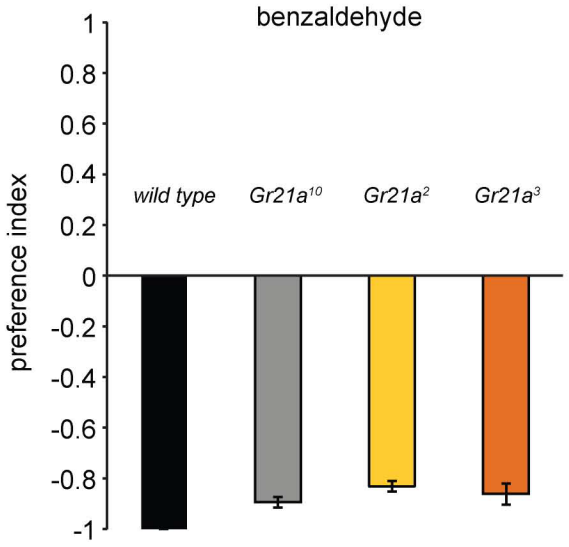

Figure S1. Related to Figure 1.
Behavioral responses to benzaldehyde in Gr21a mutants (n = 10). Error bars are s.e.m.

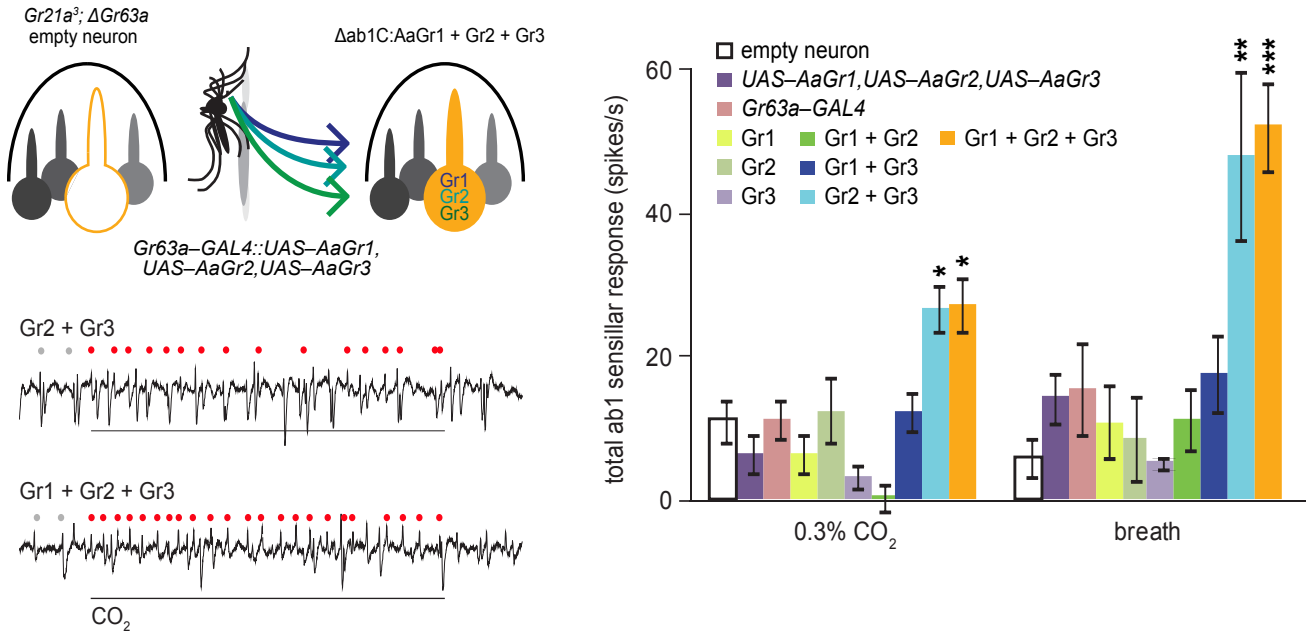

Figure S2. Related to Figure 3.

Schematic, representative traces, and mean responses of ab1 sensilla expressing mosquito receptors in the CO2 empty neuron to 0.5 s stimuli of CO2 or puffs of exhaled breath. One copy of each indicated transgene was present. Dots mark action potentials attributed to the ab1C neuron. (n = 6–28; ANOVA followed by Dunnett's test comparing results to empty neuron control,
*p < 0.05, **p < 0.01, ***p < 0.001). Error bars are s.e.m.

