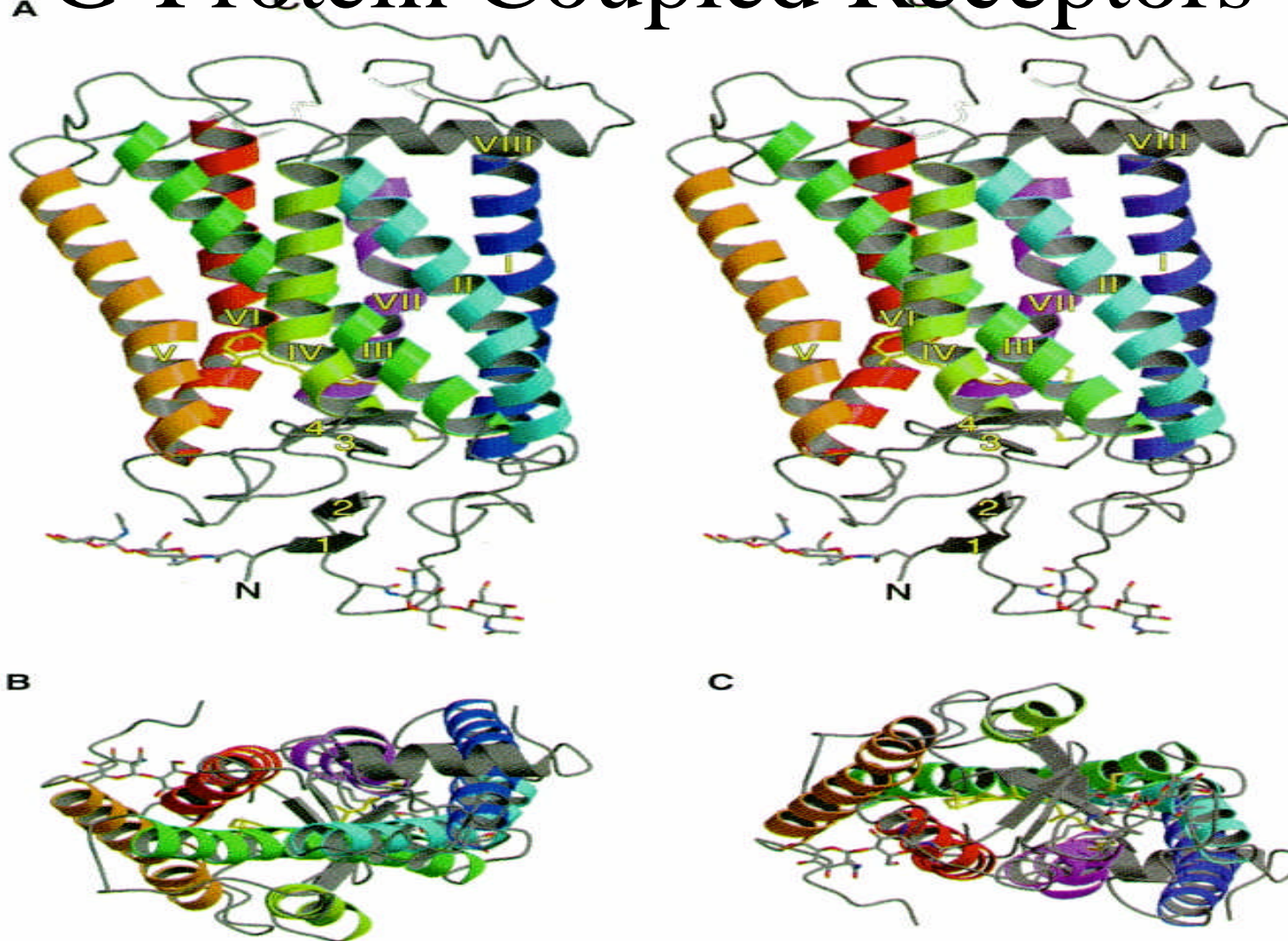
