



Figure S1 The expression pattern of *sws1* in medaka. (A) Detection of *sws1* mRNA expression in different tissues by RT-PCR (n = 3). (B) The mRNA level of *sws1* in larval and adult medaka (n = 6). All data were expressed as means \pm S.E.M.



Figure S2 The survival and morphology of WT and *sws1*^{-/-} medaka larvae. (A) Statistic analysis of survival rate in WT and *sws1*^{-/-} medaka larvae. (B) Photographs of larvae at 6 dph for WT and *sws1*^{-/-} medaka. Scale bar: 500 μ m.

Table S1 The primers used for CRISPR/Cas9.

Gene	Sequence (5'-3')
<i>sws1</i> guide RNA1	GTACTACCTGGCCCCGACGTGGG
<i>sws1</i> guide RNA2	GTGAGGGGCTACTACTTCTTTGG
<i>sws1</i> test-F	TCAGCTTCACGATGGGAAAAT
<i>sws1</i> test-R	CAGGCCTGCAGAGAAAGCAC
<i>sws1</i> ISH-F	TGGAGCCTTCAAGTTTGGCA
<i>sws1</i> ISH-R	TGACGAGCCGGTAGTCTTTG

Table S2 The primers for *q*RT-PCR.

Gene	Gene No.	Forward (5'-3')	Reverse (5'-3')
<i>actin</i>	NM_001104808.1	TATCATTCGCCTGAAACCGAT	CTTTGCACATGCCAGATCCG
<i>sws1</i>	NM_001104656.1	ACAAAGACTACCGGCTCGTCA	GCTTCCTCCATCTTCTTTCCGA
<i>sws2a</i>	XM_004069227.4	TGTTACCTGGGTGTGTGCTC	GAACCGCGAAGCAGAAACAG
<i>sws2b</i>	NM_001104654.1	TTCTGCTTTGCCGTCCCTT	AAGCAACAACCATGACGACCA
<i>rh2-a</i>	NM_001104655.1	TTTGGTTGGCTGGTCAAGGT	CACAAGGCTGCCATAGGTGA
<i>rh2-b</i>	XM_004086130.4	TGCACTTCTTCGTCCCAGTC	CCAAGCTACCAGGAAGCCAA
<i>rh2-c</i>	XM_004086132.4	CTTCTGTGCCGTTGAGGGAT	ACAAGCCAGAGCCATTACCC
<i>lws</i>	XM_004069094.4	TGAGGGCTATGTGGTCTCCA	ACCTGCTCCATCCAAAGACG
<i>rho</i>	NM_001104695.1	CTCGTTACATCCCAGAGGGC	ATGATGACAACCATGCGGGT
<i>gnat1</i>	XM_004084384.4	AAGCCCATCTGAGCATGTGT	TGATGATGTCGGTTACGGCA
<i>gnat2</i>	XM_004070401.3	GTGAGTCGGGAAAAAGCACC	CCAGAGCCAGAACCGAAGTC
<i>gnb3a</i>	XM_004077988.4	CAGCCTCAAAGACCAGATTACGG	TCATCTGCACACGTCCCAC
<i>gnb3b</i>	NM_001104851.1	GAAAGCTGAAATGGATGCACTGAA	ACATGCTCCCATCATTTGCTG
<i>grk7a</i>	NM_001104661.1	CCACCAAGGACGTCATCCA	CGTGTTTCCTCGGATCCTC
<i>grk7b</i>	XM_004075815.3	TGAGAGGCAGAAGATTACTGACA	GCACAACACAAACCTCACCAAA
<i>pde6c</i>	XM_004080270.3	CGGCAAACCTCCAAAAAGCCA	TGAGGGGGAAGGTGAGCATA