

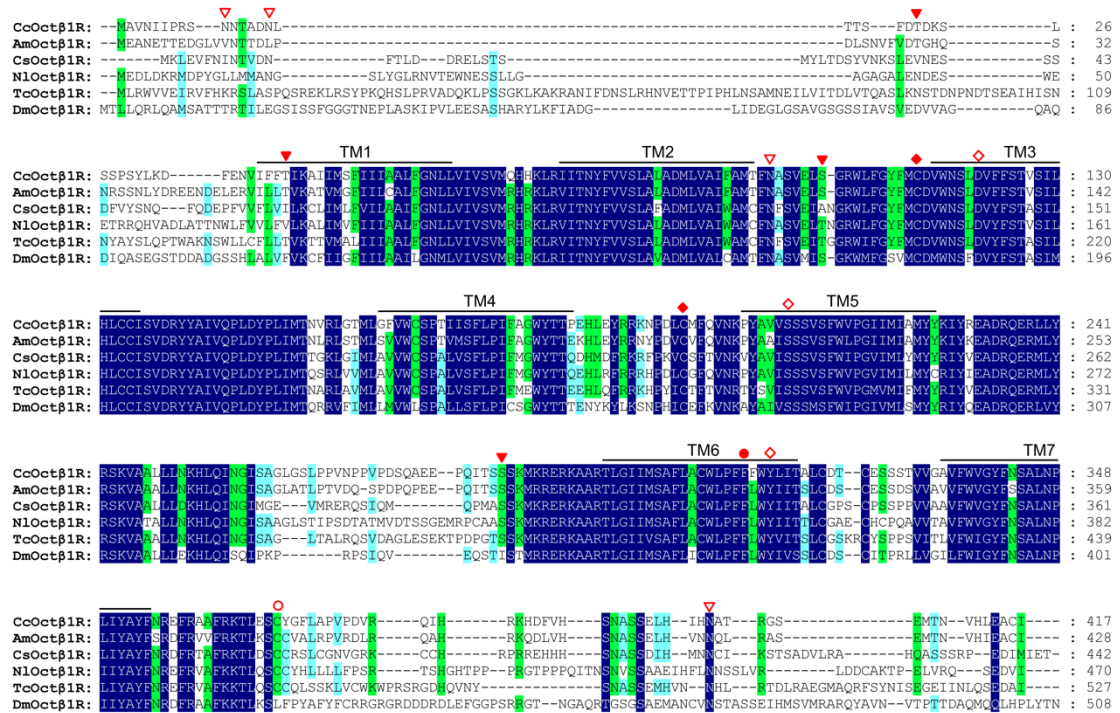


Figure S1. Multiple sequence alignment of CcOctβ1R and its orthologous receptors from *Apis mellifera* (AmOctβ1R), *Chilo suppressalis* (CsOctβ1R), *Nilaparvata lugens* (NlOctβ1R), *Tribolium castaneum* (TcOctβ1R), and *Drosophila melanogaster* (DmOctβ1R). Putative seven transmembrane (TM1-TM7) domains are indicated by black lines. Potential phosphorylation sites by PKC and potential N-glycosylation sites are marked with filled triangles and empty triangles, respectively. A disulphide bond is formed by two conserved cysteine residues that are labelled with diamonds. The empty diamonds mark the amino acid residues that are believed to function in ligand binding. The empty circles indicate potential palmitoylation sites. The filled circle labels the second phenylalanine (F₃₁₄) behind the FxxxWxP motif.

