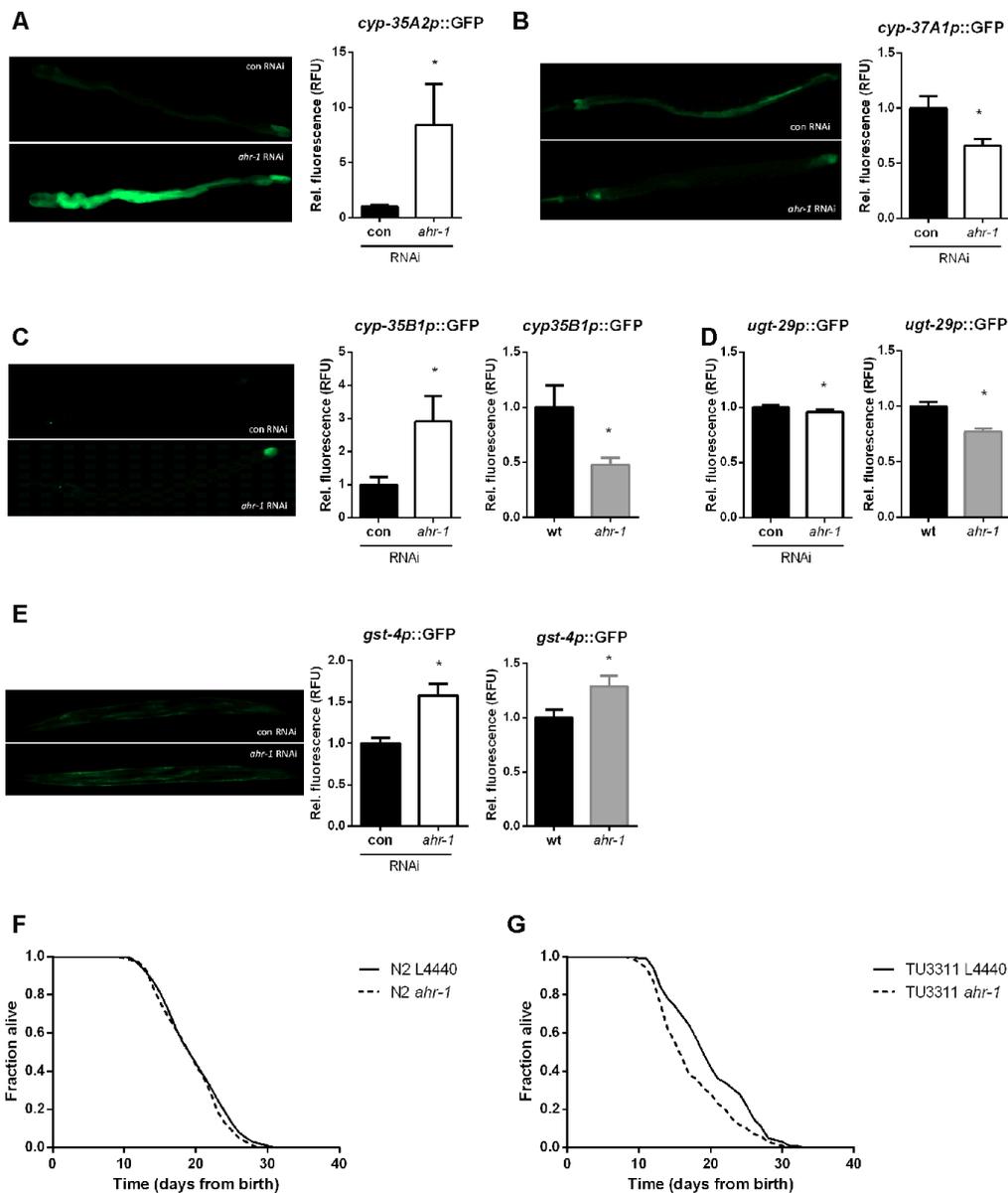
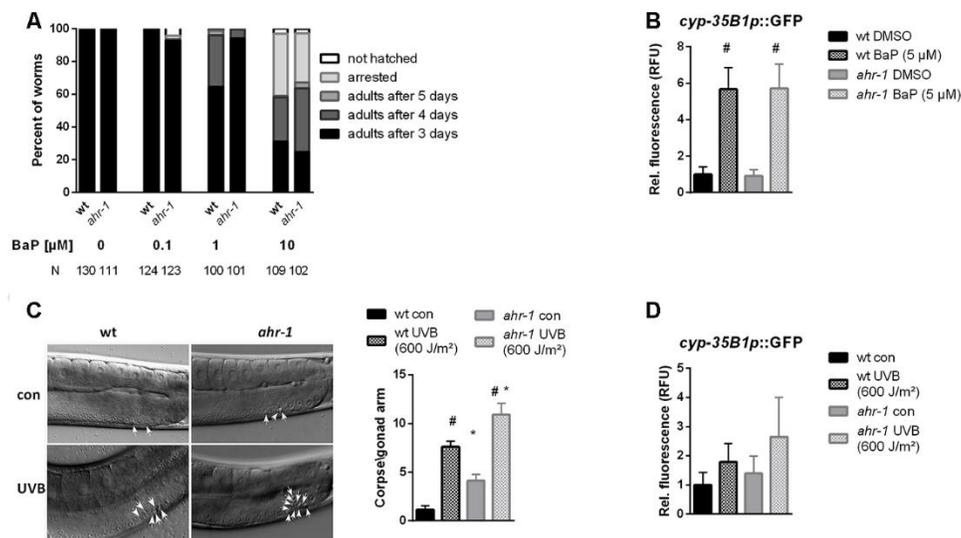


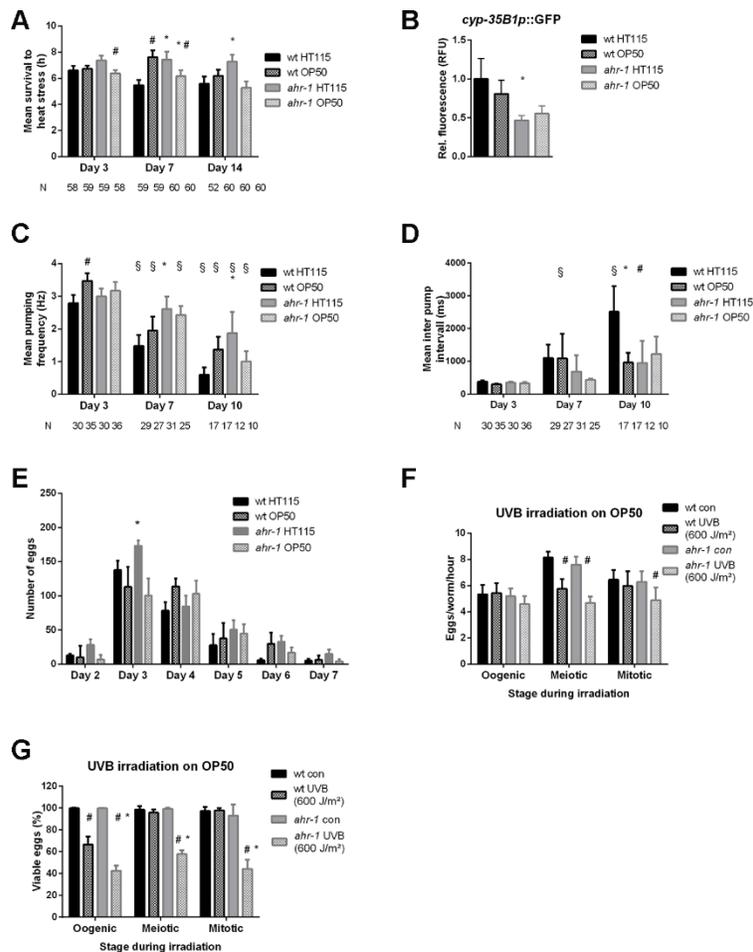
SUPPLEMENTARY FIGURES



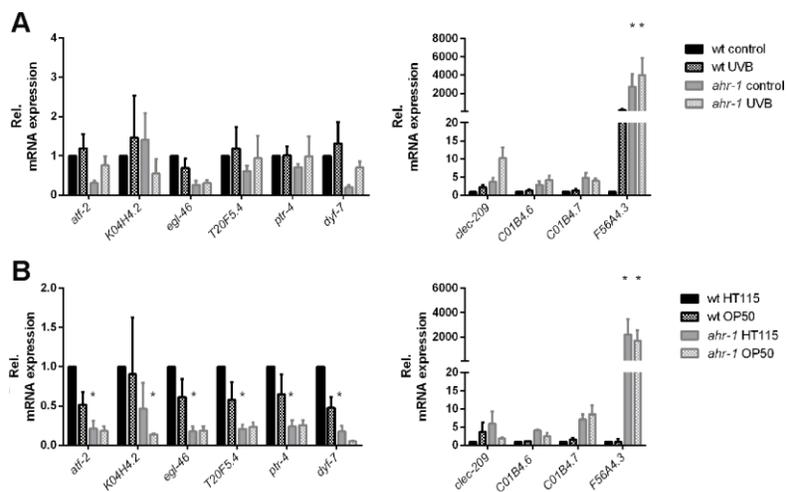
**Supplementary Figure 1. AHR-1 regulates Phase I and Phase II enzyme genes.** (A) Quantification of *cyp-35A2p::GFP* expression in worms treated with control or *ahr-1* RNAi. Mean + 95 % CI of pooled data from 3 independent experiments with 43 worms are shown. (B) Quantification of *cyp-37A1p::GFP* expression in worms treated with control or *ahr-1* RNAi. Mean + 95 % CI of pooled data from 2 independent experiments with 38 (con RNAi) and 26 (*ahr-1* RNAi) worms are shown. (C) Quantification of *cyp-35B1p::GFP* expression in worms treated with control or *ahr-1* RNAi (left panel) or worms with either wild-type *ahr-1* or the *ju145* allele (right panel). Mean + 95 % CI of pooled data from 60 (con RNAi), 40 (*ahr-1* RNAi), 52 (wt), and 63 (*ahr-1*) worms in 3 independent experiments are shown. (D) Quantification of *ugt-29p::GFP* expression in *ahr-1*-depleted worms. Mean + 95 % CI of pooled data from 3 independent experiments are shown. Number of worms 44 (con RNAi), 36 (*ahr-1* RNAi) [left panel], 34 (wt), 40 (*ahr-1*) [right panel]. (E) Quantification of *gst-4p::GFP* expression in worms treated with control or *ahr-1* RNAi (left panel) or worms with either wild-type *ahr-1* or the *ju145* allele (right panel). Mean + 95 % CI of pooled data from 27 (con RNAi), 29 (*ahr-1* RNAi), 