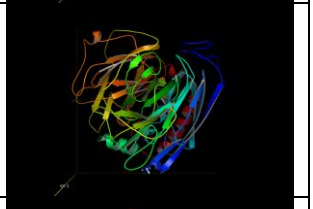
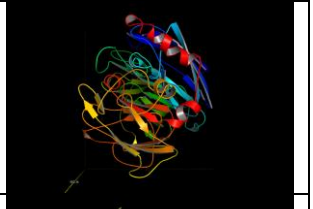
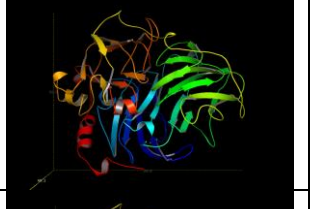
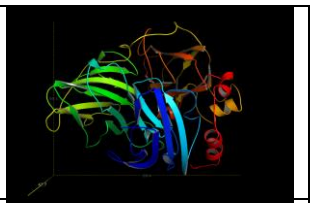
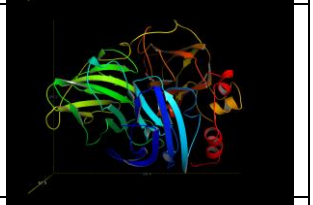
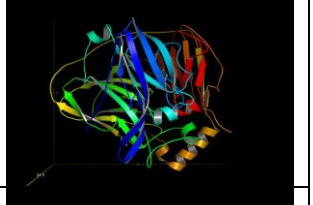
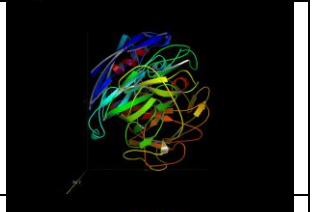
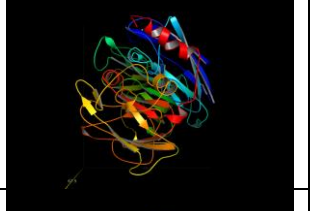
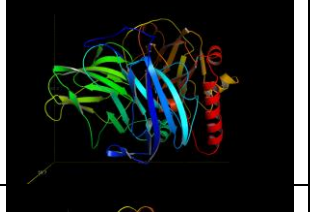
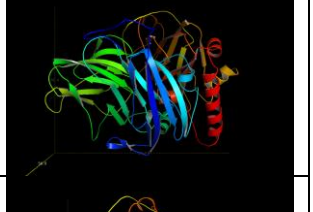
Supplementary file 3: Protein three-dimensional sizes of structurally known laccases.

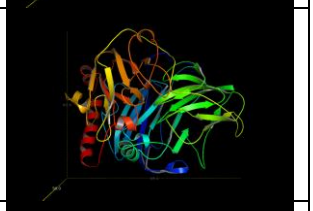
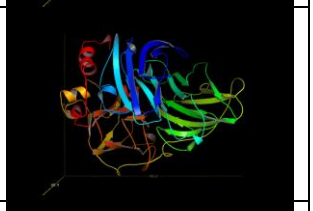
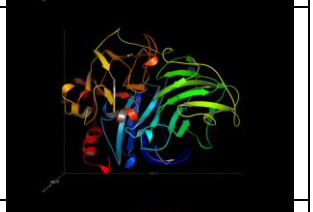
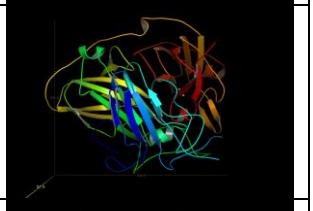
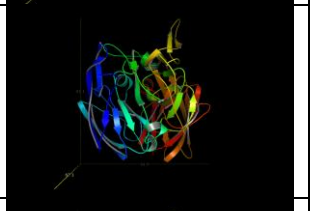
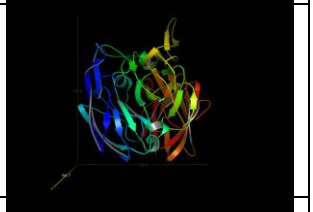
We used Draw_Protein_Dimensions.py that publicly available in the GitHub (https://github.com/Pymol-Scripts) to calculate the three-dimensional sizes of laccases. Here, a laccase three-dimensional size was measured by three sides. Among them, *a* is the minimum and *c* is the maximum. And the remaining one is *b*.

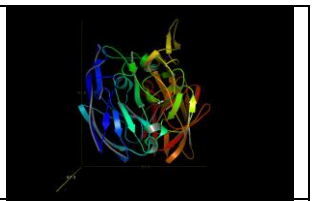
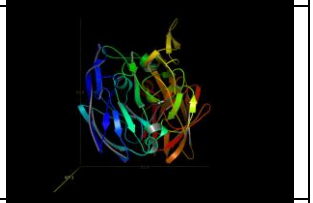
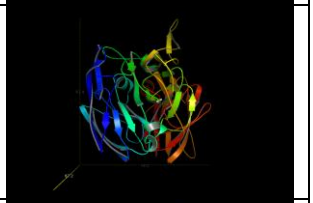
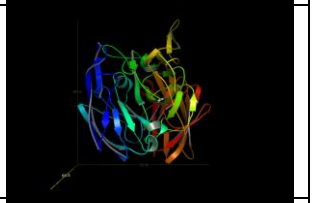
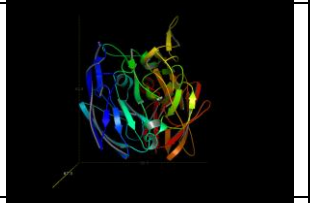
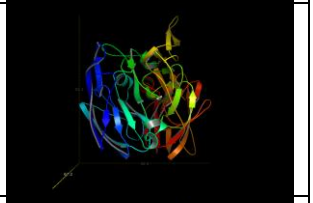
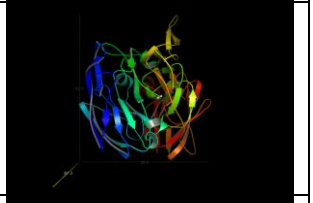
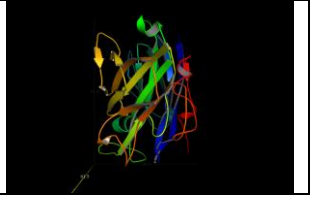
Table S1. Protein three-dimensional sizes of laccases

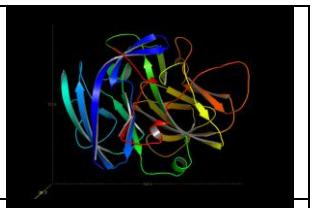
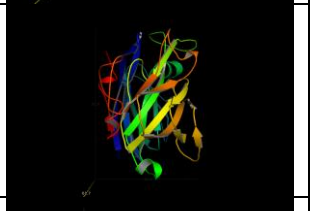
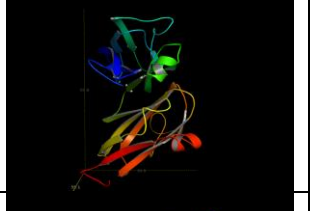
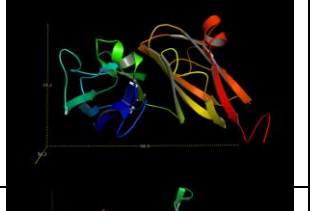
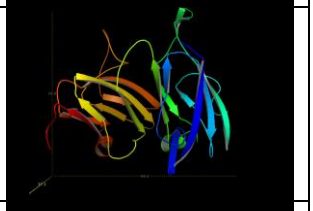
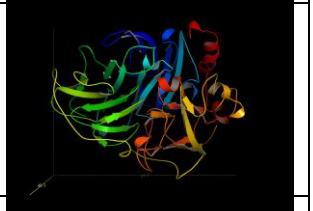
protein_chain	A	B	C	3D picture
1A65A	48.5	61.8	70.3	
1GW0A	55.6	60.2	69.6	
1GW0B	56.2	60.5	69.3	
1GYCA	51.2	57.1	69.6	
1HFUA	49.1	59.9	69.6	
1KYAA	48.2	59.2	69.5	
1KYAB	47.8	59.1	69.4	

