

## Supplementary file

### Impact on Bile Acid Concentrations by Alveolar Echinococcosis and Treatment with Albendazole in Mice

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**Table S1:** Optimized multiple reaction monitoring (MRM) transitions used as quantifiers and qualifiers, electrospray ionization (ESI) mode (positive (+) or negative (-)), and collision energies (CE).

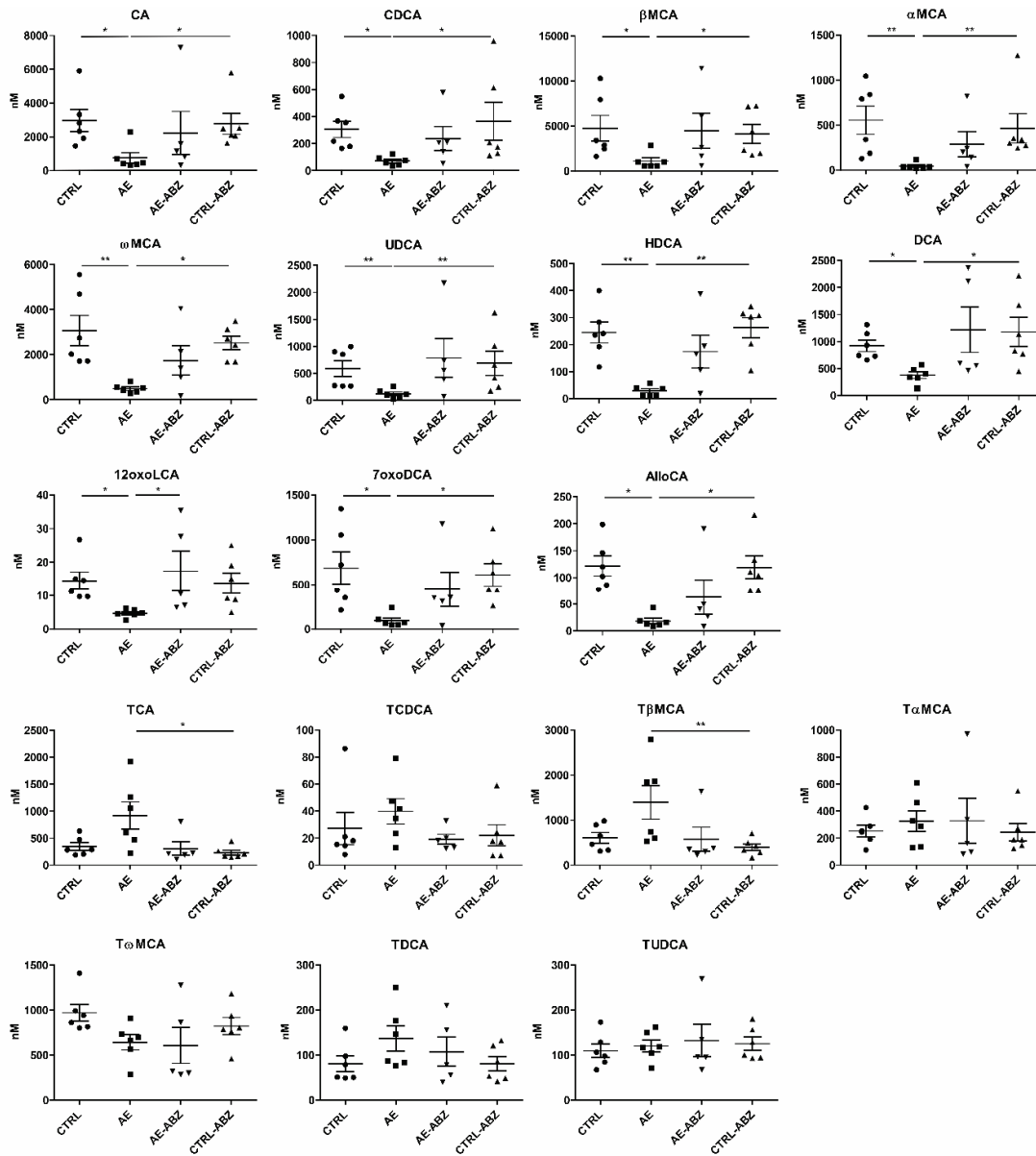
Compound	Abbreviation	ESI	RT (min)	Transition	CE (V)	Transition	CE (V)
Tauro- $\omega$ -muricholic acid	T $\omega$ MCA	+	2.82	480.3 > 126	24	480.3 > 462.1	8
Tauro- $\alpha$ -muricholic acid	T $\alpha$ MCA	+	3.07	480.3 > 126	24	480.3 > 462.1	8
Tauro- $\beta$ -muricholic acid	T $\beta$ MCA	+	3.30	480.3 > 126	24	480.3 > 462.2	8
Tauro-ursodeoxycholic acid	TUDCA	+	5.20	464.2 > 126	28	464.2 > 464.2	0
Tauro-ursodeoxycholic acid	TUDCA	-	5.20	498.2 > 124.2	47	-	-
Tauro-cholic acid	TCA	+	5.45	480.3 > 461.9	8	480.3 > 126	24
Tauro-cholic acid	TCA	-	5.45	514.2 > 124.2	46	-	-
