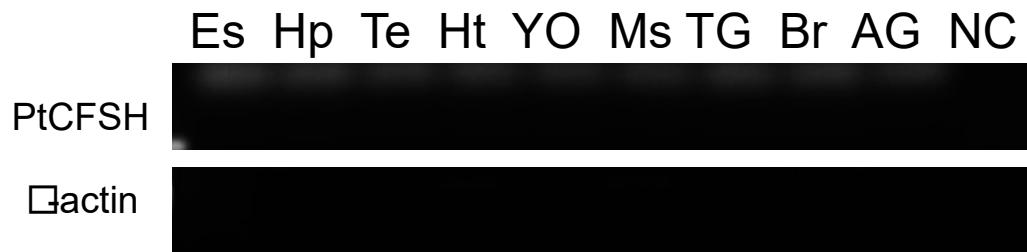
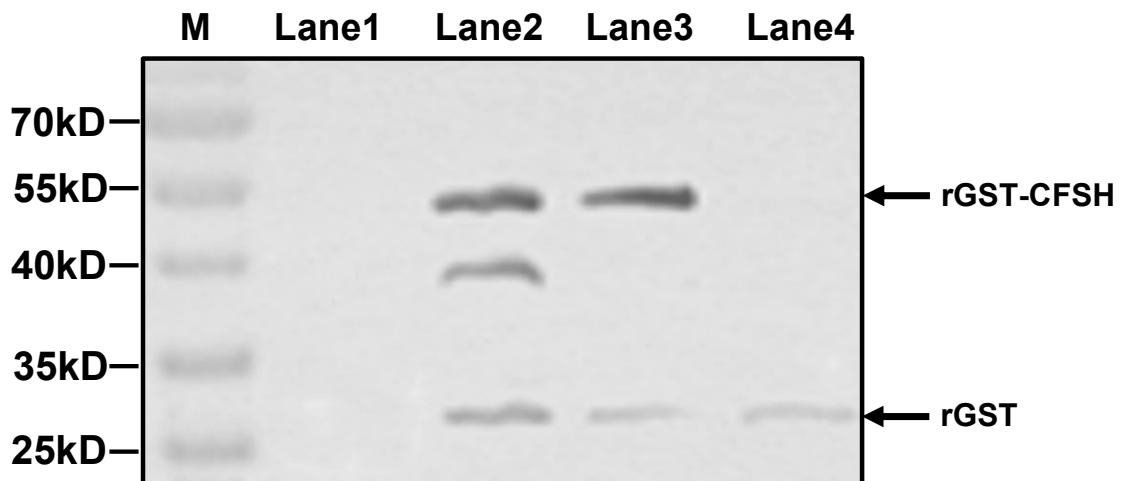


