Figure S1: Cross scheme for collecting large numbers of *Blm* mutant mothers. Due to the severe maternal-effect lethality observed in *Blm* females, (90-95% of embryos from *Blm* mothers fail to hatch) we used a scheme to make it easier to collect large numbers of *Blm* mothers, which makes it possible to produce sufficient numbers of progeny in order to carry out our experiments. We utilized the following cross, based on a similar scheme from McMahan et. al (2013) to achieve

this aim. Virgin female flies containing the Blm^{N1} null allele were crossed to male flies containing the Blm^{D2} null allele, both of which were maintained over a balancer chromosome to prevent recombination. Most of the progeny classes from this cross inherit the yeast transcriptional activator GAL4 as well as the GAL4 DNA recognition sequence, UAS, attached to the pro-apoptotic gene *rpr* (this includes all classes of male flies, which inherit the UAS::rpr construct on the Y chromosome). The combination of the GAL4 and UAS::rpr genetic elements in the same cell activates expression of Rpr and is lethal (Wang *et al.* 1999). One additional progeny class inherits two copies of the *Stubble* (*Sb*) allele, which is lethal. Shaded boxes indicate a genotype class of flies that does not survive. Only female progeny inheriting both the Blm^{N1} and the Blm^{D2} alleles survive (white box). Red arrows indicate the cause of lethality in each class of flies, where applicable.

Table S1: Statistical Results from Figure 2

Tests for normal distribution		
Cross	**Shapiro Wilks test statistic**	**p-value**
Blm^+ x w^{1118}	0.95794	0.2921
Blm^+ x $C(1;Y)3$/O	0.97992	0.9414
Blm^+ x $C(1;Y)6$/Y	0.99062	0.9672
Blm^+ x $Dp(1;Y)B^S$	0.93479	0.09062
Blm^+ x $Dp(1;Y)y^+$	0.88919	0.004615*
Blm^+ x $In(1)sc^{4L}sc^{8R}$	0.97212	0.8544
Blm x w^{1118}	0.90824	0.0008018*
Blm x $C(1;Y)3$/O	0.77813	< 0.0001*
Blm x $C(1;Y)6$/Y	0.8243	< 0.0001*
Blm x $Dp(1;Y)B^S$	0.96559	0.008321*
Blm x $Dp(1;Y)y^+$	0.98927	0.6342
Blm x $In(1)sc^{4L}sc^{8R}$	0.9737	0.02033
t-tests comparing observed proportion of female progeny to expected (0.5)			
Cross	**t-statistic**	**Degrees of freedom**	**p-value**
Blm^+ x w^{1118}	0.10861	28	0.9143
Blm^+ x $C(1;Y)3$/O	2.707	18	0.01444
Blm^+ x $C(1;Y)6$/Y	1.6151	46	0.1131
Blm^+ x $Dp(1;Y)B^S$	2.7044	26	0.01191
Blm^+ x $Dp(1;Y)y^+$	0.16313	29	0.8715
Blm^+ x $In(1)sc^{4L}sc^{8R}$	2.0157	16	0.06095
Blm^- x w^{1118}	13.041	50	< 0.0001
Blm^- x $C(1;Y)3$/O	35.02	106	< 0.0001
Blm^- x $C(1;Y)6$/Y	67.759	106	< 0.0001
Blm^- x $Dp(1;Y)B^S$	42.147	103	< 0.0001

Blm⁻ x *Dp(1;Y)y⁺*	36.013	95	< 0.0001
Blm⁻ x *In(1)sc⁴ᴸsc⁸ᴿ*	29.125	117	< 0.0001
t-tests comparing observed proportions of female progeny			

Cross comparisons	t-statistic	Degrees of freedom	p-value
Blm⁺ x *w¹¹¹⁸* vs. *Blm⁻* x *w¹¹¹⁸*	11.49	71.706	< 0.0001
Blm⁺ x *C(1;Y)3*/O vs. *Blm⁻* x *C(1;Y)3*/O	40.441	93.376	< 0.0001
Blm⁺ x *C(1;Y)6/Y* vs. *Blm⁻* x *C(1;Y)6/Y*	18.418	40.202	< 0.0001
Blm⁺ x *Dp(1;Y)Bˢ* vs. *Blm⁻* x *Dp(1;Y)Bˢ*	29.49	93.556	< 0.0001
Blm⁺ x *Dp(1;Y)y⁺* vs. *Blm⁻* x *Dp(1;Y)y⁺*	21.624	63.984	< 0.0001
Blm⁺ x *In(1)sc⁴ᴸsc⁸ᴿ* vs. *Blm⁻* x *In(1)sc⁴ᴸsc⁸ᴿ*	11.705	25.674	< 0.0001
Blm⁻ x *w¹¹¹⁸* vs. *Blm⁻* x *In(1)sc⁴ᴸsc⁸ᴿ*	2.6689	81.915	0.009172
Blm⁻ x *w¹¹¹⁸* vs. *Blm⁻* x *Dp(1;Y)y⁺*	5.1182	77.964	< 0.0001
Blm⁻ x *w¹¹¹⁸* vs. *Blm⁻* x *Dp(1;Y)Bˢ*	8.0738	78.557	< 0.0001

