

Model	Reference	synonyms	nst	basefrequencies = state frequencies	rate classes PAUP, Garii	Partitioncode (jmodeltest, Garii)	Substitution rates (PAUP, Garii)	rate classes PAML	free parameters	Substitution rates in detail
JC	Jukes and Cantor 1969		1	equal	aaaaaa	000000	a=b=c=d=e=f	aaaaaa	0	AC=AG=AT=CG=CT=GT
F81	Felsenstein 1981	TN84	1	estimated	aaaaaa	000000	a=b=c=d=e=f	aaaaaa	3	AC=AG=AT=CG=CT=GT
K80	Kimura 1980	Kimura 2-parameter	2	equal	abaaba	010010	a=c=d=f, b=e	abbbba	1	AC=AT=CG=GT, AG=CT
HKY	Hasegawa et. al. 1985	Hasegawa-Kishino-Yano	2	estimated	abaaba	010010	a=c=d=f, b=e	abbbba	4	AC=AT=CG=GT, AG=CT
TrNef	Tamura Nei 1993	Tamura-Nei with Equal frequencies	6	equal	abaaea	010020	a=c=d=f, b,e	abbbbf	2	AC=AT=CG=GT, AG, CT
TrN	Tamura Nei 1993		6	estimated	abaaea	010020	a=c=d=f, b,e	abbbbf	5	AC=AT=CG=GT, AG, CT
K81	Kimura 1981	Kimura 3-parameter (K3P) TPM1, 3-parameter model	6	equal	abccba	012210	a=f, c=d, b=e	abccba	2	AC=GT, AT=CG, AG=CT
K81uf	Kimura 1981	TPM1uf	6	estimated	abccba	012210	a=f, c=d, b=e	abccba	5	AC=GT, AT=CG, AG=CT
TIMef	Posada 2003	Transitional Model with equal frequencies	6	equal	abccea	012230	a=f, c=d, b,e	abccbe	3	AC=GT, AT=CG, AG, CT
TIM	Posada 2003	Transitional Model	6	estimated	abccea	012230	a=f, c=d, b,e	abccbe	6	AC=GT, AT=CG, AG, CT
TVMef	Posada 2003	Transversional Model With equal frequencies	6	equal	abcdbe	012314	a,c,d,f, b=e	abcdea	4	AC, AT, CG, GT, AG=CT
TVM	Posada 2003	Transitional Model	6	estimated	abcdbe	012314	a,c,d,f, b=e	abcdea	7	AC, AT, CG, GT, AG=CT
SYM	Zharkikh 1994	symmetrical model	6	equal	abcdef	012345	a,c,d,f,b,e	abcdef	5	AC, AG, AT, CG, CT, GT
GTR	e.g. Lanave et al. 1984, Tavare 1986, Rodriguez et. al. 1990	REV	6	estimated	abcdef	012345	a,c,d,f,b,e	abcdef	8	AC, AG, AT, CG, CT, GT
TPM2	see jmodeltest manual		6	equal	abadbd	010212	a=c, d=f, b=e	abcbca	2	AC=AT, CG=GT, AG=CT
TPM2uf	see jmodeltest manual		6	estimated	abadbd	010212	a=c, d=f, b=e	abcbca	5	AC=AT CG=GT, AG=CT
TPM3	see jmodeltest manual		6	equal	abcabc	012012	a=d, c=f, b=e	abbdda	2	AC=CG, AT=GT, AG=CT
TPM3uf	see jmodeltest manual		6	estimated	abcabc	012012	a=d, c=f, b=e	abbdda	5	AC=CG, AT=GT, AG=CT
TIM2ef	see jmodeltest manual		6	equal	abaded	010232	a=c, d=f, b, e	abcbcf	3	AC=AT, CG=GT, AG, CT
TIM2	see jmodeltest manual		6	estimated	abaded	010232	a=c, d=f, b, e	abcbcf	6	AC=AT, CG=GT, AG, CT
TIM3ef	see jmodeltest manual		6	equal	abcaec	012032	a=d, c=f, b, e	abdddf	3	AC=CG, AT=GT, AG, CT
TIM3	see jmodeltest manual		6	estimated	abcaec	012032	a=d, c=f, b, e	abdddf	6	AC=CG, AT=GT, AG, CT
	all models can also have +G and +I									
	+G: rate heterogeneity	We did our best to summarize everything here, but there could be mistakes – please double check and let us know if you find any. thanks!								
	+I: proportion of invariable sites									
Jukes, T. H., and C. R. Cantor. 1969. Evolution of protein molecules. Pages 21-123 in Mammalian Protein Metabolism (H. N. Munro, ed.). Academic Press, New York.										