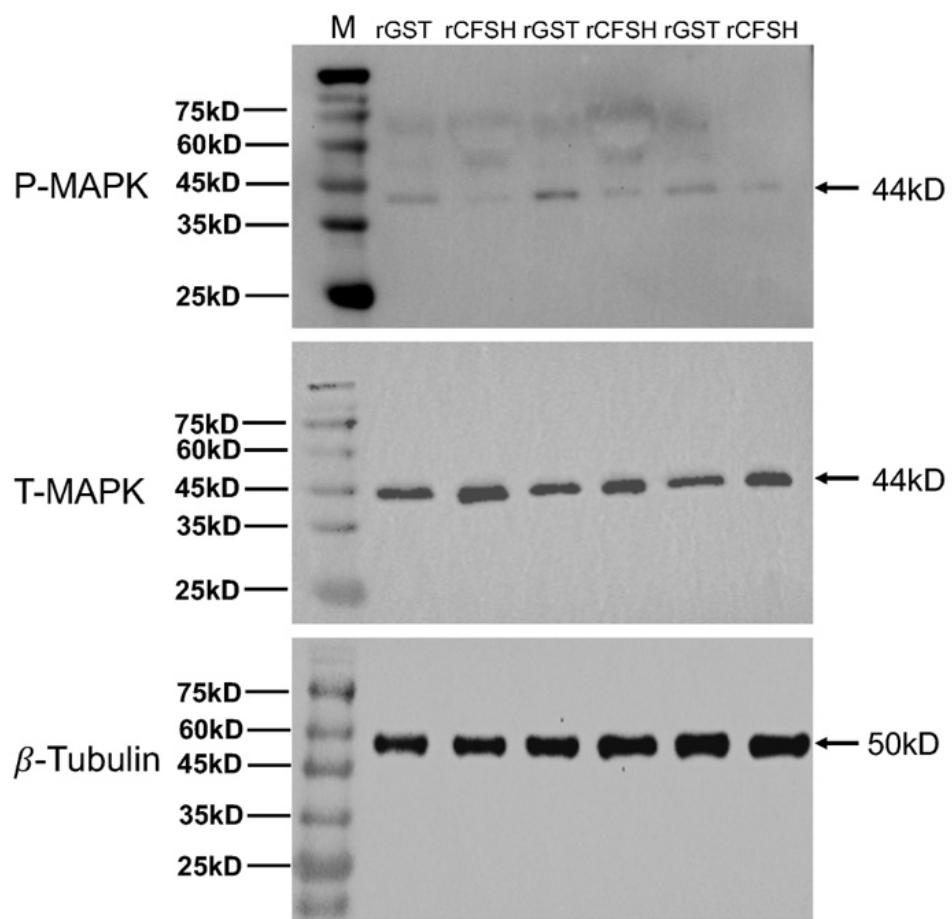
Supplemental Materials



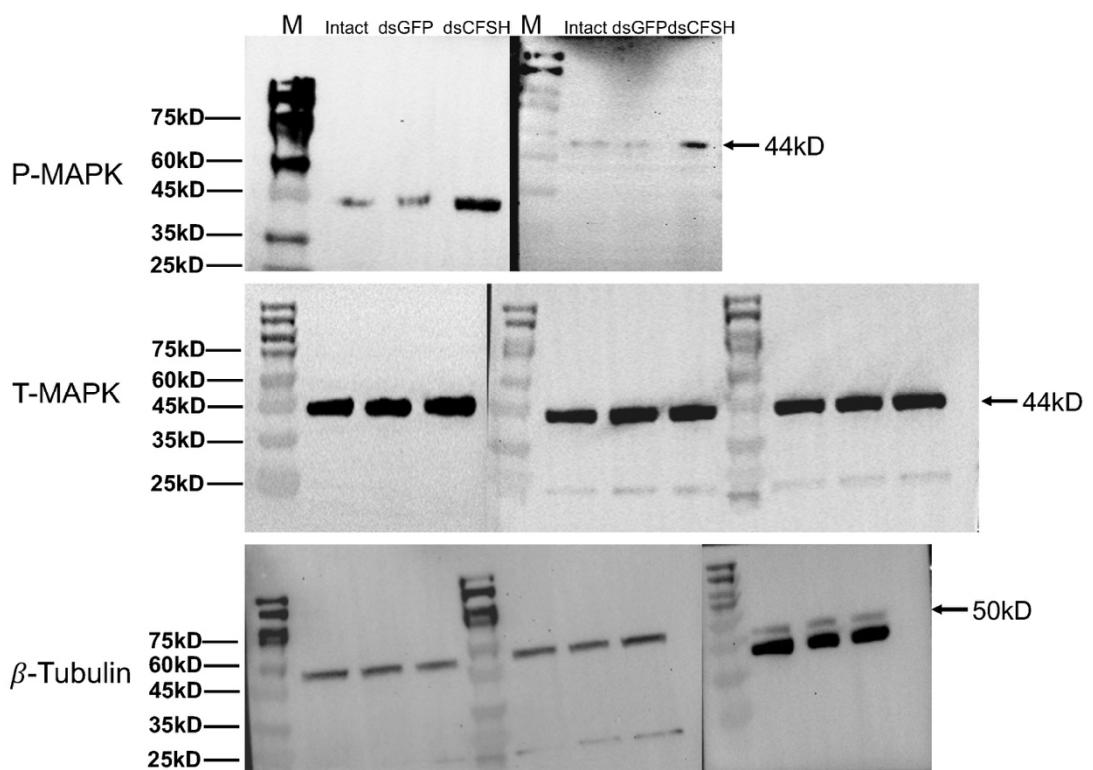
Supplemental Figure S1. Detection of PtCFSH expression in tissues by RT-PCR. β -actin as internal reference. Es: eyestalk; Hp: Hepatopancreas; Te: testis; Ht: heart; YO: Y organ; Ms: muscle; TG: Thoracic ganglia; Br: Brain; AG: androgenic gland; NC: negative control.