Tauro-7-oxolithocholic acid	T7oxoLCA	+	5.84	480.3 > 126	24	480.3 > 461.9	8
$\omega$ -muricholic acid	$\omega$ MCA	+	6.29	373.3 > 159.1	20	373.3 > 355.2	15
Glyco-ursodeoxycholic acid	GUDCA	-	6.43	448.2 > 74	37	448.2 > 386.1	35
Glyco-ursodeoxycholic acid	GUDCA	-	6.43	448.2 > 404.1	40	-	-
$\alpha$ -muricholic acid	$\alpha$ MCA	+	6.50	373.3 > 355.2	15	373.3 > 105.1	
Glyco-cholic acid	GCA	-	6.63	464.4 > 74	37	464.2 > 402.1	25
7-oxo-deoxycholic acid	7oxoDCA	+	6.81	371.3 > 353.2	8	371.3 > 335.2	12
$\beta$ -muricholic acid	$\beta$ MCA	+	6.85	391.3 > 355.2	16	373.3 > 355.2	8
$\beta$ -muricholic acid	$\beta$ MCA	+	6.85	373.3 > 105.1	58	-	-
Glyco-7-oxo-lithocholic acid	G7oxoLCA	-	7.63	446.2 > 74	37	446.2 > 330.1	49
Tauro-chenodeoxycholic acid	TCDC	+	7.91	464.2 > 126	28	464.2 > 464.2	0
Tauro-chenodeoxycholic acid	TCDC	-	7.91	498.2 > 124.2	45	-	-
$\gamma$ -muricholic acid	$\gamma$ MCA	+	8.14	373.3 > 355	16	391.3 > 355.2	10
Tauro-deoxycholic acid	TDCA	-	8.79	498.2 > 124.2	45	-	-

