depositor
Electron dose ($e^-/\text{\AA}^2$)	60	Depositor
Minimum defocus (nm)	1500	Depositor
Maximum defocus (nm)	2500	Depositor
Magnification	Not provided	
Image detector	GATAN K3 (6k x 4k)	Depositor
Maximum map value	6.350	Depositor
Minimum map value	-0.105	Depositor
Average map value	0.076	Depositor
Map value standard deviation	0.164	Depositor
Recommended contour level	0.35	Depositor
Map size (\AA)	499.96802, 499.96802, 499.96802	wwPDB
Map dimensions	336, 336, 336	wwPDB
Map angles ($^\circ$)	90.0, 90.0, 90.0	wwPDB
Pixel spacing (\AA)	1.488, 1.488, 1.488	Depositor

5 Model quality [i](#)

5.1 Standard geometry [i](#)

Bond lengths and bond angles in the following residue types are not validated in this section:
ZN

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	B	0.25	0/34727	0.50	2/47063 (0.0%)
1	E	0.25	0/34727	0.50	2/47063 (0.0%)
1	G	0.25	0/34727	0.50	2/47063 (0.0%)
1	J	0.25	0/34727	0.50	2/47063 (0.0%)
2	A	0.26	0/834	0.51	0/1123
2	D	0.26	0/834	0.51	0/1123
2	H	0.25	0/834	0.51	0/1123
2	I	0.26	0/834	0.51	0/1123
3	C	0.25	0/987	0.51	0/1340
3	F	0.25	0/987	0.51	0/1340
3	K	0.25	0/987	0.51	0/1340
3	M	0.25	0/987	0.51	0/1340
All	All	0.25	0/146192	0.50	8/198104 (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	B	1503	PRO	N-CA-CB	5.74	110.19	103.30
1	E	1503	PRO	N-CA-CB	5.74	110.19	103.30
1	G	1503	PRO	N-CA-CB	5.70	110.14	103.30
1	J	1503	PRO	N-CA-CB	5.70	110.14	103.30
1	E	4097	MET	CB-CG-SD	-5.16	96.94	112.40

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	B	33956	0	33378	744	0
1	E	33956	0	33378	756	0
1	G	33956	0	33378	749	0
1	J	33956	0	33378	765	0
2	A	818	0	824	17	0
2	D	818	0	824	17	0
2	H	818	0	824	19	0
2	I	818	0	824	19	0
3	C	967	0	916	36	0
3	F	967	0	916	34	0
3	K	967	0	916	36	0
3	M	967	0	916	36	0
4	B	1	0	0	0	0
4	E	1	0	0	0	0
4	G	1	0	0	0	0
4	J	1	0	0	0	0
All	All	142968	0	140472	3180	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 11.

The worst 5 of 3180 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:J:4961:CYS:SG	1:J:4983:HIS:CE1	2.58	0.97
1:B:4961:CYS:SG	1:B:4983:HIS:CE1	2.58	0.96
1:E:4961:CYS:SG	1:E:4983:HIS:CE1	2.58	0.96
1:G:4961:CYS:SG	1:G:4983:HIS:CE1	2.58	0.95
1:B:870:ILE:HA	1:B:873:LYS:HE2	1.57	0.86

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	B	4247/5037 (84%)	4148 (98%)	96 (2%)	3 (0%)	48	80
1	E	4247/5037 (84%)	4149 (98%)	96 (2%)	2 (0%)	100	100
1	G	4247/5037 (84%)	4148 (98%)	97 (2%)	2 (0%)	100	100
1	J	4247/5037 (84%)	4148 (98%)	97 (2%)	2 (0%)	100	100
2	A	105/107 (98%)	102 (97%)	3 (3%)	0	100	100
2	D	105/107 (98%)	102 (97%)	3 (3%)	0	100	100
2	H	105/107 (98%)	102 (97%)	3 (3%)	0	100	100
2	I	105/107 (98%)	102 (97%)	3 (3%)	0	100	100
3	C	124/137 (90%)	118 (95%)	6 (5%)	0	100	100
3	F	124/137 (90%)	118 (95%)	6 (5%)	0	100	100
3	K	124/137 (90%)	118 (95%)	6 (5%)	0	100	100
3	M	124/137 (90%)	117 (94%)	7 (6%)	0	100	100
All	All	17904/21124 (85%)	17472 (98%)	423 (2%)	9 (0%)	50	80

5 of 9 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	B	4117	ALA
1	E	4117	ALA
1	G	4117	ALA
1	J	4117	ALA
1	B	375	LYS

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	B	3658/4276 (86%)	3584 (98%)	74 (2%)	50	75
1	E	3658/4276 (86%)	3584 (98%)	74 (2%)	50	75
1	G	3658/4276 (86%)	3584 (98%)	74 (2%)	50	75
1	J	3658/4276 (86%)	3584 (98%)	74 (2%)	50	75
2	A	88/88 (100%)	87 (99%)	1 (1%)	70	86
2	D	88/88 (100%)	87 (99%)	1 (1%)	70	86
2	H	88/88 (100%)	87 (99%)	1 (1%)	70	86
2	I	88/88 (100%)	87 (99%)	1 (1%)	70	86
3	C	104/114 (91%)	99 (95%)	5 (5%)	21	55
3	F	104/114 (91%)	99 (95%)	5 (5%)	21	55
3	K	104/114 (91%)	99 (95%)	5 (5%)	21	55
3	M	104/114 (91%)	99 (95%)	5 (5%)	21	55
All	All	15400/17912 (86%)	15080 (98%)	320 (2%)	49	74

5 of 320 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
1	J	436	LEU
1	J	3933	PHE
1	J	1025	ARG
1	J	2738	ARG
3	C	3	GLN

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 57 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	877	ASN
1	J	4574	ASN
1	G	3150	HIS
1	J	3970	GLN
1	J	3150	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](#)

Of 4 ligands modelled in this entry, 4 are monoatomic - leaving 0 for Mogul analysis.