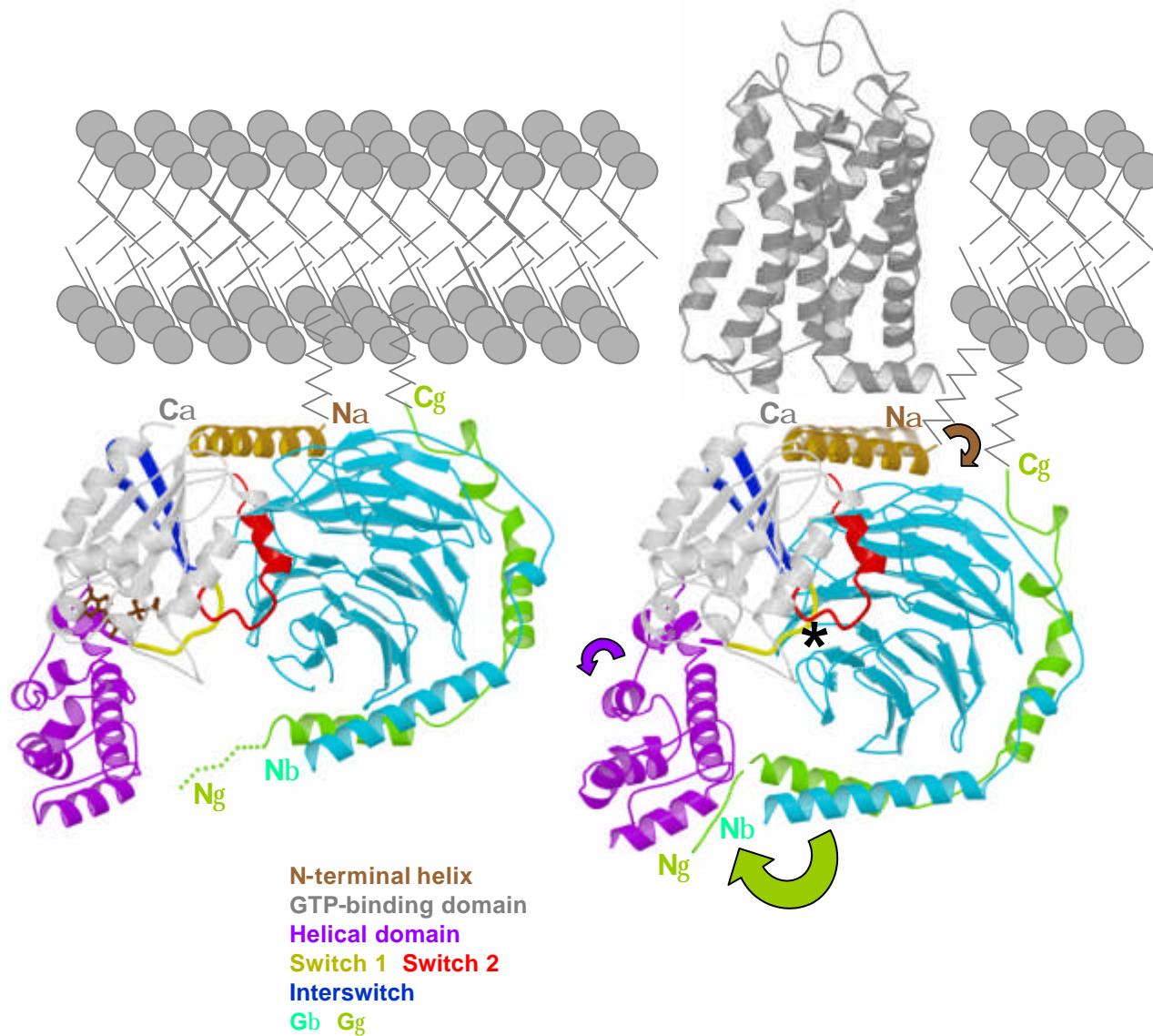


