

## Supplementary Tables and Figures

**Supplementary Table S1.** Raw sequence information.

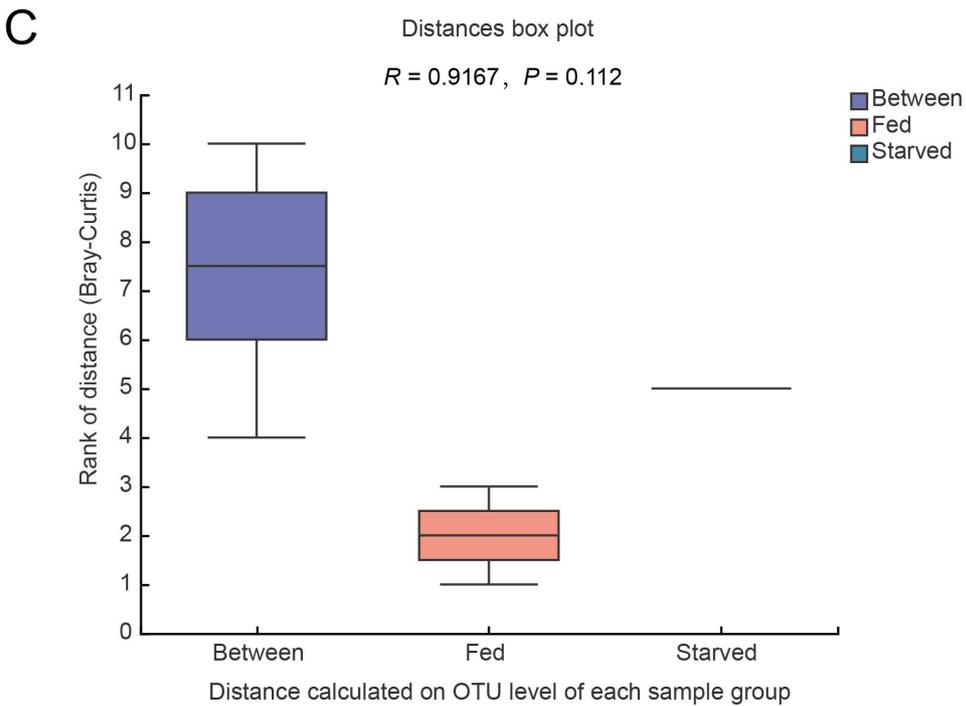
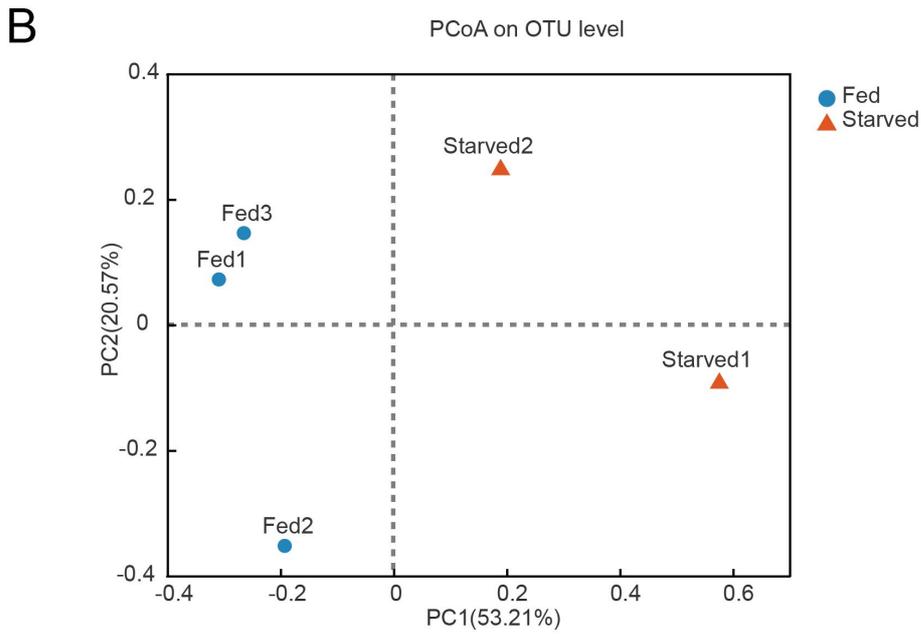
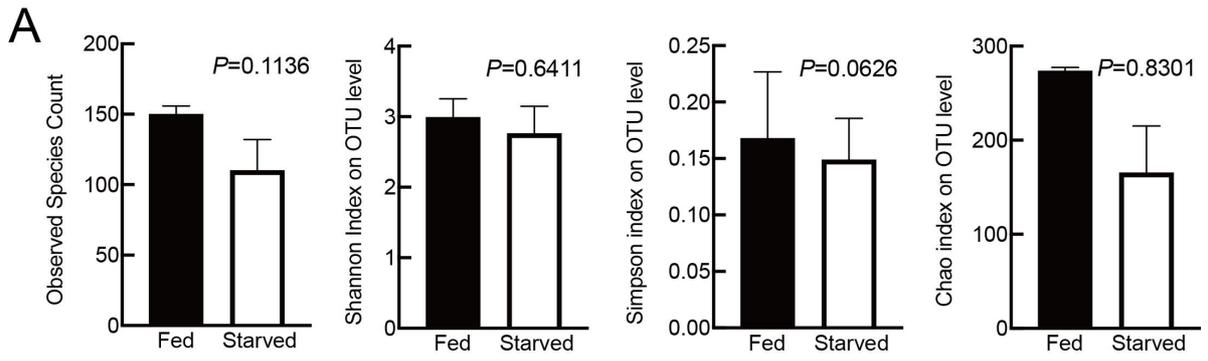
<b>Amplified Region</b>	<b>Insert_size</b>	<b>Sequencing_length</b>	<b>Raw_reads</b>	<b>Total_base</b>
338F_806R	468	PE300	236101*2	142132802