Tauro-deoxycholic acid	TDCA	+	8.79	464.2 > 126	28	464.2 > 464.2	0
Allo-cholic acid	AlloCA	+	9.44	373.3 > 355.2	12	373.3 > 159.1	20
Cholic Acid	CA	+	9.81	373.3 > 355.2	8	373.3 > 159.1	20
Ursodeoxycholic acid	UDCA	+	9.92	357.2 > 95	35	357.2 > 80.9	50
Allo-3 $\beta$ -deoxycholic acid	Allo3 $\beta$ DCA	-	10.10	391.3 > 345.1	40	391.3 > 342.8	40
Hyodeoxycholic acid	HDCA	+	10.34	357.2 > 95.1	40	357.3 > 104.8	50
Glyco-chenodeoxycholic acid	GCDCA	-	10.58	448.2 > 74	30	448.2 > 404.1	32
Glyco-deoxycholic acid	GDCA	-	11.43	448.2 > 74	30	448.2 > 404.1	32
Glyco-deoxycholic acid	GDCA	-	11.43	448.2 > 386.1	35	-	-
6,7-dioxo-lithocholic acid	6,7dioxoLCA	+	11.71	405.3 > 351.1	12	405.3 > 333.1	16
7-oxolithocholic acid	7oxoLCA	+	11.80	373.3 > 355.1	8	373.3 > 105.1	58
Allo-12 $\beta$ -deoxycholic acid	Allo12 $\beta$ DCA	-	11.94	391.3 > 345.1	36	391.3 > 327.3	40
12-oxo-lithocholic acid	12oxoLCA	+	12.25	391.3 > 145.1	32	391.3 > 309.3	20
Tauro-lithocholic acid	TLCA	-	13.11	482.2 > 80	56	482.2 > 107.2	50
Tauro-lithocholic acid	TLCA	-	13.11	482.2 > 124.2	45	-	-
Chenodeoxycholic acid	CDCA	+	13.76	357.2 > 104.9	50	357.2 > 81.1	48
Allo-deoxycholic acid	AlloDCA	-	13.91	391.3 > 345	36	391.3 > 327.1	40
Allo-deoxycholic acid	AlloDCA	+	13.91	357.2 > 104.9	50	357.2 > 81.1	48
Deoxycholic acid	DCA	-	14.14	391.3 > 345	36	391.3 > 327.1	40
Deoxycholic acid	DCA	+	14.14	357.2 > 104.9	50	357.2 > 81.1	48
Glyco-lithocholic acid	GLCA	-	14.59	432.2 > 74	41	432.2 > 388.1	37
Allo-3 $\beta$ -lithocholic acid	Allo3 $\beta$ LCA	+	15.56	359.3 > 135.1	25	359.3 > 95.1	32
Allo-lithocholic acid	AlloLCA	+	17.08	359.3 > 135.1	25	359.3 > 95.1	32
Lithocholic acid	LCA	+	17.19	359.3 > 135.1	24	359.3 > 95.1	32
3-oxo-lithocholic acid	3oxoLCA	+	17.43	357.3 > 80.9	48	357.3 > 95.1	40
<b>Internal Standards</b>							
d4-Glyco-ursodeoxycholic acid	d4-GUDCA	-	6.40	452.2 > 74	37	-	-
d4-Glyco-cholic acid	d4-GCA	-	6.61	468.2 > 74	49	-	-
d4-Cholic acid	d4-CA	+	9.79	377.3 > 359.2	8	-	-
d4-Ursodeoxycholic acid	d4-UDCA	+	10.02	361.2 > 95.1	40	-	-
d4-Glyco-chenodeoxycholic acid	d4-GCDCA	-	10.55	452.2 > 74	37	-	-
d4-Chenodeoxycholic acid	d4-CDCA	+	13.70	361.3 > 95.1	40	-	-
d4-Deoxycholic acid	d4-DCA	+	14.16	361.3 > 95.1	40	-	-
d4-Lithocholic acid	d4-LCA	+	17.05	363.3 > 139.1	24	-	-

