Supporting Information

Microplastics (Polystyrene) Exposure Induce Metabolic Changes in the Liver of Rare Minnow (*Gobiocypris rarus*)

Chunling Wang [1], Miaomiao Hou [1,2], Kunyu Shang [3], Huanshan Wang [1] and Jianwei Wang [1,*]

1 The Key Laboratory of Aquatic Biodiversity and Conservation of Chinese Academy of Sciences, Institute of Hydrobiology, Chinese Academy of Sciences, Wuhan 430072, China; chwang@ihb.ac.cn (C.W.); houmiao006@163.com (M.H.); hswang@ihb.ac.cn (H.W.)

2 University of Chinese Academy of Sciences, Beijing 100049, China

3 College of Fisheries,Huazhong Agricultural University, Wuhan, 430070, China; 15127315124@163.com (K.S.)

* Correspondence: wangjw@ihb.ac.cn (J.W.)

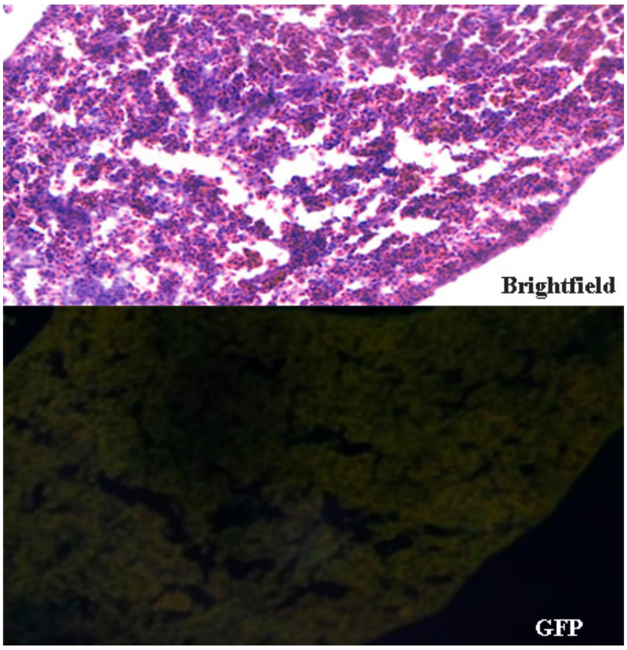

Figure S1. Fluorescently labeled PS-MPs of 1-μm diameter didn't accumulate in liver of rare minnow.

Table S1. Pathway analysis (KEGG) for metabolites and genes significantly affected by MP exposure

Pathway	Description	Metabolites/Genes
ko00051	Fructose and mannose metabolism	C00577,C00644,C05345,akr1b,sord,aldo,hk,tigar,pfkfb1,pfkfb4,tpi,pmm,gmpp,fcl,fbp,pfka,fpgt,fuk
ko00360	Phenylalanine metabolism	C03519,C05620,tat,ddc,mao,hpd,aldh3
ko00040	Pentose and glucuronate interconversions	C00817,C00514,glcak,akr1a1,kl,ugp2,akr1b,dhdh,sord,xylb
ko00760	Nicotinate and nicotinamide metabolism	C16159,C16390,nadx,aox,puna,sirt3,sirt6,sirt7,nrk1,nrk2,nmnat,enpp1,enpp3,nadx
ko00052	Galactose metabolism	C01216,C00577,ugp2,ganc,mgam,malz,galt,glb1,pgm2,g6pc,gla,hk,pfka,akr1b
ko00030	Pentose phosphate pathway	C05345,C00577,gnl,h6pd,tkta,fbp,pfka,aldo,tala,pgm2,prps,
ko00561	Glycerolipid metabolism	C00577,aldh,akr1a1,akr1b,glpk,gpat1,gpat2,cel,lipg,plpp1,plpp2,plpp3,lpin,lpl,dgk,dgat1,dgat2,gla
ko01200	Carbon metabolism	C00577,C00085,C05345
ko00280	Valine, leucine and isoleucine degradation	C06000,mccc1,auh,hibch,hmgcs2,oxct,aacs,aldh,aox
ko00600	Sphingolipid metabolism	C03640,plpp1,plpp2,plpp3,acer1,acer2degs,sgms,b4galt6,cerk,gla,smpd1,smpd4,enpp7,psap,
ko02010	ABC transporters	C20570,abca5,abcb9,abcb11,abcc10,abcd2,abcd3,abcg2,abcg5,abcg8,
ko00240	Pyrimidine metabolism	C00380,comeb,cdd,udp,dctpp1,dck,udk,entpd5,entpd6,dhodh,cad,psug,psuk,puna,cmpk1,enpp1,enpp3,dpys,deoa,tdk,ndk,rrm1,thya,dut,nt5c
ko00010	Glycolysis / Gluconeogenesis	C05345, pgm,g6pc,hk,fbp,pfka,aldo,tpi,gapdh,eno,acee,akr1a1,aldh3,ldh,aldh,acss
ko00520	Amino sugar and nucleotide sugar metabolism	C06241,C05345,cyb5r,uap1,hk,nagb,chit1,glcak,pgm,ga1t,uap2,fuk,pgm2,pmm,tsta3

