



# wwPDB X-ray Structure Validation Summary Report ⓘ

Sep 17, 2023 – 10:30 AM EDT

PDB ID : 4YFX  
Title : Escherichia coli RNA polymerase in complex with Myxopyronin B  
Authors : Molodtsov, V.; Fleming, P.R.; Eyermann, C.J.; Ferguson, A.D.; Foulk, M.A.;  
McKinney, D.C.; Masse, C.E.; Buurman, E.T.; Murakami, K.S.  
Deposited on : 2015-02-25  
Resolution : 3.84 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](mailto: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>.

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

MolProbity : 4.02b-467  
Mogul : 1.8.5 (274361), CSD as541be (2020)  
Xtriage (Phenix) : 1.13  
EDS : 2.35.1  
buster-report : 1.1.7 (2018)  
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

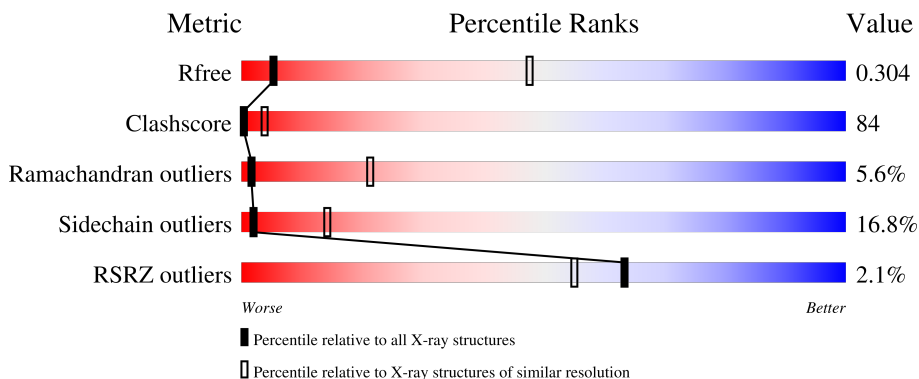
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*X-RAY DIFFRACTION*

The reported resolution of this entry is 3.84 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	1242 (4.08-3.60)
Clashscore	141614	1004 (4.04-3.64)
Ramachandran outliers	138981	1003 (4.06-3.62)
Sidechain outliers	138945	1266 (4.08-3.60)
RSRZ outliers	127900	1149 (4.08-3.60)

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  $\geq 3$ , 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 electron density. The numeric value is given above the bar.

Mol	Chain	Length	Quality of chain
1	A	329	
1	B	329	
1	G	329	
1	H	329	
2	C	1342	

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Mol	Chain	Length	Quality of chain
2	I	1342	<p>2% 20% 65% 14%</p>
3	D	1407	<p>12% 52% 17% 17%</p>
3	J	1407	<p>13% 53% 15% 18%</p>
4	E	91	<p>22% 67% 9%</p>
4	K	91	<p>8% 19% 60% 8% 13%</p>
5	F	613	<p>4% 16% 46% 12% 25%</p>
5	L	613	<p>3% 17% 48% 9% 25%</p>

## 2 Entry composition [i](#)

There are 8 unique types of molecules in this entry. The entry contains 55388 atoms, of which 33 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 DNA-directed RNA polymerase subunit alpha.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
1	A	229	Total 1779	C 1108	N 316	O 349	S 6	0	0	0
1	B	289	Total 2239	C 1403	N 393	O 435	S 8	0	0	0
1	G	227	Total 1755	C 1093	N 311	O 345	S 6	0	0	0
1	H	216	Total 1662	C 1038	N 292	O 326	S 6	0	0	0

- Molecule 2 is a protein called DNA-directed RNA polymerase subunit beta.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
2	C	1340	Total 10564	C 6628	N 1838	O 2055	S 43	0	0	0
2	I	1340	Total 10552	C 6621	N 1835	O 2053	S 43	0	0	0

- Molecule 3 is a protein called DNA-directed RNA polymerase subunit beta'.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
3	D	1166	Total 9062	C 5701	N 1622	O 1693	S 46	0	0	0
3	J	1155	Total 9021	C 5675	N 1617	O 1683	S 46	0	0	0

- Molecule 4 is a protein called DNA-directed RNA polymerase subunit omega.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
4	E	89	Total 691	C 421	N 129	O 140	S 1	0	0	0
4	K	79	Total 627	C 382	N 118	O 126	S 1	0	0	0

- Molecule 5 is a protein called RNA polymerase sigma factor RpoD.

Mol	Chain	Residues	Atoms					ZeroOcc	AltConf	Trace
			Total	C	N	O	S			
5	F	458	Total 3726	C 2332	N 668	O 703	S 23	0	0	0
5	L	458	Total 3640	C 2282	N 647	O 690	S 21	0	0	0

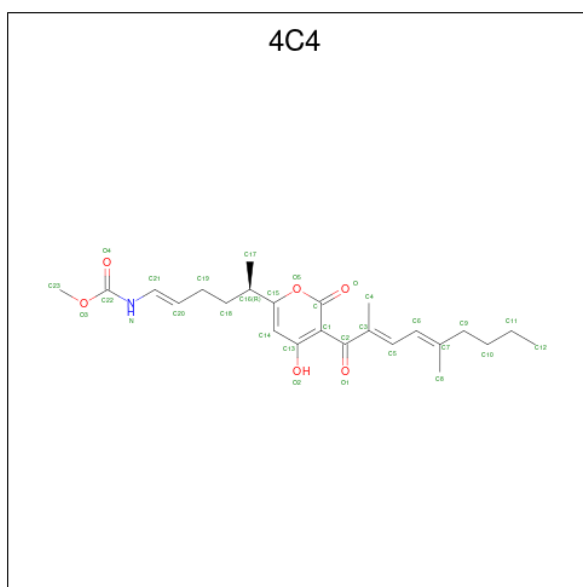
- Molecule 6 is MAGNESIUM ION (three-letter code: MG) (formula: Mg).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Mg		
6	D	1	Total 1	Mg 1	0	0
6	J	1	Total 1	Mg 1	0	0

- Molecule 7 is ZINC ION (three-letter code: ZN) (formula: Zn).

Mol	Chain	Residues	Atoms		ZeroOcc	AltConf
			Total	Zn		
7	D	2	Total 2	Zn 2	0	0
7	J	2	Total 2	Zn 2	0	0

- Molecule 8 is Myxopyronin B (three-letter code: 4C4) (formula: C<sub>24</sub>H<sub>33</sub>NO<sub>6</sub>).

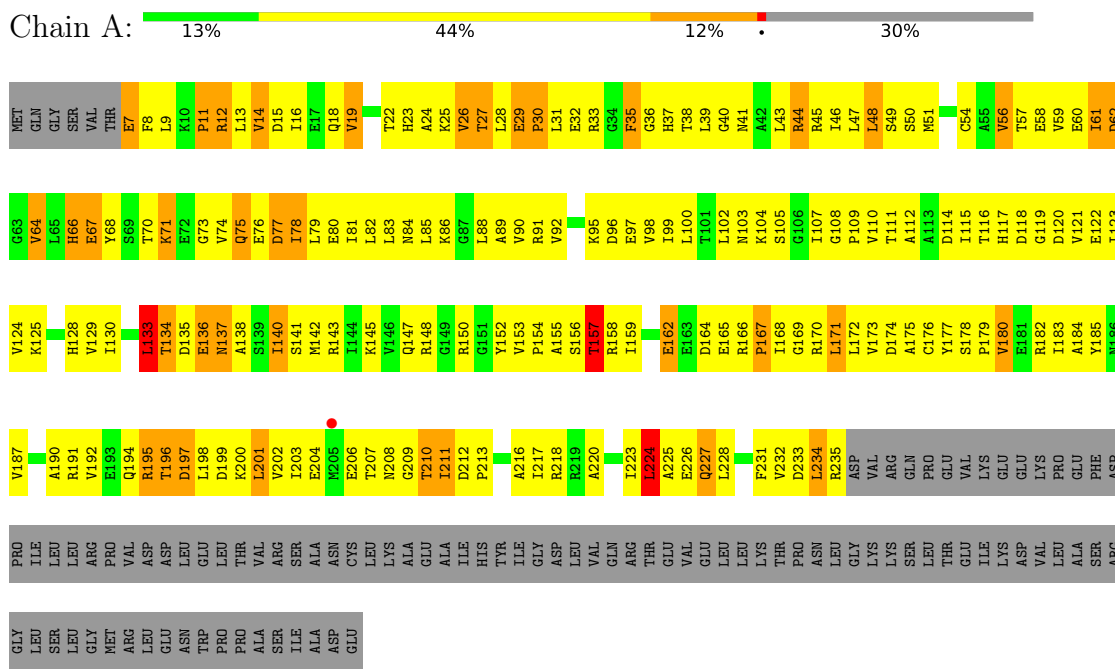


Mol	Chain	Residues	Atoms					ZeroOcc	AltConf
			Total	C	H	N	O		
8	D	1	64	24	33	1	6	0	0

