

Figure S1. The images of the GFP expression patterns driven under *idha-1* promoter in the *Pidha-1::gfp* transgenic worm by fluorescent microscopy.

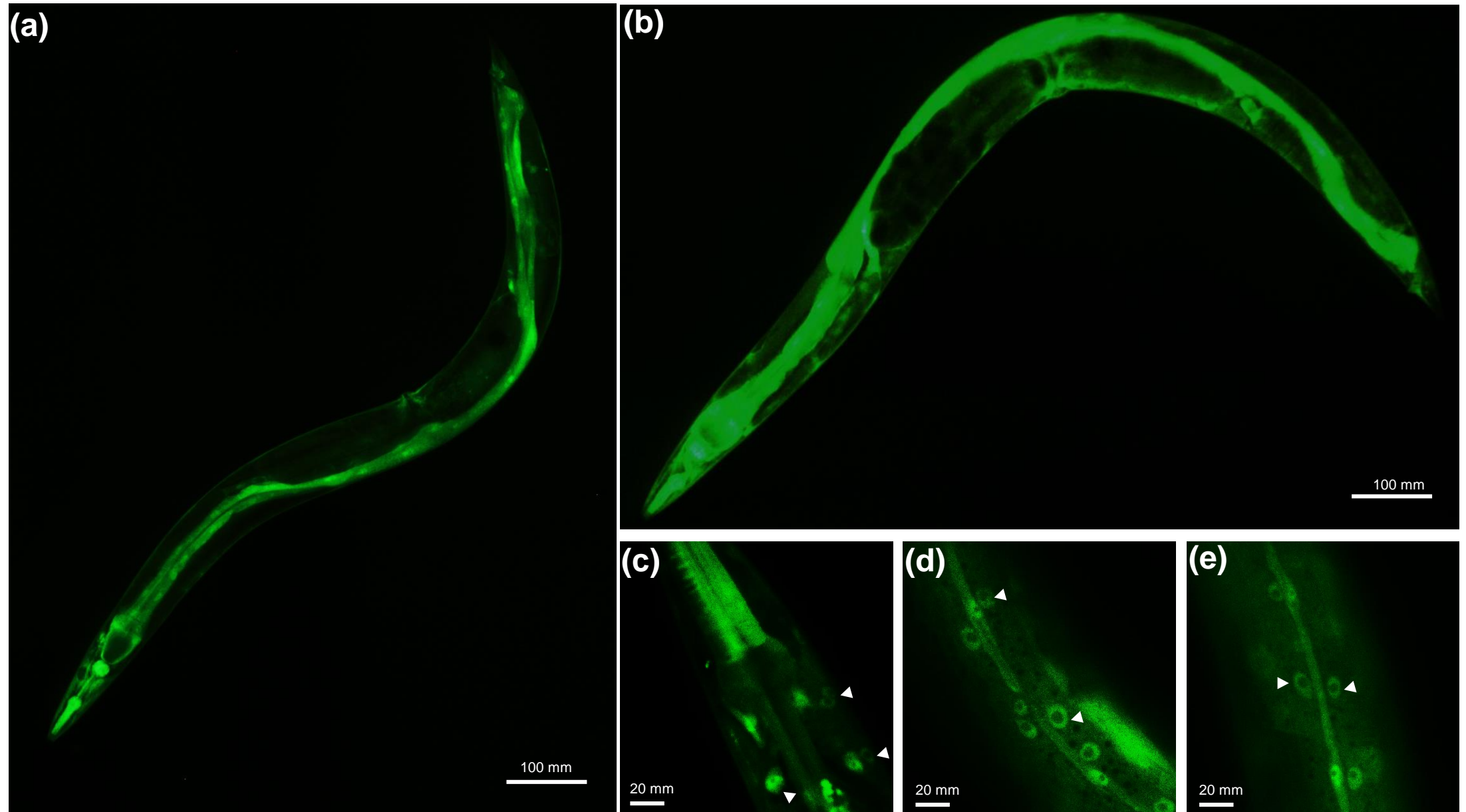


Figure S2. Upregulated *idha-1* mRNA levels are detected in the DR treatment and DR models.