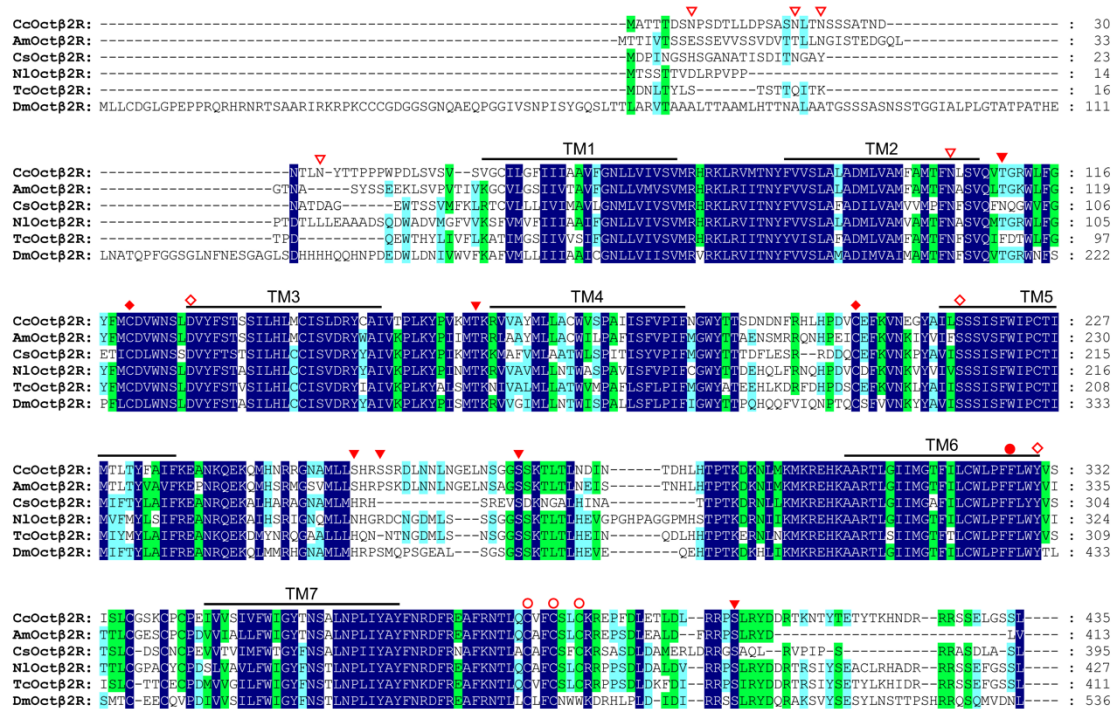


Figure S2. Multiple sequence alignment of CcOctβ2R and its orthologous receptors from *Apis mellifera* (AmOctβ2R), *Chilo suppressalis* (CsOctβ2R), *Nilaparvata lugens* (NlOctβ2R), *Tribolium castaneum* (TcOctβ2R), and *Drosophila melanogaster* (DmOctβ2R). Putative seven transmembrane (TM1-TM7) domains are indicated by black lines. Potential phosphorylation sites by PKC and potential N-glycosylation sites are marked with filled triangles and empty triangles, respectively. A disulphide bond is formed by two conserved cysteine residues that are labelled with diamonds. The empty diamonds mark the amino acid residues that are believed to function in ligand binding. The empty circles indicate potential palmitoylation sites. The filled circle labels the second phenylalanine (F₃₂₇) behind the FxxxWxP motif.