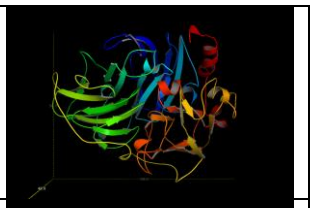
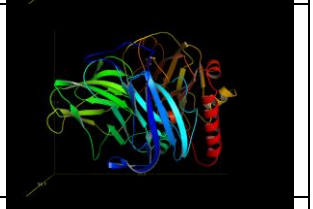
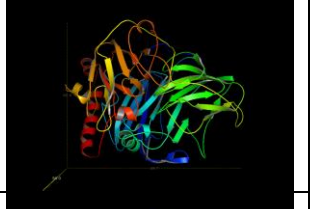
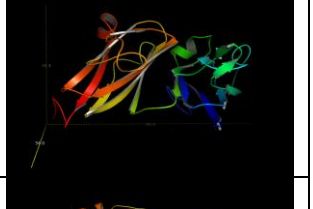
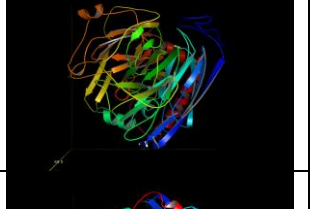
1KYAC	47.7	59.1	69.4	
1KYAD	47.5	59.2	69.4	
1V10A	49.7	57.8	68.2	
1Z9TA	36.2	47.0	50.6	
2FQDA	53.9	54.0	62.5	
2FQEA	52.0	53.7	62.0	
2FQFA	52.4	53.9	62.2	
2FQGA	52.1	54.0	62.2	

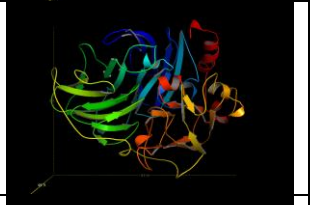
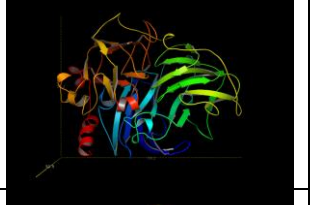
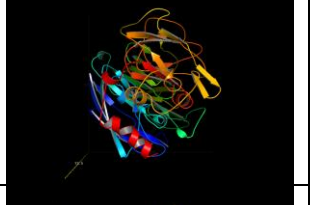
2H5UA	49.5	56.3	67.7	
2HRGA	48.3	57.4	71.0	
2HRHA	48.5	57.0	70.7	
2HZHA	49.7	57.5	67.5	
2IH8A	55.7	60.2	69.0	
2IH8B	55.8	60.4	69.9	
2IH9A	56.9	60.4	69.7	
2IH9B	57.1	60.8	68.8	

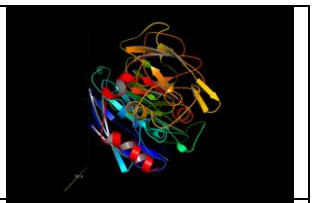
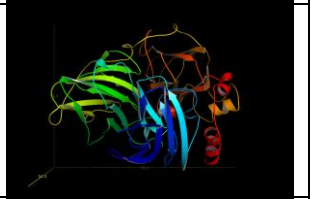
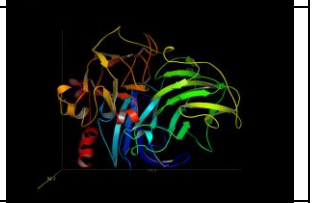
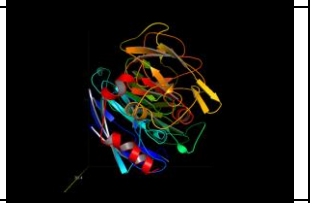
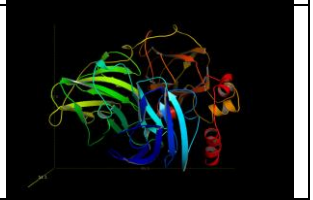
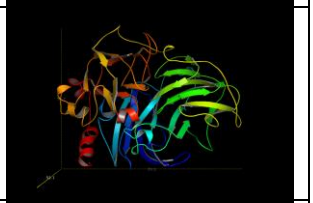
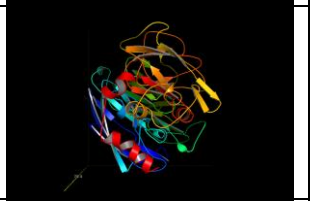
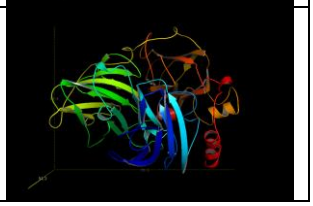
2Q9OA	55.6	60.7	69.4	
2Q9OB	56.0	60.6	69.4	
2QT6A	49.4	58.6	70.2	
2QT6B	49.4	58.8	70.7	
2WSDA	57.6	59.4	64.2	
2XU9A	51.7	61.1	67.1	
2XUWA	52.4	61.0	66.7	
2XYBA	48.8	58.2	69.1	

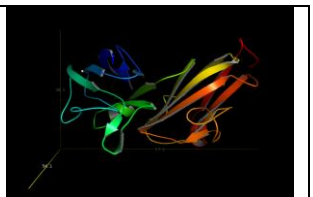
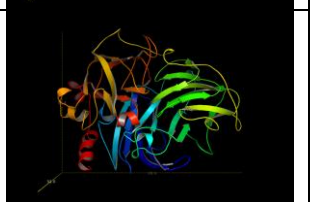
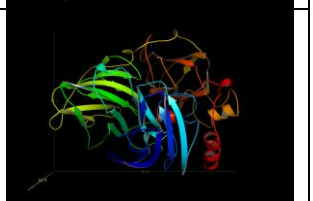
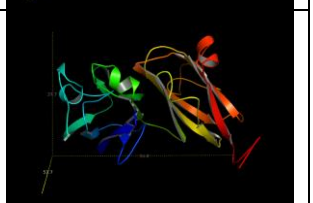
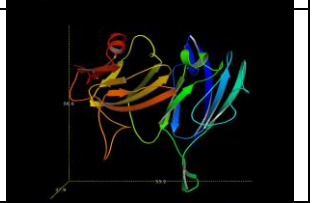
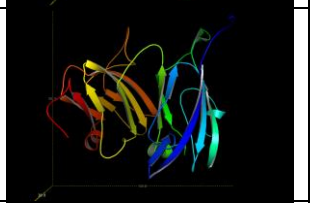
2YAEA	51.3	61.8	67.3	
2YAFA	51.9	62.0	67.1	
2YAHA	52.2	61.4	67.2	
2YAOA	52.8	60.6	66.8	
2YAPA	52.5	61.8	67.3	
2YAQA	52.5	62.1	67.2	
2YARA	52.4	61.5	67.2	
2ZWNA	35.5	51.8	61.5	

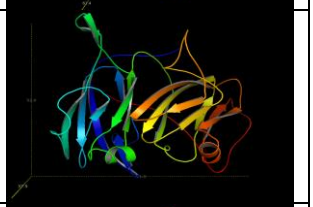
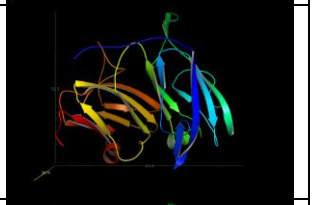
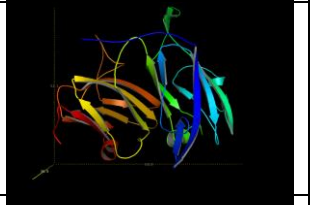
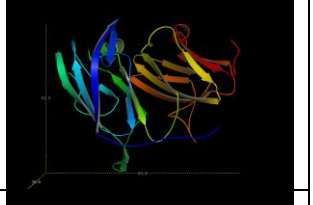
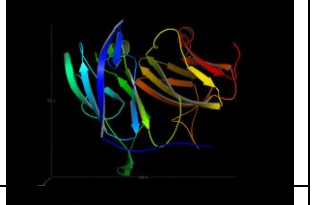
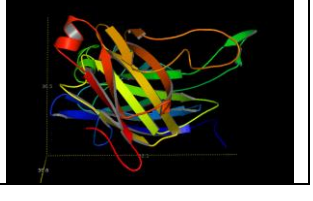
2ZWNB	36.3	53.6	62.1	
2ZWNC	36.0	53.6	61.7	
3CG8A	36.9	55.1	59.6	
3CG8B	37.2	54.2	58.5	
3CG8C	37.2	54.8	59.2	
3DIVA	49.2	56.4	67.7	
3DKHA	56.1	60.7	70.1	
3DKHB	56.4	60.5	69.3	