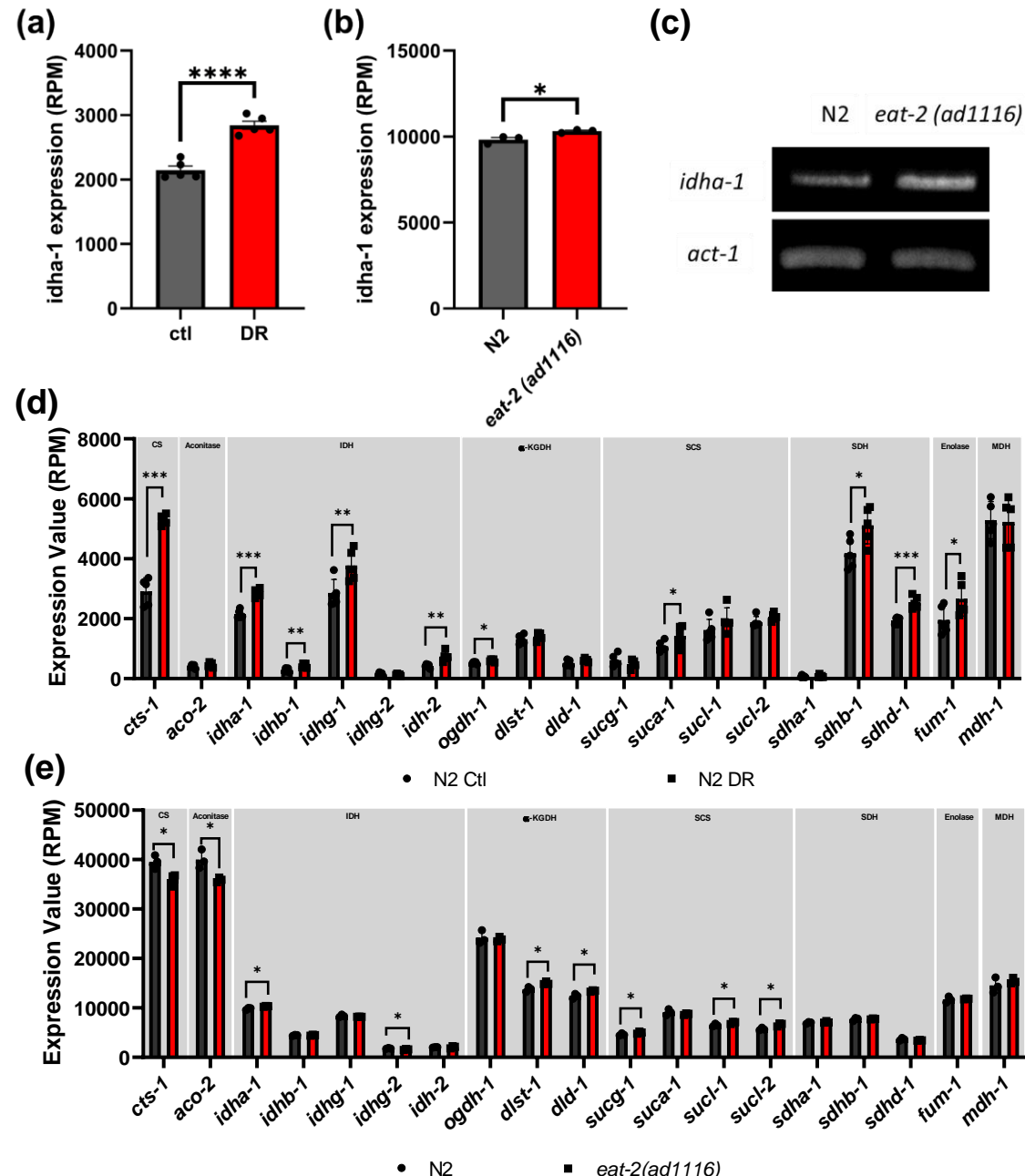
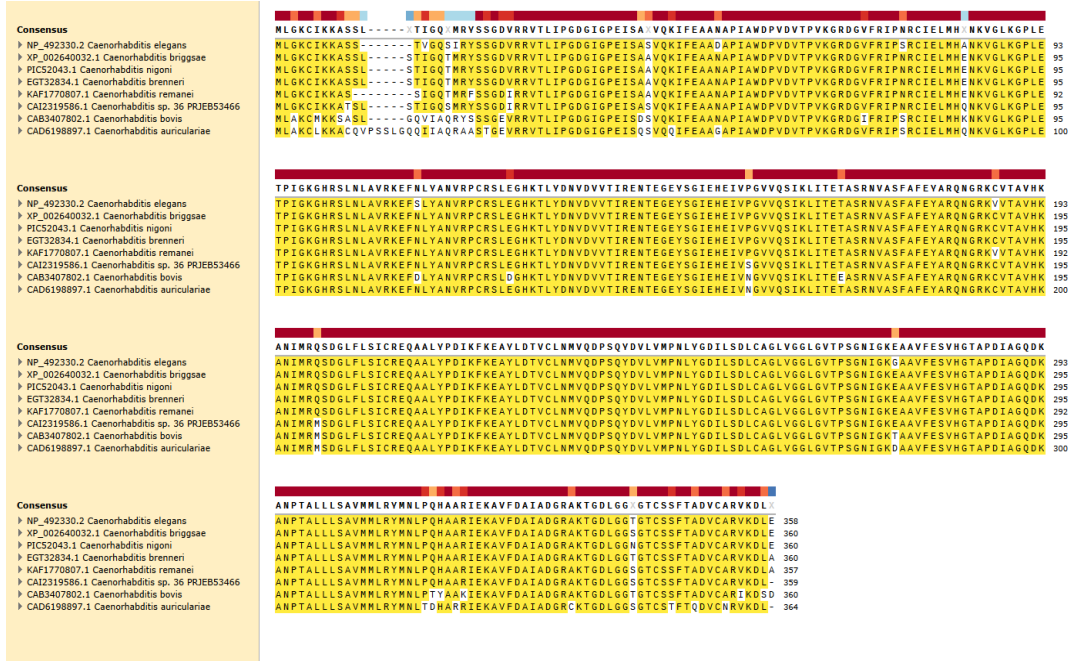