# A G-Protein Coupled Receptors





# 3-D representation



# **G-Protein Coupled Receptors (GPCR)**

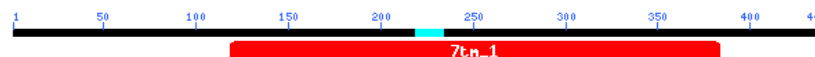
- Endothelin Receptors (endothelins)
- C-X-C Chemokine Type 3 Receptors (chemokines)
- Cysteinyl-leukotriene Receptors (cysteinyl-Leukotrienes)
- Protein Activated Receptors (Thrombin, trypsin)

# Domain Maps of some G-Protein- coupled Receptors

**Endothelin Receptor A**



**Endothelin Receptor B**



**Cysteinyl-leukotriene Receptor 1**



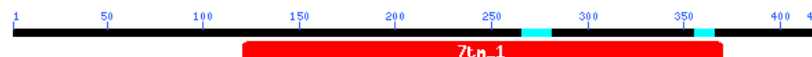
**Cysteinyl-leukotriene Receptor 2**



**C-X-C Chemokine Receptor type 3 A**



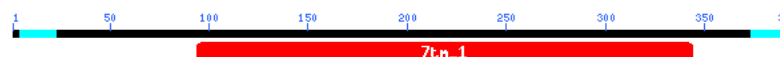
**C-X-C Chemokine Receptor type 3 B**



**Proteinase Activated Receptor 1**



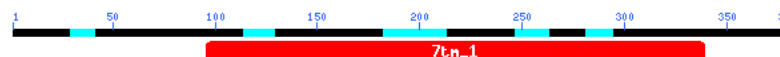
**Proteinase Activated Receptor 2**



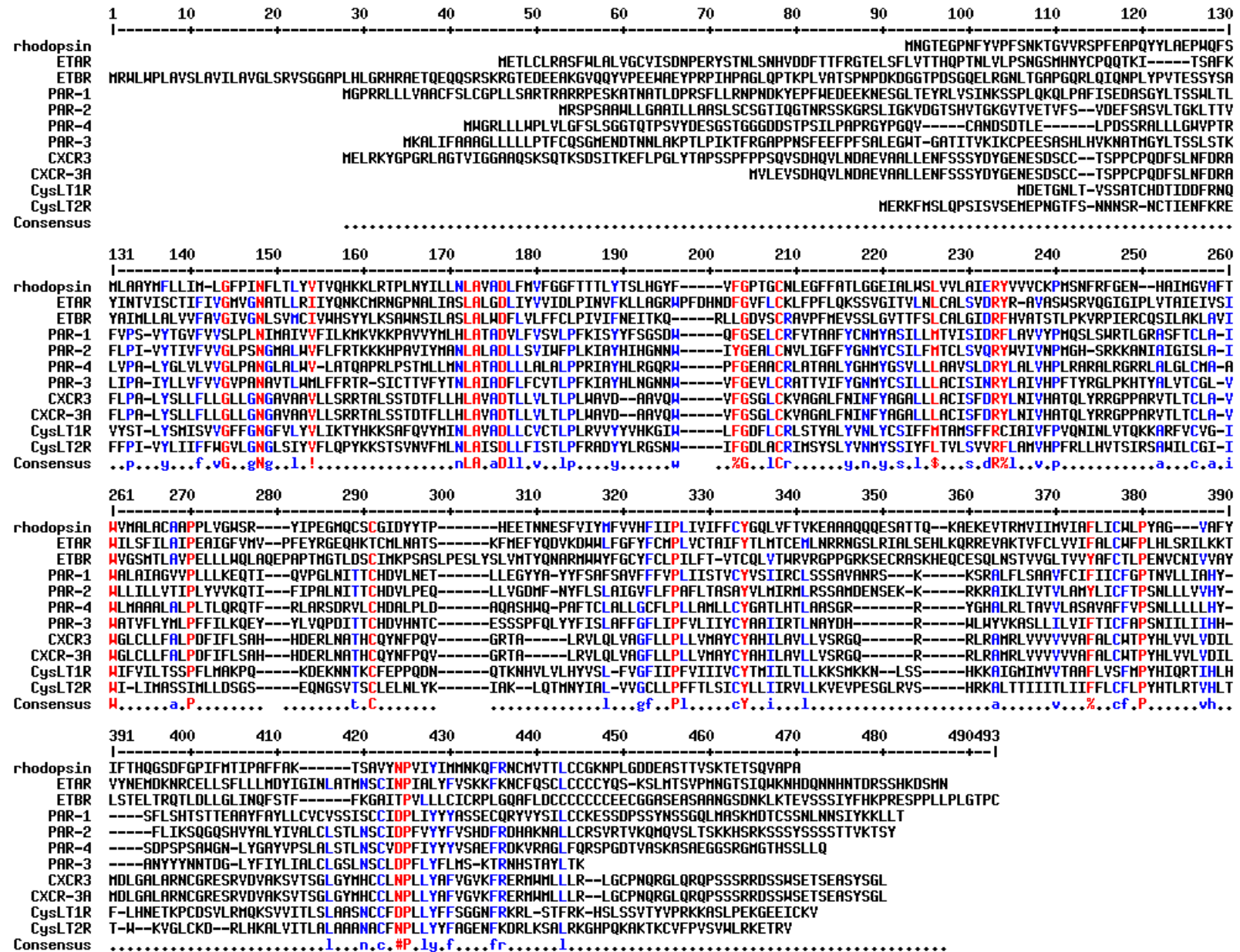
**Proteinase Activated Receptor 3**



**Proteinase Activated Receptor 4**



# Comparison between sequences (with Mutlialin)







# Comparison of intra cellular loops

## Loop 1

	1	10	14									
	-----+-----											
ETAR	R	I	I	Y	Q	N	K	C	M	R		
ETBR	Y	K	N	K	C	M	R	N	G	P	N	
rhodopsin	T	V	Q	H	K	K	L	R	T	P	L	N
cysLTR1	K	T	Y	H	K	K	S	A				
cysLTR2	L	Q	P	Y	K	K	S	T				
PAR-1	L	K	M	K	Y	K	K	P	A			
PAR-2	F	R	T	K	K	K	H	P	A			
CXCR3A	R	R	T	A	L	S	S	T				
PAR-3	F	R	T	R	S	I	C	T				
PAR-4	T	Q	A	P	R							
Consensus	.....											