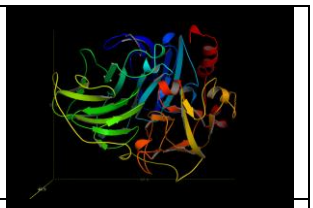
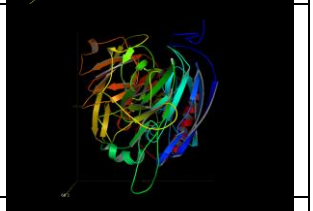
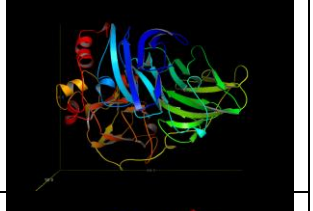
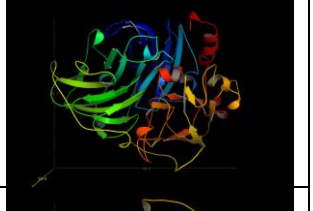
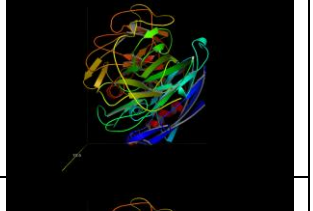
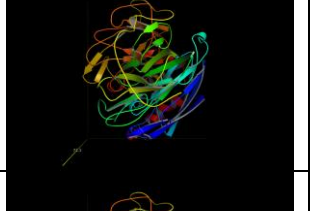
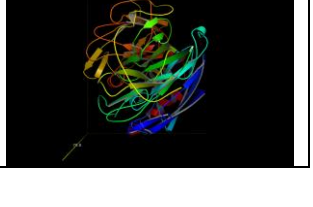
3FPXA	48.8	56.6	68.0	
3FU7A	55.7	59.5	69.8	
3FU7B	56.0	60.8	69.7	
3FU8A	55.8	61.3	70.0	
3FU8B	56.1	61.2	69.9	
3KW8A	37.4	54.0	60.6	
3PPSA	59.2	60.4	69.5	
3PPSB	59.1	59.4	69.4	

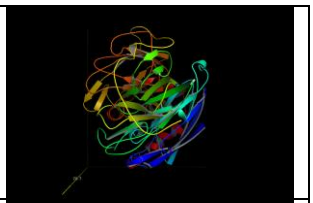
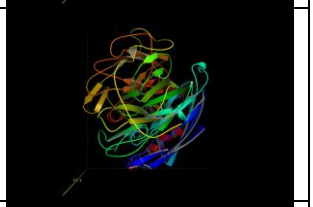
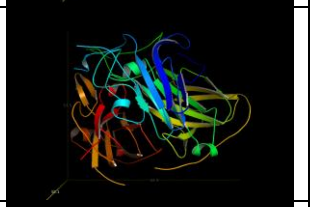
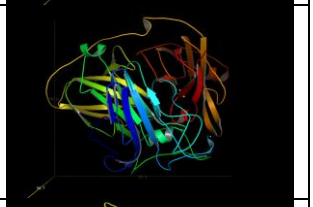
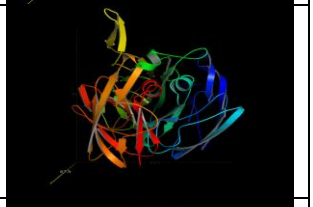
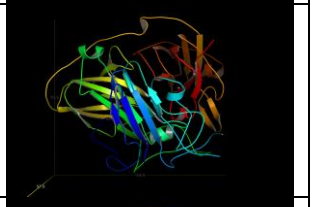
3PPSC	59.1	59.5	69.3	
3PPSD	59.1	60.5	69.6	
3PXLA	48.9	57.3	67.5	
3SQRA	53.7	61.4	68.1	
3T6VA	51.5	57.2	70.2	
3T6VB	50.8	57.7	70.5	
3T6VC	50.6	57.1	70.7	
3T6WA	51.2	56.5	69.6	

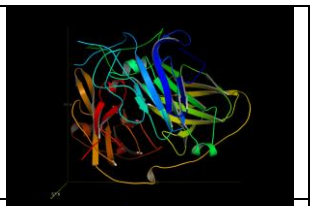
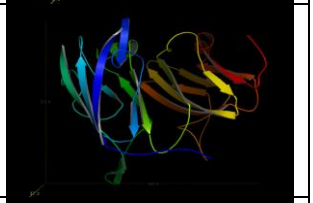
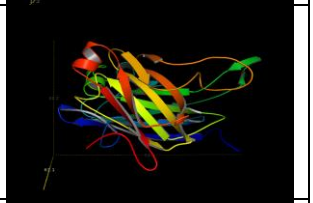
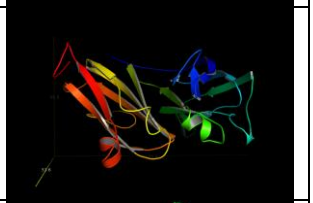
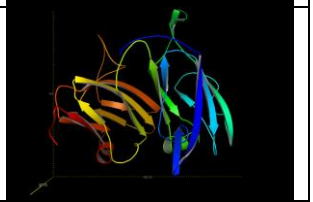
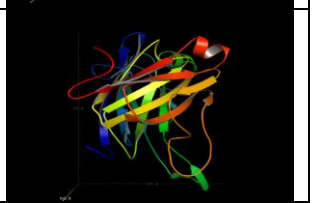
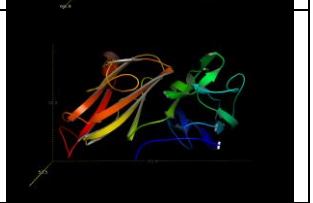
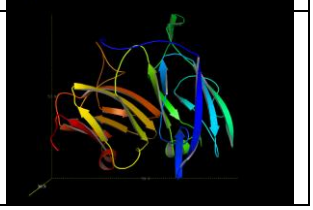
3T6WB	50.6	56.8	70.4	
3T6WC	51.0	57.5	70.0	
3T6XA	51.2	56.4	69.8	
3T6XB	50.5	56.6	70.4	
3T6XC	51.1	57.6	70.5	
3T6ZA	51.1	56.7	70.1	
3T6ZB	50.5	56.9	70.4	
3T6ZC	51.2	57.4	70.3	

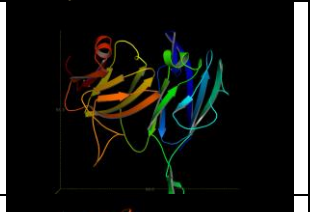
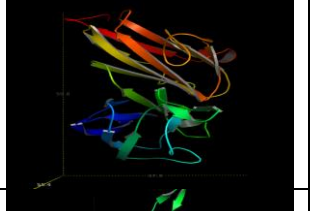
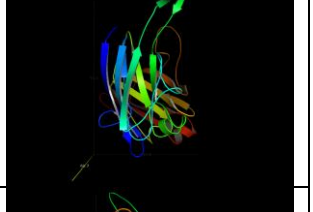
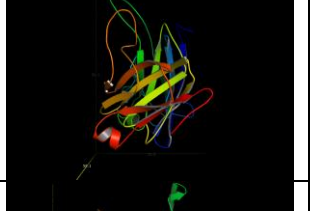
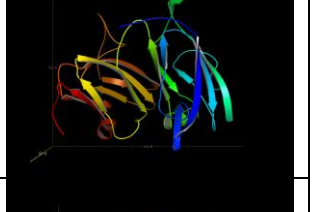
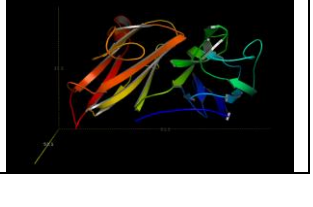
3T9WA	38.1	56.1	57.0	
3T71A	51.0	56.4	69.9	
3T71B	50.3	56.8	70.4	
3T71C	51.0	57.1	70.6	
3TA4D	37.7	56.8	57.7	
3TA4E	37.9	55.2	56.6	
3TA4F	38.8	58.8	58.9	
3TASA	38.1	51.8	61.1	