There are no bond length outliers.

There are no bond angle outliers.

There are no chirality outliers.

There are no torsion outliers.

There are no ring outliers.

No monomer is involved in short contacts.

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.

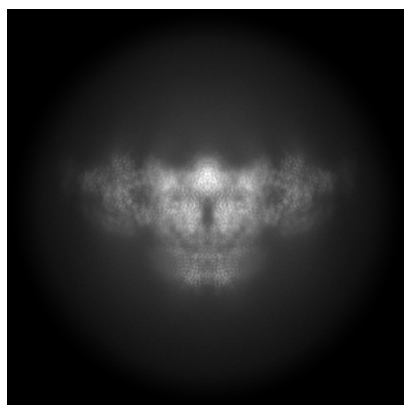
6 Map visualisation [i](#)

This section contains visualisations of the EMDB entry EMD-19466. These allow visual inspection of the internal detail of the map and identification of artifacts.

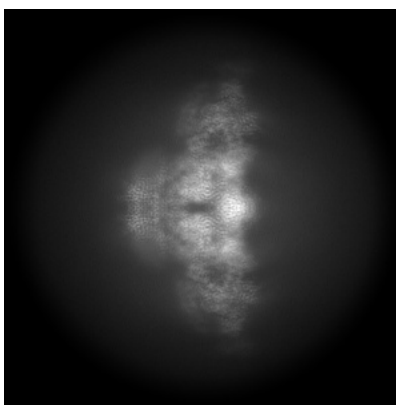
No raw map or half-maps were deposited for this entry and therefore no images, graphs, etc. pertaining to the raw map can be shown.

6.1 Orthogonal projections [i](#)

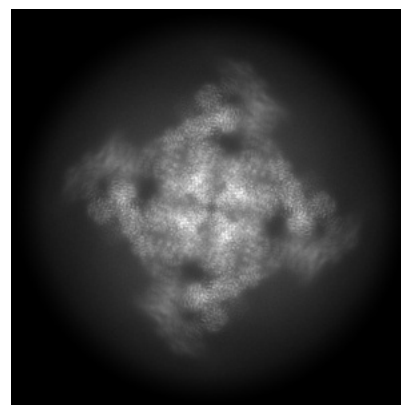
6.1.1 Primary map



X



Y

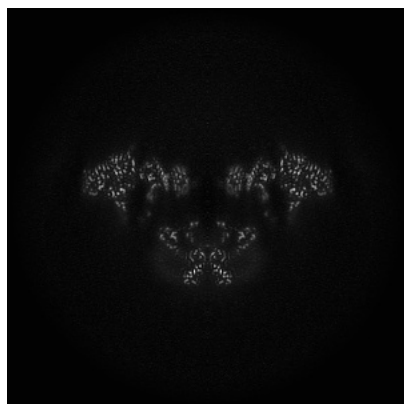


Z

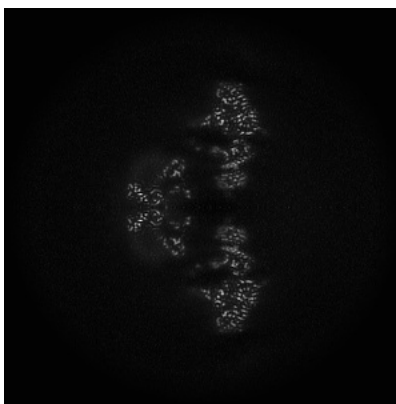
The images above show the map projected in three orthogonal directions.

6.2 Central slices [i](#)

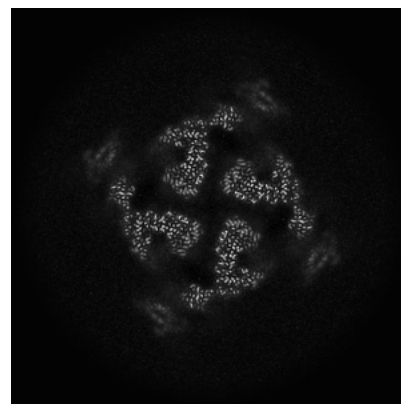
6.2.1 Primary map



X Index: 168



Y Index: 168

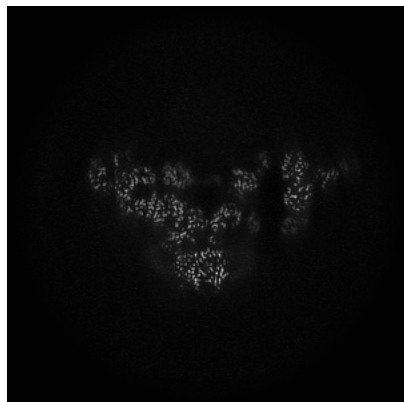


Z Index: 168

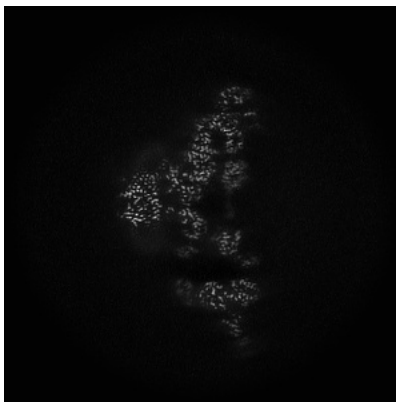
The images above show central slices of the map in three orthogonal directions.