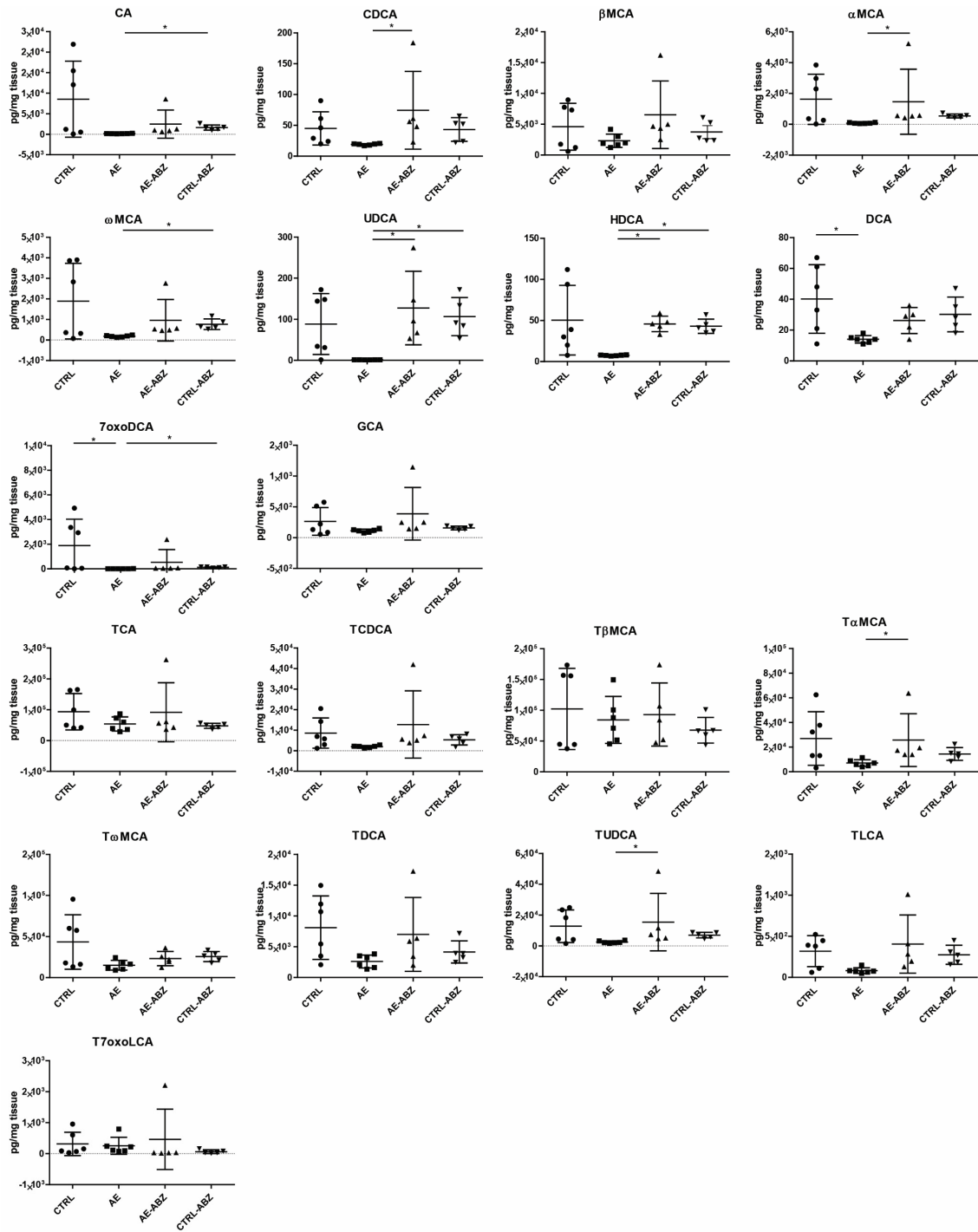
**Table S2:** Oligonucleotide primers for mRNA quantification by qPCR.

