



## wwPDB EM Validation Summary Report ⓘ

Nov 20, 2022 – 06:23 pm GMT

PDB ID : 4BOG  
EMDB ID : EMD-2376  
Title : The structure and super-organization of acetylcholine receptor-rapsyn complexes  
Authors : Zuber, B.; Unwin, N.  
Deposited on : 2013-05-20  
Resolution : 50.00 Å(reported)  
Based on initial model : 2BG9

This is a wwPDB EM 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/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>.

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

EMDB validation analysis : 0.0.1.dev43  
MolProbity : 4.02b-467  
Percentile statistics : 20191225.v01 (using entries in the PDB archive December 25th 2019)  
MapQ : **FAILED**  
Ideal geometry (proteins) : Engh & Huber (2001)  
Ideal geometry (DNA, RNA) : Parkinson et al. (1996)  
Validation Pipeline (wwPDB-VP) : 2.31.2

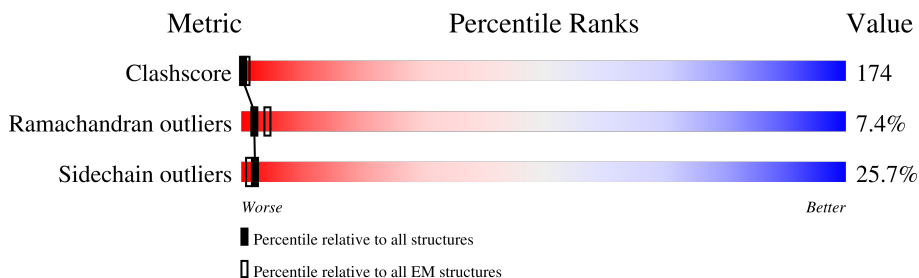
# 1 Overall quality at a glance

The following experimental techniques were used to determine the structure:

*ELECTRON MICROSCOPY*

The reported resolution of this entry is 50.00 Å.

Percentile scores (ranging between 0-100) for global validation metrics of the entry are shown in the following graphic. The table shows the number of entries on which the scores are based.



Metric	Whole archive (#Entries)	EM structures (#Entries)
Clashscore	158937	4297
Ramachandran outliers	154571	4023
Sidechain outliers	154315	3826

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  $\geq 3$ , 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  $\leq 5\%$ .

Mol	Chain	Length	Quality of chain
1	0	493	5% 49% 19% . 25%
1	B	493	5% 50% 19% . 25%
1	G	493	5% 50% 19% . 25%
1	L	493	5% 50% 19% . 25%
1	Q	493	5% 49% 19% . 25%
1	V	493	5% 49% 19% . 25%
2	1	522	7% 44% 19% . 29%
2	C	522	7% 43% 19% . 29%
2	H	522	7% 43% 19% . 29%

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Mol	Chain	Length	Quality of chain				
2	M	522	7%	43%	19%	•	29%
2	R	522	7%	43%	19%	•	29%
2	W	522	7%	43%	20%	•	29%
3	2	461	7%	51%	21%	•	20%
3	A	461	6%	51%	20%	•	20%
3	D	461	7%	51%	21%	•	20%
3	F	461	6%	50%	20%	•	20%
3	I	461	7%	51%	21%	•	20%
3	K	461	6%	50%	20%	•	20%
3	N	461	7%	51%	20%	•	20%
3	P	461	6%	50%	20%	•	20%
3	S	461	7%	51%	21%	•	20%
3	U	461	6%	51%	20%	•	20%
3	X	461	7%	51%	21%	•	20%
3	Z	461	6%	50%	20%	•	20%
4	3	505	6%	46%	18%	•	27%
4	E	505	6%	46%	18%	•	27%
4	J	505	6%	47%	18%	•	27%
4	O	505	6%	46%	18%	•	27%
4	T	505	6%	46%	18%	•	27%
4	Y	505	7%	46%	18%	•	27%

## 2 Entry composition [i](#)

There are 4 unique types of molecules in this entry. The entry contains 89544 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 Acetylcholine receptor beta subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
1	0	370	2972	1938	465	554	15	0	0
1	B	370	2972	1938	465	554	15	0	0
1	G	370	2972	1938	465	554	15	0	0
1	L	370	2972	1938	465	554	15	0	0
1	Q	370	2972	1938	465	554	15	0	0
1	V	370	2972	1938	465	554	15	0	0

- Molecule 2 is a protein called Acetylcholine receptor delta subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
2	1	370	2983	1944	489	536	14	0	1
2	C	370	2983	1944	489	536	14	0	1
2	H	370	2983	1944	489	536	14	0	1
2	M	370	2983	1944	489	536	14	0	1
2	R	370	2983	1944	489	536	14	0	1
2	W	370	2983	1944	489	536	14	0	1

- Molecule 3 is a protein called Acetylcholine receptor subunit alpha.

Mol	Chain	Residues	Atoms					AltConf	Trace
			Total	C	N	O	S		
3	2	370	2991	1954	478	540	19	0	0

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Mol	Chain	Residues	Atoms					AltConf	Trace
3	A	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	D	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	F	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	I	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	K	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	N	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	P	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	S	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	U	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	X	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		
3	Z	370	Total	C	N	O	S	0	0
			2991	1954	478	540	19		

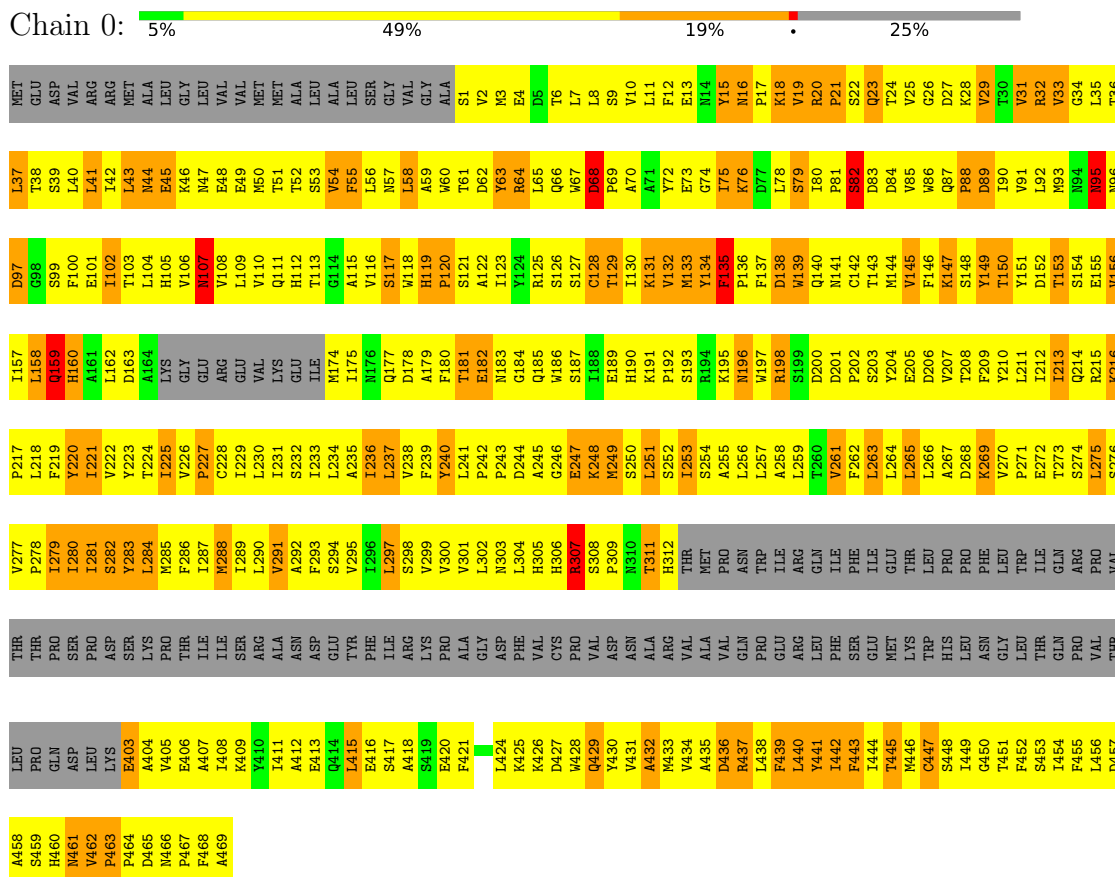
- Molecule 4 is a protein called Acetylcholine receptor gamma subunit.

Mol	Chain	Residues	Atoms					AltConf	Trace
4	3	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		
4	E	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		
4	J	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		
4	O	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		
4	T	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		
4	Y	371	Total	C	N	O	S	0	1
			2987	1948	478	551	10		

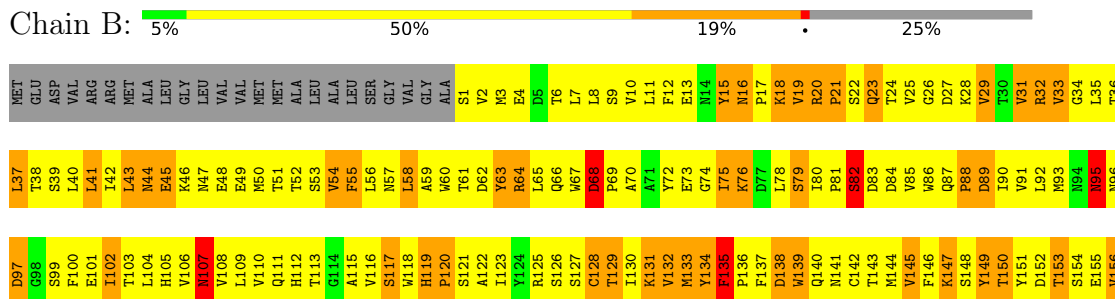
### 3 Residue-property plots

These plots are drawn for all protein, RNA, DNA and oligosaccharide chains in the entry. The first graphic for a chain summarises the proportions of the various outlier classes displayed in the second graphic. The second graphic shows the sequence view annotated by issues in geometry. Residues are color-coded according to the number of geometric quality criteria for which they contain at least one outlier: green = 0, yellow = 1, orange = 2 and red = 3 or more. Stretches of 2 or more consecutive residues without any outlier are shown as a green connector. Residues present in the sample, but not in the model, are shown in grey.