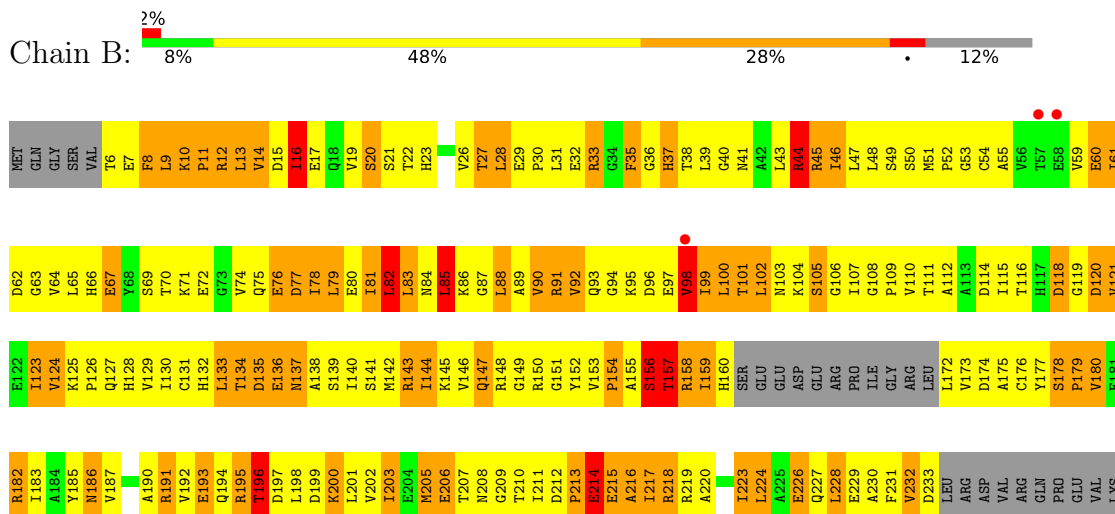
### 3 Residue-property plots

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 and electron density. 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. A red dot above a residue indicates a poor fit to the electron density ( $RSRZ > 2$ ). 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: DNA-directed RNA polymerase subunit alpha



- Molecule 1: DNA-directed RNA polymerase subunit alpha







• Molecule 2: DNA-directed RNA polymerase subunit beta

Chain C:  17%  66%  15%

MET VAL	Y3	S4	Y5	T6	E7	K8	R9	R10	S11	I12	R13	K14	D15	F16	G17	V18	R19	I20	D21	D22	D23	Y24	L25	S26	S27	S28	S29	L30	Q31	L32	F35	Q36	K37	F38	L39	E40	Q41	D42	E43	E44	G45	Q46	Y47	G48	L49	E50	E51	A52	F53	R54	S55	Q56	F57	E58	I59	Q60	G61	E62	G63	E64	E65	E66	E67	E68	E69	E70	E71	E72	E73	E74	E75	E76	E77	E78	E79	E80	E81	E82	E83	E84	E85	E86	E87	E88	E89	E90	E91	E92	E93	E94	E95	E96	E97	E98	E99	F100	F101	F102	F103	F104	F105	F106	F107	F108	F109	F110	F111	F112	F113	F114	F115	F116	F117	F118	F119	F120	F121	F122	F123	F124	F125	F126	F127	F128	F129	F130	F131	F132	F133	F134	F135	F136	F137	F138	F139	F140	F141	F142	F143	F144	F145	F146	F147	F148	F149	F150	F151	F152	F153	F154	F155	F156	F157	F158	F159	F160	F161	F162	F163	F164	F165	F166	F167	F168	F169	F170	F171	F172	F173	F174	F175	F176	F177	F178	F179	F180	F181	F182	F183	F184	F185	F186	F187	F188	F189	F190	F191	F192	F193	F194	F195	F196	F197	F198	F199	F200	F201	F202	F203	F204	F205	F206	F207	F208	F209	F210	F211	F212	F213	F214	F215	F216	F217	F218	F219	F220	F221	F222	F223	F224	F225	F226	F227	F228	F229	F230	F231	F232	F233	F234	F235	F236	F237	F238	F239	F240	F241	F242	F243	F244	F245	F246	F247	F248	F249	F250	F251	F252	F253	F254	F255	F256	F257	F258	F259	F260	F261	F262	F263	F264	F265	F266	F267	F268	F269	F270	F271	F272	F273	F274	F275	F276	F277	F278	F279	F280	F281	F282	F283	F284	F285	F286	F287	F288	F289	F290	F291	F292	F293	F294	F295	F296	F297	F298	F299	F300	F301	F302	F303	F304	F305	F306	F307	F308	F309	F310	F311	F312	F313	F314	F315	F316	F317	F318	F319	F320	F321	F322	F323	F324	F325	F326	F327	F328	F329	F330	F331	F332	F333	F334	F335	F336	F337	F338	F339	F340	F341	F342	F343	F344	F345	F346	F347	F348	F349	F350	F351	F352	F353	F354	F355	F356	F357	F358	F359	F360	F361	F362	F363	F364	F365	F366	F367	F368	F369	F370	F371	F372	F373	F374	F375	F376	F377	F378	F379	F380	F381	F382	F383	F384	F385	F386	F387	F388	F389	F390	F391	F392	F393	F394	F395	F396	F397	F398	F399	F400	F401	F402	F403	F404	F405	F406	F407	F408	F409	F410	F411	F412	F413	F414	F415	F416	F417	F418	F419	F420	F421	F422	F423	F424	F425	F426	F427	F428	F429	F430	F431	F432	F433	F434	F435	F436	F437	F438	F439	F440	F441	F442	F443	F444	F445	F446	F447	F448	F449	F450	F451	F452	F453	F454	F455	F456	F457	F458	F459	F460	F461	F462	F463	F464	F465	F466	F467	F468	F469	F470	F471	F472	F473	F474	F475	F476	F477	F478	F479	F480	F481	F482	F483	F484	F485	F486	F487	F488	F489	F490	F491	F492	F493	F494	F495	F496	F497	F498	F499	F500	F501	F502	F503	F504	F505	F506	F507	F508	F509	F510	F511	F512	F513	F514	F515	F516	F517	F518	F519	F520	F521	F522	F523	F524	F525	F526	F527	F528	F529	F530	F531	F532	F533	F534	F535	F536	F537	F538	F539	F540	F541	F542	F543	F544	F545	F546	F547	F548	F549	F550	F551	F552	F553	F554	F555	F556	F557	F558	F559	F560	F561	F562	F563	F564	F565	F566	F567	F568	F569	F570	F571	F572	F573	F574	F575	F576	F577	F578	F579	F580	F581	F582	F583	F584	F585	F586	F587	F588	F589	F590	F591	F592	F593	F594	F595	F596	F597	F598	F599	F600	F601	F602	F603	F604	F605	F606	F607	F608	F609	F610	F611	F612	F613	F614	F615	F616	F617	F618	F619	F620	F621	F622	F623	F624	F625	F626	F627	F628	F629	F630	F631	F632	F633	F634	F635	F636	F637	F638	F639	F640	F641	F642	F643	F644	F645	F646	F647	F648	F649	F650	F651	F652	F653	F654	F655	F656	F657	F658	F659	F660	F661	F662	F663	F664	F665	F666	F667	F668	F669	F670	F671	F672	F673	F674	F675	F676	F677	F678	F679	F680	F681	F682	F683	F684	F685	F686	F687	F688	F689	F690	F691	F692	F693	F694	F695	F696	F697	F698	F699	F700	F701	F702	F703	F704	F705	F706	F707	F708	F709	F710	F711	F712	F713	F714	F715	F716	F717	F718	F719	F720	F721	F722	F723	F724	F725	F726	F727	F728	F729	F730	F731	F732	F733	F734	F735	F736	F737	F738	F739	F740	F741	F742	F743	F744	F745	F746	F747	F748	F749	F750	F751	F752	F753	F754	F755	F756	F757	F758	F759	F760	F761	F762	F763	F764	F765	F766	F767	F768	F769	F770	F771	F772	F773	F774	F775	F776	F777	F778	F779	F780	F781	F782	F783	F784	F785	F786	F787	F788	F789	F790	F791	F792	F793	F794	F795	F796	F797	F798	F799	F800	F801	F802	F803	F804	F805	F806	F807	F808	F809	F810	F811	F812	F813	F814	F815	F816	F817	F818	F819	F820	F821	F822	F823	F824	F825	F826	F827	F828	F829	F830	F831	F832	F833	F834	F835	F836	F837	F838	F839	F840	F841	F842	F843	F844	F845	F846	F847	F848	F849	F850	F851	F852	F853	F854	F855	F856	F857	F858	F859	F860	F861	F862	F863	F864	F865	F866	F867	F868	F869	F870	F871	F872	F873	F874	F875	F876	F877	F878	F879	F880	F881	F882	F883	F884	F885	F886	F887	F888	F889	F890	F891	F892	F893	F894	F895	F896	F897	F898	F899	F900	F901	F902	F903	F904	F905	F906	F907	F908	F909	F910	F911	F912	F913	F914	F915	F916	F917	F918	F919	F920	F921	F922	F923	F924	F925	F926	F927	F928	F929	F930	F931	F932	F933	F934	F935	F936	F937	F938	F939	F940	F941	F942	F943	F944	F945	F946	F947	F948	F949	F950	F951	F952	F953	F954	F955	F956	F957	F958	F959	F960	F961	F962	F963	F964	F965	F966	F967	F968	F969	F970	F971	F972	F973	F974	F975	F976	F977	F978	F979	F980	F981	F982	F983	F984	F985	F986	F987	F988	F989	F990	F991	F992	F993	F994	F995	F996	F997	F998	F999	F1000
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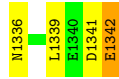
D881	B844	E1006	A1067	I1128	D1188	T1248	Q1314
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L883	A946	Q1008	H1069	A130	G1190	S1250	M1316
M884	E947	N1009	H1070	M131	K1191	Y1251	P1317
G885	E948	Q1010	G1071	L132	A1193	S1252	G1318
K886	E949	L1011	N1072	K133	E1194	L1253	M1319
V887	E950	E1012	K1073	Q134	E1195	V1254	P1320
T888	A951	Q1013	G1074	Q135	K1196	L1255	E1321
P889	A952	L1014	G1075	Q136	K1197	Q1256	S1322
K890	L953	A1015	I1076	E137	L1198	P1257	M1324
G891	A956	E1016	S1077	V138	L1199	Q1258	V1325
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T893	K958	Y1018	I1079	K140	L1201	G1260	L1327
Q894	P959	G1082	M1080	L141	G1202	Q1264	K1328
L895	L960	K1021	P1081	R142	D1203	F1265	E1329
T896	L961	K1022	I1082	E143	E1204	G1266	I1330
P897	E962	E1023	E1083	F144	P1205	Q1268	R1331
E898	E963	E1024	D1084	I145	R1206	R1269	S1332
E899	L964	F1025	M1085	Q146	S1207	F1270	L1333
K900	L967	E1026	P1086	R147	G1208	G1271	E1334
L901	E968	K1027	Y1087	A148	Q1209	G1272	I1335
R902	A969	L1028	D1088	Y149	I1210	E1273	M1336
R903	G970	L1029	G1091	D150	I1211	R1274	I1337
A904	L971	E1030	T1092	L151	L1212	V1275	E1338
I905	L972	A1031	P1093	A153	Y1213	W1276	L1339
F906	F972	K1032	V1094	D154	D1214	A1277	E1340
G907	S973	R1033	D1095	V155	G1215	L1278	D1341
E908	R974	R1034	I1096	R156	R1216	E1279	E1342
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D912	V978	Q1038	P1100	D160	Q1220	A1283	E1346
V913	K914	G1039	L1101	L161	F1221	L1284	E1347
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D915	A981	L1041	L1042	T163	R1223	T1286	E1349
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S917	G983	A1044	P1044	S165	V1225	Q1288	E1351
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V920	A986	L1047	N1108	E168	G1228	L1291	E1354
P921	E987	L1048	I1109	V169	Y1229	T1292	E1355
N922	K988	K1049	G1110	M170	M1230	V1293	E1356
G923	L989	V1050	Q1111	R171	Y1231	K1294	E1357
V924	D990	K1051	I1112	L172	M1232	S1295	E1358
S925	K991	V1052	L1113	A173	L1233	D1296	E1359
G926	L992	Y1053	E1114	E174	K1234	D1297	E1360
T927	P993	L1054	T1115	M175	L1235	V1298	E1361
V928	R994	A1055	H1116	L176	M1236	M1299	E1362
I929	D995	V1056	L1117	R177	H1237	G1300	E1363
D930	R996	K1057	G1118	K178	L1238	R1301	E1364
V931	A997	M1119	M1119	G1179	V1239	M1304	E1365
Q932	L998	A1120	A1120	M180	D1240	Y1305	E1366
V933	E999	I1060	A1121	P181	D1241	V1306	E1367
F934	L1000	Q1061	L1122	I182	I1242	M1308	E1368
T935	G1001	P1062	G1123	A183	M1243	V1309	E1369
R936	L1002	G1063	I1124	T184	H1244	M1312	E1370
K941	T1003	K1064	G1125	P185	A1245	M1313	E1371
D942	D1004	K1065	V186	V186	R1246	E1372	E1372
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• Molecule 2: DNA-directed RNA polymerase subunit beta