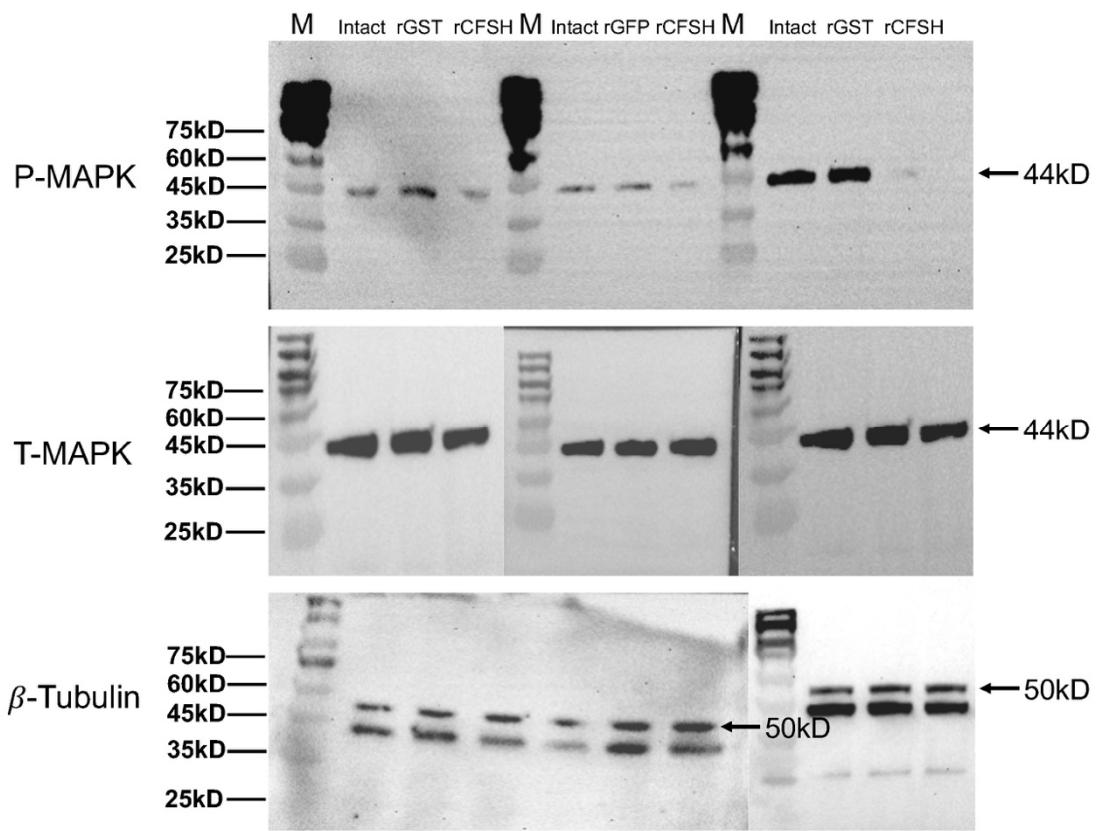
Supplemental Figure S2. Prokaryotic expression and purification of PtCFSH and empty vector. Lane1: Pre-induction; Lane2: Post-induction; Lane3: Post-purified rGST-PtCFSH; Lane4: Post-purified rGST; Arrows indicate the size of protein molecules.