6.3 Largest variance slices [i](#)

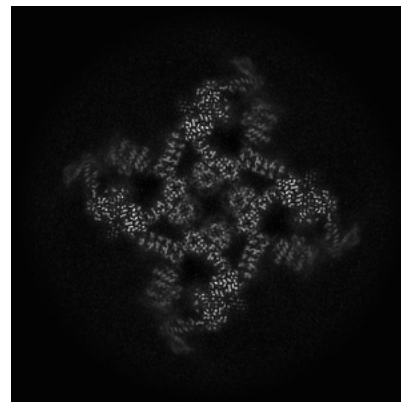
6.3.1 Primary map



X Index: 178



Y Index: 178

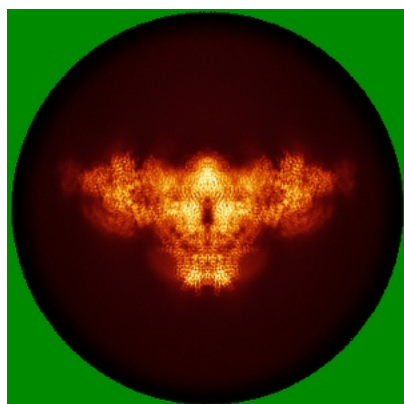


Z Index: 187

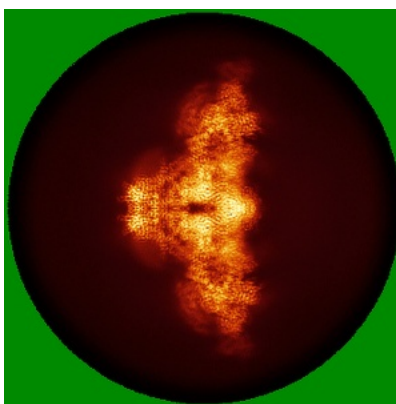
The images above show the largest variance slices of the map in three orthogonal directions.

6.4 Orthogonal standard-deviation projections (False-color) [i](#)

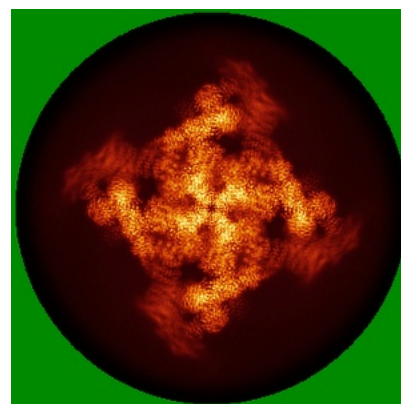
6.4.1 Primary map



X



Y

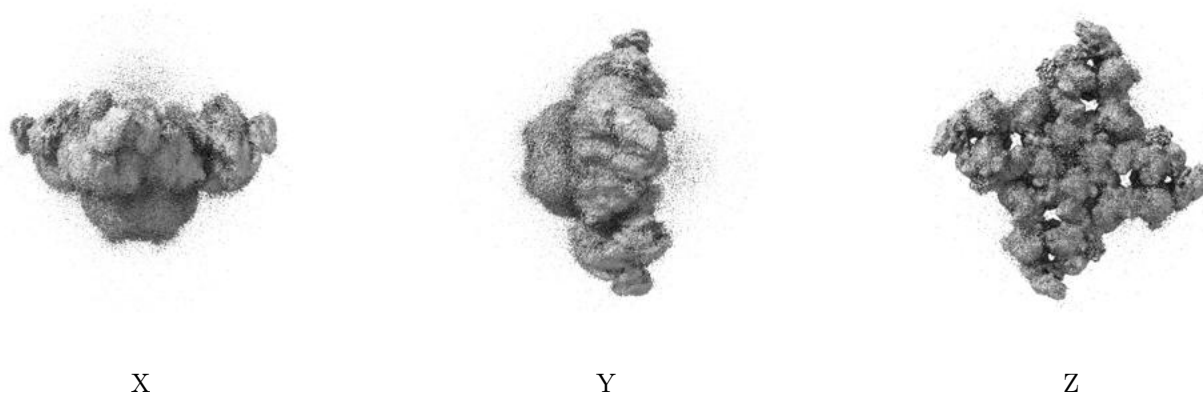


Z

The images above show the map standard deviation projections with false color in three orthogonal directions. Minimum values are shown in green, max in blue, and dark to light orange shades represent small to large values respectively.

6.5 Orthogonal surface views [i](#)

6.5.1 Primary map



The images above show the 3D surface view of the map at the recommended contour level 0.35. These images, in conjunction with the slice images, may facilitate assessment of whether an appropriate contour level has been provided.