**Supplementary Table S2.** Sample information statistics.

<b>Sample Information</b>	<b>Sequences number</b>	<b>Base number</b>	<b>Mean length</b>
PWFeed1	52783	22027418	417.3203115
PWFeed2	40130	16763009	417.7176427
PWFeed3	54943	22629000	411.8632037
PWStar1	36410	15333024	421.1212304
PWStar2	51835	21734586	419.3032893
Total (5)	236101	98487037	417.4651355

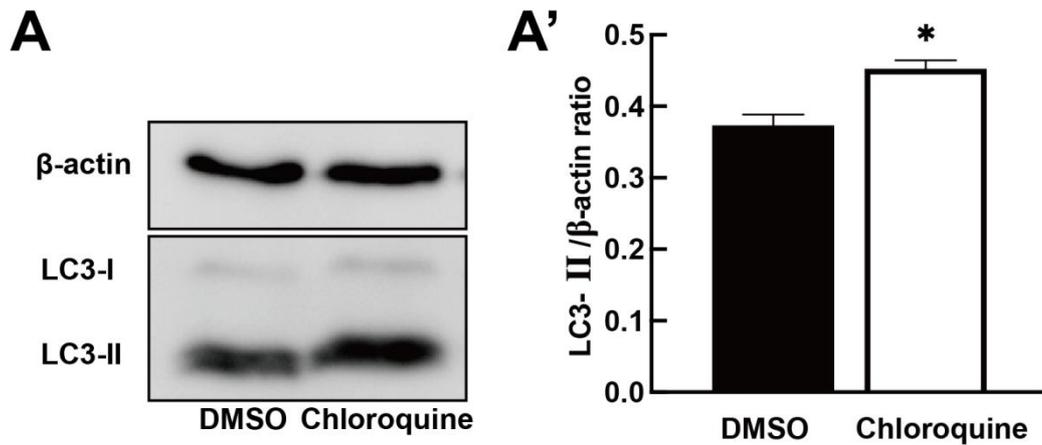
**Supplementary Table S3.** qPCR primer sequences.