Table S2: Statistical Results from Figure 3

Tests for female proportion throughout development		
Comparison	z-test statistic	p-value
Embryo vs. 1st instar larvae	3.1416	0.00168
Embryo vs. 3rd instar larvae	3.7332	0.0002
Embryo vs. adult	3.7191	0.0002
1st instar larvae vs. 3rd instar larvae	1.0314	0.30302
1st instar larvae vs. adult	1.0338	0.30302
3rd instar larvae vs. adult	0.0164	0.98404

Table S3: Statistical Results from Figure 5

Test for normal distribution of data		
Data Set	Shapiro Wilks test statistic	p-value
w^{1118} fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	0.97998	0.06055
B^{S}Y fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	0.90465	< 0.0001[#]
C(1:Y)6 fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	0.86422	< 0.0001*
Tests for differences in proportion of females based on maternal genetic background		

Data Set	ANOVA test statistic	df	p-value
w^{1118} fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	68.095	2	< 0.0001
B^{S}Y fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	404.85	2	< 0.0001
C(1:Y)6 fathers (*Blm$^+$*, *Blm$^-$*, and *Blm^{N2}* mothers)	786.62	2	< 0.0001
Post-hoc comparisons of proportion female			

Comparison	t-statistic	df	p-value
Blm^- x w^{1118} vs. Blm^{N2} x w^{1118}	8.879	122	< 0.0001
Blm^- x w^{1118} vs. Blm^+ x w^{1118}	10.560	122	< 0.0001
Blm^+ x w^{1118} vs. Blm^{N2} x w^{1118}	2.687	122	0.0222
Blm^- x B^SY vs. Blm^{N2} x B^SY	23.568	166	< 0.0001
Blm^- x B^SY vs. Blm^+ x B^SY	21.035	166	< 0.0001
Blm^+ x B^SY vs. Blm^{N2} x B^SY	0.302	166	0.9511
Blm^- x $C(1:Y)6$ vs. Blm^{N2} x $C(1:Y)6$	24.778	190	< 0.0001
Blm^- x $C(1:Y)6$ vs. Blm^+ x $C(1:Y)6$	36.758	190	< 0.0001
Blm^+ x $C(1:Y)6$ vs. Blm^{N2} x $C(1:Y)6$	8.300	190	< 0.0001

[#] Nonparametric tests due to non-normally distributed data

*sample size >30, so parametric tests appropriate

Data Set	Kruskal-Wallis result	df	p-value
B^SY fathers (Blm^+, Blm^-, and Blm^{N2} mothers)	119.04	2	< 0.0001

Post-hoc comparisons of proportion female

Comparison	Wilcoxon ran sum test	p-value
Blm^- x B^SY vs. Blm^{N2} x B^SY	3947	< 0.0001
Blm^- x B^SY vs. Blm^+ x B^SY	2808	< 0.0001
Blm^+ x B^SY vs. Blm^{N2} x B^SY	525	0.8783