69 (wt), and 66 (*ahr-1*) worms in 2 or 4 independent experiments are shown. (F) *ahr-1* depletion via RNAi does not affect the lifespan of N2. Kaplan Meier curves of control (L4440) or *ahr-1* RNAi treated worms. Pooled data of 280 (N2 L4440) and 264 (N2 *ahr-1*) worms/condition in 5 independent replicates are shown. \* p-value < 0.05 vs. wt, statistical test: Log-rank test. (G) *ahr-1* depletion via RNAi shortens the lifespan in a strain with enhanced RNAi in the nervous system (TU3311). Kaplan Meier curves of control (L4440) or *ahr-1* RNAi treated worms. Pooled data of 180 worms/condition in 3 independent replicates are shown. \* p-value < 0.05 vs. wt, statistical test: Log-rank test.



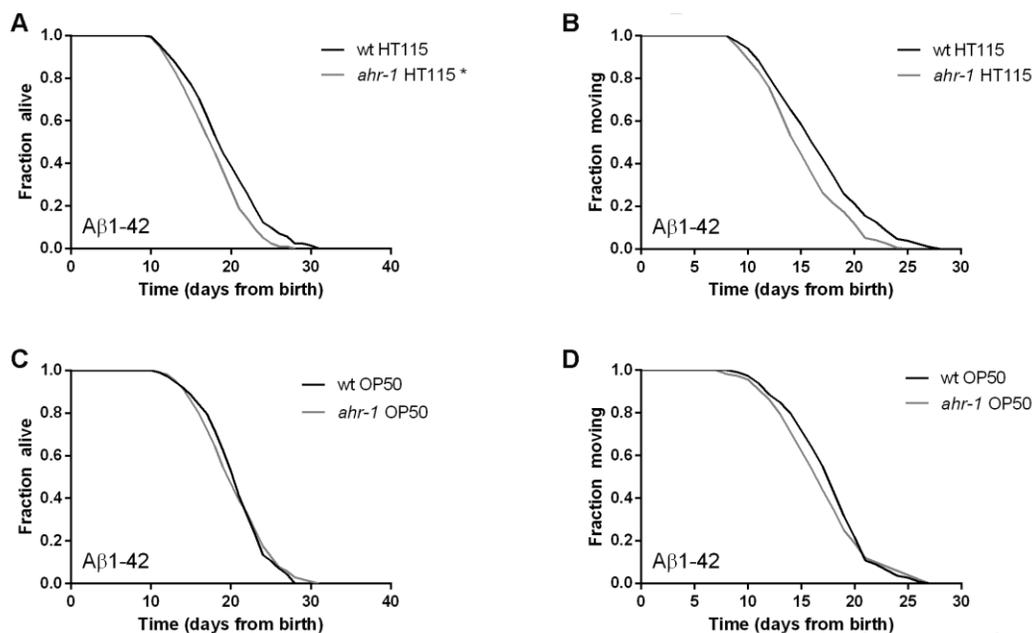
**Supplementary Figure 2. Responses of *C. elegans* to known mammalian AhR activators. (A)** Development of wild-type and *ahr-1* on indicated doses of BaP. Pooled data of 3 independent experiments are shown, the number of individuals is presented as N. Statistical test: 2-Way ANOVA with Tukey's multiple comparisons test, no statistical differences were observed. **(B)** *cyp-35B1p::GFP* induction in response to 5  $\mu\text{M}$  of BaP. Mean + 95 % CI of pooled data of 58 (wt DMSO), 51 (wt BaP), 53 (*ahr-1* DMSO), and 65 (*ahr-1* BaP) in 3 independent experiments are shown. \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. DMSO, statistical test: One-way ANOVA with Tukey's multiple comparisons test. **(C)** UVB irradiation