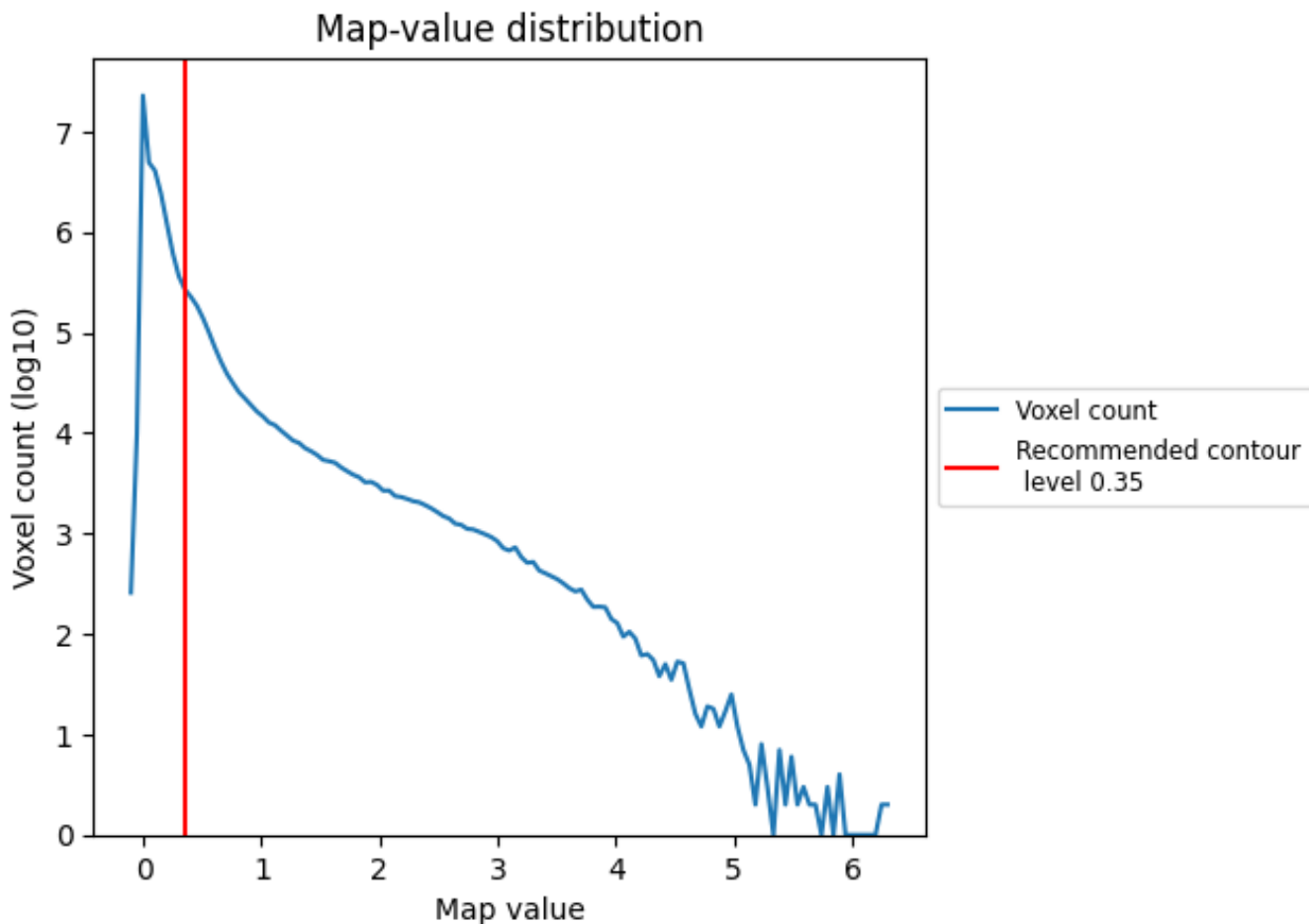
6.6 Mask visualisation [i](#)

This section was not generated. No masks/segmentation were deposited.

7 Map analysis [i](#)

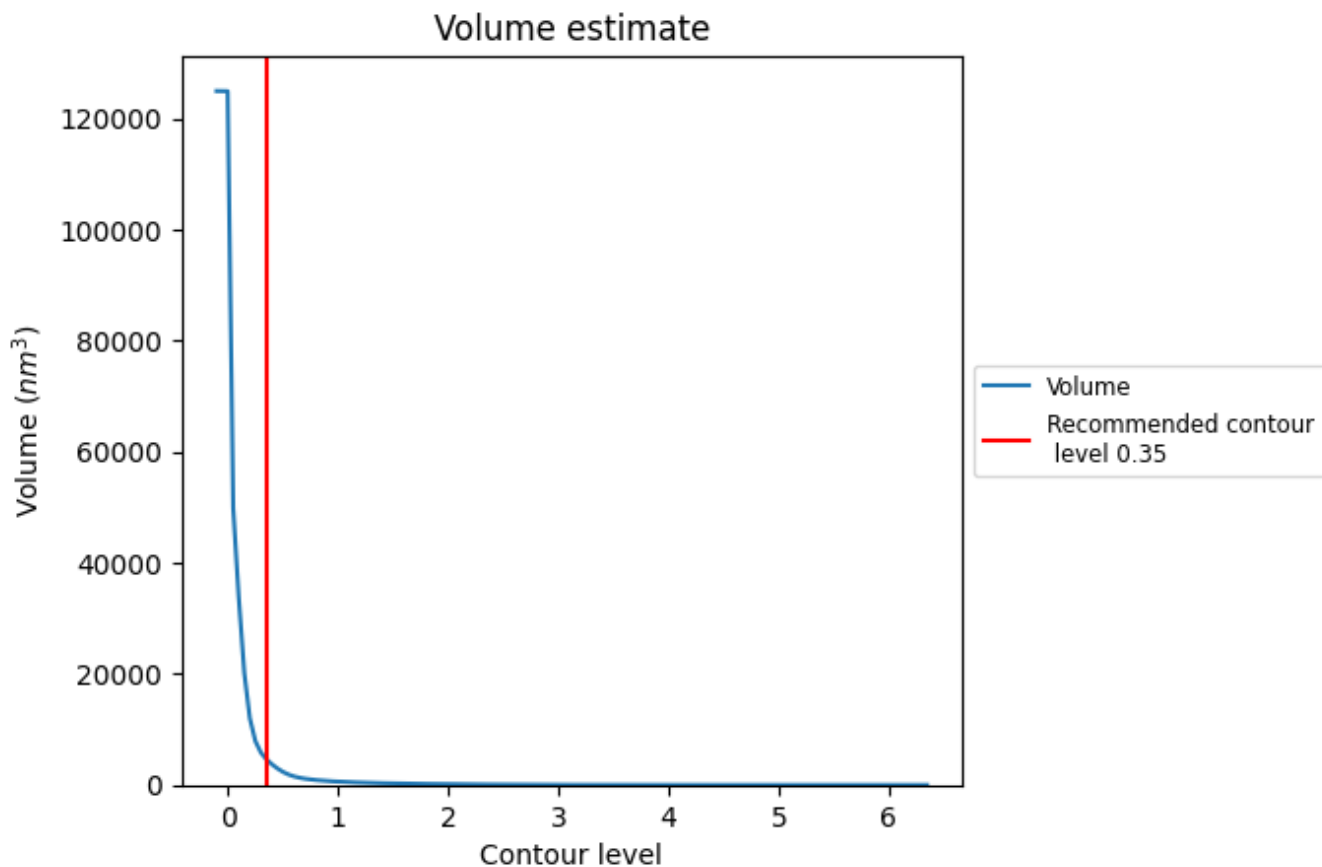
This section contains the results of statistical analysis of the map.