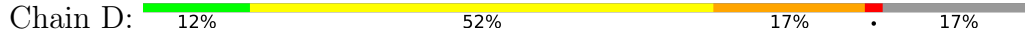


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S4	E67	P128	A251	A251	Q327
Y5	L68	M129	N192	S252	S328
T6	Q69	M130	M193	F253	
E7	Y70	T131	L194	Y262	K331
K8	V71	D132	F195	V263	R332
K9	S72	M133	R197	V264	I333
R10	Y73	G134	L198	R268	E334
I11	R74	T135	D199	I269	T335
R12	L75	F136	L200	T270	L336
K13	G76	V137	R200	A271	F337
D14	E77	I138	R201	A272	T338
F15	P78	M139	R202	R272	N339
G16	G79	G140	K203	H273	D340
K17	F80	L204	L204	L274	L341
R18	D81	R143	P205	R275	L342
P19	W82	V144	A206	Q276	H343
Q20	Q83	I146	T207	L277	G344
V21	E84	V148	I208	P345	P345
D22	C85	S147	L209	D280	Y346
D23	Q86	Q148	L210	D281	I347
Y26	I87	H150	R211	V282	S348
L27	V90	R151	A212	K283	F349
L28	T91	S152	L213	L284	T350
S29	Y92	P153	N214	I285	L351
I30	S93	G154	Y215	E286	R352
Q31	A94	V155	T216	R287	V353
L32	P95	P156	R217	P288	D354
D33	L96	F157	E218	V289	P355
S34	R97	D158	Q219	E290	T356
F35	V98	S159	L220	Y291	N357
Q36	K99	D160	L221	I292	D358
K37	L100	K161	D222	L293	R359
F38	R101	G162	L223	K295	L360
L39	L102	K163	F224	V296	S361
D42	V103	T164	F225	V297	A362
P43	I104	H165	E226	A298	L363
E44	E105	S166	K227	Y301	Y367
G45	R107	G168	V228	I302	R368
Q46	E108	K169	F230	D303	M369
Y47	A109	V170	E231	T306	K370
G48	P110	L171	I232	G307	R371
L49	E111	Y172	R233	P372	P372
E50	G112	M173	D234	G373	G373
A51	T113	A174	E308	E374	E374
A52	V114	R175	N235	I310	P375
F53	K115	L176	K236	P376	P376
R54	D116	I177	L237	M314	T377
F57	K118	Y179	Q238	M315	R378
F58	E119	P178	M239	E316	E379
I59	Q120	L181	E240	L317	A380
Q60	E121	S182	L241	S318	A381
S61	V122	H183	V242	L319	E382
Y62	L123	D185	E244	D320	S383
S63	M124	F186	R245	L321	L384
			L246	L322	F385
			R247	A323	E386