- Molecule 1: Acetylcholine receptor beta subunit



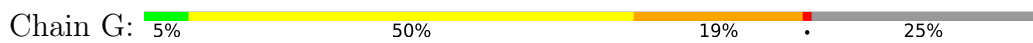
- Molecule 1: Acetylcholine receptor beta subunit



L157	L158	L159	L160	L161	L162	L163	L164	L165	L166	L167	L168	L169	L170	L171	L172	L173	L174	L175	L176	L177	L178	L179	L180	L181	L182	L183	L184	L185	L186	L187	L188	L189	L190	L191	L192	L193	L194	L195	L196	L197	L198	L199	L200	L201	L202	L203	L204	L205	L206	L207	L208	L209	L210	L211	L212	L213	L214	L215	L216								
P217	L218	F219	Y220	I221	V222	Y223	T224	I225	V226	F227	C228	ARG	GLU	VAL	V291	I231	S232	I233	L234	S294	V295	L236	Q177	L237	V238	F239	Y240	L241	P242	N303	L304	H305	G246	E247	K248	M249	S250	L251	S252	I253	S254	A255	L256	L257	A258	L259	T260	V261	F262	L263	L264	L265	L266	A267	D268	K269	Y270	L271	TRP	L272	I273	T274	L275	S276			
V277	F278	I279	L280	L281	S282	Y283	L284	M285	F286	L287	M288	ARG	GLU	VAL	L289	L290	V291	A292	F293	S294	V295	L296	L297	S298	V299	V300	V301	L302	N303	L304	H305	G306	R307	S308	F309	N310	L311	S312	THR	MET	PRO	ASN	TRP	ILE	ARG	GLN	ILE	PHE	SER	GLU	MET	LYS	TRP	LEU	HIS	LEU	ASN	PHE	GLY	LEU	TRP	ILE	THR	GLN	PRO	ARG	VAL
THR	THR	PRO	SER	PRO	ASP	SER	LYS	PRO	THR	THR	ILE	ILE	ARG	VAL	ARG	ALA	ALA	ASN	ASP	GLU	TYR	PHE	ILE	ARG	LYS	PRO	ALA	GLY	ASP	PHE	VAL	CYS	PRO	VAL	ASP	ASN	ALA	ARG	VAL	ALA	VAL	GLN	GLN	PRO	GLU	GLU	MET	LYS	TRP	LEU	PHE	ILE	SER	GLU	MET	LYS	TRP	LEU	GLY	GLN	THR	LEU	THR	GLN	PRO	VAL	THR

A458	S459	H460	N461	V462	P463	P464	D465	M466	P467	F468	A469
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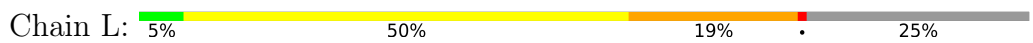
● Molecule 1: Acetylcholine receptor beta subunit



MET	GLU	ASP	VAL	ARG	MET	E403	A404	V405	E406	A407	I408	K409	Y410	A411	A412	E413	Q414	L415	E416	S417	A418	S419	E420	F421	L424	K425	K426	D427	W428	Q429	Y430	V431	A432	M433	V434	A435	D436	R437	L438	F439	L440	Y441	I442	F443	T444	T445	M446	C447	S448	I449	G450	T451	F452	S453	I454	F455	L456	D457									
L37	T38	S39	L40	L41	I42	L43	M44	E45	K46	N47	E48	E49	M50	T51	T52	S53	V54	F55	L56	M57	L58	A59	W60	T61	D62	M63	E64	L65	Q66	Q67	D68	P69	I70	A71	L11	F12	E13	G14	I15	K16	D17	D77	L78	S79	I80	P81	S82	D83	D84	V85	W86	Q87	P88	D89	I90	V91	L92	M93	N94	S95	N96						
D97	G98	S99	F100	E101	I102	T103	L104	H105	N106	R107	V108	L109	V110	H111	K112	T113	G114	A115	V116	S117	H118	L119	P120	S121	A122	I123	Y124	L125	Q126	S127	G128	L129	I130	K131	L132	V133	M134	F135	P136	F137	D138	V139	Q140	M141	S22	C142	T143	M144	M145	F146	K147	S148	Y149	T150	V151	D152	T153	S154	E155	V156							
I157	L158	Q159	H160	A161	L162	D163	L164	LYS	GLU	GLU	ARG	VAL	VAL	LYS	GLU	ILE	M174	I175	Q176	Q177	D178	A179	F180	T181	E182	M183	G184	Q185	W186	S187	I188	M189	H190	K191	P192	S193	R194	K195	M196	W197	R198	S199	D200	D201	P202	S203	Y204	E205	D206	V207	T208	F209	Y210	L211	L212	L213	Q214	R215	K216								
P217	L218	F219	Y220	I221	V222	Y223	T224	I225	V226	F227	C228	ARG	GLU	VAL	L229	L230	V291	I231	S232	I233	L234	S294	V295	L236	Q177	L237	V238	F239	Y240	L241	P242	N303	L304	H305	G246	E247	K248	M249	S250	L251	S252	I253	S254	A255	L256	L257	A258	L259	T260	V261	F262	L263	L264	L265	L266	A267	D268	K269	Y270	L271	TRP	L272	I273	T274	L275	S276	
V277	F278	I279	L280	L281	S282	Y283	L284	M285	F286	L287	M288	ARG	GLU	VAL	L289	L290	V291	A292	F293	S294	V295	L296	L297	S298	V299	V300	V301	L302	N303	L304	H305	G306	R307	S308	F309	N310	L311	S312	THR	MET	PRO	ASN	TRP	ILE	ARG	GLN	ILE	PHE	SER	GLU	MET	LYS	TRP	LEU	HIS	LEU	ASN	PHE	GLY	LEU	TRP	ILE	THR	GLN	PRO	ARG	VAL
THR	THR	PRO	SER	PRO	ASP	SER	LYS	PRO	THR	THR	ILE	ILE	ARG	VAL	ARG	ALA	ALA	ASN	ASP	GLU	TYR	PHE	ILE	ARG	LYS	PRO	ALA	GLY	ASP	PHE	VAL	CYS	PRO	VAL	ASP	ASN	ALA	ARG	VAL	ALA	VAL	GLN	GLN	PRO	GLU	GLU	MET	LYS	TRP	LEU	HIS	LEU	ASN	PHE	GLY	LEU	TRP	ILE	THR	GLN	PRO	ARG	VAL	THR			

A458	S459	H460	N461	V462	P463	P464	D465	M466	P467	F468	A469
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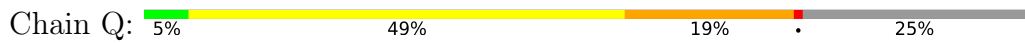
● Molecule 1: Acetylcholine receptor beta subunit



MET	GLU	ASP	VAL	ARG	MET	E403	A404	V405	E406	A407	I408	K409	Y410	A411	A412	E413	Q414	L415	E416	S417	A418	S419	E420	F421	L424	K425	K426	D427	W428	Q429	Y430	V431	A432	M433	V434	A435	D436	R437	L438	F439	L440	Y441	I442	F443	T444	T445	M446	C447	S448	I449	G450	T451	F452	S453	I454	F455	L456	D457			
L37	T38	S39	L40	L41	I42	L43	M44	E45	K46	N47	E48	E49	M50	T51	T52	S53	V54	F55	L56	M57	L58	A59	W60	T61	D62	M63	E64	L65	Q66	Q67	D68	P69	I70	A71	L11	F12	E13	G14	I15	K16	D17	D77	L78	S79	I80	P81	S82	D83	D84	V85	W86	Q87	P88	D89	I90	V91	L92	M93	N94	S95	N96

L37	D97	I157	P217	V277	THR	LEU	A458
T38	G98	L158	L218	P278	THR	PRO	S459
S39	S99	Q159	F219	I279	PRO	GLN	H460
L40	F100	H160	Y220	I280	SER	ASP	N461
L41	A161	A161	I221	L281	PRO	LEU	V462
L42	I102	L162	V222	S282	ASP	LYS	P463
L43	T103	D163	Y223	Y283	SER	E403	P464
M44	L104	A164	T224	L284	LYS	A404	D465
E45	L105	L105	I225	M285	PRO	V405	N466
K46	V106	GLU	V226	F286	THR	A406	P467
N47	N107	GLY	P227	L287	ILE	A407	F468
E48	V108	ARG	C228	M288	ILE	I408	A469
E49	L109	ARG	I229	L289	SER	K409	
M50	V110	VAL	L230	L290	ARG	Y410	
	Q111	LYS	I231	V291	ALA	I411	
T52	H112	GLU	S232	A292	ASN	A412	
S53	T113	GLU	I233	F293	ASP	E413	
	I114	ILE	L234	S294	GLU	Q414	
V54	G114	M174	L235	V295	TVR	I415	
F55	A115	I175	A235	V296	PHE	E416	
L56	V116	H176	T236	I297	ILE	S417	
N57	S117	Q177	L237	L298	ILE	A418	
L58	H118	D178	V238	S298	ARG	S419	
A59	H119	A179	F239	V299	LYS	E420	
M60	F120	F180	Y240	V300	PRO	F421	
T61	S121	T181	L241	V301	ALA	F421	
D62	A122	E182	P242	L302	GLY	L424	
Y63	I123	M183	P243	N303	ASP	K425	
R64	Y124	G184	D244	L304	PHE	K426	
L65	L125	M185	A245	H305	VAL	D427	
Q66	S126	M186	G246	H306	CYS	W428	
M67	S127	S187	E247	R307	PRO	Q429	
D68	C128	H188	K248	S308	VAL	Y430	
P69	T129	E189	M249	P309	ASP	V431	
A70	I130	H190	S250	N310	ASN	A432	
A71	K131	K191	L251	T311	ALA	M433	
Y72	V132	P192	S252	H312	ARG	V434	
E73	M133	S193	I253	THR	VAL	A435	
G74	Y134	E194	S254	MET	ALA	D436	
I75	F136	K196	A255	PRO	VAL	R437	
K76	P136	M196	L256	ASN	GLN	L438	
D77	F137	W197	L257	TRP	PRO	L439	
L78	D138	R198	A258	ILE	GLU	L440	
S79	W139	S199	L259	ARG	ARG	Y441	
T80	Q140	D200	T260	GLN	LEU	I442	
P81	D201	D201	V261	ILE	PHE	I442	
S82	C142	P202	F262	PHE	SER	F443	
D83	S203	S203	L263	ILE	GLU	T444	
D84	M144	Y204	L264	GLU	MET	T445	
V85	V145	E205	L265	THR	LYS	M446	
H86	D206	D206	L266	LEU	TRP	C447	
Q87	K147	V207	A267	PRO	HIS	S448	
P88	T208	T208	D268	PRO	LEU	K449	
D89	Y149	F209	K269	PHE	ASN	G450	
L90	T150	Y210	V270	GLY	GLY	T451	
V91	Y151	L211	P271	TRP	LEU	F452	
L92	L152	L212	E272	ILE	THR	L454	
H93	T153	T213	T273	GLN	GLN	F455	
N94	S154	Q214	S274	ARG	PRO	L456	
E155	E155	R215	L275	VAL	VAL	D457	
N96	V156	K216	S276	VAL	THR	D457	