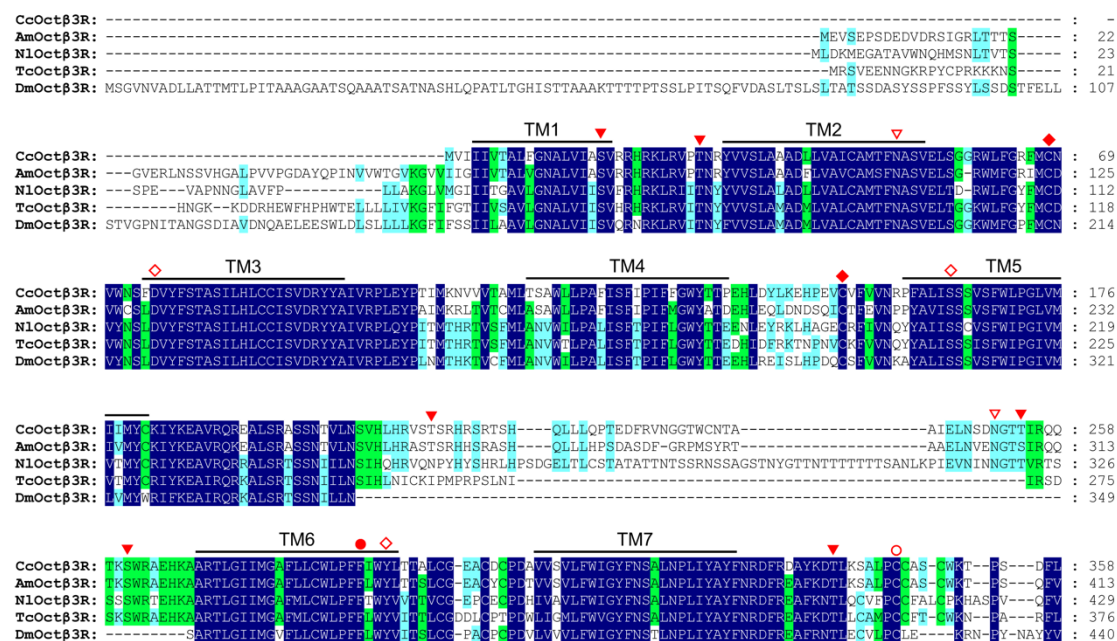


Figure S3. Multiple sequence alignment of CcOctβ3R and its orthologous receptors from *Apis mellifera* (AmOctβ3R), *Nilaparvata lugens* (NlOctβ3R), *Tribolium castaneum* (TcOctβ3R), and *Drosophila melanogaster* (DmOctβ3R). Putative seven transmembrane (TM1-TM7) domains are indicated by black lines. Potential phosphorylation sites by PKC and potential N-glycosylation sites are marked with filled triangles and empty triangles, respectively. A disulphide bond is formed by two conserved cysteine residues that are labelled with diamonds. The empty diamonds mark the amino acid residues that are believed to function in ligand binding. The empty circles indicate potential palmitoylation sites. The filled circle labels the second phenylalanine (F₂₈₇) behind the FxxxWxP motif.

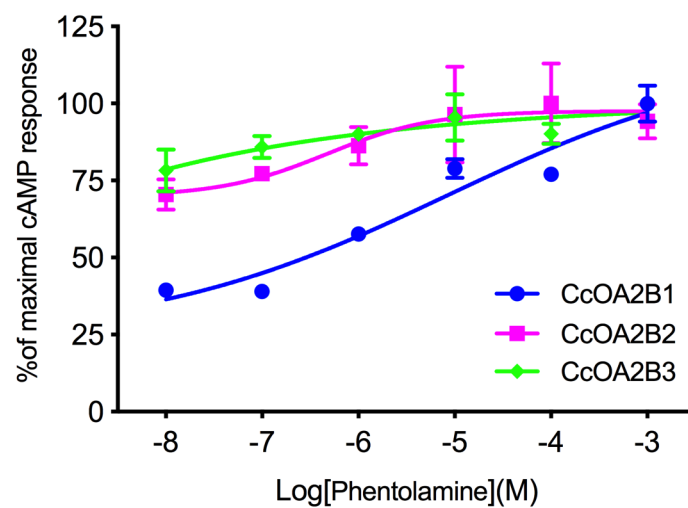


Figure S4. Dose-response curves of phentolamine on intracellular cAMP levels in CHO-K1 cell lines stably expressing CcOct β R_s. The values were normalized to the maximal cAMP response (100%). The data represent means $\pm$ SE of four experiments.

Table S1. The accession numbers of the sequences used in this study.

Name	Accession No.	Description
PROTOSTOMIA, Ecdysozoa, Arthropoda		
CcOct β 1R	OP422531	octopamine receptor β 1-R [<i>Cotesia chilonis</i>]
CcOct β 2R	OP422532	octopamine receptor β 2-R [<i>Cotesia chilonis</i>]
CcOct β 3R	OP422533	octopamine receptor β 3-R [<i>Cotesia chilonis</i>]
AmOct α 1R	NP_001011565.1	octopamine receptor 1 [<i>Apis mellifera</i>]
AmOct β 1R	CCO13922.1	octopamine receptor β 1-R [<i>Apis mellifera</i>]
AmOct β 2R	CCO13923.1	octopamine receptor β 2-R [<i>Apis mellifera</i>]
AmOct β 3R	CCO13924.1	octopamine receptor β 3-R [<i>Apis mellifera</i>]
AmOct β 4R	CCO13925.1	octopamine receptor β 4-R [<i>Apis mellifera</i>]
AmOct α 2R	XP_001122075.2	α 2-adrenergic-like octopamine receptor [<i>Apis mellifera</i>]
AmDOP1	NP_001011595.1	dopamine receptor 1 [<i>Apis mellifera</i>]
AmDOP2	NP_001011567.1	dopamine receptor 2 [<i>Apis mellifera</i>]
AmDOP3	NP_001014983.1	dopamine receptor 3 [<i>Apis mellifera</i>]
AmDopEcR	AJE75857.1	dopamine/ecdysone receptor, partial [<i>Apis mellifera</i>]
AmTA1	NP_001011594.1	tyramine receptor type 1 [<i>Apis mellifera</i>]
AmTA2	NP_001032395.1	tyramine receptor type 2 [<i>Apis mellifera</i>]
CsOct α 1R	AEQ33589.1	octopamine receptor 1 [<i>Chilo suppressalis</i>]
CsOct β 1R	AGV79326.1	octopamine receptor β 1-R [<i>Chilo suppressalis</i>]
CsOct β 2R	AEO89318.1	octopamine receptor β 2-R [<i>Chilo suppressalis</i>]
CsOct α 2R	AIC75370.1	α 2-adrenergic-like octopamine receptor long variant [<i>Chilo suppressalis</i>]
CsDOP1	AKR18178.1	dopamine receptor 1 [<i>Chilo suppressalis</i>]
CsDOP2	AKR18179.1	dopamine receptor 2 [<i>Chilo suppressalis</i>]
CsDOP3	AKR18180.1	dopamine receptor 3 [<i>Chilo suppressalis</i>]
CsTA1	AFG26689.1	tyramine receptor type 1 [<i>Chilo suppressalis</i>]
CsTA2	ADK91078.1	tyramine receptor type 2 [<i>Chilo suppressalis</i>]
DmOct α 1AR	NP_732541.1	octopamine receptor in mushroom bodies, isoform F [<i>Drosophila melanogaster</i>]
DmOct α 1BR	NP_524669.2	octopamine receptor in mushroom bodies, isoform B [<i>Drosophila melanogaster</i>]
DmOct β 1R	NP_651057.1	octopamine receptor β 1-R [<i>Drosophila melanogaster</i>]
DmOct β 2R	NP_001034049.1	octopamine receptor β 2-R [<i>Drosophila melanogaster</i>]
DmOct β 3R	NP_001034043.2	octopamine receptor β 3-R [<i>Drosophila melanogaster</i>]
DmOct α 2R	NP_650754.2	α 2-adrenergic-like octopamine receptor [<i>Drosophila melanogaster</i>]
DmDOP1	CAA54451.1	dopamine receptor 1 [<i>Drosophila melanogaster</i>]
DmDOP2	NP_733299.1	dopamine receptor 2 [<i>Drosophila melanogaster</i>]
DmDOP3	AAN15955.1	dopamine receptor 3 [<i>Drosophila melanogaster</i>]
DmDopEcR	AAF47893.1	dopamine/ecdyteroid receptor [<i>Drosophila melanogaster</i>]
DmTA1	NP_524419.2	tyramine receptor type 1 [<i>Drosophila melanogaster</i>]
DmTA2	NP_650652.1	tyramine receptor type 2 [<i>Drosophila melanogaster</i>]
NIOct α 1R	ATY68965.1	octopamine receptor 1 [<i>Nilaparvata lugens</i>]
NIOct β 1R	ATY68966.1	octopamine receptor β 1-R [<i>Nilaparvata lugens</i>]