L387	R452	Q513	V577	S642	T702	W768	Q834	E888	H1023	M1085	R1147	Q1209	M1273
L388	L463	D516	M582	S643	G703	F769	E835	E899	E1024	P1086	A1148	I1210	E1274
F389	R454	Q517	N582	L644	G704	C770	L836	E890	F1025	Y1087	Y1149	R1211	E1275
F390	S455	D518	M583	F645	E705	M705	A837	E891	E1026	D1088	D1150	L1212	V1276
	S456	N519	G584	F646	R706	L773	C838	E902	K1027	E1089	L1151	Y1213	A1277
D393	G457	M518	G585	S647	A707	G774	R839	R903	L1028	M1090	G1152	D1214	L1278
R394	G458	P520	F586	D648	W708	E775	S840	A904	L1029	G1091	A1153	G1215	E1279
Y395	M459	L521	L587	Q649	A709	F776	R841	I905	E1030	L1092	D1154	R1216	I1280
D396	M460	S522	E588	V650	V710	V777	D842	F906	L1031	P1093	V1155	R1217	A1281
L397	E461	E523	T689	D651	W714	E778	T843	G907	R1033	D1094	R1156	G1218	A1282
S398	E462	S524	P590	G652	T715	R779	R844	E908	E1034	D1095	Q1157	E1219	A1283
A399	A399	T525	Y591	M653	T716	E782	L845	K909	K1035	I1096	K1158	Q1220	A1284
V400	F464	H526	G592	V654	V717	W782		A910	T1037	V1097	V1159	F1221	Y1285
G401	R465	K527	K593	V655	R720	L783	E848	Y913	L1038	L1098	D1160	E1222	T1286
R402	V466	R528	V594	S656	G721	A784	E849	N913	Q1039	M1099	L1161	R1223	L1287
M403	G467	R529	T595	T657	G722	T785	R850	K914	G1045	P1100	S1162	P1224	L1288
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F405	V469	S531	G597	Q659	W724	G786	A852	R916	D1047	G1102	F1164	T1226	M1290
M406	R470	A532	V598	V660	Y725	W789	E853	S917	L1042	V1103	S1165	V1227	L1291
R407	V471	L533	V599	V661	Y726	D790	R854	L918	A1043	P1104	D1166	G1228	T1292
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L410	A474	E602	A474	G664	A729	E793	R857	P921	V1046	R1107	M1170	M1231	S1295
R411	V475	L538	L481	A665	S730	W794	C858	R922	K1047	M1108	R1171	M1232	D1296
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L419	D482	W547		R673	E738	R802	D866	D930	A1055	H1116	G1179	D1240	M1304
L420	L484	R548	Y614	D674	D739	A803	E867	Y931	I1056	L1117	V1180	D1241	Y1305
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	D491	Y555	S621	M681	A746	Y810	W877	G1001	G1063	L1002	F1187	T1248	
	I492	G556	N622	G682	G747	N811	T878	E940	D1064	L1002	D1188	G1249	
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K431	N494	V558	D624	N684	D749	E813	C880	K943	M1066	D1004	K1127	G1251	
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	P497		G627	R687	L753	I816	L883	A945	H1070	K1007	A1193	L1254	
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	A501	G566	E631	F681	T757	E820	X887	E949	G1074	L1011	Q1134	P1258	
	V502	P567	D632	T682	R758	R821	T888	E950	I1075	E1012	Q1135	L1259	
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D443	E504	I569	V634	R694	W823	W823	C890	Y952	T1077	L1014	E1137	G1261	
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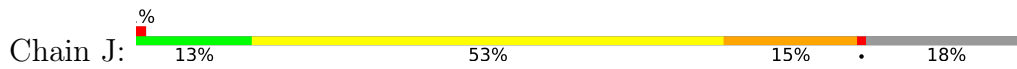
● Molecule 3: DNA-directed RNA polymerase subunit beta'



MET	LYS	ASP	LEU	LEU	LEU	PHE	L8	K9	A10	Q11	T12	K13	T14	E15	E16	F17	D18	A19	L20	K21	L22	A23	L24	A25	S26	P27	D28	M29	V30	R31	S32	W33	S34	F35	G36	E37	V38	K39	K40	P41	E42	G43	T44	N45	Y46	R47	F48	F49	K50	F51	E52	R53	D54	G55	L56	F57	C58	A59	R60																																																												
F61	F62	G63	F64	V65	K66	D67	F68	E69	C70	L71	G72	C73	K74	Y75	K76	R77	L78	K79	H80	R81	G82	Y83	L84	C85	S86	K87	C88	G89	V90	F91	I92	I93	Q94	I95	G96	Y97	R98	A99	E100	R101	M102	G103	T104	I105	E106	L107	A108	S109	P110	T111	H112	H113	I114	G115	F116	L117	S118	R119	L120																																																												
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L614	K615	T616	T617	V618	I619	F620	A621	D622	Q623	G624	M625	T627	F628	G629	A630	Y631	A632	A633	R634	S635	S636	S637	S638	G639	G640	I641	D642	D643	M644	V645	L646	P647	E648	K649	K650	H651	E652	I653	I654	S655	A656	E657	E658	A659	V660	V661	A662	E663	I664	Q667	N606	S670	G671	L672	V673	T674	L675	L676	L677																																																												
E677	R678	Y679	M680	K681	V682	L683	D684	I685	D686	S687	M688	R689	K690	A691	M692	M693	A694	L701	Q702	T703	E704	T705	V706	I707	N708	F709	D710	F711	G712	E713	L714	K715	G716	L717	S718	F719	N720	I721	S722	E723	Y724	M725	A726	D727	S728	I729	R730	G731	G732	S733	Q736	I737	R738	Q739	L740	A741	G742																																																														
M743	R744	G745	L746	M747	V748	K749	P750	D751	Q752	S753	I754	E755	E756	S757	I759	N762	F763	R764	G765	T766	L767	N768	V769	L770	Q771	F772	F773	I774	S775	H776	H777	G778	A779	L780	R781	G782	L783	A784	D785	L786	A787	L788	K789	T790	A791	N792	S793	G794	Y795	L796	L797	V798	P799	R800	L801	V802	L803	L804	L805	L806	L807	L808	L809	L810	L811	L812	L813	L814	L815	L816	L817	L818	L819	L820	L821	L822	L823	L824	L825	L826	L827	L828	L829	L830	L831	L832	L833	L834	L835	L836	L837	L838	L839	L840	L841	L842	L843	L844	L845	L846	L847	L848	L849	L850	L851	L852	L853	L854	L855	L856	L857	L858	L859	L860	L861	L862	L863	L864	L865

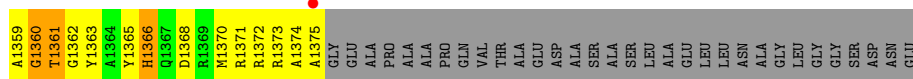
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P926	<b>G927</b>	Q929	L930	<b>T931</b>	MET	ARG	THR	THR	PHE	HIS	ILE	GLY	GLY	ALA	ALA	ALA	VAL	VAL	ALA	ALA	ALA	GLU	ASP	GLY	ILE	GLN	GLN	VAL	VAL	ASN	GLY	GLY	THR	VAL	ILE	ASN	ASN	VAL	LYS	LYS	VAL	VAL	THR	GLY	LYS	LYS	LEU	VAL	ILE	THR	ARG	THR	ASN	ASN	THR	THR	LEU	LYS	LEU	ILE
ASP	GLU	PHE	GLY	THR	THR	LYS	GLU	SER	THR	LYS	VAL	PRO	TYR	GLY	VAL	ALA	VAL	GLY	LYS	LYS	GLY	ASP	GLY	GLN	VAL	VAL	ALA	ALA	ASN	GLY	GLY	THR	THR	VAL	ALA	ASP	PRO	HIS	THR	LYS	MET	VAL	GLU	THR	VAL	ARG	PHE	THR	ARG	THR	ASN	ASN	THR	THR	LEU	ASP	GLY	THR	ALA	
ILE	THR	ARG	GLN	THR	ASP	GLU	LEU	THR	THR	GLY	LEU	LEU	VAL	VAL	VAL	ALA	VAL	GLU	GLY	ARG	ARG	THR	ALA	GLY	GLY	GLY	THR	LYS	ASP	LEU	ILE	THR	ILE	ASP	ALA	ALA	GLN	THR	GLY	ASN	ASP	VAL	THR	PRO	VAL	GLY	THR	GLN	THR	ASN	THR	THR	THR	LEU	GLY	GLY	ALA			
ILE	VAL	GLN	LEU	GLU	ASP	GLY	VAL	GLN	VAL	ILE	SER	SER	THR	THR	THR	ALA	ALA	GLN	GLN	ARG	ARG	THR	GLY	GLY	THR	LYS	LYS	ASP	ILE	THR	ILE	VAL	ASP	ASP	ALA	GLN	THR	GLY	ASN	ASP	VAL	THR	PRO	VAL	GLY	THR	GLN	THR	ASN	ASN	THR	THR	LEU	LYS	LEU	ALA				
G1186	K1187	T1188	T1189	G1170	G1171	K1172	R1173	R1174	L1175	V1176	I1177	P1178	P1179	<b>V1180</b>	D1181	G1182	S1183	D1184	P1185	Y1186	E1187	M1188	M1189	M1190	P1191	M1192	W1193	R1194	I1195	<b>Q1196</b>	L1196	M1197	F1198	F1199	E1200	G1201	E1202	R1203	V1204	E1205	R1206	R1207	D1208	V1209	I1210	S1211	E1212	G1213	P1214	E1215	A1216	P1217	H1218	V1219	I1220	S1221	L1222	R1223	L1224	G1225
V1226	H1227	A1228	A1229	V1229	T1230	R1231	Y1232	I1233	M1234	M1235	E1236	V1237	Q1238	D1239	<b>V1240</b>	I1241	R1242	L1243	<b>V1246</b>	R1247	I1248	M1249	D1250	K1251	H1252	E1253	E1254	V1255	I1256	L1257	R1258	Q1259	L1260	L1261	R1262	K1263	A1264	T1265	I1266	V1267	M1268	A1269	G1270	S1271	S1272	D1273	V1274	L1275	E1276	<b>G1277</b>	E1278	D1279	V1280	L1281	Y1282	S1283	R1284	V1285	K1286	
I1287	A1288	<b>M1289</b>	E1293	A1294	<b>K1297</b>	V1298	P1299	A1300	A1301	T1301	Y1302	S1303	R1304	<b>D1305</b>	L1306	L1307	G1308	I1309	T1310	E1311	A1312	S1313	<b>L1314</b>	A1315	T1316	E1317	A1318	V1319	I1320	S1321	A1322	A1323	F1324	F1325	Q1326	<b>E1327</b>	T1328	T1329	R1330	V1331	L1332	E1333	E1334	A1335	A1336	V1337	A1338	<b>G1339</b>	K1340	D1341	D1342	V1343	L1344	R1345	G1346	L1347	K1348	E1349		
N1350	V1351	I1352	V1353	R1354	R1355	L1356	I1357	P1358	A1359	G1360	T1361	G1362	Y1363	<b>H1366</b>	<b>Q1367</b>	D1368	R1369	<b>M1370</b>	R1371	R1372	A1373	<b>A1374</b>	A1375	<b>G1376</b>	GLU	GLY	ALA	ALA	PRO	PRO	GLN	VAL	THR	ALA	GLY	ASP	ALA	ALA	SER	K40	P41	E42	T43	I44	M45	<b>Y46</b>	R47	T48	F49	K50	P51	E52	R53	D54	G55	L56	F57	C58	<b>A59</b>	R60