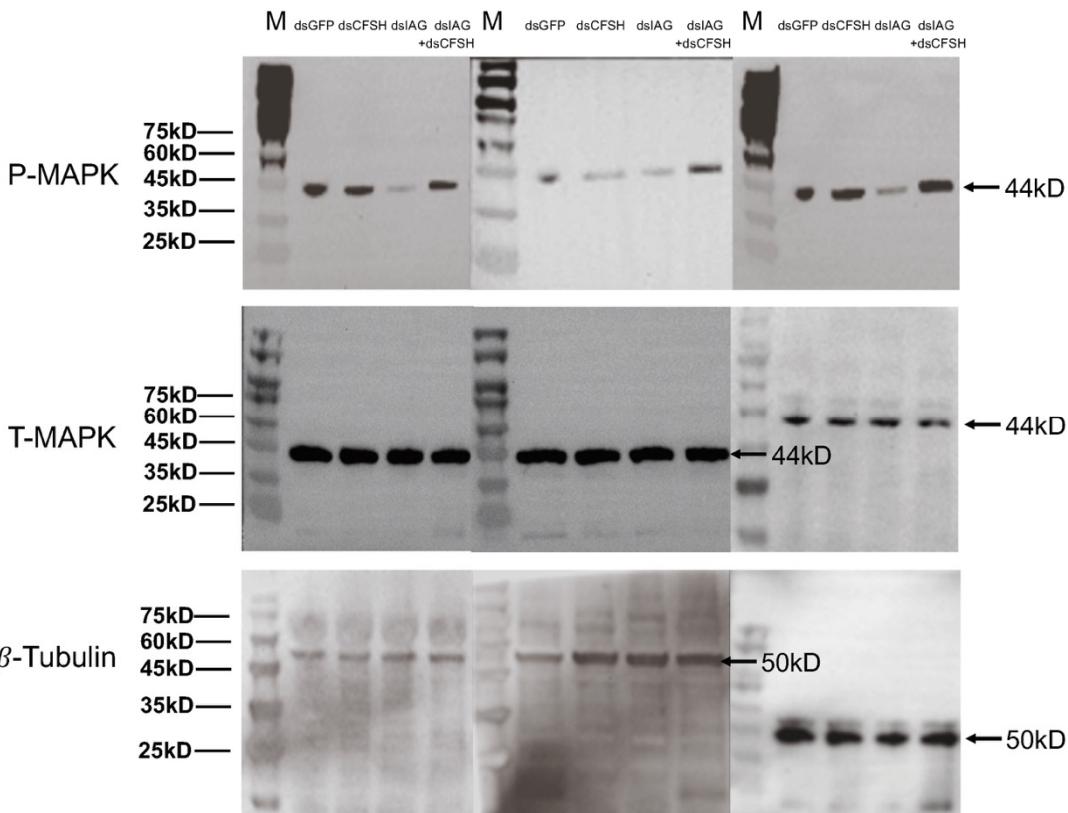
Supplemental Figure S3. Phosphorylated-MAPK was detected in testis after long-term *in vivo* injection of rPtCFSH. Total-MAPK and β -tubulin were used as internal reference. Arrows indicate the size of protein molecules.



Supplemental Figure S4. Phosphorylated-MAPK was detected in testis after long-term in vivo injection of dsPtCFSH, dsGFP. Total-MAPK and β -tubulin were used as internal reference. Arrows indicate the size of protein molecules.



Supplemental Figure S5. Phosphorylated-MAPK was detected in stestis after incubation of teitis in vitro and addition of rPtCFSH and rGST, respectively. Total-MAPK and β -tubulin were used as internal reference. Arrows indicate the size of protein molecules.



Supplemental Figure S6. Phosphorylated-MAPK was detected in testis after short-term in vivo injection of dsCFSH, dsIAG, dsIAG followed by dsCFSH, and dsGFP, respectively. Total-MAPK and β -tubulin were used as internal reference. Arrows indicate the size of protein molecules.

Supplemental Table S1

Table S1. Primers used in this study

Name	Sequence (5'-3')	PCR objective
PtCFSH-F1	CGTCAAATACAAGGACCGCTC	3' RACE
PtCFSH-F2	CAATGTTCTCAAGATGGGTCC	3' RACE
PtCFSH -R1	CCTCGCAGTCCAGAACCAA	5' RACE
PtCFSH -R2	GTGATAGAGGGCGTGGG	5' RACE
PtCFSH-F	TCCTATTGGAGTGTTCATCGC	cDNA clone
PtCFSH-R	GTGGTGGTACAGTTGGTGGG	cDNA clone
PtCFSH-RT-F	ACCGCCTACCAGTATGGATTAG	RT-PCR
PtCFSH-RT-R	GCATCAGCAACAAACAGCAGTA	RT-PCR
5'outer	CTAATACGACTCACTATAGGGC	5' RACE
5'inner	AAGCAGTGGTATCAACGCCAGACT	5' RACE
3'inner	TCCACTAGTGATTCACTATAAGG	3' RACE