and *ahr-1* loss of function induce apoptosis. Mean + 95 % CI of pooled data of 39 (wt con, *ahr-1* UVB) and 38 (wt UVB, *ahr-1* con) worms in 3 independent experiments are shown. Statistical test: 2-Way ANOVA with Tukey's multiple comparisons test, \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. con. **(D)** *cyp-35B1p::GFP* induction in response to UVB irradiation. Mean + 95 % CI of pooled data of 34 (wt con), 37 (wt UVB), 28 (*ahr-1* con), and 35 (*ahr-1* UVB) worms in 2 independent experiments are shown. \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. control, statistical test: One-way ANOVA with Tukey's multiple comparisons test.



**Supplementary Figure 3. Aging is influenced by the bacterial diet in the *ahr-1* mutant.** (A) Heat shock resistance of wild-type and *ahr-1* feeding on HT115 or OP50. Mean survival times + SEM of 3 independent experiments are shown, the number of individuals is presented as N. Statistical test: Two-way ANOVA with Tukey's multiple comparisons test. \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. HT115, (B) *cyp-35B1p::GFP* expression of worms feeding on HT115 or OP50. Mean + 95 % CI of pooled data of 37 (wt HT115), 27 (wt OP50), 44 (*ahr-1* HT115), and 19 (*ahr-1* OP50) in 2 independent experiments are shown. \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. HT115, statistical test: One-way ANOVA with Tukey's multiple comparisons test. (C, D) Pumping frequencies and inter pump intervals of pooled