• Molecule 3: DNA-directed RNA polymerase subunit beta'

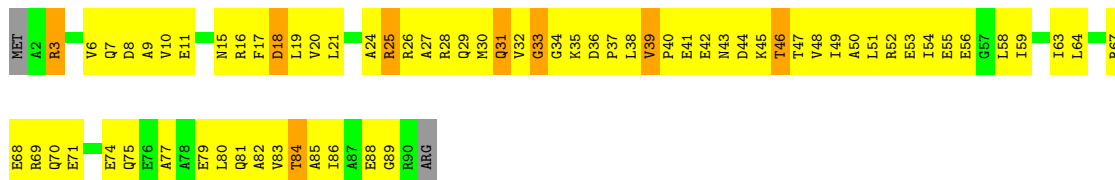
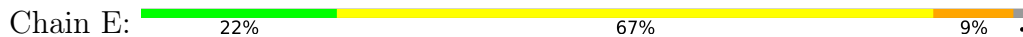


MET	LYS	ASP	LEU	LEU	PHE	LEU	LYS	LYS	ALA	GLN	THR	LYS	THR	GLU	E16	F17	D18	A19	<b>I20</b>	K21	I22	A23	A24	L24	A25	S26	P27	D28	M29	I30	R31	S32	W33	S34	F35	G36	E37	<b>V38</b>	K39	K40	P41	E42	T43	I44	M45	<b>Y46</b>	R47	T48	F49	K50	P51	E52	R53	D54	G55	L56	F57	C58	<b>A59</b>	R60		
I61	F62	G63	L64	<b>D67</b>	V68	E69	C70	L71	C72	G73	K74	Y75	K76	<b>R80</b>	R81	D82	G83	<b>V83</b>	<b>I84</b>	E85	E86	<b>K87</b>	C88	G89	V90	M91	V92	R93	T93	Q94	T95	<b>A96</b>	V97	R98	R99	E100	R101	M102	G103	H104	I105	E106	L107	<b>A108</b>	S109	P110	T111	F112	E113	I114	M115	F116	L117	K118	M119	L120	P121	S122	L123	R123		
I124	G125	L126	L127	L128	<b>D129</b>	<b>M130</b>	<b>P131</b>	L132	R133	L134	E135	L136	R137	V138	L139	F140	F141	E142	S143	Y144	R145	V146	I147	E148	G149	G150	M151	T152	M153	T93	K216	E155	R156	Q157	Q158	R159	L160	L161	Q164	Y165	L166	D167	A168	<b>L169</b>	E170	E171	F172	G173	D174	E175	F176	D177	A178	L179	V241	M180	L242	G181	A182	E183	L244	P246
I185	<b>Q186</b>	L187	L188	L189	K190	S191	M192	D193	L194	E195	F196	A197	C198	L201	E202	R203	E204	N205	N206	N207	R208	<b>T209</b>	I210	S211	E211	T212	R213	R214	K215	K216	L217	R220	L221	K222	G223	L224	L225	L226	E227	A228	D229	F230	V231	V232	Q233	P234	E235	<b>R236</b>	W237	L238	Q300	E301	A302	L303	V304	D305	L306	L307	D308			
P247	<b>D248</b>	L249	R250	<b>P251</b>	L252	V253	<b>D256</b>	R259	R260	L320	A261	T262	S263	L324	K325	S326	L327	A328	D329	M330	L331	<b>K332</b>	<b>L333</b>	<b>K334</b>	G335	G336	R337	R338	R339	Q340	N341	L342	L343	G344	L285	<b>A286</b>	A287	P288	D289	L290	G351	R352	S353	V354	L355	T356	V357	G358	P359	<b>V360</b>	L361	R362	L363	H364	Q365	C366	G367	<b>L368</b>				

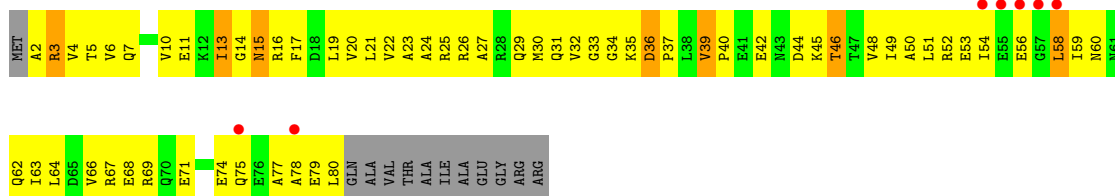




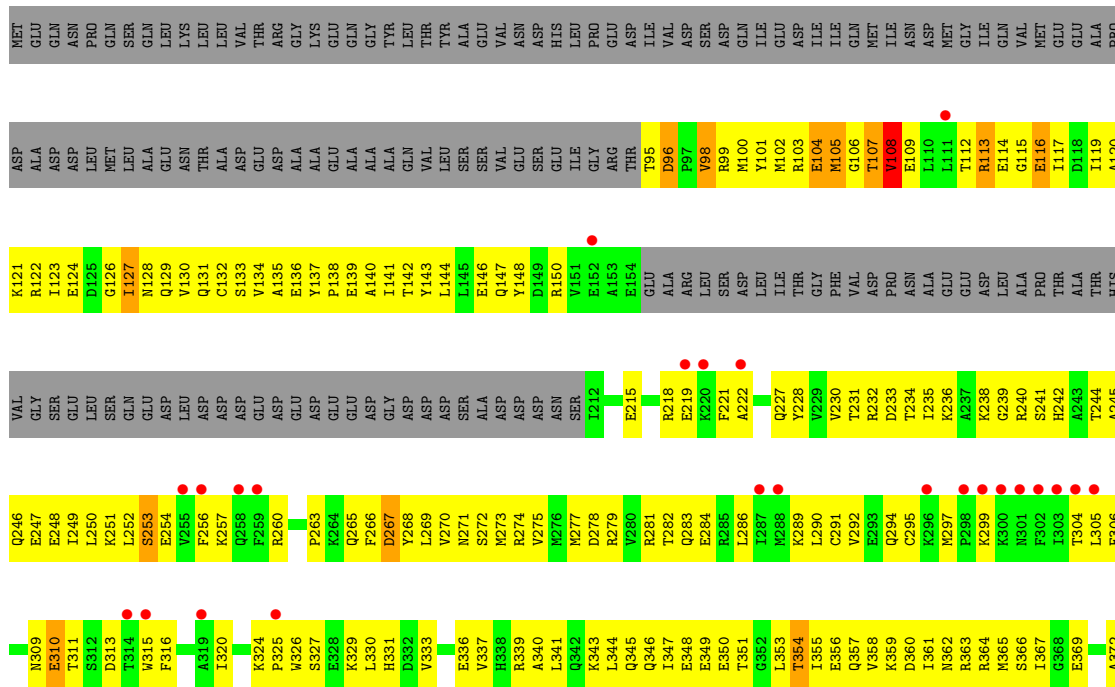
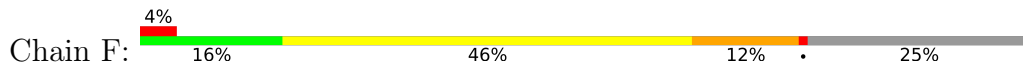
• Molecule 4: DNA-directed RNA polymerase subunit omega