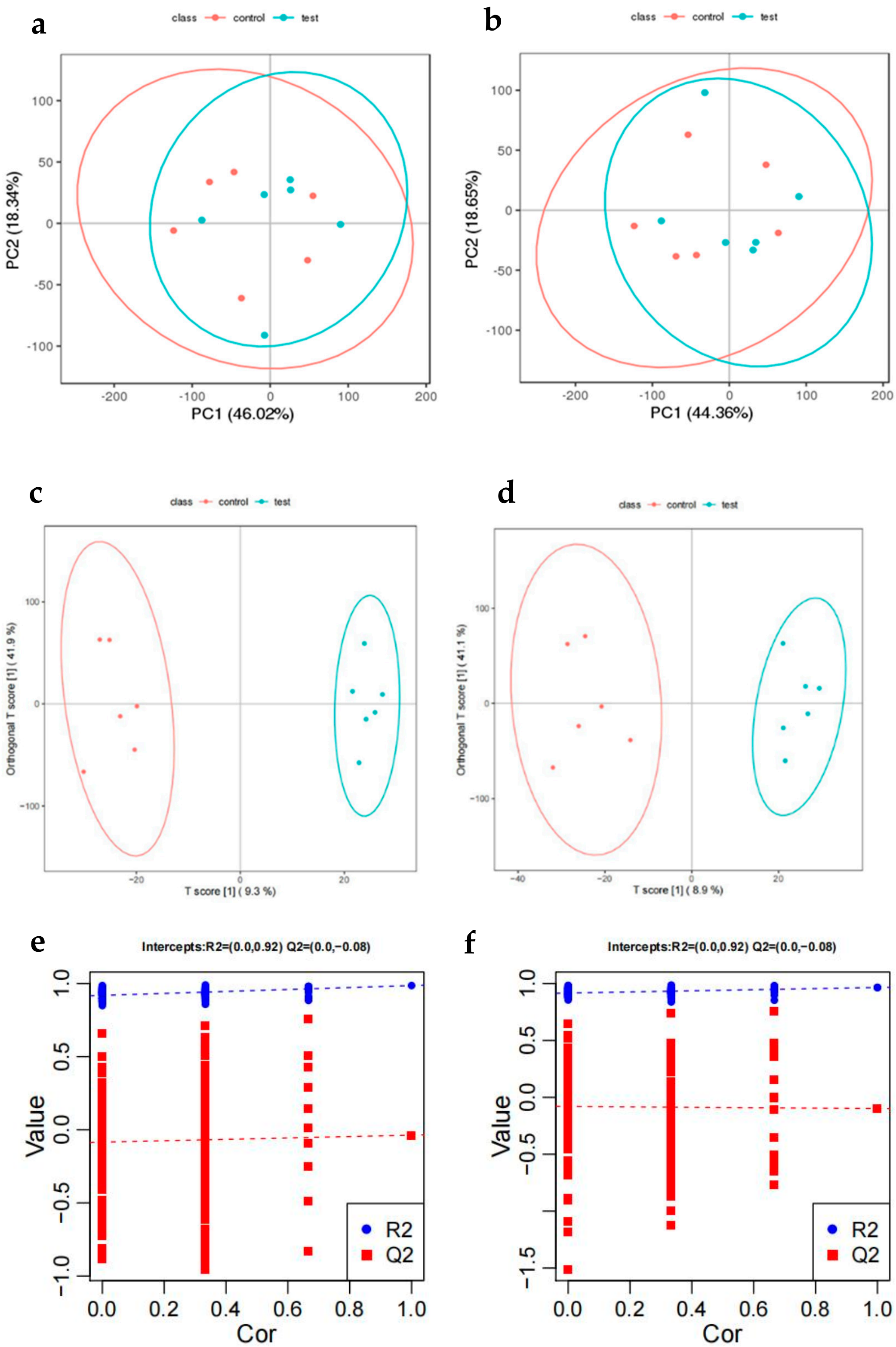

Figure S2. Multivariate statistical analysis in control and MPs-exposure groups. (a) Score scatter plot of PCA model of ESI+. (b) Score scatter plot of PCA model of ESI-. (c) OPLS-DA scores plot of ESI+. (d) OPLS-DA scores plot of ESI-. R2X=0.56, R2Y=0.991, Q2Y=0.689. (e) Verification diagram for OPLS-DA modle of ESI+. (f) Verification diagram for OPLS-DA modle of ESI-.

