Table S1: Degree of *rp* message reduction in *rp* homozygous mutant embryos correlates with severity of homozygous mutant phenotype but does not correlate with incidence of zMPNSTs in adult *rp* heterozygotes.

Incidence of zMPNSTs in adult *rp* heterozygotes was determined in Table 1. RNA was isolated from homozygous *rp* mutant embryos and their wild-type siblings. PCR was performed using serial dilutions of cDNA to detect the *rp* message and estimate the level of knockdown in the homozygous mutants compared to their wild-type siblings. The severity of the homozygous mutant phenotype was rated on a scale as follows:

+++ = severe defects, including very obvious brain necrosis on 1 dpf
++ = moderate defects, including some brain necrosis on 1 dpf
+ = mild defects: no visible necrosis on 1 dpf; mild necrosis and body curvature on 3 dpf

Note that while the fold *rp* message reduction in *rp* homozygotes generally correlates with the severity of the homozygous mutant phenotype, it does not correlate with the incidence of zMPNSTs in the adult *rp* heterozygotes.

Gene	Line	Fold *rp* message reduction in *rp* homozygotes	Severity of homozygous mutant phenotype	Incidence of zMPNSTs in adult heterozygotes
rpS15	*hi2430*	2000	+++	0%
rpS15a	*hi2649*	200	+++	71%
rpS29	*hi2903*	200	+++	27%
rpS5	*hi577B*	50	++	43%
rpL36a	*hi10*	30	++	63%
rpS8	*hi1974*	20	++	62%
rpL36	*hi1807*	10	+	65%
rpS7	*hi1034B*	10	++	33%
rpL7	*hi1061*	5	++	45%
rpL24	*hi1284*	5	+	0%
rpLP1	*hi1444*	3	+	0%

Table S2: Heterozygous fish from the tumor-prone *hi258* (*rpL35*) line are growth-impaired.

The fish depicted in Figure 2A represent one tank of offspring from an outcross of a *hi258* (*rpL35*) heterozygous fish. The weights of all fish and their genotypes are listed below. The smallest fish are *hi258* heterozygous (HET), the largest fish are wild-type (WT), and those in the middle of the weight range are either *hi258* heterozygous or wild-type.

Weight (mg)	Genotype
2.1	HET
2.2	HET
3.0	HET
3.4	HET
3.4	HET
6.2	HET
6.7	HET
8.7	WT
11.2	HET
11.8	HET
12.3	WT
15.3	WT
15.3	WT
16.8	WT
17.6	WT
18.0	WT
20.5	WT
21.2	WT
23.7	WT
27.1	WT