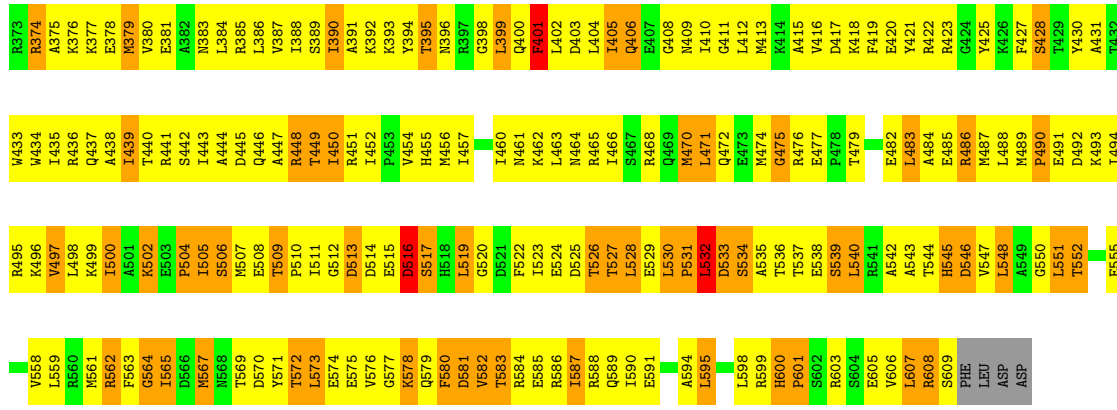


• Molecule 4: DNA-directed RNA polymerase subunit omega

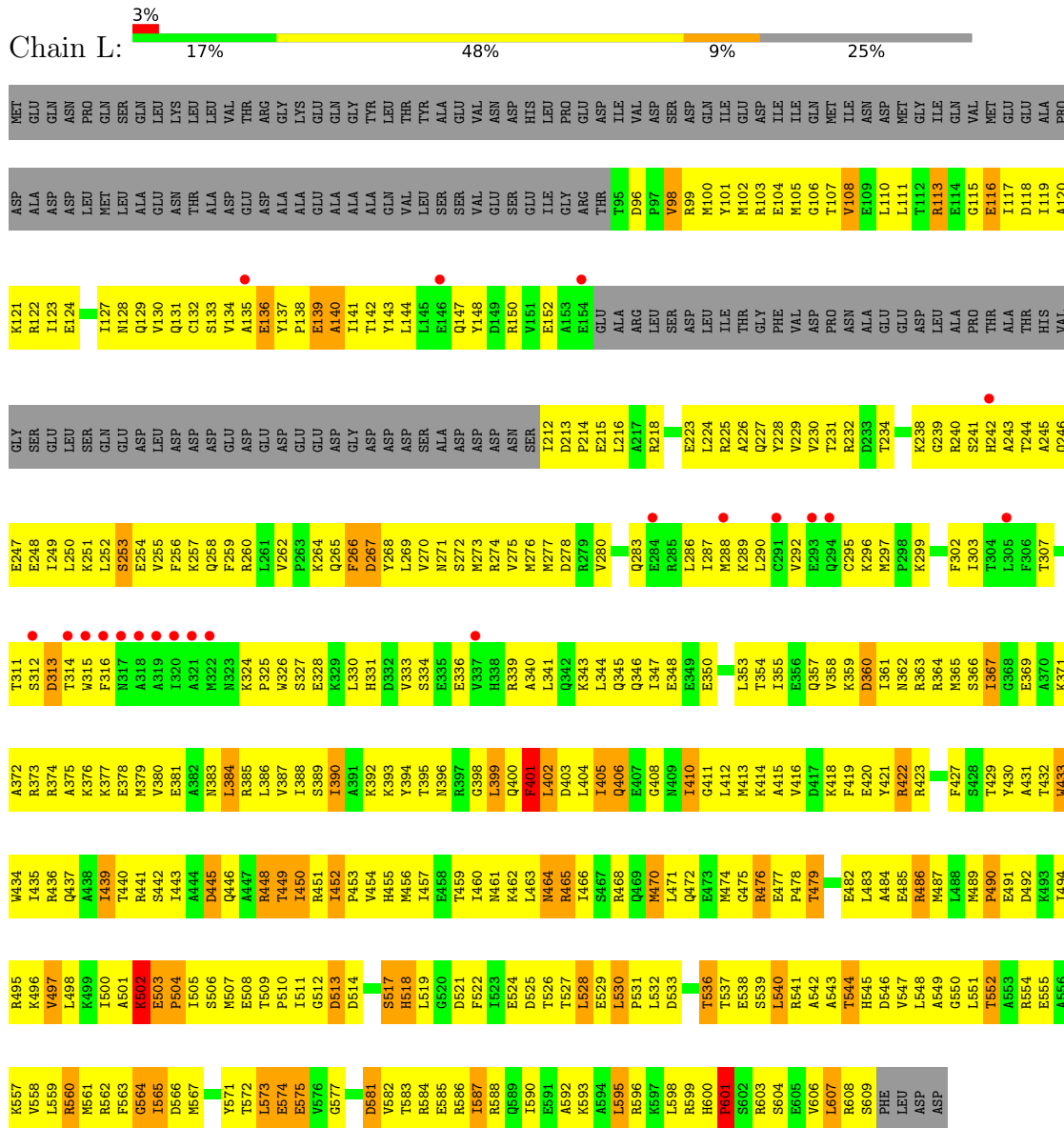


• Molecule 5: RNA polymerase sigma factor RpoD





● Molecule 5: RNA polymerase sigma factor RpoD





## 4 Data and refinement statistics

Property	Value	Source
Space group	P 21 21 21	Depositor
Cell constants a, b, c, $\alpha$ , $\beta$ , $\gamma$	188.52Å 205.18Å 310.14Å 90.00° 90.00° 90.00°	Depositor
Resolution (Å)	29.95 – 3.84 44.64 – 3.84	Depositor EDS
% Data completeness (in resolution range)	92.4 (29.95-3.84) 79.3 (44.64-3.84)	Depositor EDS
$R_{merge}$	(Not available)	Depositor
$R_{sym}$	(Not available)	Depositor
$\langle I/\sigma(I) \rangle$ <sup>1</sup>	1.08 (at 3.88Å)	Xtrriage
Refinement program	PHENIX (phenix.refine: 1.9_1692)	Depositor
R, $R_{free}$	0.236 , 0.300 0.241 , 0.304	Depositor DCC
$R_{free}$ test set	1859 reflections (1.75%)	wwPDB-VP
Wilson B-factor (Å <sup>2</sup> )	136.1	Xtrriage
Anisotropy	0.197	Xtrriage
Bulk solvent $k_{sol}$ (e/Å <sup>3</sup> ), $B_{sol}$ (Å <sup>2</sup> )	0.27 , 117.7	EDS
L-test for twinning <sup>2</sup>	$\langle  L  \rangle = 0.47$ , $\langle L^2 \rangle = 0.30$	Xtrriage
Estimated twinning fraction	No twinning to report.	Xtrriage
$F_o, F_c$ correlation	0.93	EDS
Total number of atoms	55388	wwPDB-VP
Average B, all atoms (Å <sup>2</sup> )	170.0	wwPDB-VP

Xtrriage's analysis on translational NCS is as follows: *The largest off-origin peak in the Patterson function is 2.12% of the height of the origin peak. No significant pseudotranslation is detected.*

<sup>1</sup>Intensities estimated from amplitudes.

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

## 5 Model quality i

### 5.1 Standard geometry i

Bond lengths and bond angles in the following residue types are not validated in this section: 4C4, MG, 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	A	0.75	0/1801	1.11	5/2440 (0.2%)
1	B	0.52	0/2265	0.90	3/3066 (0.1%)
1	G	0.49	0/1777	0.88	0/2408
1	H	0.49	0/1681	0.93	4/2278 (0.2%)
2	C	0.79	4/10733 (0.0%)	1.13	39/14482 (0.3%)
2	I	0.63	0/10721	0.98	23/14468 (0.2%)
3	D	0.77	3/9202 (0.0%)	1.15	45/12424 (0.4%)
3	J	0.62	1/9161 (0.0%)	1.02	17/12366 (0.1%)
4	E	0.67	0/693	1.01	0/935
4	K	0.36	0/629	0.72	0/847
5	F	0.57	0/3777	0.93	6/5076 (0.1%)
5	L	0.48	0/3689	0.83	4/4969 (0.1%)
All	All	0.67	8/56129 (0.0%)	1.03	146/75759 (0.2%)

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	B	0	1
2	C	0	3
2	I	0	3
3	D	0	5
3	J	0	2
All	All	0	14

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

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
3	D	377	PHE	CE1-CZ	6.64	1.50	1.37

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Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
2	C	1276	TRP	CB-CG	-6.57	1.38	1.50
2	C	1270	PHE	CE1-CZ	6.17	1.49	1.37
3	D	1319	PHE	CE2-CZ	6.01	1.48	1.37
3	J	686	TRP	CB-CG	-5.50	1.40	1.50

The worst 5 of 146 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
5	L	540	LEU	CA-CB-CG	-9.96	92.38	115.30
2	C	32	LEU	CA-CB-CG	-9.67	93.07	115.30
2	I	575	LEU	CA-CB-CG	-9.22	94.10	115.30
2	C	1161	LEU	CA-CB-CG	-9.16	94.23	115.30
3	D	788	LEU	CA-CB-CG	-9.10	94.38	115.30

There are no chirality outliers.