Table S4: Statistical Results from Figure 6

Test for normal distribution of data		
Data Set	**Shapiro Wilks test statistic**	**p-value**
w^{1118} fathers (Blm^+, Blm^-, Blm^+ $pol\alpha^{+/-}$, and Blm^- $pol\alpha^{+/-}$ mothers)	0.95725	0.0001305[#]
$C(1:Y)6$ fathers (Blm^+, Blm^-, Blm^+ $pol\alpha^{+/-}$, and Blm^- $pol\alpha^{+/-}$ mothers)	0.77936	< 0.0001[#]
Parametric tests for differences in proportion of females based on maternal genetic background		
Data Set	**ANOVA test statistic**	**df**	**p-value**
w^{1118} fathers (Blm^+, Blm^-, Blm^+ $pol\alpha^{+/-}$, and Blm^- $pol\alpha^{+/-}$ mothers)	88.328	3	< 0.0001
$C(1:Y)6$ fathers (Blm^+, Blm^-, Blm^+ $pol\alpha^{+/-}$, and Blm^- $pol\alpha^{+/-}$ mothers)	915.24	3	< 0.0001
Nonparametric post-hoc comparisons of proportion female		
Comparison	**t-statistic**	**df**	**p-value**
Blm^- x w^{1118} vs. Blm^+ x w^{1118}	11.247	147	< 0.0001
Blm^- x w^{1118} vs. Blm^+ $pol\alpha^{+/-}$ x w^{1118}	10.142	147	< 0.0001
Blm^- x w^{1118} vs. Blm^- $pol\alpha^{+/-}$ x w^{1118}	1.979	147	0.2006
Blm^+ $pol\alpha^{+/-}$ x w^{1118} vs. Blm^- $pol\alpha^{+/-}$ x w^{1118}	11.585	147	< 0.0001
Blm^+ $pol\alpha^{+/-}$ x w^{1118} vs. Blm^+ x w^{1118}	0.512	147	0.9561
Blm^- $pol\alpha^{+/-}$ x w^{1118} vs. Blm^+ x w^{1118}	12.729	147	< 0.0001
Blm^- x $C(1:Y)6$ vs. Blm^+ x $C(1:Y)6$	43.319	212	< 0.0001

Blm⁻ x *C(1:Y)6* vs. *Blm⁺ polα⁺ᐟ⁻* x *C(1:Y)6*	26.736	212	< 0.0001
Blm⁻ x *C(1:Y)6* vs. *Blm⁻ polα⁺ᐟ⁻* x *C(1:Y)6*	6.193	212	< 0.0001
Blm⁺ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁻ polα⁺ᐟ⁻* x *C(1:Y)6*	28.386	212	< 0.0001
Blm⁺ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁺* x *C(1:Y)6*	2.119	212	0.1504
Blm⁻ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁺* x *C(1:Y)6*	41.622	212	< 0.0001

 # Nonparametric tests due to non-normally distributed data

Data Set	Kruskal-Wallis result	df	p-value
w^{1118} fathers (*Blm⁺*, *Blm⁻*, *Blm⁺ polα⁺ᐟ⁻*, and *Blm⁻ polα⁺ᐟ⁻* mothers)	92.01	3	< 0.0001
C(1:Y)6 fathers (*Blm⁺*, *Blm⁻*, *Blm⁺ polα⁺ᐟ⁻*, and *Blm⁻ polα⁺ᐟ⁻* mothers)	153.33	3	< 0.0001

Nonparametric post-hoc comparisons of proportion female

Comparison	Wilcoxon ran sum test	p-value
Blm⁻ x w^{1118} vs. *Blm⁺* x w^{1118}	1397	< 0.0001
Blm⁻ x w^{1118} vs. *Blm⁺ polα⁺ᐟ⁻* x w^{1118}	1189	< 0.0001
Blm⁻ x w^{1118} vs. *Blm⁻ polα⁺ᐟ⁻* x w^{1118}	959.5	0.1238
Blm⁺ polα⁺ᐟ⁻ x w^{1118} vs. *Blm⁻ polα⁺ᐟ⁻* x w^{1118}	6	< 0.0001
Blm⁺ polα⁺ᐟ⁻ x w^{1118} vs. *Blm⁺* x w^{1118}	397	0.5553
Blm⁻ polα⁺ᐟ⁻ x w^{1118} vs. *Blm⁺* x w^{1118}	1334	< 0.0001
Blm⁻ x *C(1:Y)6* vs. *Blm⁺* x *C(1:Y)6*	0.5	< 0.0001

Blm⁻ x *C(1:Y)6* vs. *Blm⁺ polα⁺ᐟ⁻* x *C(1:Y)6*	1	< 0.0001
Blm⁻ x *C(1:Y)6* vs. *Blm⁻ polα⁺ᐟ⁻* x *C(1:Y)6*	3902	< 0.0001
Blm⁺ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁻ polα⁺ᐟ⁻* x *C(1:Y)6*	765	< 0.0001
Blm⁺ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁺* x *C(1:Y)6*	289.5	0.096
Blm⁻ polα⁺ᐟ⁻ x *C(1:Y)6* vs. *Blm⁺* x *C(1:Y)6*	0	< 0.0001