• Molecule 1: Acetylcholine receptor beta subunit

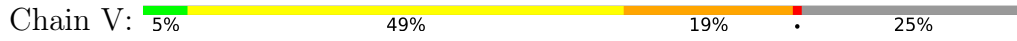


MET	THR	LEU	A458
GLU	THR	PRO	S459
VAL	PRO	GLN	H460
ARG	SER	ASP	N461
MET	PRO	LEU	V462
ALA	ASP	LYS	P463
ALA	SER	E403	P464
GLY	LYS	A404	D465
LEU	PRO	V405	N466
LEU	THR	A406	P467
LEU	ILE	A407	F468
VAL	ILE	I408	A469
VAL	SER	K409	
MET	ARG	Y410	
MET	ALA	I411	
ALA	ASN	A412	
LEU	ASP	F293	
LEU	GLU	S294	
LEU	TVR	V295	
SER	PHE	I297	
GLY	ILE	Q177	
VAL	ARG	D178	
VAL	LYS	A179	
M3	GLY	F180	
E4	PRO	M60	
T6	ALA	T61	
L7	ALA	S121	
L8	GLY	A122	
S9	ASP	D62	
L11	ASN	Y63	
F12	ALA	H64	
E13	ARG	R64	
H14	VAL	L65	
Y15	VAL	Q66	
M16	VAL	M67	
P17	GLN	N68	
K18	GLN	P69	
V19	PRO	T129	
R20	ASN	I130	
P21	ALA	A71	
S22	ARG	A71	
Q23	ALA	K131	
T24	ARG	V132	
V25	VAL	M133	
G26	ALA	S193	
D27	VAL	E194	
K28	VAL	F136	
V29	GLN	M196	
T30	PRO	I197	
L31	PRO	W197	
R32	LEU	D138	
V33	ARG	L78	
G34	ARG	S79	
L35	PHE	T80	
T36	PHE	P81	

• Molecule 1: Acetylcholine receptor beta subunit







MET	L37	D97	I157	P217	V277	THR	LEU	A458
GLU	T38	G98	L158	L218	P278	THR	PRO	S459
ASP	S39	S99	Q159	F219	I279	PRO	GLN	H460
VAL	L40	F100	H160	Y220	I279	SER	ASP	H461
ARG	L41	F100	A161	V221	I281	PRO	LEU	V462
MET	L42	I102	L162	V222	S282	ASP	LYS	P463
ALA	L43	T103	D163	Y223	Y283	SER	E403	P464
LEU	N44	L104	A164	T224	L284	LYS	A404	D465
GLY	E45	L106	LYS	L225	M285	PRO	V405	F466
LEU	K46	V106	GLU	F226	F286	THR	A406	P467
LEU	N47	N107	GLU	P227	L287	ILE	A407	F468
VAL	E48	I108	ARG	C228	M288	ILE	I408	A469
VAL	E49	L109	GLU	L229	L289	SER	K409	
MET	H50	V110	VAL	L230	L290	ARG	F410	
MET	T51	Q111	LYS	I231	V291	ALA	A411	
ALA	T52	Q112	GLU	S232	A292	ASN	A412	
LEU	S53	T113	ILE	L233	F293	ASP	E413	
ALA	V54	G114	GLU	L234	S294	GLU	G414	
LEU	F55	A115	TVR	A235	V295	TVR	L415	
SER	L56	V116	PHE	L236	L296	ILE	A416	
GLY	N57	S117	ILE	L237	L297	ILE	S417	
VAL	L58	H118	ARG	V238	S298	ARG	A418	
GLY	A59	H119	LYS	F239	V299	LYS	A419	
VAL	N60	N120	PRO	Y240	V300	PRO	E420	
ALA	S1	S121	ALA	L241	V301	ALA	F421	
V2	D62	A122	GLY	P242	L302	GLY		
M3	Y63	I123	ASP	P243	N303	ASP	L424	
E4	R64	G124	PHE	D244	L304	PHE	K425	
D5	L65	H125	VAL	A245	H305	VAL	K426	
T6	O66	S126	CYS	G246	H306	VAL	D427	
L7	M67	S127	PRO	E247	R307	PRO	W428	
L8	R68	C128	VAL	K248	S308	VAL	Q429	
S9	F69	L129	ASP	M249	P309	ASP	F430	
V10	A70	I130	ASN	S250	N310	ASN	V431	
L11	A71	L131	ALA	L251	T311	ALA	A432	
F12	Y72	V132	ARG	S252	H312	ARG	M433	
E13	E73	M133	VAL	I253	THR	VAL	V434	
H14	G74	Y134	ALA	S254	MET	ALA	A435	
Y15	L75	F135	VAL	A255	PRO	VAL	D436	
N16	K76	P136	GLN	L256	ASN	GLN	R437	
P17	D77	F137	PRO	L257	TRP	PRO	L438	
K18	L78	D138	GLU	A258	ILE	GLU	F439	
V19	S79	M139	ARG	L259	ARG	ARG	L440	
R20	I80	Q140	LEU	T260	GLN	LEU	Y441	
P21	F81	N141	PHE	V261	ILE	PHE	I442	
S22	S82	C142	SER	F262	PHE	SER	F443	
Q23	D83	T143	GLU	L263	ILE	GLU	L444	
T24	D84	M144	MET	L264	GLU	MET	T445	
V25	Y85	E205	LYS	L265	THR	LYS	M446	
G26	W86	F146	TRP	L266	LEU	TRP	C447	
D27	K87	K147	HIS	A267	PRO	HIS	S448	
R28	P88	S148	LEU	D268	PRO	LEU	I449	
V29	D89	Y149	ASN	K269	PHE	ASN	G450	
T30	L90	T150	GLY	V270	GLU	GLY	F451	
V31	Y91	I151	LEU	P271	TRP	LEU	F452	
R32	L92	D152	THR	E272	ILE	THR	S453	
V33	H93	T153	GLN	T273	GLN	GLN	I454	
G34	N94	Q214	PRO	S274	ARG	PRO	F455	
L35	N95	L155	VAL	L275	VAL	VAL	L456	
T36	N96	V156	THR	S276	THR	THR	D457	

• Molecule 2: Acetylcholine receptor delta subunit



MET	S40	G100	M160	R223	V285	GLU
GLY	N41	Q101	D161	K224	P286	ILE
ASN	L42	Y102	L162	P225	L287	GLU
ILE	I43	N103	MET	L226	I288	GLN
HIS	S44	V104	THR	F227	G289	PRO
PHE	L45	A105	ASP	Y228	K290	ASP
VAL	K46	Y106	THR	V229	Y291	TRP
TYR	E47	F107	ILE	I230	L292	GLN
LEU	T48	C108	ASP	N231	M293	ASN
LEU	D49	N109	GLY	F232	F294	ASP
LEU	E50	V110	LYS	I233	I295	LEU
ILE	T51	L111	ASP	T234	M296	LYS
CYS	L52	V112	TVR	P235	S297	LEU
LEU	T53	R113	PRO		L298	ARG
TYR	T54	P114	ILE	L238	V299	ARG
TYR	N55	N115	GLU	I239	T300	SER
TYR	V56	G210	TRP	S240	G301	SER
SER	W57	Y117	ILE	F241	V302	SER
GLY	M58	V118	I178	L242	V303	VAL
CYS	D59	T119	I179	A243	V304	GLY
SER	H60	W120	D180	A244	N305	TVR
GLY	R66	F126	P181	A245	C306	ILE
V1	A61	L121	E182	A246	G307	ILE
N2	W62	P122	A183	F247	I308	SER
E3	D63	P123	F184	Y248	V309	LYS
E4	G64	A124	F185	L249	L310	ALA
E5	H65	I125	I185	P250	M311	GLN
R6	L67	R127	E186	A251	F312	GLU
L7	T68	S128	G188	E252	H313	TYR
I8	W69	S129	E189	S253	F314	PHE
N9	M70	C130	W190	K256	R315	PHE
D10	A71	P131	E191	M257	F317	ILE
L11	S72	I132	I192	S258	T318	LYS
L12	E73	M133	H193	T259	F319	SER
I13	Y74	V134	H194	A260	H320	ARG
M15	S75	L135	K195	I261	V320	GLU
K16	D76	Y136		C262	LEU	VAL
Y17	I77	F137	K198	V263	SER	MET
M18	S78	P138	K199	L264	THR	PHE
K19	I79	F139	N200	L265	GLU	GLY
H20	L80	D140	I201	A266	ARG	LEU
V21	R81	W141	Y202	Q267	VAL	LEU
R22	L82	Q142	G203	A268	LYS	PRO
P23	R83	N143	D204	F270	GLN	ARG
V24	P84	C144	K205	P207	ILE	ARG
K25	E85	S145	F206	M211	PHE	HIS
H26	L86	L146	P207	V215	LEU	GLY
N27	I87	K147	F148	T216	LEU	LEU
M28	W88	F148	W88	T217	LEU	GLU
E29	I89	T149	E29	Y218	HIS	VAL
V30	P90	A150	V30	L219	ARG	PRO
N31	I92	L151	D214	I220	PRO	ARG
N32	V93	N152	V215	L282	THR	VAL
I33	L94	Y153	T216	I221	ILE	GLY
A34	A35	N154	F217	R222	PRO	ASN
L35	Q95	A155	Y218		THR	
S36	N96	M156	L219		ARG	
L37	N97	E157	I220		GLY	
T38	N98	I158	I221		PHE	
L39	D99	S159	R222		GLY	

ASN	ASN	ASN	ASN	ALA	ALA	SER	ASP	GLN	LEU	HIS	ASP	GLU	ILE	LYS	G421	G422	I423	I424	S425	T426	N427	I428	I429	V430	K431	Q432	I433	K434	E435	K436	N437	A438	Y439	D440	E441	E442	V443	G444	N445	W446	W447	L448	V449	G450	Q451	T452	I453	D454	R455	L456	S457	M458	F459	I460	I461	T462	P463	V464
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M465	V466	G467	G468	T469	I470	F471	I472	F473	V474	M475	G476	N477	F478	N479	R480	P481	P482	A483	K484	P485	PHE	GLU	GLY	ASP	PRO	PHE	ASP	TYR	I433	SER	SER	ASP	HIS	ARG	PRO	CYS	ALA
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• Molecule 2: Acetylcholine receptor delta subunit