5 of 14 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
1	B	196	THR	Peptide
2	C	236	LYS	Peptide
2	C	600	THR	Peptide
2	C	658	GLN	Peptide
3	D	14	THR	Peptide

## 5.2 Too-close contacts [i](#)

In the following table, the Non-H and H(model) columns list the number of non-hydrogen atoms and hydrogen atoms in the chain respectively. The H(added) column lists the number of hydrogen atoms added and optimized by MolProbity. The Clashes column lists the number of clashes within the asymmetric unit, whereas Symm-Clashes lists symmetry-related clashes.

Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
1	A	1779	0	1806	347	0
1	B	2239	0	2300	482	0
1	G	1755	0	1773	325	0
1	H	1662	0	1687	285	0
2	C	10564	0	10571	1842	1
2	I	10552	0	10548	1775	0
3	D	9062	0	9227	1784	1
3	J	9021	0	9213	1774	1
4	E	691	0	695	88	0

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Mol	Chain	Non-H	H(model)	H(added)	Clashes	Symm-Clashes
4	K	627	0	634	104	0
5	F	3726	0	3798	623	1
5	L	3640	0	3650	576	0
6	D	1	0	0	0	0
6	J	1	0	0	0	0
7	D	2	0	0	0	0
7	J	2	0	0	0	0
8	D	31	33	32	17	0
All	All	55355	33	55934	9319	2

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 84.

The worst 5 of 9319 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:88:LEU:HD12	1:B:89:ALA:H	1.07	1.18
2:I:280:ASP:HB3	2:I:282:VAL:HG23	1.24	1.18
3:D:850:LYS:HG2	3:D:857:LEU:HD11	1.24	1.18
2:C:798:GLN:HB2	2:C:828:PHE:HE1	1.04	1.17
3:D:1372:ARG:HH21	3:J:854:ALA:HB3	1.07	1.15

All (2) 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)
3:D:170:GLU:OE1	3:J:165:TYR:OH[3_444]	2.04	0.16
2:C:44:GLU:OE1	5:F:599:ARG:NE[4_445]	2.09	0.11

## 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	227/329 (69%)	179 (79%)	35 (15%)	13 (6%)	1	21
1	B	283/329 (86%)	167 (59%)	60 (21%)	56 (20%)	0	2
1	G	225/329 (68%)	177 (79%)	40 (18%)	8 (4%)	3	29
1	H	212/329 (64%)	170 (80%)	35 (16%)	7 (3%)	4	31
2	C	1338/1342 (100%)	1019 (76%)	256 (19%)	63 (5%)	2	24
2	I	1338/1342 (100%)	1031 (77%)	261 (20%)	46 (3%)	3	30
3	D	1162/1407 (83%)	850 (73%)	234 (20%)	78 (7%)	1	18
3	J	1151/1407 (82%)	851 (74%)	232 (20%)	68 (6%)	1	20
4	E	87/91 (96%)	69 (79%)	14 (16%)	4 (5%)	2	24
4	K	77/91 (85%)	61 (79%)	13 (17%)	3 (4%)	3	27
5	F	454/613 (74%)	342 (75%)	89 (20%)	23 (5%)	2	23
5	L	454/613 (74%)	336 (74%)	94 (21%)	24 (5%)	2	22
All	All	7008/8222 (85%)	5252 (75%)	1363 (19%)	393 (6%)	2	21

5 of 393 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	A	136	GLU
1	A	162	GLU
1	B	11	PRO
1	B	12	ARG
1	B	44	ARG

### 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	197/286 (69%)	164 (83%)	33 (17%)	2	14
1	B	250/286 (87%)	169 (68%)	81 (32%)	0	2
1	G	193/286 (68%)	171 (89%)	22 (11%)	5	27
1	H	183/286 (64%)	149 (81%)	34 (19%)	1	11

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Mol	Chain	Analysed	Rotameric	Outliers	Percentiles	
2	C	1154/1157 (100%)	982 (85%)	172 (15%)	3	18
2	I	1151/1157 (100%)	987 (86%)	164 (14%)	3	20
3	D	963/1168 (82%)	768 (80%)	195 (20%)	1	9
3	J	965/1168 (83%)	780 (81%)	185 (19%)	1	10
4	E	72/75 (96%)	65 (90%)	7 (10%)	8	33
4	K	67/75 (89%)	60 (90%)	7 (10%)	7	30
5	F	406/540 (75%)	346 (85%)	60 (15%)	3	18
5	L	385/540 (71%)	339 (88%)	46 (12%)	5	25
All	All	5986/7024 (85%)	4980 (83%)	1006 (17%)	2	14

5 of 1006 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
3	D	1250	ASP
3	J	774	ILE
1	H	43	LEU
3	J	712	GLN
3	J	1324	SER

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 114 such sidechains are listed below:

Mol	Chain	Res	Type
1	G	84	ASN
5	L	400	GLN
2	I	834	GLN
5	L	357	GLN
3	J	910	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](#)

Of 7 ligands modelled in this entry, 6 are monoatomic - leaving 1 for Mogul analysis.

In the following table, the Counts columns list the number of bonds (or angles) for which Mogul statistics could be retrieved, the number of bonds (or angles) that are observed in the model and the number of bonds (or angles) that are defined in the Chemical Component Dictionary. The Link column lists molecule types, if any, to which the group is linked. 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  $|Z| > 2$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Type	Chain	Res	Link	Bond lengths			Bond angles		
					Counts	RMSZ	# Z  > 2	Counts	RMSZ	# Z  > 2
8	4C4	D	2004	-	30,31,31	0.56	0	30,40,40	0.82	1 (3%)

In the following table, the Chirals column lists the number of chiral outliers, the number of chiral centers analysed, the number of these observed in the model and the number defined in the Chemical Component Dictionary. Similar counts are reported in the Torsion and Rings columns. '-' means no outliers of that kind were identified.

Mol	Type	Chain	Res	Link	Chirals	Torsions	Rings
8	4C4	D	2004	-	-	11/29/31/31	0/1/1/1

There are no bond length outliers.

All (1) bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
8	D	2004	4C4	C4-C3-C2	2.12	119.22	115.62

There are no chirality outliers.

5 of 11 torsion outliers are listed below:

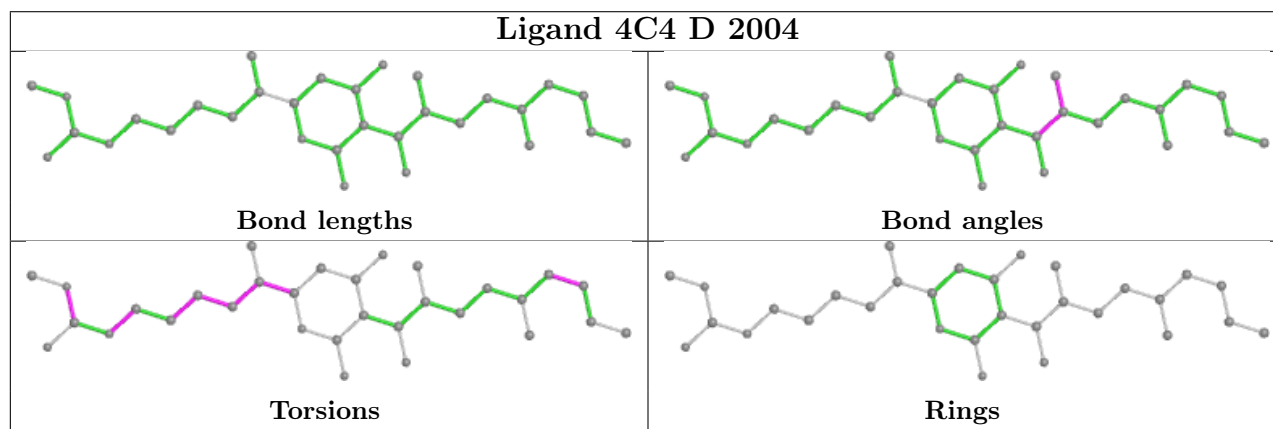
Mol	Chain	Res	Type	Atoms
8	D	2004	4C4	O5-C15-C16-C18
8	D	2004	4C4	O5-C15-C16-C17
8	D	2004	4C4	C14-C15-C16-C17
8	D	2004	4C4	C17-C16-C18-C19
8	D	2004	4C4	O4-C22-O3-C23

There are no ring outliers.