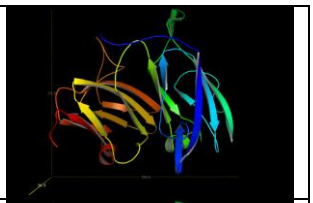
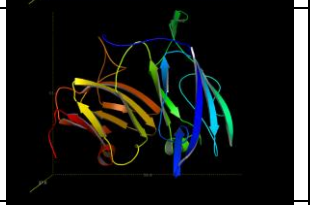
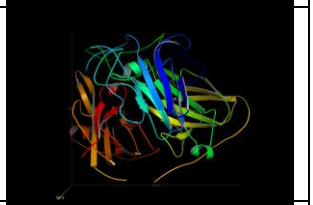
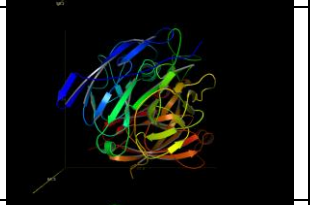
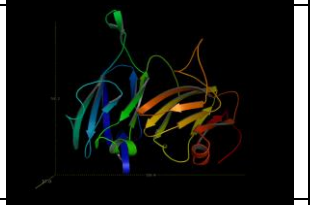
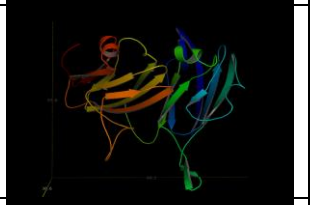
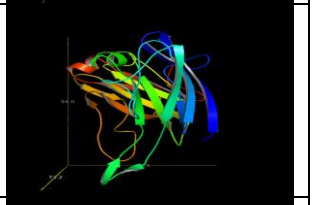
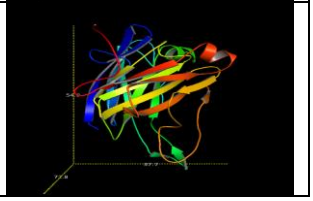
3TASB	38.0	51.9	61.4	
3TASC	37.5	52.0	61.0	
3TBBA	36.6	52.5	61.8	
3TBBB	36.5	52.1	60.8	
3TBBC	36.7	52.1	58.7	
3TBCA	36.6	52.3	61.2	
3TBCB	36.6	52.1	60.4	
3TBCC	36.5	52.1	59.6	

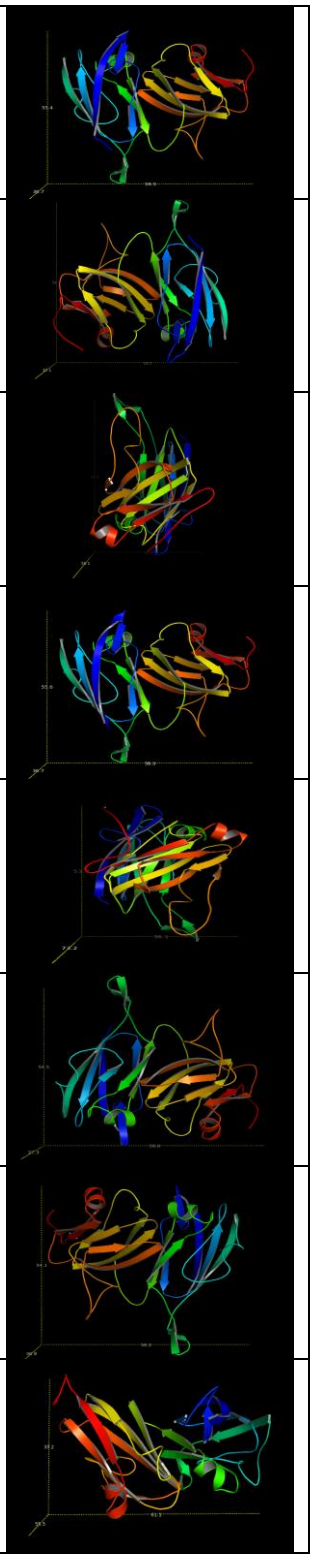
3V9CA	48.9	57.6	67.9	
3V9EA	53.7	60.9	68.1	
3X1BA	50.0	58.0	69.5	
3X1BB	50.6	58.1	68.9	
3ZDWA	57.3	59.1	64.9	
4A2DA	48.3	57.0	70.6	
4A2EA	48.4	57.2	71.2	
4A2FA	48.0	56.5	70.8	

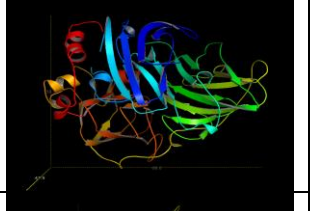
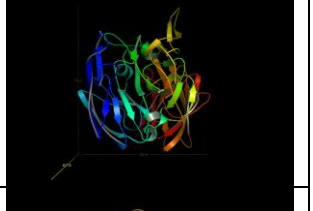
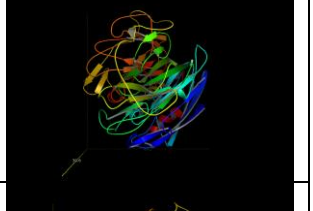
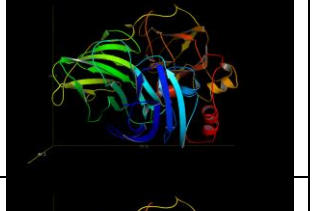
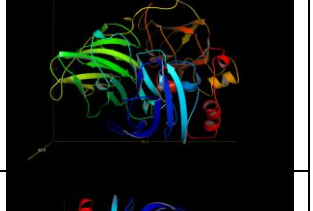
4A2GA	48.0	57.1	70.7	
4A2HA	48.3	56.6	71.1	
4A66A	57.5	58.1	64.3	
4A67A	57.0	59.6	64.7	
4A68A	56.7	59.0	65.1	
4AI7A	53.2	60.5	67.9	
4AKOA	57.6	59.9	63.9	
4AKPA	57.4	60.0	64.2	

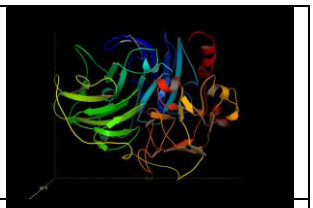
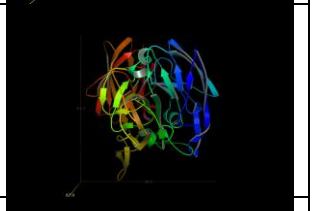
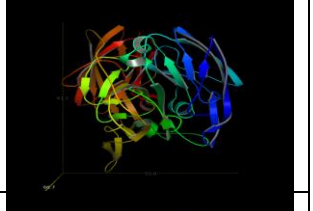
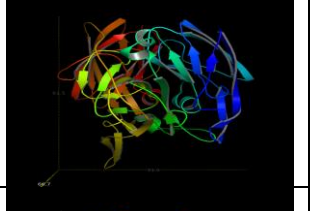
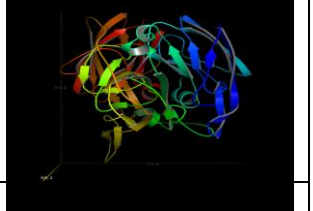
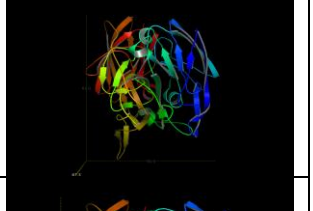
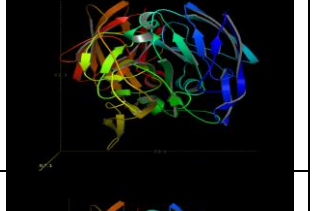
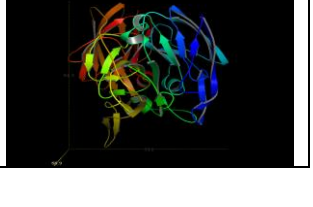
4AKQA	57.6	59.8	64.5	
4GXFA	37.2	53.5	60.4	
4GXFB	37.2	53.6	61.1	
4GXFC	37.3	53.6	61.4	
4GY4A	37.0	54.7	60.0	
4GY4B	37.3	54.4	60.8	
4GY4C	37.3	53.5	61.3	
4GYBA	36.9	53.9	59.3	