7.1 Map-value distribution [i](#)



The map-value distribution is plotted in 128 intervals along the x-axis. The y-axis is logarithmic. A spike in this graph at zero usually indicates that the volume has been masked.

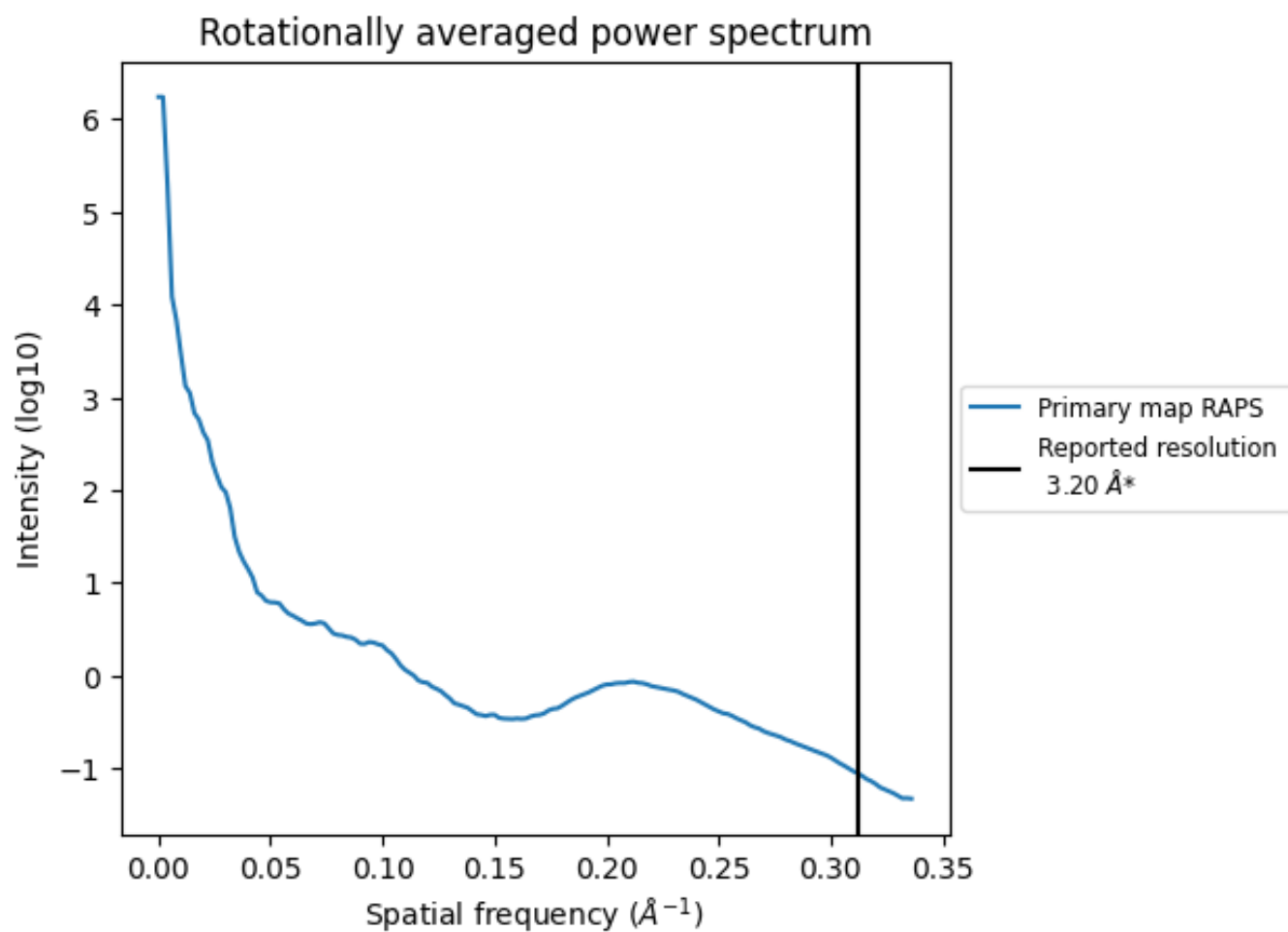
7.2 Volume estimate [i](#)



The volume at the recommended contour level is 4570 nm^3 ; this corresponds to an approximate mass of 4129 kDa.