Figure S3. IDHA-1 is conserved among the *Caenorhabditis* genus.

(a)



(b)

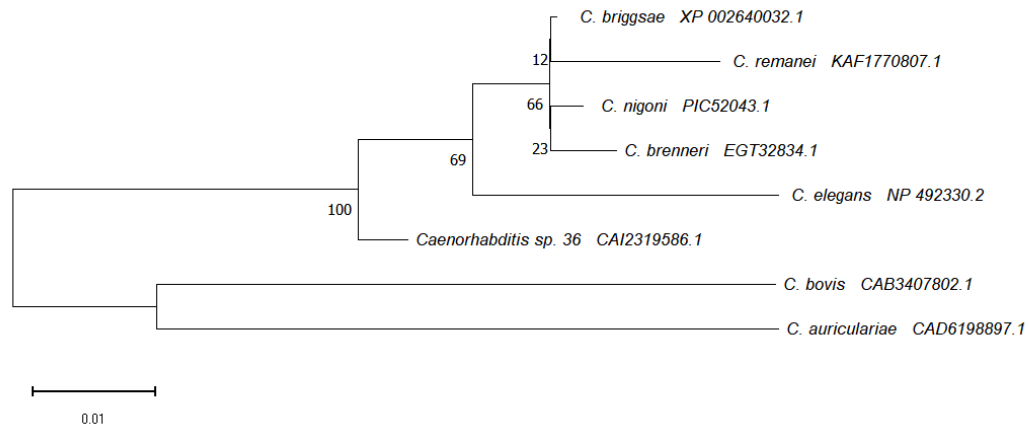


Figure S4. The elevated NAD⁺ levels are detected in *idha-1* overexpression transgenic worm.