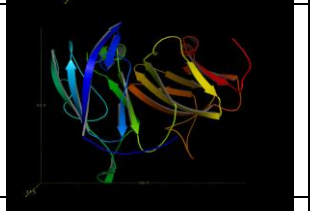
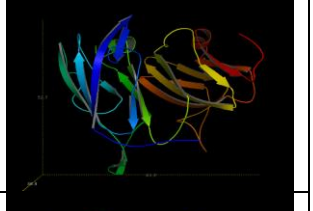
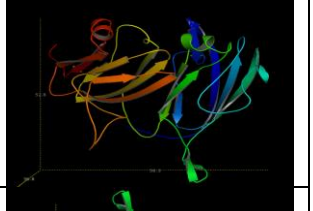
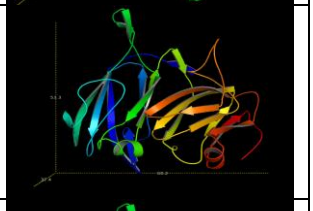
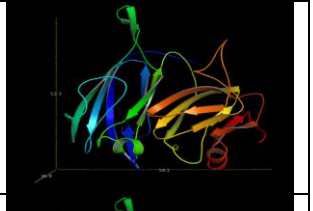
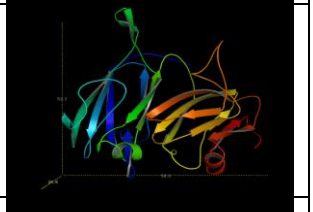
4JHUA	47.8	58.3	71.6	
4JHVA	48.6	58.5	72.3	
4M3HA	37.5	55.3	60.0	
4M3HB	37.3	55.4	59.8	
4M3HC	37.0	55.2	60.7	
4N8UA	38.0	56.2	58.1	
4N8UB	37.0	52.9	62.0	
4N8UC	37.5	53.0	61.2	

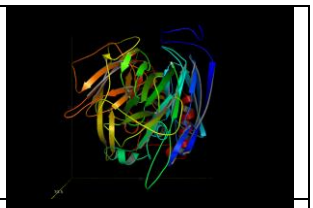
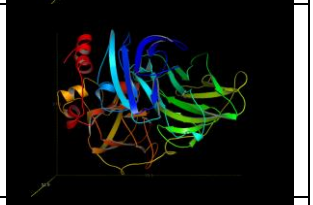
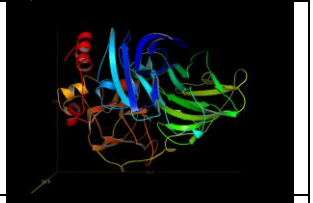
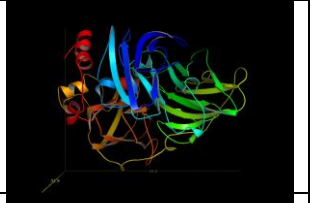
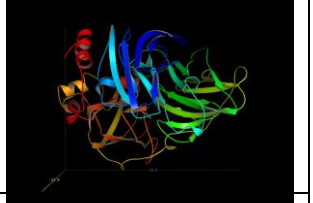
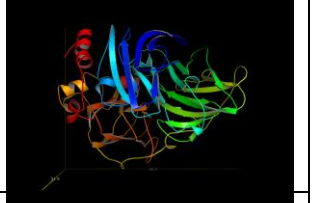
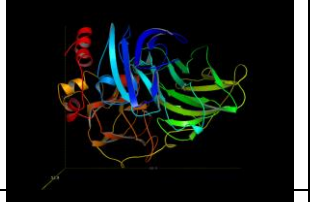
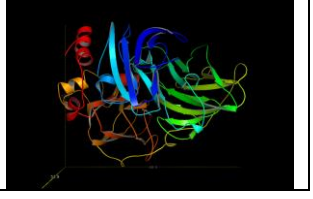
4NAJA	36.9	54.9	59.6	
4NB7A	37.0	53.4	59.9	
4Q8BA	58.2	59.9	63.6	
4Q8BB	54.2	57.8	64.5	
4UAHA	37.0	54.2	59.4	
4UAHB	36.6	55.6	60.2	
4UAHC	37.9	54.0	73.2	
4UANA	37.7	54.0	72.8	

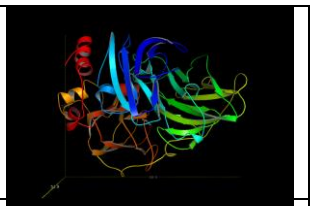
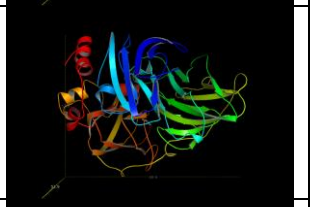
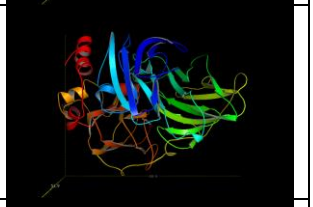
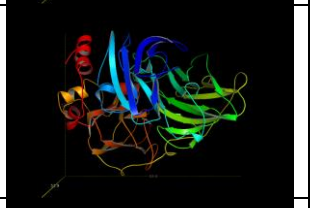
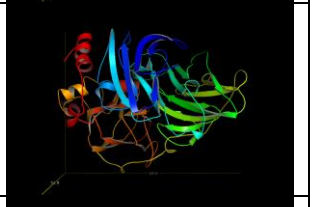
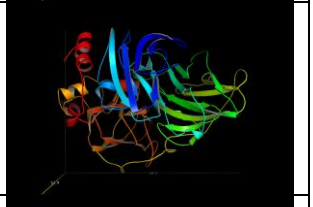
4UANB	36.7	55.4	59.9	
4UANC	37.1	54.1	59.2	
4W1TA	37.1	53.9	59.1	
4W1TB	36.7	55.6	58.9	
4W1TC	38.1	53.7	73.2	
4WTQA	37.3	54.5	59.6	
4WTQB	36.8	54.1	58.2	
4WTQC	37.2	55.5	61.1	

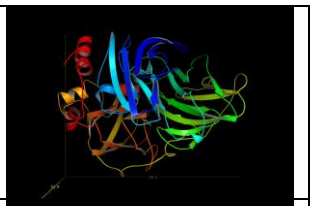
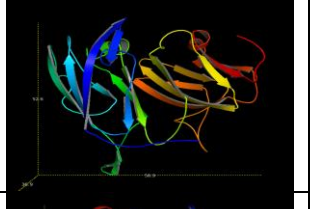
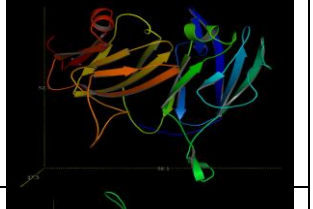
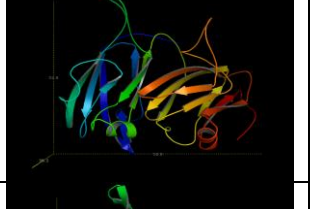
4X4KA	51.7	57.5	68.0	
4YVNA	57.3	61.5	63.3	
5A7EA	47.9	58.3	68.6	
5AFAA	52.8	62.2	67.6	
5ANHA	49.2	57.2	70.6	
5ANHB	49.1	56.9	70.6	
5ANHC	48.8	57.7	70.2	
5E9NA	51.1	56.1	68.6	