MET	GLY	ASN	ILE	PHE	VAL	TYR	LEU	LEU	LEU	ILE	SER	CYS	LEU	TYR	TYR	TRP	SER	CYS	SER	V1	N2	E3	E4	E5	R6	L7	I8	N9	D10	L11	L12	I13	V14	M15	K16	Y17	M18	K19	H20	V21	R22	P23	V24	K25	H26	N27	M28	E29	V30	V31	N32	I33	A34	L35	S36	L37	T38	L39
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S40	M41	L42	L43	S44	K46	E47	T48	D49	E50	T51	L52	T53	T54	N55	V56	M57	M58	D59	H60	A61	M62	Y63	D64	H65	R66	L67	T68	M69	N70	A71	S72	E73	Y74	S75	D76	I77	S78	I79	L80	R81	R82	L83	P84	E85	L86	I87	W88	I89	P90	D91	I92	V93	L94	O95	N96	N97	N98	D99
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G100	Q101	Y102	M103	V104	A105	Y106	F107	C108	M109	V110	L111	V112	R113	P114	M115	G116	Y117	V118	T119	W120	L121	P122	Y123	A124	I125	F126	R127	S128	M129	C130	P131	I132	M133	V134	L135	Y136	F137	P138	F139	D140	W141	R81	Q142	M143	C144	S145	L146	K147	F148	T149	A150	L151	M152	Y153	N154	A155	M156	E157	I158	S159
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M160	D161	L162	MET	THR	ASP	THR	ILE	ASP	C108	LYS	LYS	TYR	PRO	ILE	TRP	I178	I179	D180	P181	E182	A183	F184	T185	E186	G187	G188	E189	W190	E191	I192	I193	H194	K195	K198	K199	M200	L201	Y202	G203	D204	K205	F206	P207	N211	V215	T216	F217	Y218	L219	I220	I221	R222
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R223	K224	P225	L226	F227	K228	Y229	V230	M231	L238	L239	S240	F241	L242	A243	A244	A246	F247	Y248	L249	P250	N311	F312	H313	S314	S253	K256	M257	S258	T259	A260	I261	C262	V263	L264	L265	A266	Q267	A268	V269	F270	L271	L272	L273	T274	S275	Q276	E277	L278	P279	E280	T281	A282	L283	A284
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Y285	P286	L287	M288	K289	Y291	L292	M293	L294	F295	M296	S297	L298	V299	T300	G301	V302	V303	V304	N305	C306	G307	I308	Y309	L310	N311	F312	H313	S314	S315	T316	SER	S318	T319	H320	VAL	LEU	SER	THR	ARG	GLN	VAL	ARG	HIS	GLY	LEU	VAL	PRO	ARG	VAL	THR	PRO	HIS	ARG	GLY	ILE	ASP
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GLU	ILE	GLN	GLU	ASP	TRP	GLN	ASN	ASP	ASP	LEU	LEU	LYS	LEU	ARG	ARG	SER	SER	VAL	GLY	TYR	ILE	SER	ALA	GLN	GLU	GLU	TYR	PHE	ARG	ARG	SER	GLU	LEU	MET	PHE	GLU	THR	LYS	GLN	VAL	VAL	ARG	HIS	GLY	LEU	PRO	ARG	ARG	VAL	THR	PRO	HIS	ARG	ILE	GLY	PHE	GLY	ASN
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ASN	ASN	GLN	ASN	ILE	ALA	ALA	SER	ASP	ASP	GLN	LEU	HIS	ASP	GLU	ILE	LYS	G421	G422	I423	I424	S425	T426	N427	Y428	I429	V430	K431	Q432	I433	K434	E435	K436	N437	A438	Y439	D440	E441	E442	V443	G444	N445	W446	W447	L448	V449	G450	Q451	T452	I453	D454	R455	L456	S457	M458	F459	I460	I461	T462	P463	V464
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M465	V466	G467	G468	T469	I470	F471	I472	F473	V474	M475	G476	N477	F478	N479	R480	P481	P482	A483	K484	P485	PHE	GLU	GLY	ASP	PRO	PHE	ASP	TYR	I433	SER	SER	ASP	HIS	ARG	PRO	CYS	ALA
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• Molecule 2: Acetylcholine receptor delta subunit



MET	GLY	ASN	ILE	PHE	VAL	TYR	LEU	LEU	LEU	ILE	SER	CYS	LEU	TYR	TYR	TRP	SER	CYS	SER	V1	N2	E3	E4	E5	R6	L7	I8	N9	D10	L11	L12	I13	V14	M15	K16	Y17	M18	K19	H20	V21	R22	P23	V24	K25	H26	N27	M28	E29	V30	V31	N32	I33	A34	L35	S36	L37	T38	L39
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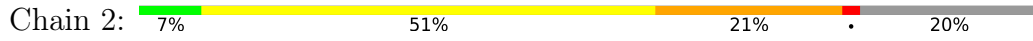
S40	M41	L42	L43	S44	K46	E47	T48	D49	E50	T51	L52	T53	T54	N55	V56	M57	M58	D59	H60	A61	M62	Y63	D64	H65	R66	L67	T68	M69	N70	A71	S72	E73	Y74	S75	D76	I77	S78	I79	L80	R81	R82	L83	P84	E85	L86	I87	W88	I89	P90	D91	I92	V93	L94	O95	N96	N97	N98	D99
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G100	Q101	Y102	M103	V104	A105	Y106	F107	C108	M109	V110	L111	V112	R113	P114	M115	G116	Y117	V118	T119	W120	L121	P122	Y123	A124	I125	F126	R127	S128	M129	C130	P131	I132	M133	V134	L135	Y136	F137	P138	F139	D140	W141	R81	Q142	M143	C144	S145	L146	K147	F148	T149	A150	L151	M152	Y153	N154	A155	M156	E157	I158	S159
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M160	D161	L162	MET	THR	ASP	THR	ILE	ASP	C108	LYS	LYS	TYR	PRO	ILE	TRP	I178	I179	D180	P181	E182	A183	F184	T185	E186	G187	G188	E189	W190	E191	I192	I193	H194	K195	K198	K199	M200	L201	Y202	G203	D204	K205	F206	P207	N211	V215	T216	F217	Y218	L219	I220	I221	R222
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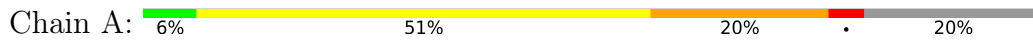




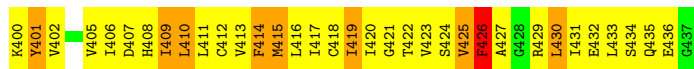


MET	I1E	LEU	CYS	TYR	TRP	HIS	VAL	GLY	LEU	LEU	LEU	PHE	SER	CYS	CYS	GLY	LEU	VAL	GLY	S1	E2	H3	E4	L7	V8	A9	M10	L11	L12	Y15	M16	K17	V18	I19	R20	P21	V22	E23	H24	W25	W26	H27	F28	V29	D30	I31	T32	V33	G34	L35	Q36	L37	I38								
Q39	L40	I41	M42	V43	D44	E45	V46	M47	K107	M48	Q48	L108	I49	V50	VAL	E51	T52	M53	V54	R55	L56	R57	Q58	W60	I61	D62	V63	R64	L65	R66	W67	N68	P69	A70	D71	G72	H73	G74	I75	K76	I77	I78	R79	L80	S82	D83	H24	V85	W86	L87	P88	D89	L90	V91	L92	V93	N94	N95	A96	D97	G98
D99	F100	A101	I102	V103	H104	M105	T106	K107	G114	V113	L113	L114	L115	L116	M117	M118	T119	P120	P121	A122	V123	F124	K125	S126	Y127	C128	E129	I130	L131	V132	T133	H134	F135	P136	F137	Q138	Q139	Q140	M141	C142	T143	M144	V145	R209	L146	G147	I148	M149	L212	L213	F214	V215	G216	N217	V218	I219	I220	I158			
S159	P160	E161	S162	D163	R164	P165	D166	L167	G174	E175	M176	W177	M178	K179	D180	Y181	W184	K185	H186	W187	S188	Y189	C192	C193	P194	D195	T196	P197	Y198	L199	D200	I201	T202	Y203	H204	F205	L206	M207	Q208	R209	I210	P211	L212	L213	F214	V215	V216	N217	V218	I219	I220	P221									
C222	L223	L224	F225	I226	F227	L228	T229	V230	L231	V232	F233	V234	L235	T236	T237	E175	M243	L245	I247	S248	W249	L250	L251	S252	L253	T254	V255	F256	L257	P197	L258	V259	L260	V261	E262	L263	L264	P265	S266	T267	S268	S269	MET	LYS	A270	V271	P272	L273	I274	G275	K276	Y277	M278	L279	F280	T281					
M282	I283	P284	V285	I286	S287	S288	I289	I290	V291	T292	V293	V294	V295	I296	N297	T298	H299	R300	R301	S302	P303	S304	T305	H306	THR	MET	PRO	GLN	GLN	TRP	VAL	ARG	LYS	I284	I285	PHE	ILE	ILE	ASN	THR	ILE	ALA	S387	D389	E390	E391	S392	S393	N394	A395	A396	E397	E398	W399	K400	Y401					
PHE	ALA	ASP	ASP	ILE	ASP	ILE	SER	ASP	VAL	ILE	SER	GLY	GLN	VAL	THR	THR	GLY	GLU	VAL	PHE	THR	THR	PRO	LEU	ILE	S374	A375	I376	E377	G378	V379	K380	Y381	I382	A383	E384	H385	M386	K387	S388	D389	E390	E391	S392	S393	N394	A395	A396	E397	E398	W399	K400	Y401								
V402	A403	M404	V405	I406	D407	H408	L409	L410	L411	C412	V413	F414	M415	L416	I417	C418	I419	I420	G421	T422	V423	S424	V425	F426	A427	L430	I431	E432	Q435	E436	G437																														