Gene	Forward	Reverse
<i>Bsep</i>	TGGTAGAGAAGAGGCGACAAT	TGAGGTAGCCATGTCCAGAA
<i>Ntcp</i>	GCCACACTATGTACCCTACGTC	TTTAGTCGGAAGAGAGCAGAGA
<i>Mrp4</i>	CATCAAGTCCAGGGAAAAGGTTG	GAGGGCCGAGATGAGGGAG
<i>Mrp2</i>	GCTTAGTTCAAGTCTATGGAGT	TCCGGCCGATACCGCACTTGATA
<i>Cyp7a1</i>	CTTGAGGATGGTTCCTATAAC	TTAAAAGTCAAAGGGTCTGG
<i>Cyp27a1</i>	AAAGCTGTGATTAAGGAGAC	CAAAGTGTGTATTCTTGGGG
<i>Oatp1b2</i>	CAACCTGACTGGTTTCTATG	AAGTGAAGGATCCAATGAAG
<i>Slc51a</i> ( <i>Osta</i> )	CTTGACCCCAGGTACACAGC	ATGGGGCAAAGGGTGTCTT
<i>Slc51b</i> ( <i>Ost</i> )	AGATGCGGCTCCTTGAATTA	TGGCAGAAAGACAAGTGATG

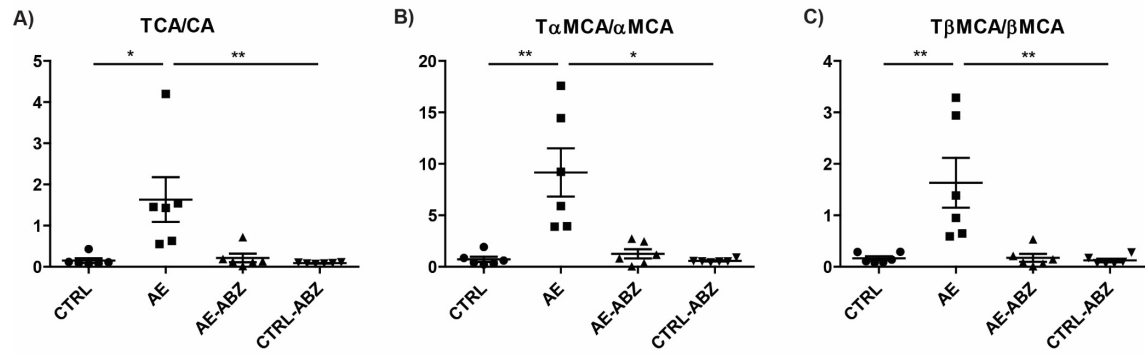
<i>Oatp1a1</i>	TAGCTTGCCTCCAGTATGCCTT	ACAGGCCAAATGCTATGTATGC
<i>Akr1d1</i>	GAAAAGATAGCAGAAGGGAAGGT	GGGACATGCTCTGTATTCCATAA
<i>Actb</i>	ACCCTGTGCTGCTCACC GA	CTGGATGGCTACGTACATGGCT



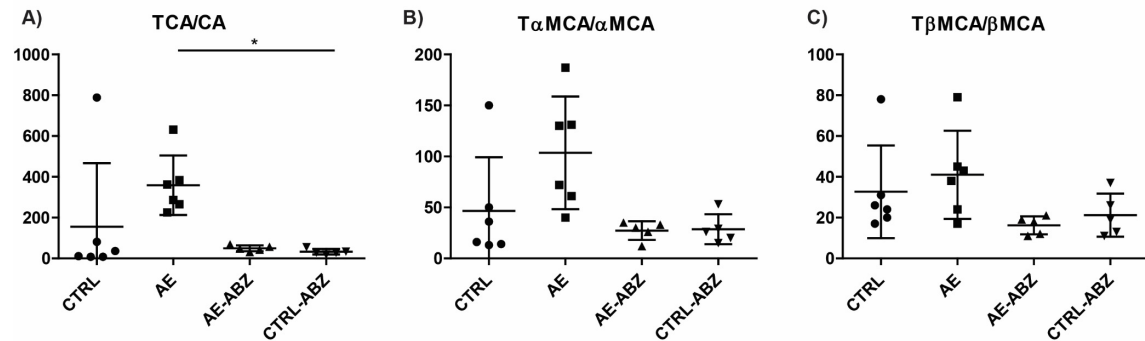
**Figure S1.** Concentrations of individual bile acids quantified in serum of mice from the four treatment groups. Non-infected control (CTRL, n=6), *E. multilocularis* infected (AE, n=6), *E. multilocularis* infected and ABZ treated (AE-ABZ, n=5, one outlier with aberrant concentrations was removed), and non-infected and ABZ treated control mice (CTRL-ABZ, n=6). Values are expressed as mean  $\pm$  SD (nM). \* p < 0.05 and \*\* p < 0.01.