data from 3 independent experiments are shown as mean + 95 % CI, the number of individuals is presented as N. \* p-value < 0.05 vs. wt, # p-value < 0.05 vs. HT115, § p-value < 0.05 vs. day 3, statistical test: Two-way ANOVA with Tukey's multiple comparisons test. (E) Comparison of the fertility of worms feeding on HT115 or OP50. Means (+SEM) of 3 independent replicates are shown. (F, G) Fertility of worms feeding on OP50 in response to a dose of 600 J/m<sup>2</sup> of UVB. Means (+SEM) of 3 independent replicates are shown.



**Supplementary Figure 4. Gene expression changes in response to AhR modulators.** Expression of the strongest up- and down-regulated genes in *ahr-1* vs. wild-type in response to (A) 1200 J/m<sup>2</sup> UVB, and (B) bacteria. Pooled data from 3 independent replicates are shown. Statistical test: 2-Way ANOVA with Tukey's multiple comparisons test, \* significance vs. wt, # significance vs. control.



**Supplementary Figure 5. AHR-1 does not influence aging in an Alzheimer's disease model.** (A, B) Kaplan Meier curves of Abeta;wt and Abeta;*ahr-1* grown on HT115. Pooled data of 240 (wt) and 236 (*ahr-1*) worms/condition in 4 independent replicates are shown. \* p-value < 0.05 vs. wt, statistical test: Log-rank test. (C, D) Kaplan Meier curves of Abeta;wt and Abeta;*ahr-1* grown on OP50. Pooled data of 120 worms/condition in 2 independent replicates are shown. Statistical evaluation with log-rank test did not display significant differences.