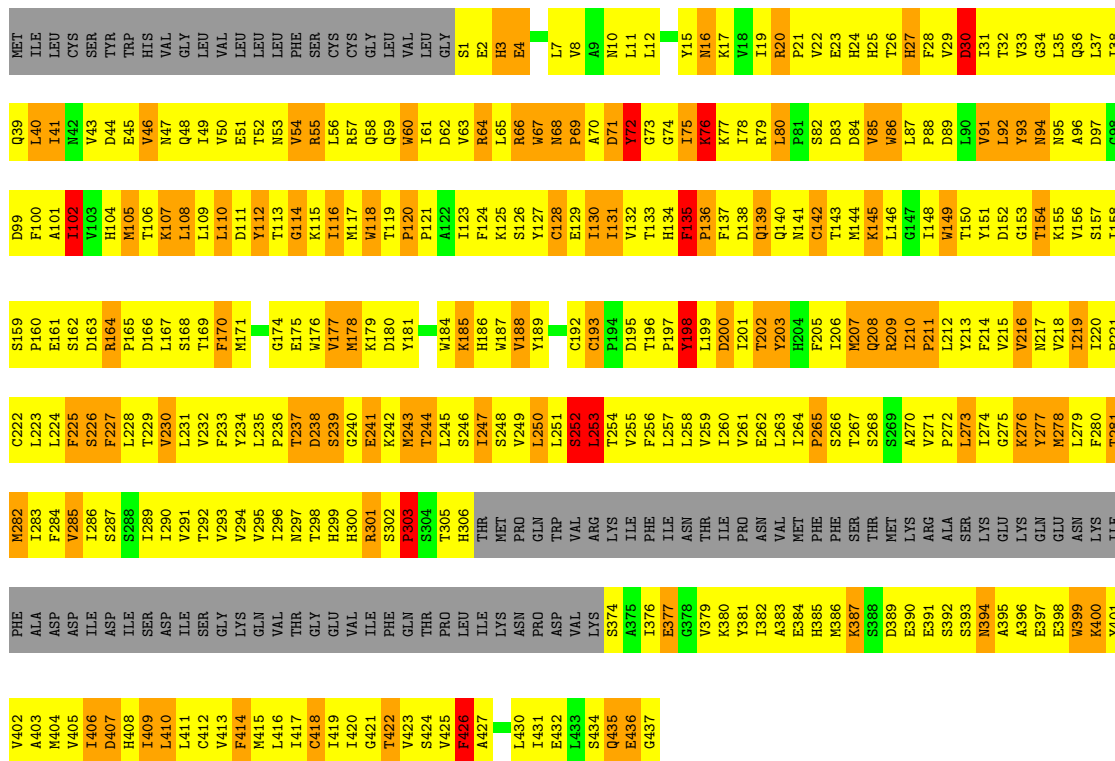
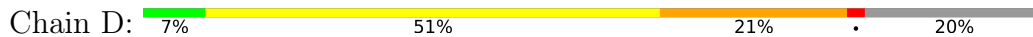
● Molecule 3: Acetylcholine receptor subunit alpha



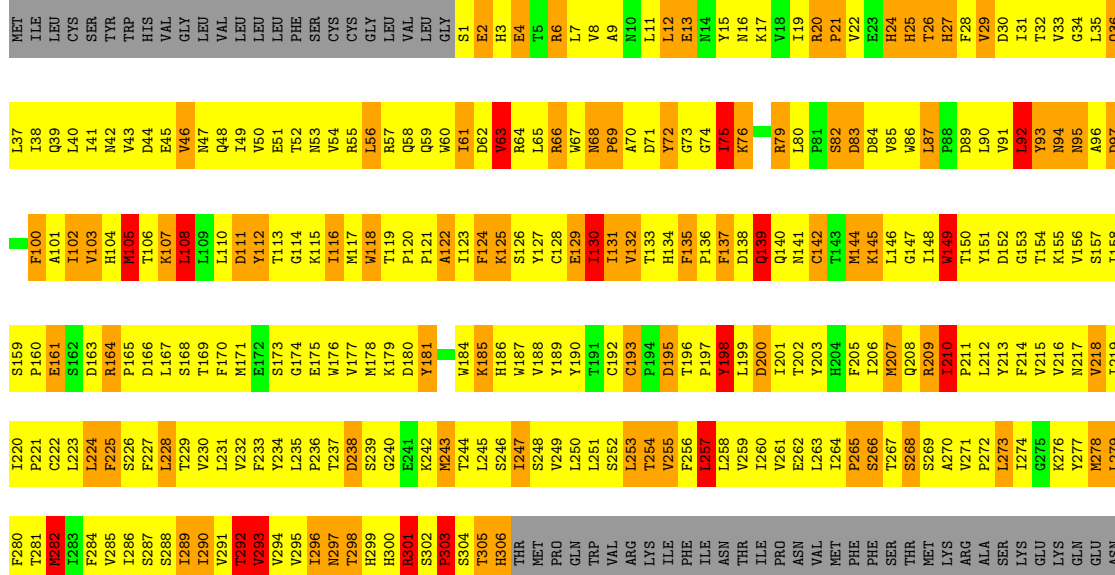
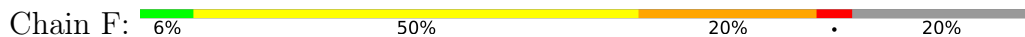
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L37	I38	Q39	L40	I41	N42	V43	D44	E45	V46	L108	L109	L110	L111	L112	T113	G114	K115	L116	M117	W118	T119	P120	P121	A122	I123	F124	K125	S126	Y127	C128	E129	I130	P69	I131	V132	T133	H134	F135	P136	F137	Q138	Q139	Q140	M141	C142	T143	M144	V145	R209	L146	G147	I148	M149	L212	L213	F214	V215	G216	N217	V218	I219	I220	D97	
F100	A101	I102	V103	H104	M105	T106	K107	M108	G114	V113	L113	L114	L115	L116	M117	M118	T119	P120	P121	A122	V123	F124	K125	S126	Y127	C128	E129	I130	L131	V132	T133	H134	F135	P136	F137	Q138	Q139	Q140	M141	C142	T143	M144	V145	R209	L146	G147	I148	M149	L212	L213	F214	V215	G216	N217	V218	I219	I220	I158						
S159	P160	E161	S162	D163	R164	P165	D166	L167	G174	E175	M176	W177	M178	K179	D180	Y181	W184	K185	H186	W187	S188	Y189	C192	C193	P194	D195	T196	P197	Y198	L199	D200	I201	T202	Y203	H204	F205	L206	M207	Q208	R209	I210	P211	L212	L213	F214	V215	G216	N217	V218	I219	I220	P221												
I220	P221	C222	L223	F224	F225	S226	F227	L228	T229	V230	L231	V232	F233	S173	G174	L235	P236	T237	D238	S239	G240	E241	M243	T244	L245	S246	I247	W187	S248	W249	Y189	Y190	L251	S252	L253	T254	V255	F256	L257	P197	L258	V259	L260	V261	E262	L263	L264	P265	S266	T267	S268	S269	MET	LYS	A270	V271	P272	L273	I274	G275	K276	Y277	M278	L279
F280	T281	P282	I283	P284	V285	L286	S287	S288	I289	I290	V291	T292	V293	V294	N297	T298	H299	R300	R301	S302	P303	S304	T305	H306	THR	MET	PRO	GLN	GLN	TRP	VAL	ARG	LYS	I284	I285	PHE	ILE	ILE	ASN	THR	ILE	ALA	S387	D389	E390	E391	S392	S393	N394	A395	A396	E397	E398	W399	K400	Y401								
LYS	ILE	PHE	ALA	ASP	ASP	ILE	ASP	ILE	ILE	SER	ASP	ASP	ILE	SER	GLY	LYS	GLN	VAL	THR	THR	GLY	GLU	VAL	VAL	THR	PRO	LEU	ILE	ILE	LYS	ILE	ILE	PHE	ILE	ILE	ASN	THR	ILE	ASN	THR	ILE	ALA	S387	D389	E390	E391	S392	S393	N394	A395	A396	E397	E398	W399	K400	Y401								



● Molecule 3: Acetylcholine receptor subunit alpha



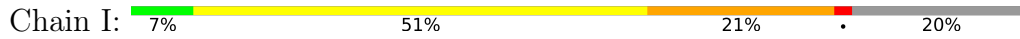
● Molecule 3: Acetylcholine receptor subunit alpha



LYS	ILE	PHE	ALA	ASP	ASP	ILE	ASP	ILE	LYS	GLN	GLN	THR	THR	GLY	GLU	VAL	ILE	PHE	GLN	PRO	THR	PRO	ASP	VAL	S374	S374	A375	I376	E377	G378	V379	K380	Y381	I382	A383	E384	H385	M386	K387	S388	D389	E390	E391	S392	S393	N394	A395	A396	E397	E398	W399
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K400	Y401	V402	V405	I406	D407	H408	I409	H409	L410	L411	L411	C412	V413	F414	M415	L416	I417	C418	I419	I420	G421	T422	V423	S424	V425	F426	A427	G428	R429	L430	I431	E432	L433	Q435	E436	G437
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● Molecule 3: Acetylcholine receptor subunit alpha



MET	ILE	LEU	CYS	SER	TYR	TRP	HIS	VAL	K107	L108	LEU	LEU	VAL	LEU	LEU	S1	E2	H3	E4	L7	V8	A9	M10	L11	L12	L13	Y15	M16	K17	I18	I19	R20	P21	V22	E23	H24	T25	H26	F28	D29	R30	I31	T32	V33	G34	N35	A36	D37	L38
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Q39	L40	I41	M42	V43	D44	E45	V46	N47	Q48	I49	V50	E51	T52	M53	V54	R55	L56	R57	Q58	W60	I61	D62	V63	R64	L65	R66	W67	N68	P69	A70	D71	Y72	G73	G74	I75	K76	K77	I78	R79	L80	P81	S82	D83	D84	V85	H86	H87	P88	D89	L90	V91	T92	V93	G94	N95	A96	D97	L98	G99
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D99	F100	A101	I102	H103	H104	M105	T106	K107	L108	I109	L110	D111	Y112	T113	G114	K115	I116	M117	W118	T119	P120	P121	A122	I123	F124	K125	S126	Y127	C128	E129	I130	L131	V132	T133	H134	F135	P136	F137	D138	Q139	Q140	R141	C142	T143	M144	K145	H146	R147	H148	M149	T150	Y151	D152	G153	T154	K155	V156	L157	I158
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C222	L223	L224	F225	S226	F227	L228	T229	V230	L231	V232	F233	Y234	L235	P236	T237	D238	H239	S239	G240	E241	K242	M243	T244	Y245	S246	I247	S248	V249	L250	L251	C192	S252	L253	T254	V255	F256	L257	L258	V259	L260	V261	E262	L263	L264	P265	S266	T267	S268	MET	S269	A270	V271	P272	L273	I274	G275	K276	N277	M278	L279	F280	T281
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M282	I283	F284	V285	I286	S287	S288	L289	I290	V291	L292	V293	V294	V295	L296	N297	H298	H299	H300	R301	S302	S303	S304	T305	H306	THR	MET	PRO	GLN	PRO	GLN	ASP	TRP	VAL	ARG	L253	L254	ILE	PHE	ILE	ASN	THR	ILE	PRO	ASN	VAL	MET	PHE	SER	THR	MET	LYS	ARG	ALA	SER	LYS	GLU	GLU	GLU	ASN	LYS	ILE
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PHE	ALA	ASP	ASP	ILE	ASP	ILE	SER	ASP	ILE	GLY	GLN	VAL	THR	GLY	GLY	GLU	GLU	VAL	ILE	PHE	THR	THR	THR	PRO	LEU	ILE	LYS	ASN	PRO	ASP	VAL	VAL	LYS	S374	A375	E377	G378	V379	K380	I381	A383	E384	H385	K387	D389	E390	E391	S392	N394	A395	A396	E397	E398	W399	K400	Y401
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V402	A403	M404	V405	I406	D407	H408	I409	H409	L410	L411	L411	C412	V413	F414	M415	L416	I417	C418	I419	I420	G421	T422	V423	S424	V425	F426	A427	L430	I431	E432	Q435	E436	G437
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● Molecule 3: Acetylcholine receptor subunit alpha