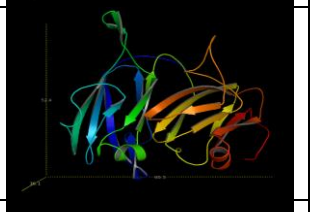
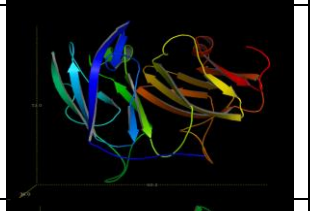
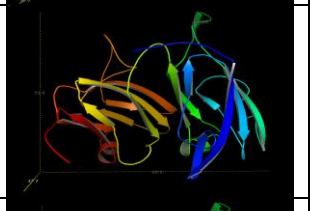
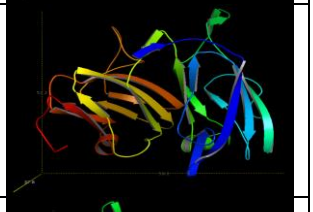
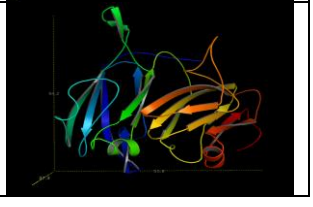
5EHFA	49.6	57.5	70.8	
5JRRA	54.0	61.1	67.0	
5JX9A	51.6	61.2	66.7	
5K0DA	51.4	61.5	66.7	
5K3KA	51.3	61.0	66.2	
5K7AA	51.9	61.0	67.3	
5K15A	53.1	61.3	67.1	
5K84A	53.2	61.3	66.9	

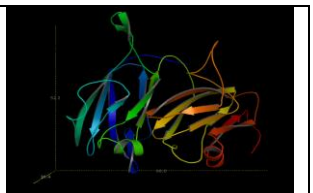
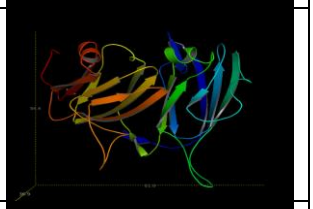
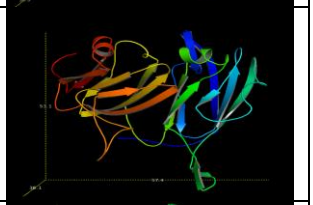
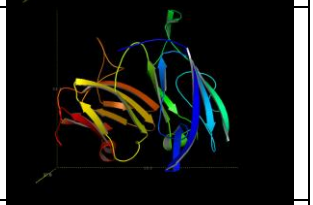
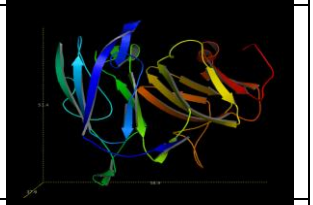
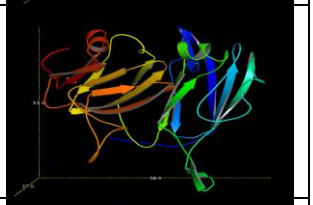
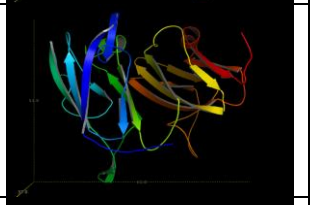
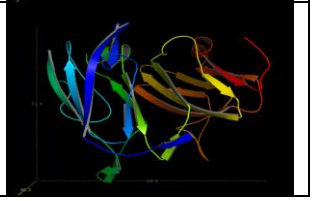
5LDUA	49.4	57.6	68.4	
5LHLA	37.5	52.9	59.7	
5LHLB	36.8	52.7	61.2	
5LHLC	36.8	52.8	58.3	
5LHLD	37.4	53.3	60.2	
5LHLE	36.9	53.3	59.2	
5LHLF	36.8	52.2	58.0	
5LM8A	56.9	59.9	70.7	

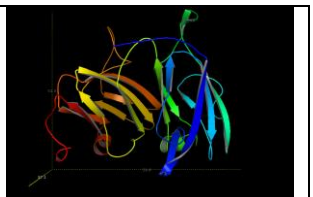
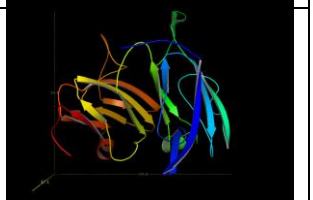
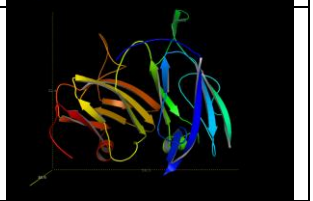
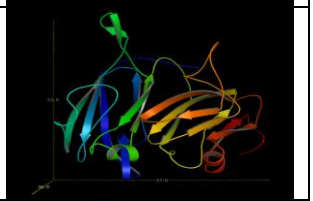
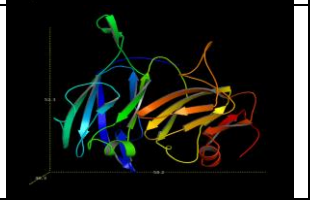
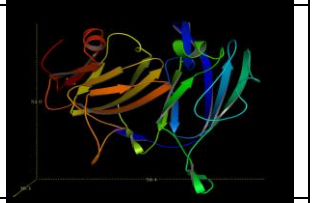
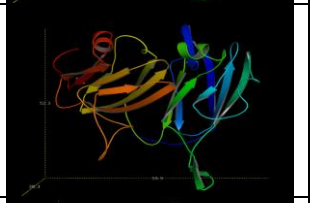
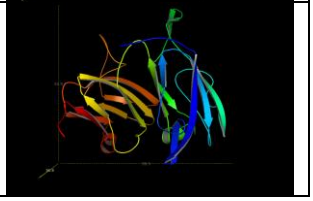
5LWWA	56.2	59.1	70.5	
5MEJA	51.9	57.6	72.1	
5MEWA	51.8	57.6	72.2	
5MHUA	51.9	57.6	68.8	
5MHVA	51.9	57.6	68.8	
5MHWA	51.9	57.6	68.9	
5MHXA	51.9	57.6	68.9	
5MHYA	51.9	57.6	68.9	

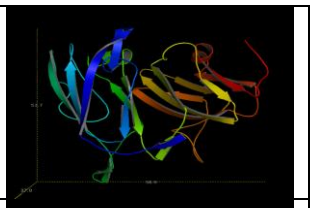
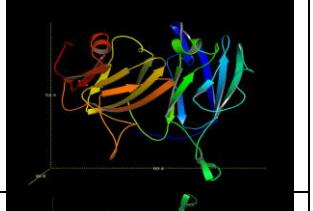
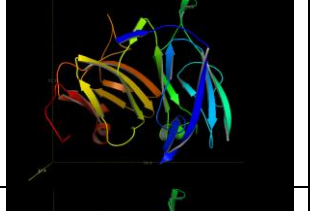
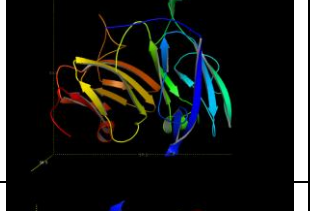
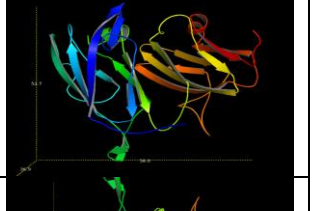
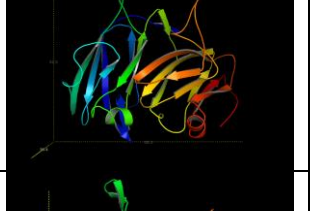
5MHZA	51.9	57.6	68.9	
5MI1A	51.9	57.6	68.9	
5MI2A	51.9	57.6	68.9	
5MIAA	51.9	57.5	68.8	
5MIBA	51.9	57.6	68.9	
5MICA	51.9	57.5	68.8	
5MIDA	51.9	57.6	68.9	
5MIEA	51.9	57.5	68.8	