The volume estimate graph shows how the enclosed volume varies with the contour level. The recommended contour level is shown as a vertical line and the intersection between the line and the curve gives the volume of the enclosed surface at the given level.

7.3 Rotationally averaged power spectrum [i](#)

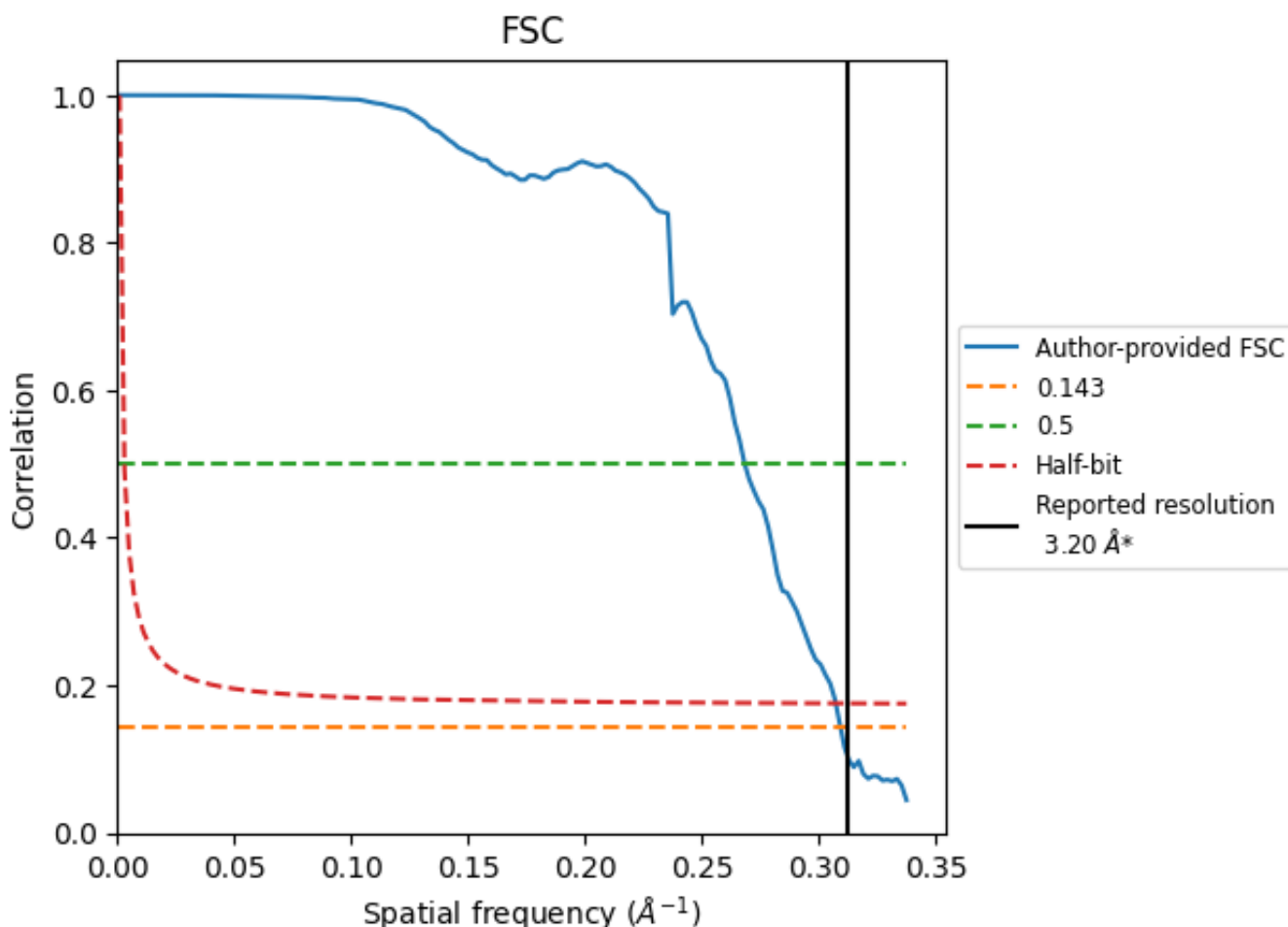


*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

8 Fourier-Shell correlation [i](#)

Fourier-Shell Correlation (FSC) is the most commonly used method to estimate the resolution of single-particle and subtomogram-averaged maps. The shape of the curve depends on the imposed symmetry, mask and whether or not the two 3D reconstructions used were processed from a common reference. The reported resolution is shown as a black line. A curve is displayed for the half-bit criterion in addition to lines showing the 0.143 gold standard cut-off and 0.5 cut-off.