<b>Gene</b>	<b>Sequence (5'-&gt;3')</b>
$\beta$ -Actin-qPCR-F	TTGTGATGGATTCTGGTGATGGT
$\beta$ -Actin-qPCR-R	TCACGACCAGCCAAGTCAAG
ULK1-qPCR-F	TCCGAATCAGTACACGCCTC
ULK1-qPCR-R	CACAAAAGGCTTAGCGCCTC
ATG12-qPCR-F	TGTGGGTGACACACCAATCAT
ATG12-qPCR-R	GCTGCTCAGATGGCTCTAGTT
ATG3-qPCR-F	CCCACAGTGCCTAGGACAAG
ATG3-qPCR-R	TCATCAGTTTCCAAGTGTCCACT



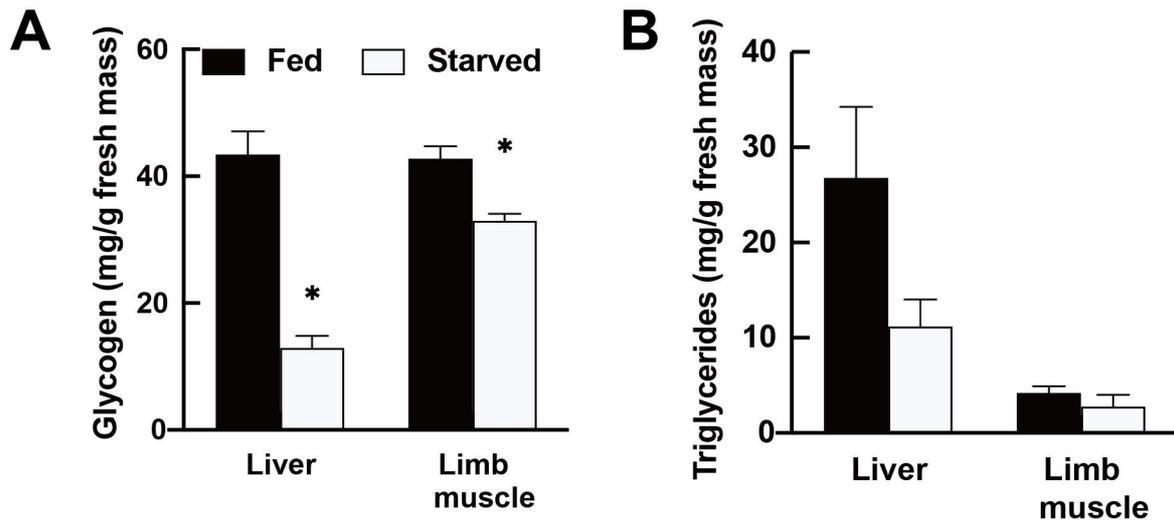
**Supplementary Figure S1. Gut microbiome composition and diversity changes during long-term starvation**

(A) Alpha diversity analysis showed that microbial community richness was similar between starved and fed groups. 'Observed species', 'Shannon', 'Chao1', and 'Simpson' indices did not differ significantly between two groups. (B) Bray-Curtis-based beta diversity analysis showed that bacterial community composition diverged between starved and fed newts. (C) Analysis of similarities (ANOSIM). Distance calculated on OTU level of each group. Difference between fed and starved groups was greater than difference within each group.



**Supplementary Figure S2. Blockage of autophagy in tissues of chloroquine-treated newts**

(A) (A') Western blot analysis and quantification of LC3 protein expression in brains of chloroquine-treated and control newts. Chloroquine inhibited autophagosome-lysosome fusion and blocked degradation of LC3-II, resulting in accumulation of LC3-II protein. Data are mean $\pm$ SEM, \* $P$ <0.05, after  $t$ -test,  $n$ =3.



**Supplementary Figure S3. Physiological alterations after short-term starvation**

(A) Glycogen content in liver and limb muscle between fed and starved newts after 3 months of starvation. (B) Triglyceride levels in liver and limb muscle between fed and starved newts after 3 months of starvation. Results are mean $\pm$ SEM, \* $P$ <0.05, after  $t$ -test,  $n=3$ .