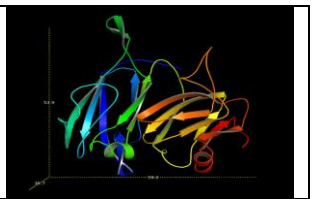
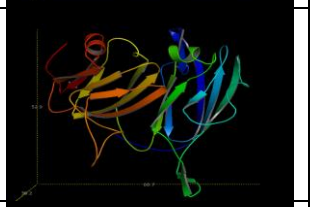
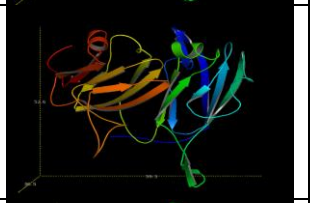
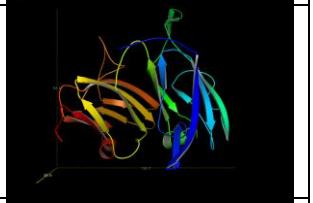
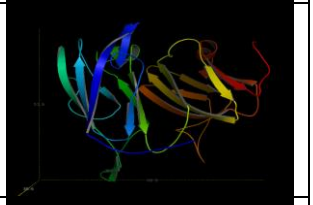
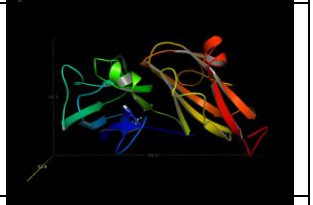
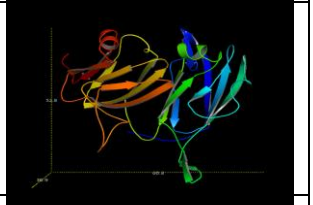
5MIGA	51.9	57.5	68.9	
5MKMA	37.9	52.5	61.2	
5MKMB	36.9	52.6	58.9	
5MKMC	37.5	52.7	58.1	
5MKMD	36.2	52.8	58.8	
5MKME	36.6	52.6	58.3	
5MKMF	36.7	52.8	55.7	
5NQ7A	48.9	58.0	68.9	

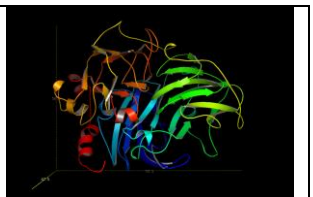
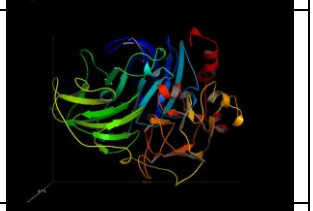
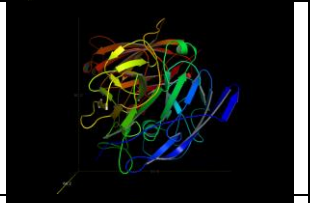
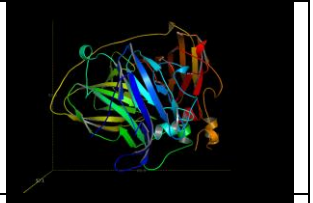
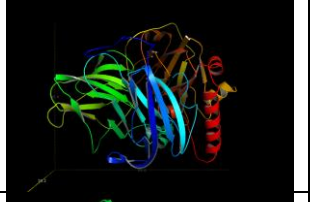
5NQ8A	49.2	57.7	70.1	
5NQ9A	49.8	59.1	68.5	
5NQ9C	49.0	58.2	68.8	
5O3KA	36.1	52.4	60.5	
5O3KB	36.0	52.0	60.2	
5O3KC	37.7	51.6	60.9	
5O3KD	37.8	53.2	59.2	
5O3KE	37.3	54.2	55.8	

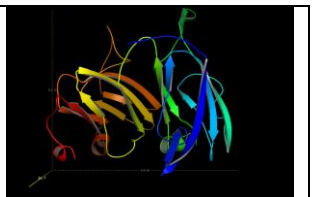
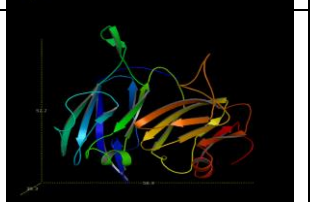
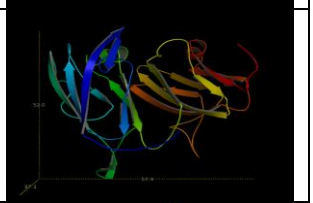
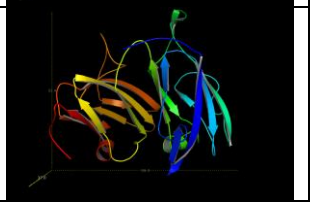
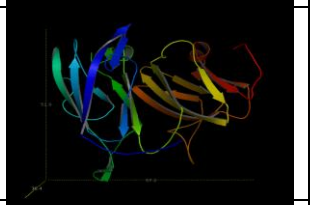
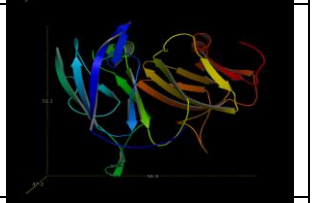
5O3KF	36.4	52.2	60.0	
5O3KG	36.9	54.4	61.0	
5O3KH	36.1	53.1	57.4	
5O3KI	37.0	53.3	59.2	
5O3KJ	37.6	51.4	58.9	
5O3KK	37.0	51.6	58.4	
5O3KL	37.0	51.9	61.0	
5O4IA	36.3	51.9	59.3	

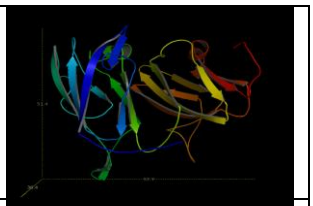
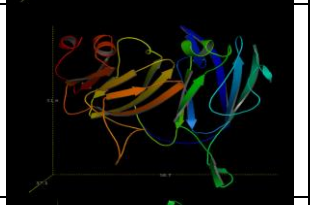
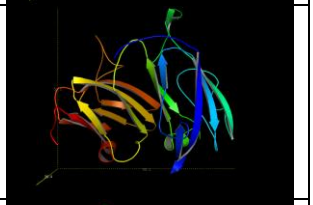
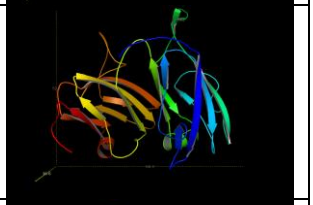
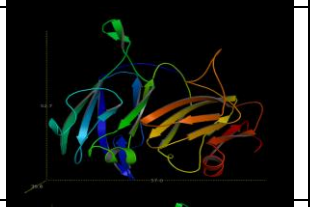
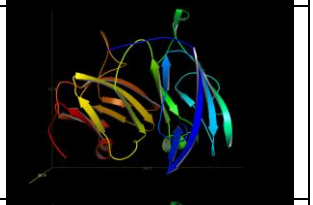
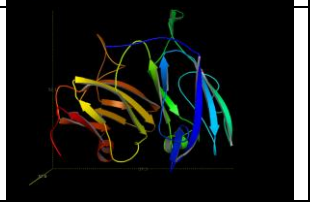
5O4IB	37.1	51.5	59.8	
5O4IC	37.1	54.4	57.3	
5O4ID	36.6	52.4	59.5	
5O4IE	36.9	55.9	57.0	
5O4IF	36.3	52.3	58.2	
5O4IG	36.1	52.0	58.4	
5O4IH	36.3	52.3	59.9	
5O4II	36.8	55.9	59.5	

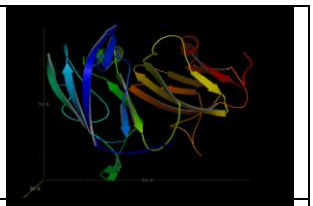
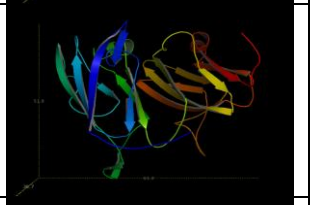
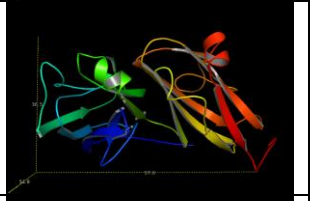
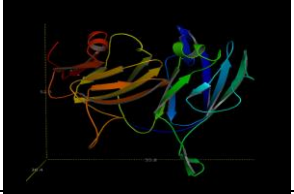
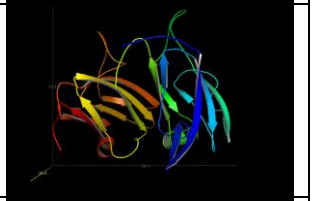
5O4IJ	37.0	53.7	58.9	
5O4IK	36.9	52.2	60.3	
5O4IL	36.8	52.5	60.4	
5O4QA	37.4	53.3	59.9	
5O4QB	36.5	53.8	57.1	
5O4QC	36.9	52.7	58.0	
5O4QD	36.4	52.5	60.3	
5O4QE	36.4	52.8	58.4	