NIOctβ2R	ASA47149.1	octopamine receptor β2-R [<i>Nilaparvata lugens</i>]
NIOctβ3R	QBC74627.1	octopamine receptor β3-R [<i>Nilaparvata lugens</i>]
NIOctα2R	ATY68968.1	α2-adrenergic-like octopamine receptor long variant [<i>Nilaparvata lugens</i>]
TcOctβ1R	NP_001280514.1	octopamine receptor β1-R [<i>Tribolium castaneum</i>]
TcOctβ2R	NP_001280501.1	octopamine receptor β2-R [<i>Tribolium castaneum</i>]
TcOctβ3R	NP_001280505.1	octopamine receptor β3-R [<i>Tribolium castaneum</i>]
TcDopEcR	NP_001280528.1	dopamine/ecdyseroid receptor [<i>Tribolium castaneum</i>]
DmFR	NP_647758.1	FMRFamide receptor [<i>Drosophila melanogaster</i>]
DmninaE	AAF55712.1	neither inactivation nor afterpotential E [<i>Drosophila melanogaster</i>]
PROTOSTOMIA, Ecdysozoa, Priapulida		
Pca1	XP_014662992.1	α _{1A} -adrenergic receptor-like [<i>Priapulid caudatus</i>]
Pca2	XP_014681069.1	α _{2C} -adrenergic receptor-like [<i>Priapulid caudatus</i>]
PROTOSTOMIA, Lophotrochozoa, Annelida		
Pdα1	APC23842.1	α ₁ -adrenergic receptor [<i>Platynereis dumerilii</i>]
Pdα2	APC23843.1	α ₂ -adrenergic receptor [<i>Platynereis dumerilii</i>]
PdTA1	AKQ63052.1	tyramine receptor 1 [<i>Platynereis dumerilii</i>]
PdTA2	APC23184.1	tyramine receptor 2 [<i>Platynereis dumerilii</i>]
PdOctα1R	APC23183.1	octopamine receptor 1 [<i>Platynereis dumerilii</i>]
PdOctβR	APC23841.1	octopamine receptor 2 [<i>Platynereis dumerilii</i>]
DEUTEROSTOMIA, Ambulacraria, Priapulida		
Skα1	ALR88680.1	α ₁ -adrenergic receptor-like 067 [<i>Saccoglossus kowalevskii</i>]
Skα2	XP_002734932.1	α _{2C} -adrenergic receptor-like [<i>Saccoglossus kowalevskii</i>]
SkTA1	XP_002742354.2	tyramine receptor 1 [<i>Saccoglossus kowalevskii</i>]
SkTA2A	XP_002734062.1	tyramine receptor 2A [<i>Saccoglossus kowalevskii</i>]
SkTA2B	XP_006812999.1	tyramine receptor 2B [<i>Saccoglossus kowalevskii</i>]
SkOctα1R	XP_006823182.1	α ₁ -adrenergic-like octopamine receptor [<i>Saccoglossus kowalevskii</i>]
SkOctβR	XP_002733926.1	β-adrenergic-like octopamine receptor [<i>Saccoglossus kowalevskii</i>]
DEUTEROSTOMIA, Chordata, Vertebrata		
Hsβ1	NP_000675.1	β-1 adrenergic receptor [<i>Homo sapiens</i>]
Hsβ2	NP_000015.1	β-2 adrenergic receptor [<i>Homo sapiens</i>]
Hsβ3	NP_000016.1	β-3 adrenergic receptor [<i>Homo sapiens</i>]
Hsa1A	NP_000671.2	α-1A adrenergic receptor [<i>Homo sapiens</i>]
Hsa1B	NP_000670.1	α-1B adrenergic receptor [<i>Homo sapiens</i>]
Hsa1D	NP_000669.1	α-1D adrenergic receptor [<i>Homo sapiens</i>]
Hsa2A	NP_000672.3	α-2A adrenergic receptor [<i>Homo sapiens</i>]
Hsa2B	NP_000673.2	α-2B adrenergic receptor [<i>Homo sapiens</i>]
Hsa2C	NP_000674.2	α-2C adrenergic receptor [<i>Homo sapiens</i>]
HsD1	NP_000785.1	D(1A) dopamine receptor [<i>Homo sapiens</i>]
HsD2	NP_000786.1	D(2) dopamine receptor isoform long [<i>Homo sapiens</i>]
HsD3	NP_000787.2	D(3) dopamine receptor isoform a [<i>Homo sapiens</i>]
HsD4	NP_000788.2	D(4) dopamine receptor [<i>Homo sapiens</i>]
HsD5	NP_000789.1	D(1B) dopamine receptor [<i>Homo sapiens</i>]