## Loop 2

	1	10	20	24																					
	-----+-----+-----																								
ETAR	D	R	Y	R	A	V	A	S	H	S	R	V	Q	G	I	G	I	P	L	Y	T	A	I	E	
ETBR	D	R	Y	R	A	V	A	S	H	S	R	I	K	G	I	G	V	P	K	A	T				
CXCR3A	D	R	Y	L	N	I	V	H	A	T	Q	L	Y	R	G	P	P	A	R	V	T				
PAR-1	D	R	F	L	A	V	Y	Y	P	H	Q	S	L	S	A	R	T	L	G	R					
PAR-4	D	R	Y	L	A	L	V	H	P	L	R	A	R	A	L	R	G	R	R	L					
PAR-3	N	R	Y	L	A	I	V	H	P	F	T	Y	R	G	L	P	K								
PAR-2	Q	R	Y	H	V	I	V	N	P	H	G	H	S	R	K	K	A	N	I						
rhodopsin	E	R	Y	V	V	V	C	K	P	H	S	N	F	R	F	G	E	N	H						
cysLTR1	P	V	Q	N	I	N	L	Y	T	Q	K	K	A	R											
cysLTR2	R	L	L	H	V	T	S	I	R																
Consensus	.r	y	l	.....	p	.....																			

## Loop 3

	1	10	20	29																													
	-----+-----+-----																																
ETAR	T	C	E	M	L	N	R	R	N	G	S	L	R	I	A	L	S	E	H	L	K	Q	R	R	E	V	A	K					
ETBR	T	C	E	M	L	R	K	K	S	G	-	H	Q	I	A	L	N	D	H	L	K	Q	R	R	E	V	A	K	T				
rhodopsin	K	E	A	A	A	Q	Q	Q	E	S	A	T	T	Q	K	A	E	K	E	V	T												
CXCR3A	C	Y	A	H	I	L	A	V	L	L	Y	S	R	G	Q	R	R	L	A	M	R												
PAR-1	C	Y	V	S	I	I	R	C	L	S	S	A	V	A	N	R	S	K	K	S	R	A											
PAR-2	A	Y	V	L	H	I	R	M	L	R	S	S	A	M	D	E	N	S	E	K	K	R	K	R	A								
PAR-3	C	Y	A	A	I	I	R	T	L	N	A	Y	D	H	R	M																	
cysLTR2	R	V	L	L	K	V	E	V	P	E	S	G	L	R	V	S	H	R	K	A													
PAR-4	H	T	L	A	A	S	G	R	R	Y	G	H	A	L	R																		
cysLTR1	T	L	L	K	K	S	H	K	K	N	L	S	S	H	K																		
Consensus	.....	l	.....	s	.....	k	.....																										