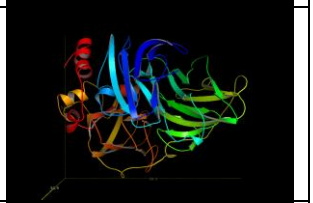
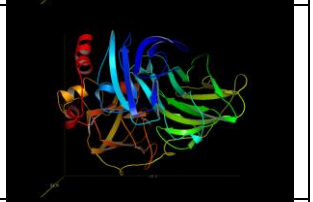
5O4QF	36.7	53.9	59.2	
5O4QG	36.2	52.9	60.7	
5O4QH	36.5	52.6	59.5	
5O4QI	36.6	54.6	58.7	
5O4QJ	36.6	51.9	60.9	
5O4QK	37.1	53.8	59.5	
5O4QL	36.9	52.8	60.8	
5Z1XA	47.3	56.1	69.8	

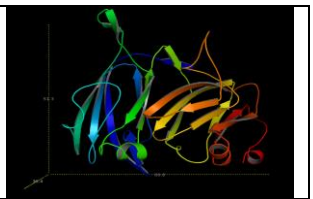
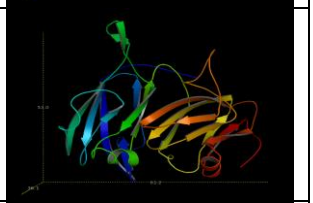
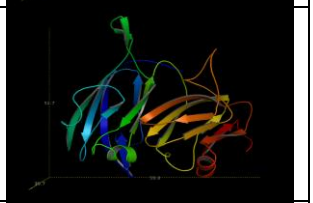
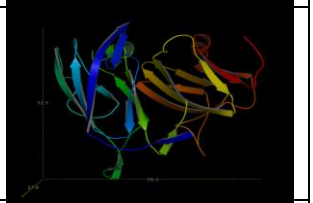
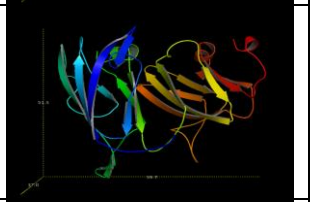
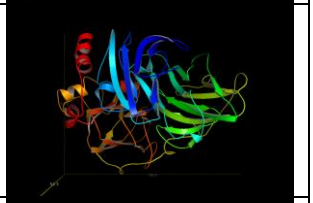
5Z1XB	47.5	56.3	70.1	
5Z22A	47.6	56.6	70.0	
5ZLKA	57.9	60.2	64.2	
5ZLLA	58.0	59.8	63.5	
5ZLMA	57.7	58.9	63.7	
6EVGA	52.1	57.9	65.9	
6F5KA	58.2	60.6	69.6	
6FC7A	37.3	51.5	60.2	

6FC7B	36.7	51.9	57.8	
6FC7C	36.3	52.2	58.3	
6FC7D	37.3	52.2	58.6	
6FC7E	37.1	52.0	57.9	
6FC7F	37.0	52.4	59.3	
6FC7G	36.4	51.9	57.2	
6FC7H	37.2	52.2	56.9	
6FC7I	37.1	54.5	57.7	

6FC7J	36.4	51.4	57.7	
6FC7K	37.1	51.6	58.7	
6FC7L	36.4	52.5	56.1	
6FDJA	36.6	52.5	57.7	
6FDJB	36.6	52.2	60.4	
6FDJC	36.8	52.7	57.0	
6FDJD	36.9	51.6	60.5	
6FDJE	37.0	52.1	57.5	

6FDJF	36.6	52.4	57.0	
6FDJG	36.7	51.9	61.2	
6FDJH	36.5	51.8	57.6	
6FDJI	36.4	52.5	55.8	
6FDJJ	36.7	52.3	59.9	
6FDJK	36.5	52.4	59.0	
6FDJL	36.8	52.8	59.4	
6KLGA	59.0	61.2	74.3	

6KLIA	59.4	64.6	74.1	
6KLJA	58.9	61.4	74.2	
6RGHA	51.4	57.5	68.6	
6RGPA	51.4	57.3	68.9	
6RHHA	51.6	57.3	68.8	
6RHIA	51.7	57.3	68.9	
6RHOA	51.8	57.5	68.9	
6RHPA	51.5	57.2	68.7	

6RHQA	36.4	51.3	60.8	
6RHQB	36.1	53.0	61.2	
6RHQC	36.7	52.7	59.8	
6RHQD	37.4	52.5	59.6	
6RHQE	37.0	51.5	59.7	
6RHQF	36.5	52.5	59.9	
6RHRA	51.3	57.1	68.8	
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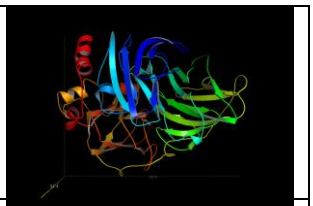
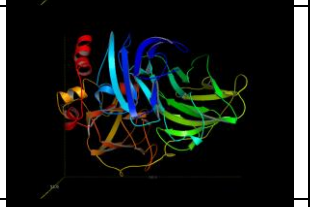
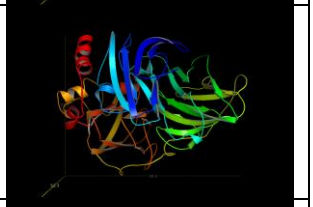
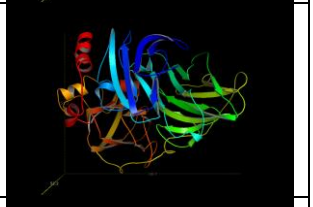
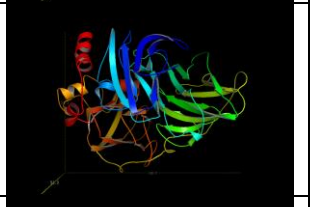
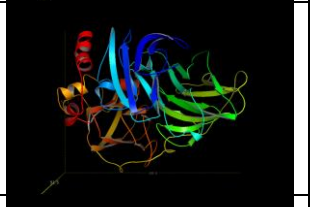
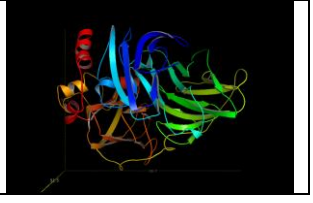
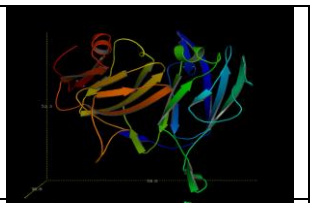
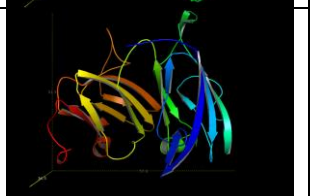
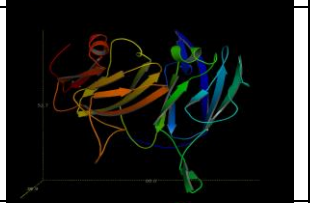
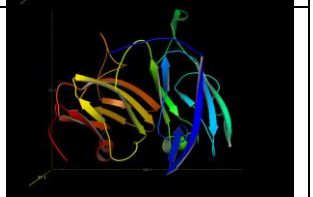
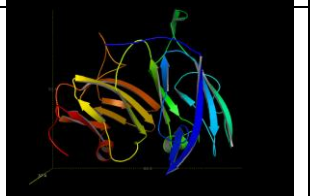
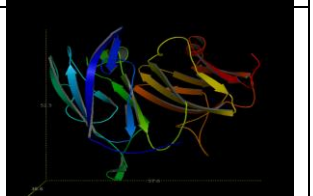
6RI0A	51.4	57.1	68.8	
6RI2A	51.6	57.3	68.6	
6RI4A	51.3	57.2	68.6	
6RI6A	51.1	57.2	68.6	
6RI8A	51.2	57.2	68.7	
6RIIA	51.3	57.2	68.7	
6RIKA	51.5	57.3	68.8	
6RILA	51.5	57.2	68.7	

6S0OA	36.6	52.3	58.0	
6S0OB	36.5	51.5	57.6	
6S0OC	36.9	52.7	60.0	
6S0OD	37.1	52.2	60.5	
6S0OE	37.4	51.8	60.2	
6S0OF	36.6	52.5	57.6	
6RH9A	37.1	52.5	60.7