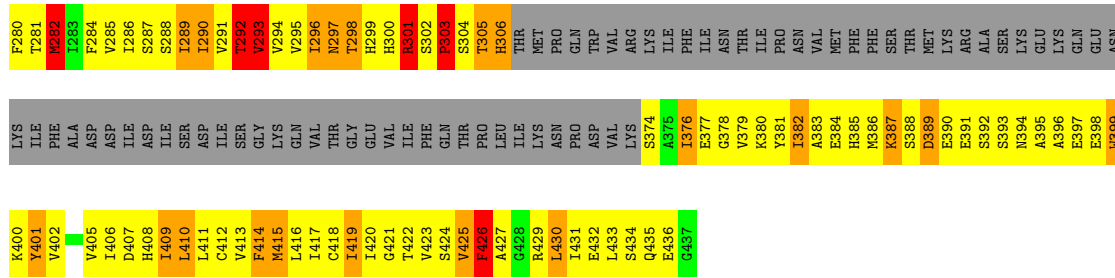
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L37	I38	Q39	L40	I41	M42	V43	D44	E45	V46	N47	Q48	I49	V50	E51	T52	M53	V54	R55	L56	R57	Q58	W60	I61	D62	V63	R64	L65	R66	W67	N68	P69	A70	D71	Y72	G73	G74	I75	K76	K77	I78	R79	L80	P81	S82	D83	D84	V85	H86	H87	P88	D89	L90	V91	T92	V93	G94	N95	A96	D97
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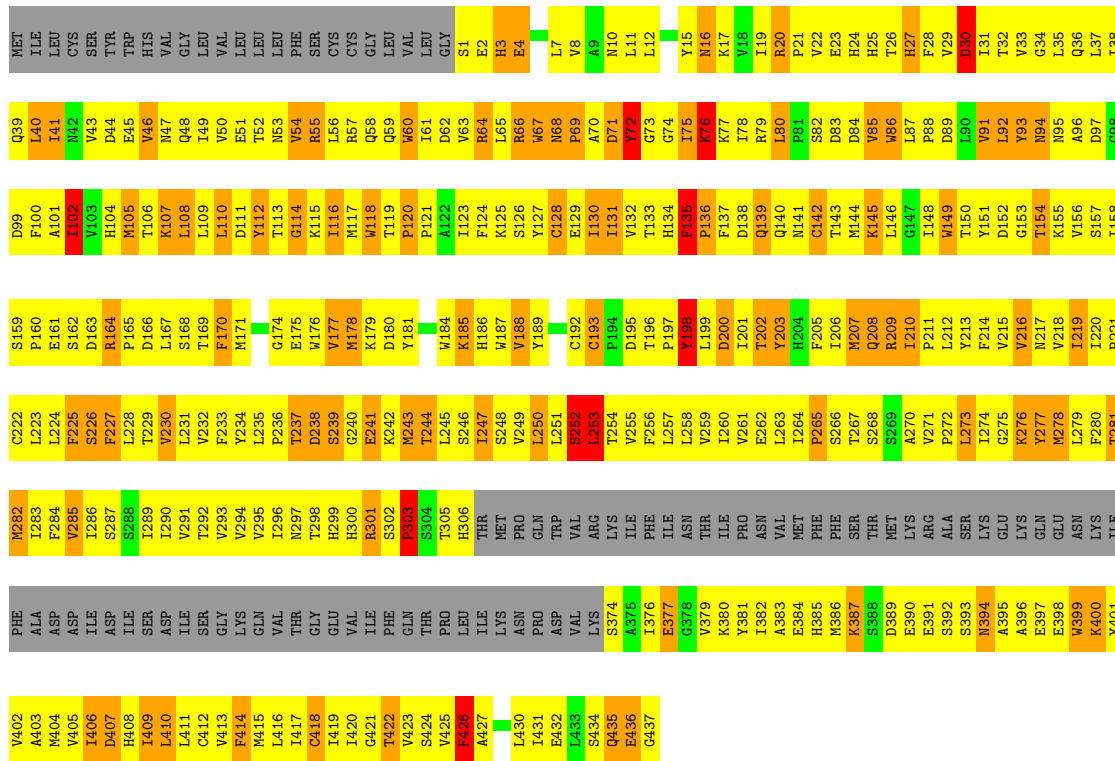
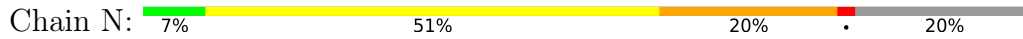
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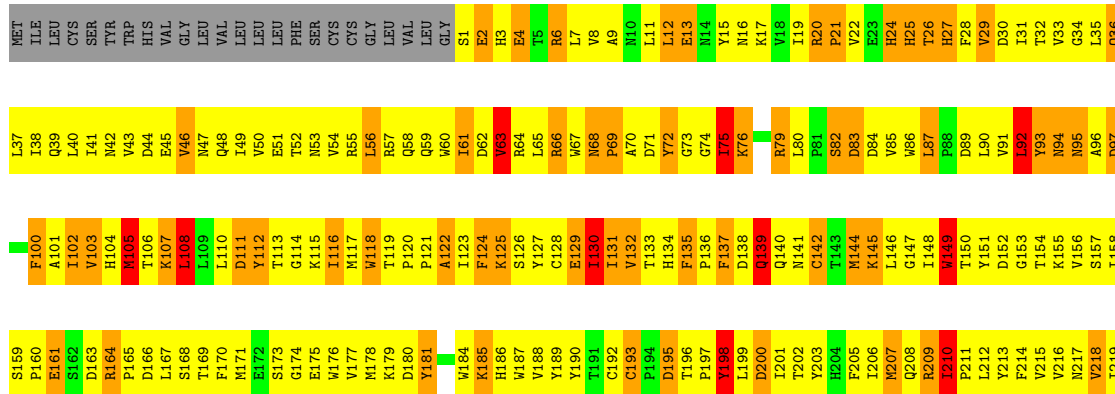
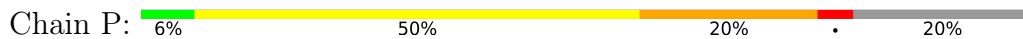
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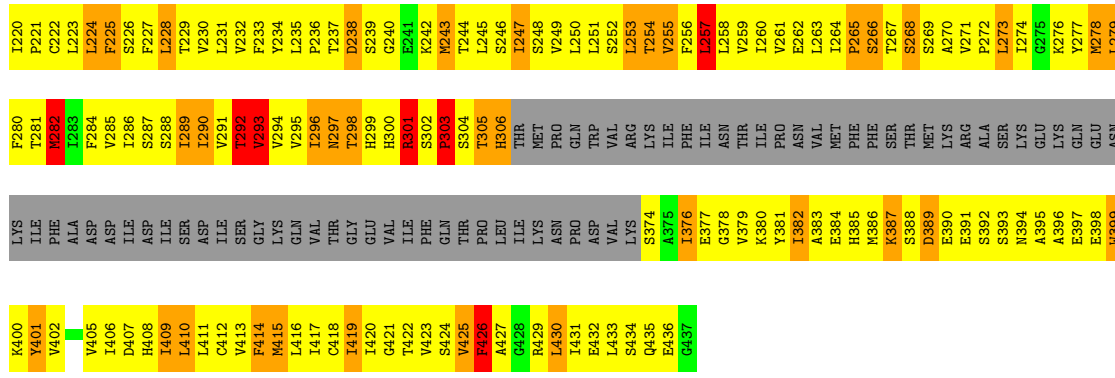
• Molecule 3: Acetylcholine receptor subunit alpha



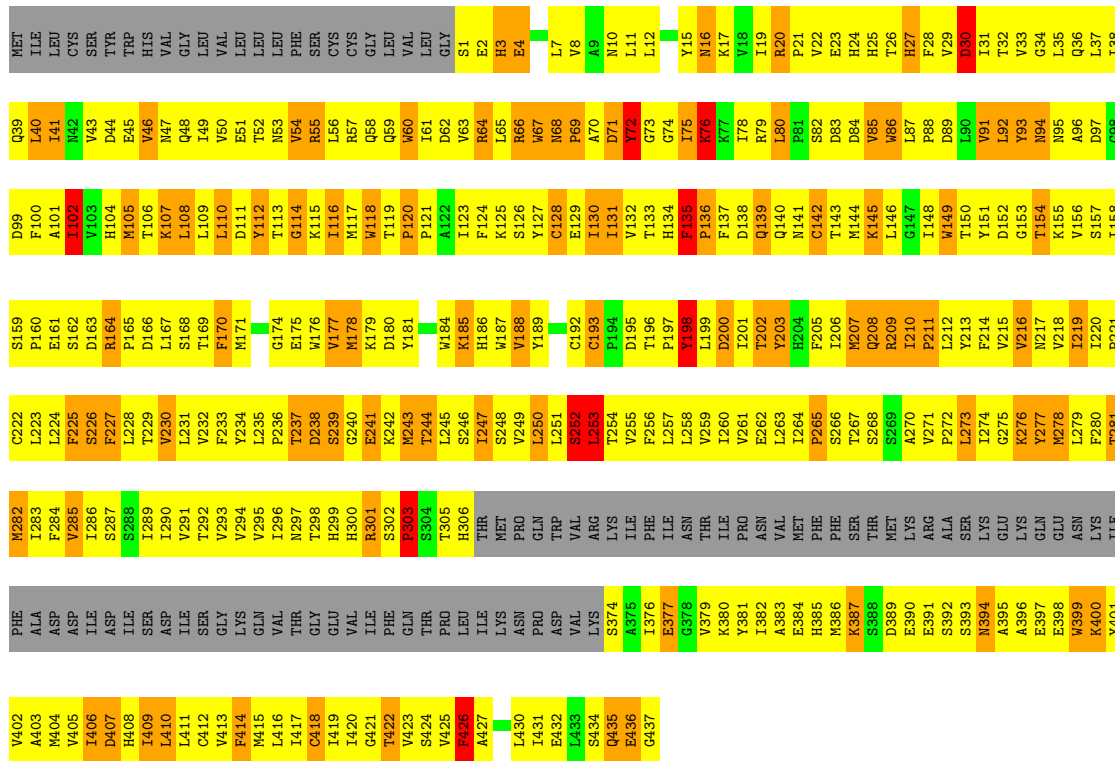
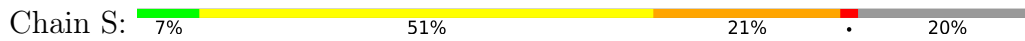
• Molecule 3: Acetylcholine receptor subunit alpha