3'outer	CTAATACGACTCACTATAAGGGC	3' RACE
AP	TACCGTCGTTCCACTAGTGA TTCACTATAAGGGCGACGTAA ACGGCCACAA	3' RACE
dsGFP-F	GT	RNAi
dsGFP-R	TAATACGACTCACTATAAGGGCTTG ACAGCTCGTCCATG C	RNAi
dsPtCFSH-F	TAATACGACTCACTATAAGGGAGATC CTATTGGAGTGTTC ATTCG	RNAi
dsPtCFSH-R	TAATACGACTCACTATAAGGGAGATA CAGTTGGTGGGTGA GTCG	RNAi
dsPtIAG-F	TAATACGACTCACTATAAGGAAACGA AAGACCCAATGCT ACC	RNAi
dsPtIAG-R	TAATACGACTCACTATAAGGGTTACTGC CTATTTCGGGAA GC	RNAi
PtCFSH-QF	GTATTTCATCTTAGGATGCCAA	qRT-PCR
PtCFSH-QR	TAAACTCTGCCCTTCATTTCT	qRT-PCR
β-actin-QF	CGAACCTTCAACACTCCCG	qRT-PCR
β-actin-QR	GATAGCGTGAGGAAGGGCATA	qRT-PCR
PtIGFBP-rp-QF	TTACCACTATTGACGGCACCT	qRT-PCR
PtIGFBP-rp-QR	TCATTATC TGTACCCATCCTGTT	qRT-PCR
PtIAG-QF	TCTTATTACCGACTTCTCCG	qRT-PCR
PtIAG-QR	CCTCTGCCCCCTCGTTATGT	qRT-PCR
PtIR1-QF	CTGATGCGTTGTCGTATTT	qRT-PCR
PtIR1-QR	GAAGCGTGGTGCCTATTT	qRT-PCR
PtIR2-QF	ACCAGCTAGTGGGAACCG	qRT-PCR
PtIR2-QR	GGGAGGGACTCTTGACG	qRT-PCR
PtAkt-QF	CTCAACCAGGAACGCTTCTTC	qRT-PCR
PtAkt-QR	TGTGTCCATCAGCATCCAGTAA	qRT-PCR
PtmTOR-QF	TCTCCTGGCTGTTGCTGTC	qRT-PCR
PtmTOR-QR	GCTTCTTGCTTGGTGTATCCTT	qRT-PCR
PtAkt-QF	CTCAACCAGGAACGCTTCTTC	qRT-PCR
PtAkt-QR	TGTGTCCATCAGCATCCAGTAA	qRT-PCR
Ptcdc2-QF	CCGTCAAGCAGATGGACAGTG	qRT-PCR
Ptcdc2-QR	CCAGGTCGTCAAAGTAAGGGTG	qRT-PCR
PtCyclinB-QF	ATGTGCCACTACAAGGGTCT	qRT-PCR
PtCyclinB-QR	ATCAGCGTGTCAATTCCAATCC	qRT-PCR
PtFoxo-QF	CGGAGGTGAAGCACATCAAC	qRT-PCR
PtFoxo-QR	TCATTGGTGGAGGCAGAGTG	qRT-PCR
PtKifc1-QF	TCCAATGCCATCTACCTCAG	qRT-PCR
PtKifc1-QR	CGTCTTCAGCATCTCCAGAATG	qRT-PCR
PtVasa-QF	GCTTGCCATCCAGATATTCCAT	qRT-PCR
PtVasa-QR	TGCTCCTTCATACGCCTCAA	qRT-PCR
PtCFSH-GST-SmaI-F	ggatccccaggaattccgggATGAAGCAGAACGGAGCTTCTC	In-Fusion clone
PtCFSH-GST-XhoI-R	gtcacgatgcggccgctcgagTCATTATTCTCGCTTAAGTCAATAT AGC	In-Fusion clone

Supplemental Table S2**Table S2.** List of species used in multiple sequence comparison phylogenetic analysis

Species	Protein name	GenBank Accession number
<i>Portunus trituberculatus</i>	CFSH	ON929327
<i>Scylla paramamosain</i>	CFSH	MN938502.1
<i>Callinectes sapidus</i>	CFSH	GU016328.1
<i>Carcinus maenas</i>	CFSH-1	AEI72264.1
<i>Marsupenaeus japonicus</i>	CFSH	BBA53799.1