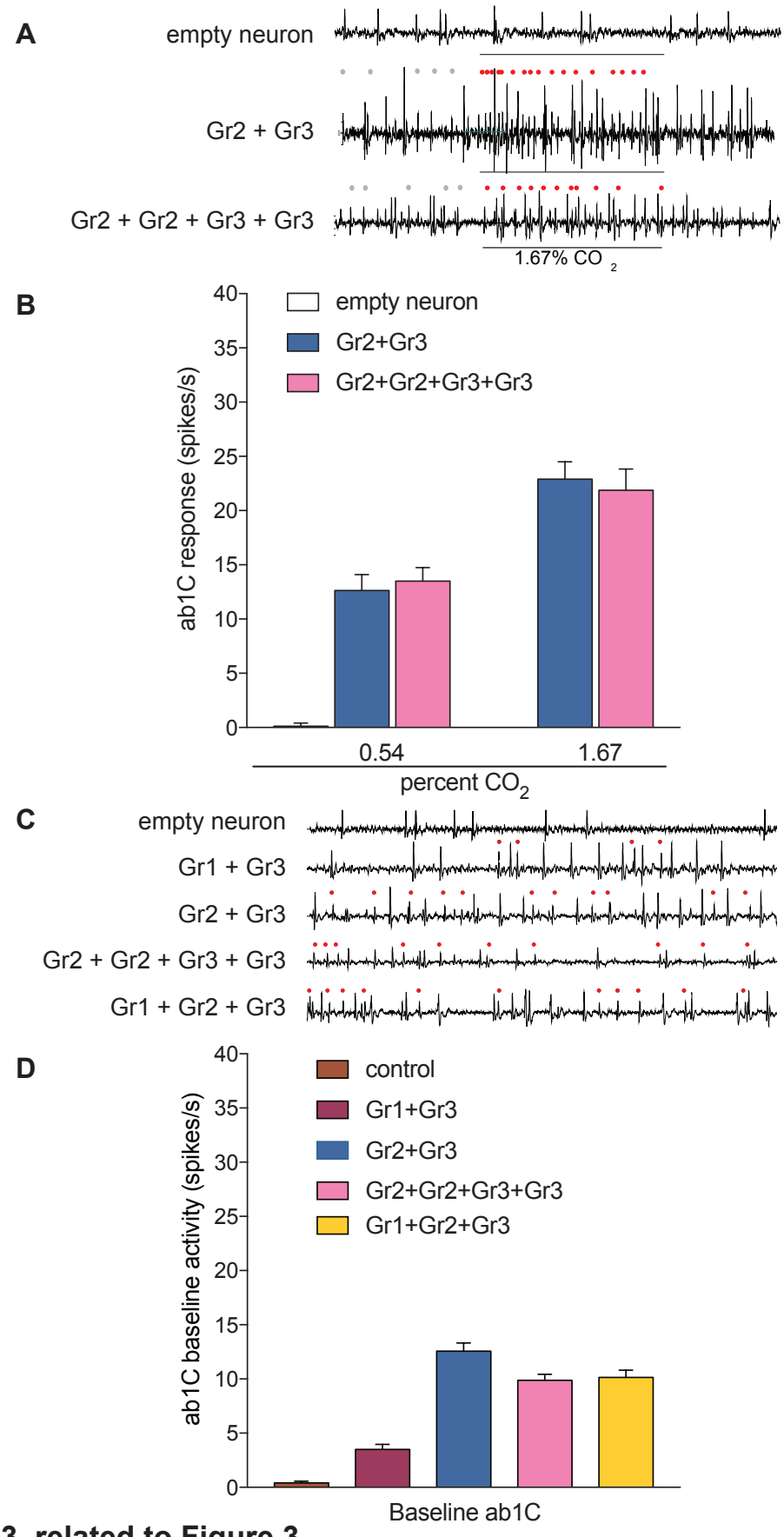

Figure S3, related to Figure 3

(A) Representative traces of the ab1 sensillum expressing mosquito receptors in the CO_2 empty neuron with responses to a 0.5 s stimulus of 1.67% CO_2. Dots mark action potentials attributed to the ab1C neuron during part of the baseline and the 0.5 s stimulus window. **(B)** Mean transgenic ab1C responses to increasing concentrations of CO_2 (n = 8). **(C)** Representative traces of the baseline response of ab1 sensillum expressing mosquito receptors in the CO_2 empty neuron. **(D)** Mean ab1C baseline activity in spikes/s.