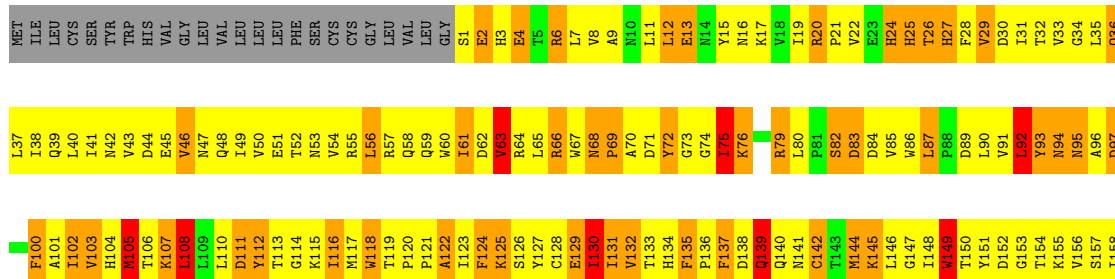




• Molecule 3: Acetylcholine receptor subunit alpha



• Molecule 3: Acetylcholine receptor subunit alpha

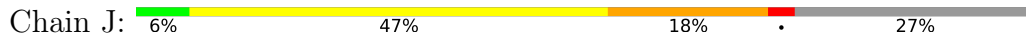




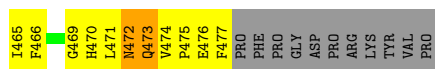
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ASP	LEU	ALA	ASN	PHE	ALA	PRO	ARG	GLY	ILE	SER	GLY	VAL	LEU	LEU	LEU	THR	THR	THR	VAL	MET
L455	L456	L457	L458	L459	L460	L461	L462	L463	L464	L465	L466	L467	L468	L469	L470	L471	L472	L473	L474	L475
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
P280	P281	P282	P283	P284	P285	P286	P287	P288	P289	P290	P291	P292	P293	P294	P295	P296	P297	P298	P299	P300
GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY
L101	L102	L103	L104	L105	L106	L107	L108	L109	L110	L111	L112	L113	L114	L115	L116	L117	L118	L119	L120	L121
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123
I40	I41	I42	I43	I44	I45	I46	I47	I48	I49	I50	I51	I52	I53	I54	I55	I56	I57	I58	I59	I60
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
E163	E164	E165	E166	E167	E168	E169	E170	E171	E172	E173	E174	E175	E176	E177	E178	E179	E180	E181	E182	E183
GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY
G283	G284	G285	G286	G287	G288	G289	G290	G291	G292	G293	G294	G295	G296	G297	G298	G299	G300	G301	G302	G303
PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO
Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123
I40	I41	I42	I43	I44	I45	I46	I47	I48	I49	I50	I51	I52	I53	I54	I55	I56	I57	I58	I59	I60
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
E163	E164	E165	E166	E167	E168	E169	E170	E171	E172	E173	E174	E175	E176	E177	E178	E179	E180	E181	E182	E183
GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY
G283	G284	G285	G286	G287	G288	G289	G290	G291	G292	G293	G294	G295	G296	G297	G298	G299	G300	G301	G302	G303
PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO

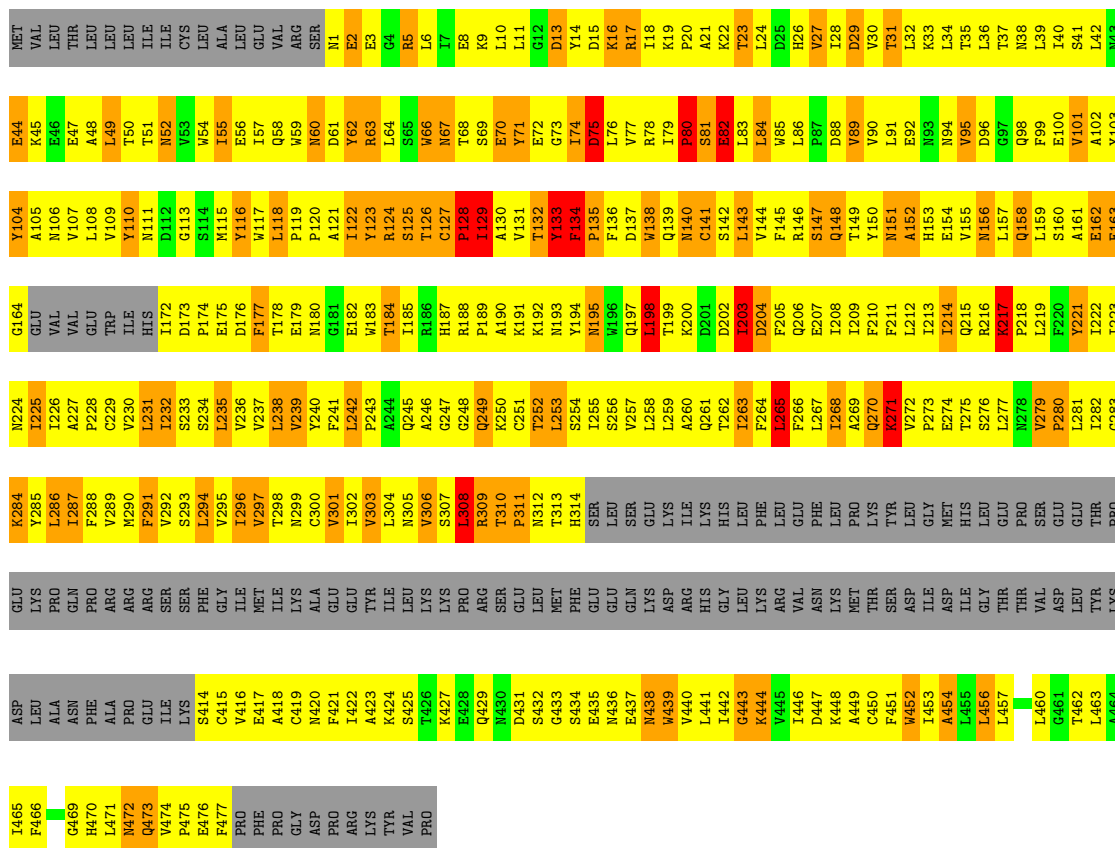
Molecule 4: Acetylcholine receptor gamma subunit



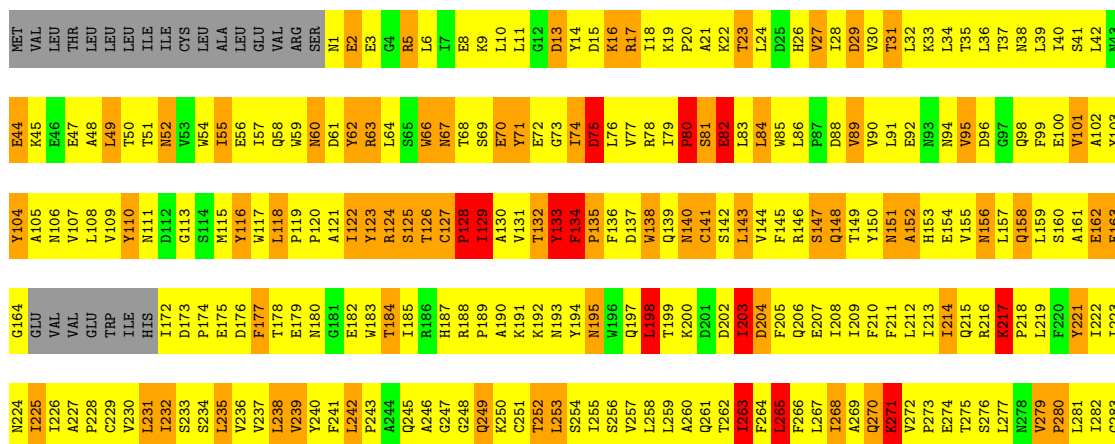
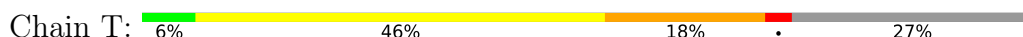
ASP	LEU	ALA	ASN	PHE	ALA	PRO	ARG	GLY	ILE	SER	GLY	VAL	LEU	LEU	LEU	THR	THR	THR	VAL	MET
L455	L456	L457	L458	L459	L460	L461	L462	L463	L464	L465	L466	L467	L468	L469	L470	L471	L472	L473	L474	L475
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
P280	P281	P282	P283	P284	P285	P286	P287	P288	P289	P290	P291	P292	P293	P294	P295	P296	P297	P298	P299	P300
GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY
L101	L102	L103	L104	L105	L106	L107	L108	L109	L110	L111	L112	L113	L114	L115	L116	L117	L118	L119	L120	L121
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
Y103	Y104	Y105	Y106	Y107	Y108	Y109	Y110	Y111	Y112	Y113	Y114	Y115	Y116	Y117	Y118	Y119	Y120	Y121	Y122	Y123
I40	I41	I42	I43	I44	I45	I46	I47	I48	I49	I50	I51	I52	I53	I54	I55	I56	I57	I58	I59	I60
THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR	THR
E163	E164	E165	E166	E167	E168	E169	E170	E171	E172	E173	E174	E175	E176	E177	E178	E179	E180	E181	E182	E183
GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY	GLY
G283	G284	G285	G286	G287	G288	G289	G290	G291	G292	G293	G294	G295	G296	G297	G298	G299	G300	G301	G302	G303
PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO	PRO



• Molecule 4: Acetylcholine receptor gamma subunit



• Molecule 4: Acetylcholine receptor gamma subunit





## 4 Experimental information

Property	Value	Source
EM reconstruction method	TOMOGRAPHY	Depositor
Imposed symmetry	POINT, C1	Depositor
Number of tilted images used	3564	Depositor
Resolution determination method	Not provided	
CTF correction method	Not provided	
Microscope	FEI TECNAI F30	Depositor
Voltage (kV)	300	Depositor
Electron dose ( $e^-/\text{\AA}^2$ )	50	Depositor
Minimum defocus (nm)	3000	Depositor
Maximum defocus (nm)	6000	Depositor
Magnification	80213	Depositor
Image detector	GATAN ULTRASCAN 4000 (4k x 4k)	Depositor

## 5 Model quality i

### 5.1 Standard geometry i

The Z score for a bond length (or angle) is the number of standard deviations the observed value is removed from the expected value. A bond length (or angle) with  $|Z| > 5$  is considered an outlier worth inspection. RMSZ is the root-mean-square of all Z scores of the bond lengths (or angles).