8.1 FSC [i](#)



*Reported resolution corresponds to spatial frequency of 0.312 Å⁻¹

8.2 Resolution estimates [i](#)

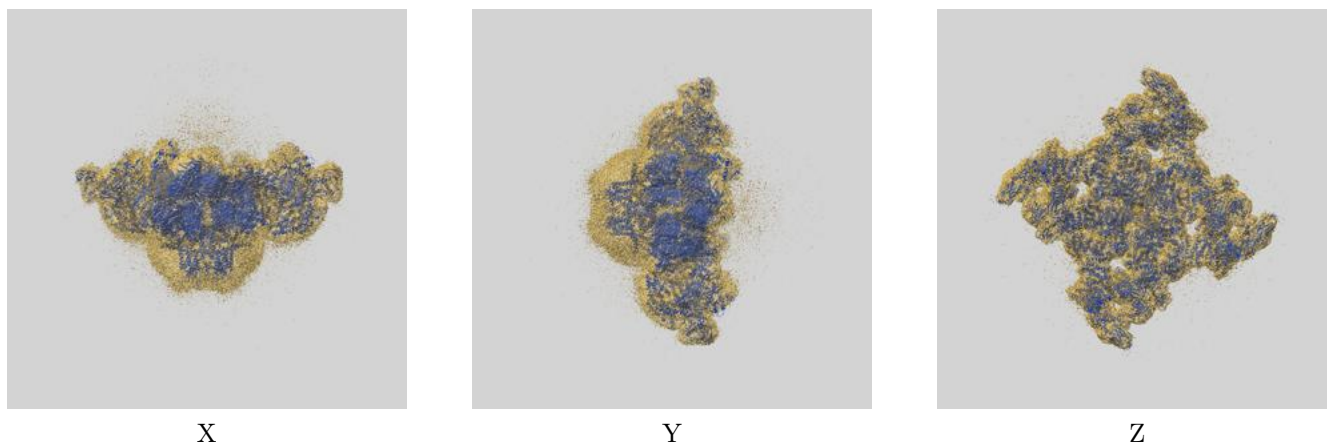
Resolution estimate (Å)	Estimation criterion (FSC cut-off)		
	0.143	0.5	Half-bit
Reported by author	3.20	-	-
Author-provided FSC curve	3.23	3.73	3.26
Unmasked-calculated*	-	-	-

*Resolution estimate based on FSC curve calculated by comparison of deposited half-maps.

9 Map-model fit [i](#)

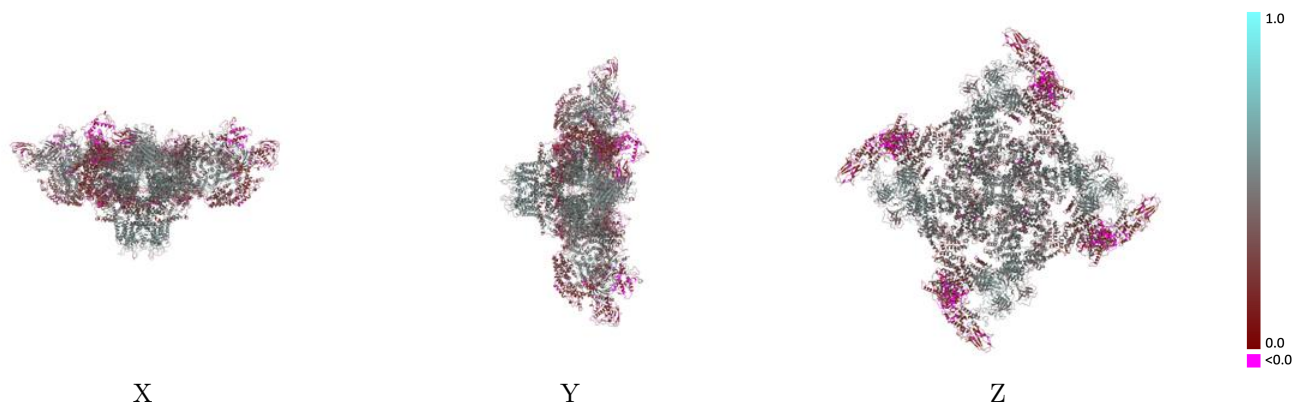
This section contains information regarding the fit between EMDB map EMD-19466 and PDB model 8RRV. Per-residue inclusion information can be found in section 3 on page 6.

9.1 Map-model overlay [i](#)



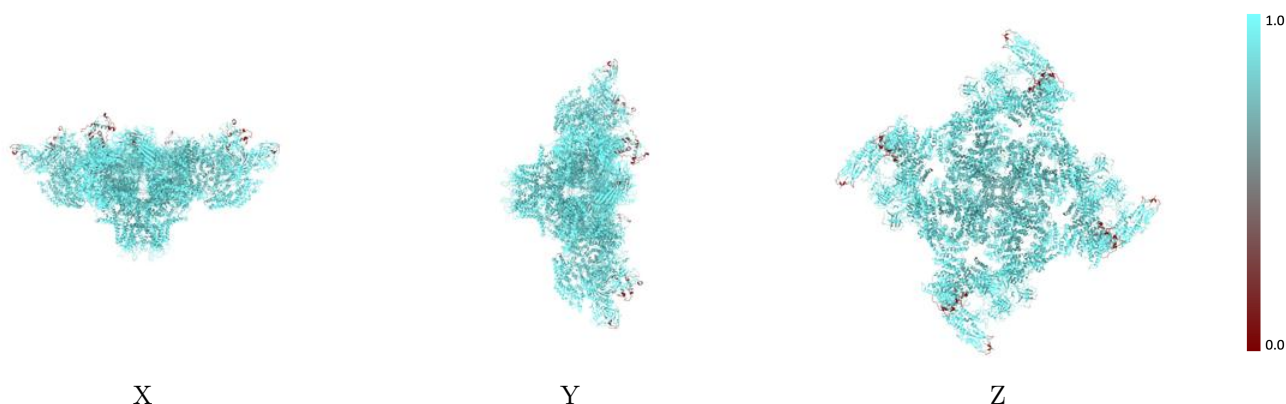
The images above show the 3D surface view of the map at the recommended contour level 0.35 at 50% transparency in yellow overlaid with a ribbon representation of the model coloured in blue. These images allow for the visual assessment of the quality of fit between the atomic model and the map.