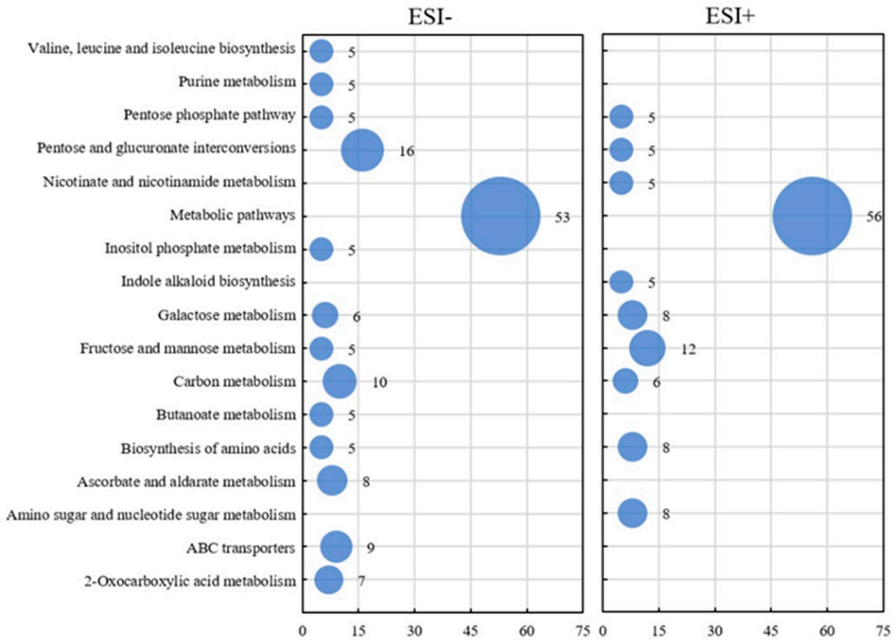

Figure S3. Kyoto Encyclopedia of Genes and Genomes (KEGG) pathway classification of the differential metabolites in "control vs exposure".

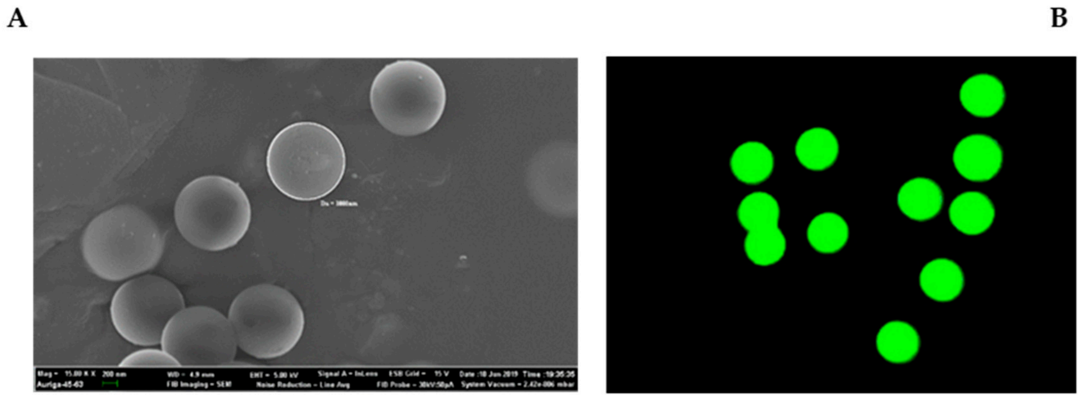

Figure S4. The images for 1 μm fluorescent PS-MPs detected by (A) scanning electron microscope (SEM) and (B) fluorescence microscopy.

Table S2. Primers used in the present study

Name of primer	**Sequence (5'-3')**
FASN-F	AACTGTAGACCTGTAACGGGAG
FASN-R	AACAACACTTCATTCTGGCAA
ACSF2-F	GGGGATACTGCGTGATGCTG
ACSF2-R	CCTTTATGCGTCCTTCTATTCTG
FAXDC2-F	AGACACATTCAACATTTCTCACAT
FAXDC2-R	GCGACCTTTTACACCACAGA
ELOVL5-F	GCGTGTCTGAAGTGAAGTGC
ELOVL5-R	GTGTCGTCAATGTGAAAGCG
CPT1A-F	TCGTCTACAAGAACGGTAAAATG
CPT1A-R	CTGTAGTCTGGTAGGGGGCG
β-actin-F	GTCCGTGACATCAAAGAG
β-actin-R	ACCGCAAGATTCCATAC