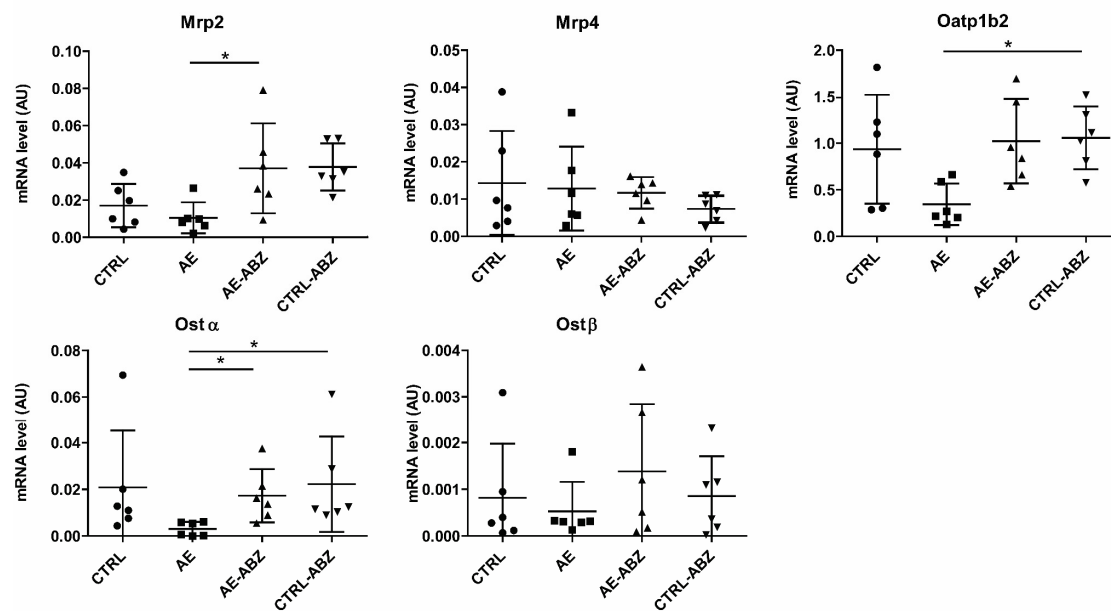
**Figure S2.** Concentrations of individual bile acids quantified in liver tissue of mice from the four treatment groups. Non-infected control (CTRL, n=6), *E. multilocularis* infected (AE, n=6), *E. multilocularis* infected and ABZ treated (AE-ABZ, n=5, one outlier with aberrant concentrations was removed), and non-infected and ABZ treated control mice (CTRL-ABZ, n=5, one outlier with aberrant concentrations was removed). Values are expressed as mean  $\pm$  SD (pg/mg tissue). \* p < 0.05 and \*\* p < 0.01.



**Figure S3:** Increased ratios of taurine-conjugated to unconjugated bile acids in serum of AE mice. The ratios of the serum concentrations of the taurine-conjugated cholic acid (A),  $\alpha$ -muricholic acid (B) and  $\beta$ -muricholic acid (C) to the respective unconjugated bile acid were determined in the four different treatment groups. Non-infected control (CTRL, n=6), *E. multilocularis* infected (AE, n=6), *E. multilocularis* infected and ABZ treated (AE-ABZ, n=5, one outlier with aberrant concentrations was removed), and non-infected and ABZ treated control mice (CTRL-ABZ, n=6). Values are expressed as mean  $\pm$  SD. \* p < 0.05 and \*\* p < 0.01.



**Figure S4:** Ratios of taurine-conjugated to unconjugated bile acids in liver tissues of AE mice. The ratios of the liver tissue concentrations of the taurine-conjugated cholic acid (A),  $\alpha$ -muricholic acid (B) and  $\beta$ -muricholic acid (C) to the respective unconjugated bile acid were determined in the four different treatment groups in liver tissue. Non-infected control (CTRL, n=6), *E. multilocularis* infected (AE, n=6), *E. multilocularis* infected and ABZ treated (AE-ABZ, n=5, one outlier with aberrant concentrations was removed), and non-infected and ABZ treated control mice (CTRL-ABZ, n=5, one outlier with aberrant concentrations was removed). Values are expressed as mean  $\pm$  SD. \* p < 0.05.



**Figure S5.** Effect of AE on mRNA expression levels of additional bile acid transporters. The mRNA levels of Mrp2, Mrp4, Ostα, Ostβ, and Oatp1b2 were determined in liver tissues of non-infected control (CTRL, n=6), *E. multilocularis* infected (AE, n=6), *E. multilocularis* infected and ABZ treated (AE-ABZ, n=6), and non-infected and ABZ treated control mice (CTRL-ABZ, n=6). Values are expressed as mean ± SD. \* p < 0.05.