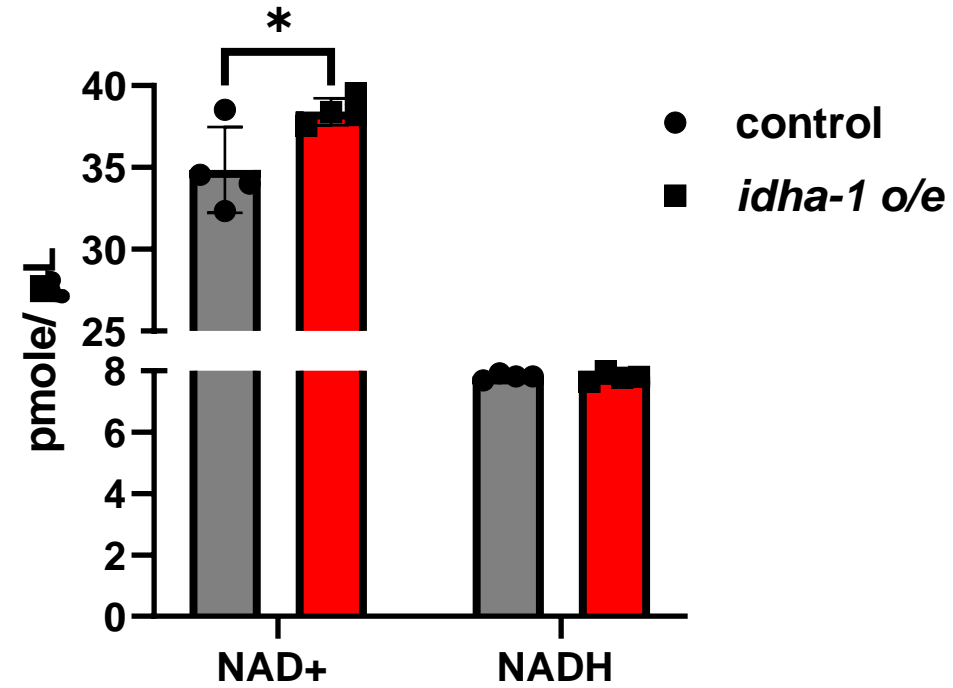


Table S1. The summary of the lifespan assays in figure 1a, 1e, 4c, 5a, 5b, 5c.

Strain	Mean lifespan (day)	Change (%)	p-value	Number of worms scored	Figure
<i>Pidha-1::gfp</i>	13.6	-	-	168	Fig. 1a
<i>Pidha-1::idha-1</i>	18.0	32.4	p<0.0001****	175	Fig. 1a
N2 EV	20.1	-	-	169	Fig. 1e
N2 <i>idha-1(RNAi)</i> 5'	16.8	-16.4	p<0.0001****	173	Fig. 1e
N2 <i>idha-1(RNAi)</i> 3'	16.3	-19.4	p<0.0001****	167	Fig. 1e
N2 EV	20.1	-	-	169	Fig. 4c
N2 <i>idha-1(RNAi)</i> 5'	16.8	-16.4	p<0.0001****	193	Fig. 4c
<i>eat-2(ad1116)</i> EV	25.7	-	-	113	Fig. 4c
<i>eat-2(ad1116) idha-1(RNAi)</i> 5'	20.8	-19.1	p<0.0001****	120	Fig. 4c
N2 EV	14.7	-	-	139	Fig. 5a
N2 <i>idha-1(RNAi)</i> 5'	11.3	-23.1	p<0.0001****	141	Fig. 5a
<i>daf-16(mu86)</i> EV	10.9	-25.9	p<0.0001****	121	Fig. 5a
<i>daf-16(mu86) idha-1(RNAi)</i> 5'	9.0	-38.8	p<0.0001****	120	Fig. 5a
N2 EV	17.2	-	-	139	Fig. 5b
N2 <i>idha-1(RNAi)</i> 5'	12.2	-29.1	p<0.0001****	141	Fig. 5b
<i>aak-2(gt33)</i> EV	12.2	-29.1	p<0.0001****	141	Fig. 5b
<i>aak-2(gt33) idha-1(RNAi)</i> 5'	10.8	-37.2	p<0.0001****	117	Fig. 5b
N2 EV	16.4	-	-	118	Fig. 5c
N2 <i>idha-1(RNAi)</i> 5'	12.1	-26.2	p<0.0001****	119	Fig. 5c
<i>rsks-1(ok1255)</i> EV	18.1	10.4	p<0.05*	122	Fig. 5c
<i>rsks-1(ok1255) idha-1(RNAi)</i> 5'	16.3	-0.6	p=0.052	122	Fig. 5c