

Table S1. The MaxASA values used in this study. The MaxASA values are measured in \AA^2 .

Residue	MaxASA	Residue	MaxASA
Alanine	129	Leucine	201
Arginine	274	Lysine	236
Asparagine	195	Methionine	224
Aspartate	193	Phenylalanine	240
Cysteine	167	Proline	159
Glutamate	223	Serine	155
Glutamine	225	Threonine	172
Glycine	104	Tryptophan	285
Histidine	224	Tyrosine	263
Isoleucine	197	Valine	174

Figure S1. Visualization of 3D structure predicted by AlphaFold2 of P15309 (colored in yellow) and P15309_V30A (colored in blue), the RMSD between these two structures is 0.050 \AA (calculated by PYMOL). The mutation site is colored in red (pointed by an arrow).

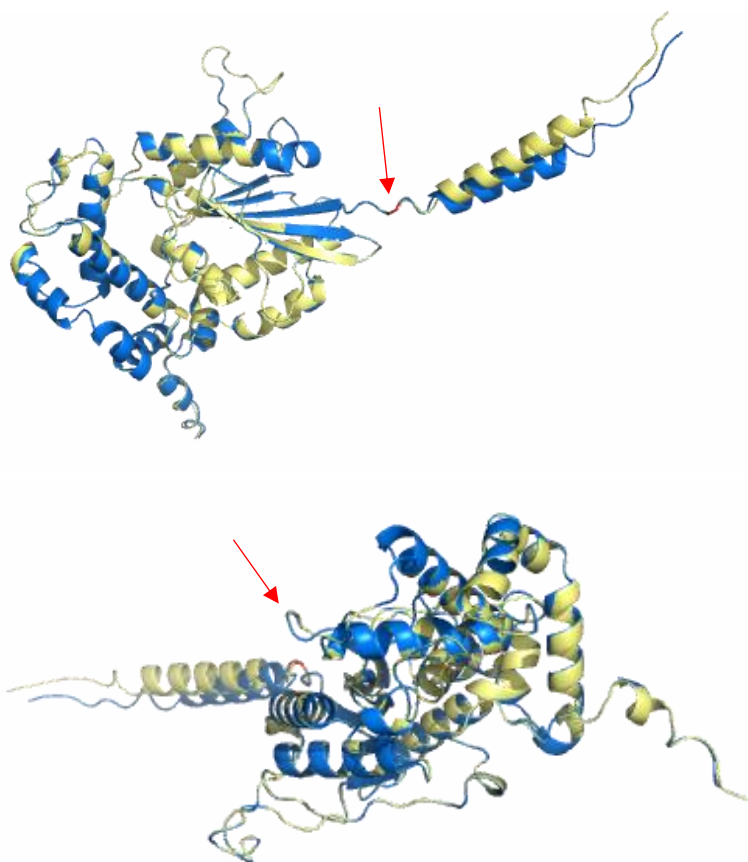


Figure S2. Visualization of 3D structure predicted by AlphaFold2 of O06071 (colored in yellow) and O06071_I30A (colored in blue), the RMSD between these two

structures is 0.441 Å (calculated by PYMOL). The mutation site is colored in red (pointed by an arrow).

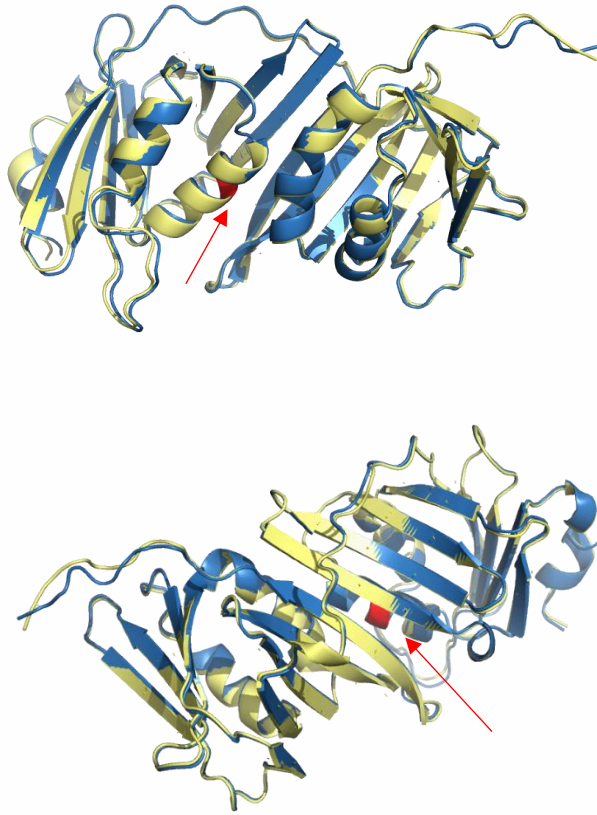


Figure S3. Visualization of 3D structure predicted by AlphaFold2 of Q9UIL1 (colored in yellow) and Q9UIL1_R30A (colored in blue), the RMSD between these two structures is 2.264 Å (calculated by PYMOL). The mutation site is colored in red (pointed by an arrow).