Mol	Chain	Bond lengths		Bond angles	
		RMSZ	# Z  >5	RMSZ	# Z  >5
1	O	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
1	B	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
1	G	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
1	L	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
1	Q	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
1	V	0.76	2/3048 (0.1%)	0.99	4/4162 (0.1%)
2	I	0.74	2/3059 (0.1%)	1.03	9/4175 (0.2%)
2	C	0.74	2/3059 (0.1%)	1.03	9/4175 (0.2%)
2	H	0.74	2/3059 (0.1%)	1.03	8/4175 (0.2%)
2	M	0.74	2/3059 (0.1%)	1.03	9/4175 (0.2%)
2	R	0.74	2/3059 (0.1%)	1.03	9/4175 (0.2%)
2	W	0.75	2/3059 (0.1%)	1.03	8/4175 (0.2%)
3	2	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	A	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
3	D	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	F	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
3	I	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	K	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
3	N	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	P	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
3	S	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	U	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
3	X	0.74	2/3069 (0.1%)	1.01	6/4186 (0.1%)
3	Z	0.72	3/3069 (0.1%)	1.03	10/4186 (0.2%)
4	3	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
4	E	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
4	J	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
4	O	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
4	T	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
4	Y	0.73	6/3057 (0.2%)	1.01	9/4174 (0.2%)
All	All	0.74	90/91812 (0.1%)	1.01	226/125298 (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
2	1	0	2
2	C	0	2
2	H	0	2
2	M	0	2
2	R	0	2
2	W	0	2
3	2	0	2
3	D	0	2
3	I	0	2
3	N	0	2
3	S	0	2
3	X	0	2
All	All	0	24

The worst 5 of 90 bond length outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(Å)	Ideal(Å)
1	B	129	THR	C-N	-8.43	1.14	1.34
1	L	129	THR	C-N	-8.42	1.14	1.34
1	V	129	THR	C-N	-8.42	1.14	1.34
1	0	129	THR	C-N	-8.41	1.14	1.34
1	G	129	THR	C-N	-8.40	1.14	1.34

The worst 5 of 226 bond angle outliers are listed below:

Mol	Chain	Res	Type	Atoms	Z	Observed(°)	Ideal(°)
2	M	266	ALA	N-CA-CB	10.41	124.67	110.10
2	C	266	ALA	N-CA-CB	10.40	124.66	110.10
2	1	266	ALA	N-CA-CB	10.39	124.64	110.10
2	H	266	ALA	N-CA-CB	10.39	124.64	110.10
2	R	266	ALA	N-CA-CB	10.39	124.64	110.10

There are no chirality outliers.

5 of 24 planarity outliers are listed below:

Mol	Chain	Res	Type	Group
2	1	63	TYR	Sidechain
2	1	74	TYR	Sidechain
3	2	277	TYR	Sidechain
3	2	72	TYR	Sidechain

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Mol	Chain	Res	Type	Group
2	C	63	TYR	Sidechain

## 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	0	2972	0	2952	1088	0
1	B	2972	0	2952	1083	0
1	G	2972	0	2953	1088	0
1	L	2972	0	2953	1094	0
1	Q	2972	0	2952	1084	0
1	V	2972	0	2952	1069	0
2	1	2983	0	2987	1163	0
2	C	2983	0	2987	1152	0
2	H	2983	0	2987	1166	0
2	M	2983	0	2987	1156	0
2	R	2983	0	2987	1158	0
2	W	2983	0	2987	1150	0
3	2	2991	0	3006	1054	0
3	A	2991	0	3005	1077	0
3	D	2991	0	3006	1060	0
3	F	2991	0	3005	1085	0
3	I	2991	0	3006	1056	0
3	K	2991	0	3005	1077	0
3	N	2991	0	3006	1066	0
3	P	2991	0	3005	1069	0
3	S	2991	0	3006	1052	0
3	U	2991	0	3005	1069	0
3	X	2991	0	3006	1067	0
3	Z	2991	0	3005	1075	0
4	3	2987	0	2994	1084	0
4	E	2987	0	2994	1088	0
4	J	2987	0	2994	1093	0
4	O	2987	0	2994	1098	0
4	T	2987	0	2994	1090	0
4	Y	2987	0	2994	1091	0
All	All	89544	0	89666	31224	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 174.

The worst 5 of 31224 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)
4:Y:183:TRP:CB	4:Y:216:ARG:HG2	1.33	1.59
4:3:183:TRP:CB	4:3:216:ARG:HG2	1.33	1.56
4:E:183:TRP:CB	4:E:216:ARG:HG2	1.33	1.55
4:J:183:TRP:CB	4:J:216:ARG:HG2	1.33	1.53
1:G:134:TYR:CE1	1:G:213:ILE:HG13	1.44	1.52

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	0	364/493 (74%)	274 (75%)	58 (16%)	32 (9%)	1	11
1	B	364/493 (74%)	274 (75%)	58 (16%)	32 (9%)	1	11
1	G	364/493 (74%)	273 (75%)	59 (16%)	32 (9%)	1	11
1	L	364/493 (74%)	273 (75%)	59 (16%)	32 (9%)	1	11
1	Q	364/493 (74%)	274 (75%)	58 (16%)	32 (9%)	1	11
1	V	364/493 (74%)	274 (75%)	58 (16%)	32 (9%)	1	11
2	1	364/522 (70%)	289 (79%)	57 (16%)	18 (5%)	2	20
2	C	364/522 (70%)	289 (79%)	57 (16%)	18 (5%)	2	20
2	H	364/522 (70%)	288 (79%)	58 (16%)	18 (5%)	2	20
2	M	364/522 (70%)	288 (79%)	58 (16%)	18 (5%)	2	20
2	R	364/522 (70%)	288 (79%)	58 (16%)	18 (5%)	2	20
2	W	364/522 (70%)	289 (79%)	57 (16%)	18 (5%)	2	20

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Mol	Chain	Analysed	Favoured	Allowed	Outliers	Percentiles	
3	2	366/461 (79%)	294 (80%)	41 (11%)	31 (8%)	1	12
3	A	366/461 (79%)	288 (79%)	50 (14%)	28 (8%)	1	13
3	D	366/461 (79%)	294 (80%)	41 (11%)	31 (8%)	1	12
3	F	366/461 (79%)	288 (79%)	50 (14%)	28 (8%)	1	13
3	I	366/461 (79%)	294 (80%)	41 (11%)	31 (8%)	1	12
3	K	366/461 (79%)	289 (79%)	48 (13%)	29 (8%)	1	13
3	N	366/461 (79%)	293 (80%)	42 (12%)	31 (8%)	1	12
3	P	366/461 (79%)	289 (79%)	49 (13%)	28 (8%)	1	13
3	S	366/461 (79%)	294 (80%)	41 (11%)	31 (8%)	1	12
3	U	366/461 (79%)	288 (79%)	50 (14%)	28 (8%)	1	13
3	X	366/461 (79%)	294 (80%)	41 (11%)	31 (8%)	1	12
3	Z	366/461 (79%)	289 (79%)	48 (13%)	29 (8%)	1	13
4	3	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
4	E	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
4	J	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
4	O	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
4	T	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
4	Y	365/505 (72%)	281 (77%)	58 (16%)	26 (7%)	1	14
All	All	10950/14652 (75%)	8553 (78%)	1585 (14%)	812 (7%)	2	14

5 of 812 Ramachandran outliers are listed below:

Mol	Chain	Res	Type
1	0	2	VAL
1	0	68	ASP
1	0	82	SER
1	0	95	ASN
1	0	131	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	0	340/449 (76%)	262 (77%)	78 (23%)	1	4
1	B	340/449 (76%)	262 (77%)	78 (23%)	1	4
1	G	340/449 (76%)	263 (77%)	77 (23%)	1	5
1	L	340/449 (76%)	262 (77%)	78 (23%)	1	4
1	Q	340/449 (76%)	262 (77%)	78 (23%)	1	4
1	V	340/449 (76%)	262 (77%)	78 (23%)	1	4
2	1	335/475 (70%)	244 (73%)	91 (27%)	0	3
2	C	335/475 (70%)	243 (72%)	92 (28%)	0	3
2	H	335/475 (70%)	244 (73%)	91 (27%)	0	3
2	M	335/475 (70%)	244 (73%)	91 (27%)	0	3
2	R	335/475 (70%)	243 (72%)	92 (28%)	0	3
2	W	335/475 (70%)	243 (72%)	92 (28%)	0	3
3	2	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	A	343/427 (80%)	248 (72%)	95 (28%)	0	3
3	D	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	F	343/427 (80%)	248 (72%)	95 (28%)	0	3
3	I	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	K	343/427 (80%)	248 (72%)	95 (28%)	0	3
3	N	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	P	343/427 (80%)	248 (72%)	95 (28%)	0	3
3	S	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	U	343/427 (80%)	248 (72%)	95 (28%)	0	3
3	X	343/427 (80%)	258 (75%)	85 (25%)	0	3
3	Z	343/427 (80%)	248 (72%)	95 (28%)	0	3
4	3	337/463 (73%)	249 (74%)	88 (26%)	0	3
4	E	337/463 (73%)	249 (74%)	88 (26%)	0	3
4	J	337/463 (73%)	250 (74%)	87 (26%)	0	3
4	O	337/463 (73%)	249 (74%)	88 (26%)	0	3
4	T	337/463 (73%)	249 (74%)	88 (26%)	0	3
4	Y	337/463 (73%)	249 (74%)	88 (26%)	0	3
All	All	10188/13446 (76%)	7565 (74%)	2623 (26%)	2	3

5 of 2623 residues with a non-rotameric sidechain are listed below:

Mol	Chain	Res	Type
2	R	114	PRO
2	W	121	LEU
2	R	455	ARG
2	R	106	TYR
4	T	308	LEU

Sometimes sidechains can be flipped to improve hydrogen bonding and reduce clashes. 5 of 379 such sidechains are listed below:

Mol	Chain	Res	Type
4	O	93	ASN
3	S	134	HIS
4	O	158	GLN
1	Q	460	HIS
4	T	153	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 monosaccharides in this entry.

### 5.6 Ligand geometry [i](#)

There are no ligands in this entry.

### 5.7 Other polymers [i](#)

There are no such residues in this entry.

## 5.8 Polymer linkage issues

The following chains have linkage breaks:

Mol	Chain	Number of breaks
1	0	1
1	B	1
1	G	1
1	L	1
1	Q	1
1	V	1

The worst 5 of 6 chain breaks are listed below:

Model	Chain	Residue-1	Atom-1	Residue-2	Atom-2	Distance (Å)
1	0	129:THR	C	130:ILE	N	1.14
1	B	129:THR	C	130:ILE	N	1.14
1	G	129:THR	C	130:ILE	N	1.14
1	L	129:THR	C	130:ILE	N	1.14
1	Q	129:THR	C	130:ILE	N	1.14

## 6 Tomogram visualisation

This section contains visualisations of the EMDB entry EMD-2376. These allow visual inspection of the internal detail of the tomogram and identification of artifacts.

### 6.1 Orthogonal projections

This section was not generated.

### 6.2 Central slices

This section was not generated.

### 6.3 Largest variance slices

This section was not generated.

### 6.4 Mask visualisation

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



## 7 Tomogram analysis

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

### 7.1 Map-value distribution

This section was not generated.

## 8 Map-model fit

This section was not generated.