

Table 4: Mutational effects of opsin family specific trace residues

TM	Residue (Bovine rhodopsin)	Mutation	Mutational Effect	Referen ces
Retinal Binding Site				
2	G90	G90D	Congenital Stationary Night Blindness, blue shift	(1) , (2), (3)
3	E113	E113Q	Blue Shift	(4, 5)
		E113Q	CA (along with M257 mutant)	(6)
		E113Q	<i>Protonated Schiff base not necessarily required</i>	(7)
		E113Q	CA	(8)
		E113D/Q	Spectral shift	(9)
	L125	L125R/A	ADRP, decreased retinal binding, misfolding Expression, no spectral activity	(10) (11)
		L125R	↓ transducin activation, ↓ time in M-II state	(3)
4	C167	C167R	ADRP, low expression levels, misfolding, In combo with other C mutants affected function	(3) (12)
			Low expression	(11)
	P171	P171L	ADRP, low expression levels, misfolding Expression, localization	(3) (11)
	W175	W175	<i>No spectral shift, No effect on transducin</i>	
5	M207	M207C	Cysteine cross linking (NA)	(13)
7	M288		NO DATA	
	F294		NO DATA	
	A295	A295S	Spectral shift	(14)
	K296	K296	Constitutive Activity, Decreased expression levels No light independent transducin stimul. <i>in vivo</i> .	(15), (3). (16)
		K296E	Activity only after arrestin removal.	(8)
		K296E	CA phos. by rhodopsin kinase & arrestin binding	(17)
		K296E/G	Not acted on by rhodopsin kinase in absence of chromophore Many more true positives available	
G-protein coupling site				
1	G51	G51R	ADRP	(3)
		G61V	<i>No effect</i>	(11)
	T58	T58S	ADRP, decreased transducin activity	(18)
		T58R	Expression	(19)
		T58R	<i>No effect.</i>	(3)
4	G156		NO DATA	
5	V230		NO DATA	
6	V250	V250A	Decreased ability to stimulate G _t , switched G- protein specificity	(20)
		V250 (deletion)	G-protein coupling	(21)
	M253	M253	Spin labeling : rhodopsin	(22)

Black Text: Mutations with functional effect

Red Text: Mutations without recorded effect

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