1 monomer is involved in 17 short contacts:

Mol	Chain	Res	Type	Clashes	Symm-Clashes
8	D	2004	4C4	17	0

The following is a two-dimensional graphical depiction of Mogul quality analysis of bond lengths, bond angles, torsion angles, and ring geometry for all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the validation Tables will also be included. For torsion angles, if less than 5% of the Mogul distribution of torsion angles is within 10 degrees of the torsion angle in question, then that torsion angle is considered an outlier. Any bond that is central to one or more torsion angles identified as an outlier by Mogul will be highlighted in the graph. For rings, the root-mean-square deviation (RMSD) between the ring in question and similar rings identified by Mogul is calculated over all ring torsion angles. If the average RMSD is greater than 60 degrees and the minimal RMSD between the ring in question and any Mogul-identified rings is also greater than 60 degrees, then that ring is considered an outlier. The outliers are highlighted in purple. The color gray indicates Mogul did not find sufficient equivalents in the CSD to analyse the geometry.



## 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues [i](#)

There are no chain breaks in this entry.



## 6 Fit of model and data [i](#)

### 6.1 Protein, DNA and RNA chains [i](#)

In the following table, the column labelled ‘#RSRZ > 2’ contains the number (and percentage) of RSRZ outliers, followed by percent RSRZ outliers for the chain as percentile scores relative to all X-ray entries and entries of similar resolution. The OWAB column contains the minimum, median, 95<sup>th</sup> percentile and maximum values of the occupancy-weighted average B-factor per residue. The column labelled ‘Q < 0.9’ lists the number of (and percentage) of residues with an average occupancy less than 0.9.

Mol	Chain	Analysed	<RSRZ>	#RSRZ>2	OWAB(Å <sup>2</sup> )	Q<0.9
1	A	229/329 (69%)	-0.33	1 (0%) 92 88	85, 130, 177, 246	0
1	B	289/329 (87%)	-0.20	8 (2%) 53 43	100, 194, 249, 268	0
1	G	227/329 (68%)	-0.19	4 (1%) 68 61	184, 217, 237, 248	0
1	H	216/329 (65%)	0.43	22 (10%) 6 6	179, 244, 274, 286	0
2	C	1340/1342 (99%)	-0.31	4 (0%) 94 91	75, 125, 228, 303	0
2	I	1340/1342 (99%)	-0.20	30 (2%) 62 53	124, 163, 252, 431	0
3	D	1166/1407 (82%)	-0.30	7 (0%) 89 85	84, 126, 211, 261	0
3	J	1155/1407 (82%)	-0.22	20 (1%) 70 62	122, 169, 233, 316	0
4	E	89/91 (97%)	-0.28	0 100 100	118, 140, 168, 177	0
4	K	79/91 (86%)	0.51	7 (8%) 9 7	223, 285, 342, 352	0
5	F	458/613 (74%)	-0.09	24 (5%) 27 23	115, 176, 321, 349	0
5	L	458/613 (74%)	-0.03	21 (4%) 32 27	153, 197, 350, 376	0
All	All	7046/8222 (85%)	-0.20	148 (2%) 63 55	75, 159, 278, 431	0

The worst 5 of 148 RSRZ outliers are listed below:

Mol	Chain	Res	Type	RSRZ
5	L	319	ALA	7.3
5	L	315	TRP	6.8
5	F	305	LEU	6.3
1	H	24	ALA	6.2
5	F	304	THR	6.1

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

There are no non-standard protein/DNA/RNA residues in this entry.

### 6.3 Carbohydrates [i](#)

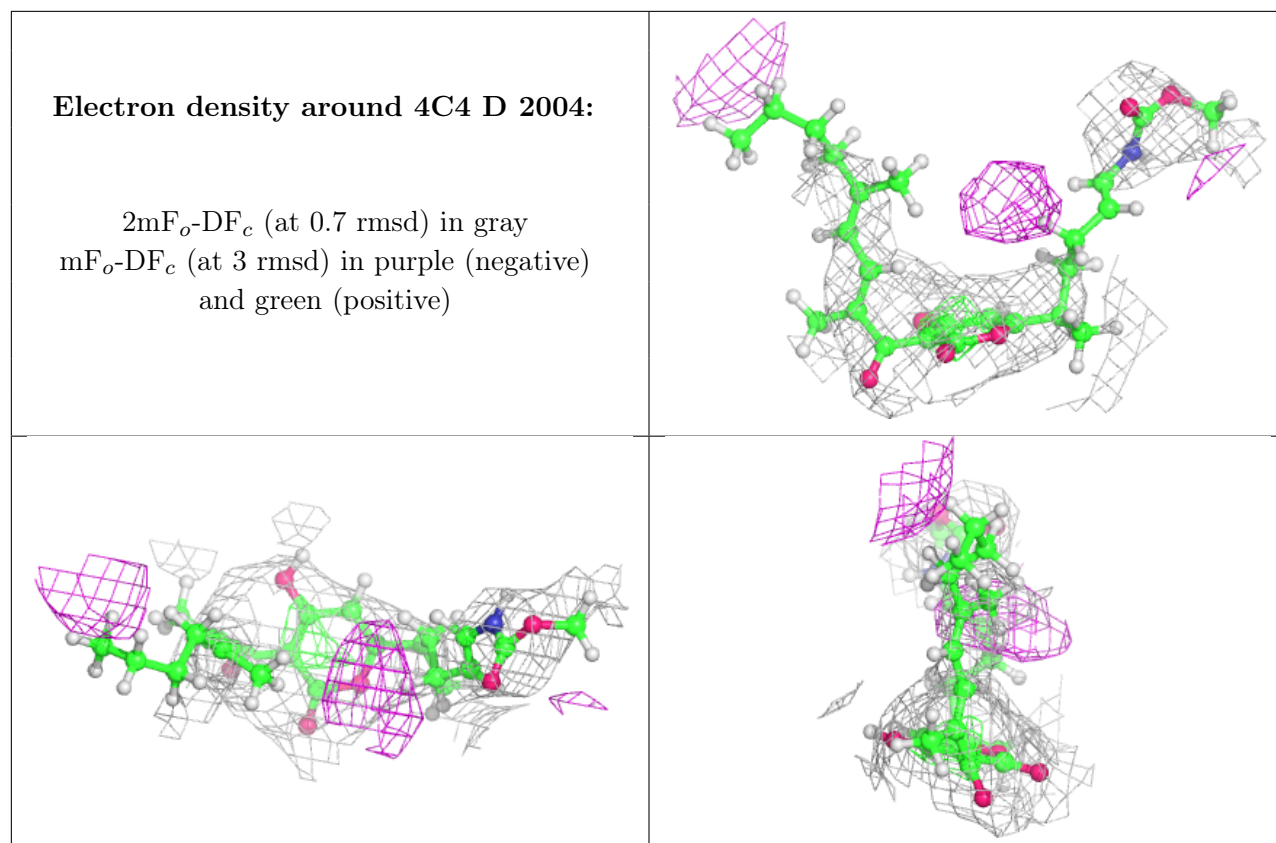
There are no monosaccharides in this entry.

### 6.4 Ligands [i](#)

In the following table, the Atoms column lists the number of modelled atoms in the group and the number defined in the chemical component dictionary. The B-factors column lists the minimum, median, 95<sup>th</sup> percentile and maximum values of B factors of atoms in the group. The column labelled 'Q< 0.9' lists the number of atoms with occupancy less than 0.9.

Mol	Type	Chain	Res	Atoms	RSCC	RSR	B-factors(Å <sup>2</sup> )	Q<0.9
8	4C4	D	2004	31/31	0.89	0.43	128,154,155,155	0
7	ZN	J	2003	1/1	0.92	0.14	130,130,130,130	0
6	MG	J	2001	1/1	0.95	0.26	127,127,127,127	0
6	MG	D	2001	1/1	0.98	0.42	126,126,126,126	0
7	ZN	J	2002	1/1	0.99	0.04	143,143,143,143	0
7	ZN	D	2002	1/1	0.99	0.08	126,126,126,126	0
7	ZN	D	2003	1/1	0.99	0.23	125,125,125,125	0

The following is a graphical depiction of the model fit to experimental electron density of all instances of the Ligand of Interest. In addition, ligands with molecular weight > 250 and outliers as shown on the geometry validation Tables will also be included. Each fit is shown from different orientation to approximate a three-dimensional view.



## 6.5 Other polymers [i](#)

There are no such residues in this entry.