9.2 Q-score mapped to coordinate model [i](#)



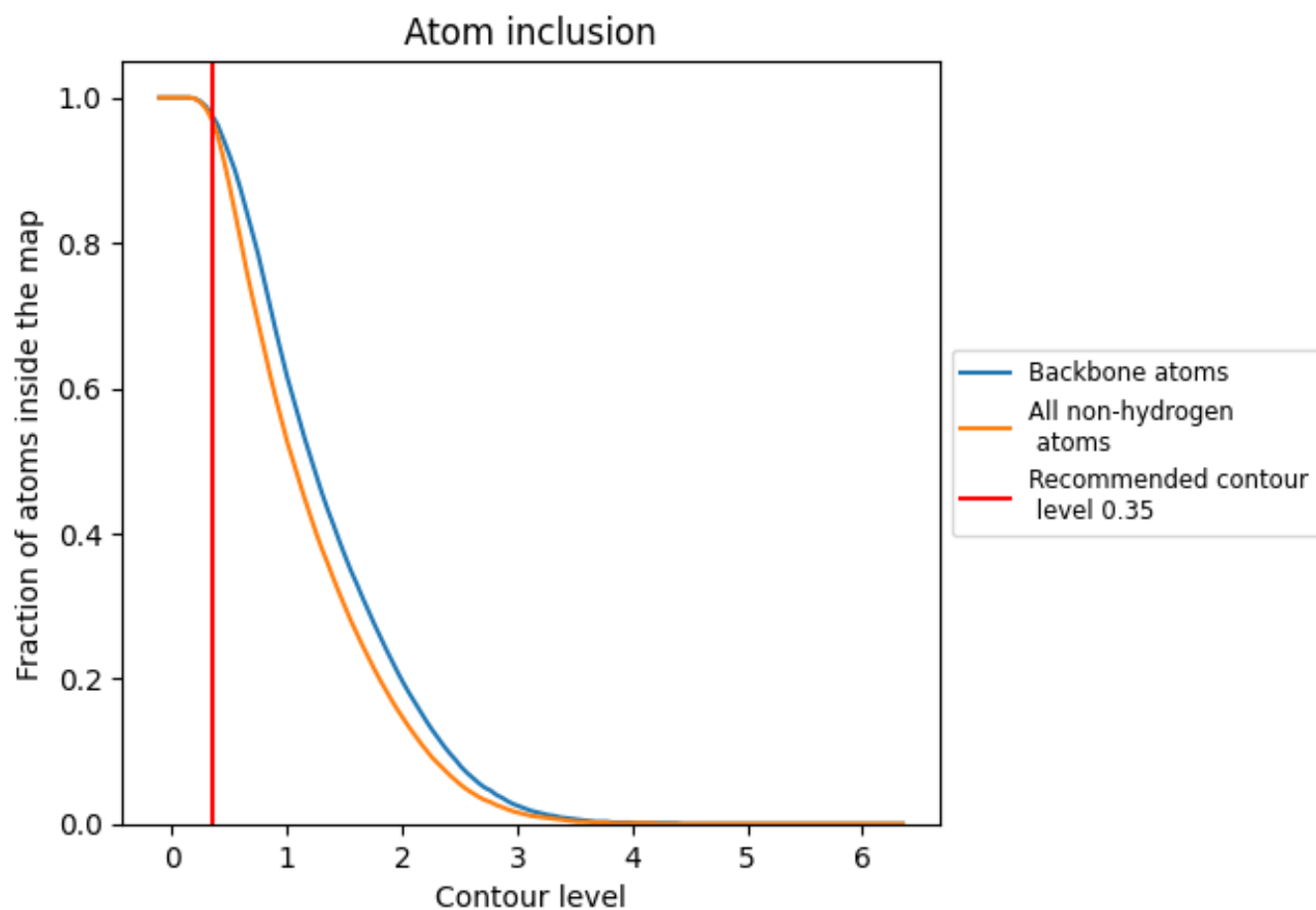
The images above show the model with each residue coloured according to its Q-score. This shows their resolvability in the map with higher Q-score values reflecting better resolvability. Please note: Q-score is calculating the resolvability of atoms, and thus high values are only expected at resolutions at which atoms can be resolved. Low Q-score values may therefore be expected for many entries.

9.3 Atom inclusion mapped to coordinate model [i](#)



The images above show the model with each residue coloured according to its atom inclusion. This shows to what extent they are inside the map at the recommended contour level (0.35).



























9.4 Atom inclusion [i](#)



At the recommended contour level, 98% of all backbone atoms, 97% of all non-hydrogen atoms, are inside the map.

9.5 Map-model fit summary

The table lists the average atom inclusion at the recommended contour level (0.35) and Q-score for the entire model and for each chain.

Chain	Atom inclusion	Q-score
All	 0.9700	 0.3800
A	 0.8810	 0.4120
B	 0.9770	 0.3850
C	 0.7720	 0.1480
D	 0.8780	 0.4170
E	 0.9780	 0.3850
F	 0.7760	 0.1480
G	 0.9770	 0.3850
H	 0.8860	 0.4150
I	 0.8810	 0.4170
J	 0.9770	 0.3860
K	 0.7770	 0.1480
M	 0.7720	 0.1500