# Comparison of C-terminal sequence

	1	10	20	30	40	50	54
	-----+	-----+	-----+	-----+	-----+	-----+	
ETAR					LLMDYIGINL	ATMNSCINPI	ALYFV
ETBR	SKR	FKNCFK	SCLCC	HCQSFE	EKQSLEE	KQSCLK	FKANDHGYDNFRSSNKYSSS
PAR-2	SHD	FRDHAKNA	LLC--	RSVRTY	KQMQVSL	TSKKHSR	KSSSYSSSSTTVKTSY
PAR-1	SSEC	QRYVYSI	LCC	KESSDP	SSYNSS	GGQLH	ASKMDTCSSNLNNSIYKLLT
CXCR3A	GVK	FRERMM	LLL--	RLGCP	NQRGL	LRQPSS	SRDSSWSETSEASYSGL
PAR-4	SAE	FRDKYR	AGLF	QRSPG	DYASKA	SAEGGS	RGHGTHSSLLQ
rhodopsin	NKQ	FRNCHL	TTIC	CGKNPL	GDDEA	SATVSK	TETSQVAPA
cysLTR1	SGGN	FRKRL-	STFRK-	HSLSS	VTYVPR	KKASL	PEKGEEICKV
cysLTR2	AGEN	FKDRL	KSAL	LRKG	HPQAK	TKCVF	PYSVHLRKETRY
PAR-3	SKT	RNHST	AYL	TK			
Consensus	.....	fr.....	l.....	.....	.....	.....	.....

## TM1 alignment

	1	10	20	27
	-----+-----+-----			
CysLTR1	LYSMISVVGFFGNGFVLYVLI			
CXCR3	AFLPALYSLLFLLGLLGNGAYAAVLLS			
PAR1	LFVPSYVTGVFVYSLPLNIMAIYVFI			
PAR2	VFLPIYVTIVFVYGLPSNGMALWVFL			
PAR3	KLIPAIYLLVFVYGPANAYTLWMLF			
PAR4	LYGLVLYVGLPANGALWVLA			
CysLTR2	IVYLIIFFGVYLGNGLSIYVF			
ET2R	YINTVYSCLVFVYLGIIGNSTLLRII			
ET1R	YINTVISCTIFIVGMVGNATLL			
Consensus	.....y..vfvvG..gNg...I.v...			

## TM2 alignment

	1	10	20	30
	-----+-----+-----			
CysLTR1	FQVYMINLAVADLL-CVCTLP			
CysLTR2	VNVFMLNLAISDLL-FISTLPF			
PAR1	VYYMLHLATAQYL-FVSYLPF			
PAR3	TVFYTNLAIADFL-FCVTLPF			
CXCR3	TFLLHLAVADTL-LVLTLPWA			
PAR2	VIYMANLALADLL-SVIMFPL			
PAR4	LPSTMLLMNLATAQDL-LALAL			
ET2R	ILIASLALGDLHIVIDIPINVKLL			
ET1R	ILIASLALGDLHIVIDIPINVKLL			
Consensus	.....nLA.aDIL..v..lp.....			

<b>Receptor</b>	<b>IL1</b>	<b>IL2</b>	<b>IL3</b>	<b>C-terminus</b>
<b>par1</b>		cki,pcsk	CaMII,PKA,PKC	CKI,CKII,GSK3
<b>par2</b>		PKC	CKII,PKA,PKC	CaMII, CKI,GSK3, PKA, PKC, PKG
<b>par3</b>	CaMII, PKA,	PKC		CaMII, CKI, S6K, PKA
<b>par4</b>			CKI, PKC	CKI, CKII
<b>CLT1</b>		PKC CKI,	PKC	CaMII, CKI, CKII, S6K, PKA, PKC, PKG
<b>CLT2</b>	PKG	GSK3, PKC	PKA, PKC	CaMII, S6K, PKA
<b>CXCR3</b>	CKI, CKII, GSK3, PKA,			CaMII, CKI, CKII, GSK3, PKA, PKC, PKG
<b>ETAR</b>		CKII	camII,PKA, ,PKC	CKI, CKII, GSK3, PKA, PKC
<b>ETBR</b>			camII,PKA, ,PKG	CKII, GSK3, PKA, PKC
<b>Rhodopsin</b>			CKI, CKII, PKC	CKI, CKII, GSK3

**Thanks very much!**

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