Table S2. The primers used in this study.

Primer name	Sequence (5'-3')
For cDNA cloning	
CcOctβ1R-compF	CTTAAAGGTTCTCCATCACAAGACG
CcOctβ1R-compR	CTATATTTAAATACACGCCTCCAAG
CcOctβ2R-compF	AGCTGCGTCACAAGTCGTCGTCGTC
CcOctβ2R-compR	GTTTCGTTTCAGAGACTGCTTCC
CcOctβ3R-compF	CGATGAAAGACAGGAATCAGCGTC
CcOctβ3R-compR	GAATACAAAGTCATTCCGCGCGAGC
For qRT-PCR	
CcOctβ1R-RTF	TTTTGGGTGCCAGGAATCAT
CcOctβ1R-RTR	TCCTAAGCCCGCTGATATGC
CcOctβ2R-RTF	TCGTCAGCATTGTCTTCTGG
CcOctβ2R-RTR	TCGATCGTTGTGTTGGTGT
CcOctβ3R-RTF	AGCAGCCGCTGATTTATTGG
CcOctβ3R-RTR	GCTGATGCAGCAAAGGTGAA
28S rRNA-RTF	ACGTGCAAATCGATCGTCTG
28S rRNA-RTR	CAAGCCAGAGATCTCACCCA
For eukaryotic expression	
pcDNA3.0-CcOctβ1R-KpnI-F	TATAGGGAGACCCAAGCTTGGTACC GCCACC ATGG CAGTGAATATAATTCCC
pcDNA3.0-CcOctβ1R-EcoRI-R	AGTGTGATGGATATCTGCAG GAATTCT TAAATAC ACGCCTCCAAGTG
pcDNA3.0-CcOctβ2R-KpnI-F	TATAGGGAGACCCAAGCTT GGTACC GCCACC ATGGCGACGACAACGGATTC
pcDNA3.0-CcOctβ2R-EcoRI-R	AGTGTGATGGATATCTGCAG GAATTCT CAGAGACTGC TTCCTAATTC
pcDNA3.0-CcOctβ3R-KpnI-F	TATAGGGAGACCCAAGCTT GGTACC GCCACC ATGGTTATTATTATAGTTACC
pcDNA3.0-CcOctβ3R-EcoRI-R	AGTGTGATGGATATCTGCAG GAATTCT CTATAGAA AATCTGAGGGCG