Table S1. Related to Figures 2-4.
Full genotypes and sources of flies used in transgenic experiments.

Alleles used in transgenic experiments.

name	full allele designation	notes
wild type		wCS (white Canton S) background
AaGr1	*UAS–AaGr1A16*	ΦC31 injection, attP40 site (2nd chromosome)
AaGr1	*UAS–AaGr1C49*	ΦC31 injection, VK00027 site (3rd chromosome)
AaGr2	*UAS–AaGr2A10*	ΦC31 injection, attP40 site (2nd chromosome)
AaGr2	*UAS–AaGr2C45*	ΦC31 injection, VK00027 site (3rd chromosome)
AaGr3	*UAS–AaGr3A2*	ΦC31 injection, attP40 site (2nd chromosome)
AaGr3	*UAS–AaGr3C46*	ΦC31 injection, VK00027 site (3rd chromosome)
ΔGr21a	$Gr21a^{3}$	CRISPR deletion, see Fig. 1
ΔGr63a	*ΔGr63a*	Bloomington *Drosophila* Stock Center 9941
GAL4	*Gr63a–GAL4*	Bloomington *Drosophila* Stock Center 9942

Full genotypes of transgenic flies. Allele/construct names are as above.

fly name	full genotype
empty neuron	*w; ΔGr21a; ΔGr63a*
DmGr21a + AaGr3	*w; AaGr3; ΔGr63a,GAL4*
AaGr1 + DmGr63a	*w; ΔGr21a,AaGr1; GAL4*
AaGr2 + DmGr63a	*w; ΔGr21a,AaGr2; GAL4*
AaGr1 + AaGr2 + DmGr63a	*w; ΔGr21a,AaGr1/ΔGr21a,AaGr2; GAL4*
UAS–AaGr1,UAS–AaGr2,UAS–AaGr3	*w; ΔGr21a,AaGr1/ΔGr21a,AaGr2; ΔGr63a,AaGr3/ΔGr63a* *w; ΔGr21a,AaGr1/ΔGr21a,AaGr3; ΔGr63a,AaGr2/ΔGr63a* *w; ΔGr21a,AaGr2/ΔGr21a,AaGr3; ΔGr63a,AaGr1/ΔGr63a*
Gr63a–GAL4	*w; ΔGr21a; ΔGr63a/ΔGr63a,GAL4*
Gr1	*w; ΔGr21a,AaGr1/ΔGr21a; ΔGr63a/ΔGr63a,GAL4*
Gr2	*w; ΔGr21a,AaGr2/ΔGr21a; ΔGr63a/ΔGr63a,GAL4*
Gr3	*w; ΔGr21a,AaGr3/ΔGr21a; ΔGr63a/ΔGr63a,GAL4*
Gr1 + Gr2	*w; ΔGr21a,AaGr1/ΔGr21a,AaGr2; ΔGr63a/ΔGr63a,GAL4*
Gr1 + Gr3	*w; ΔGr21a,AaGr1/ΔGr21a,AaGr3; ΔGr63a/ΔGr63a,GAL4*
Gr2 + Gr3	*w; ΔGr21a,AaGr2/ΔGr21a,AaGr3; ΔGr63a/ΔGr63a,GAL4* *w; ΔGr21a,AaGr2/ SΔGr21a; ΔGr63a,AaGr3/ΔGr63a,GAL4*
Gr1 + Gr2 + Gr3	*w; ΔGr21a,AaGr1/ΔGr21a,AaGr2; ΔGr63a,AaGr3/ΔGr63a,GAL4* *w; ΔGr21a,AaGr1/ΔGr21a,AaGr3; ΔGr63a,AaGr2/ΔGr63a,GAL4* *w; ΔGr21a,AaGr2/ΔGr21a,AaGr3; ΔGr63a,AaGr1/ΔGr63a,GAL4*

fly name	**full genotype**
Gr2 + Gr2 + Gr3 + Gr3	*w; ΔGr21a,AaGr2/ ΔGr21a,AaGr2; ΔGr63a,AaGr3,GAL4/ΔGr63a,AaGr3*
Gr1 + Gr1 + Gr2+ Gr3	*w; ΔGr21a,AaGr1/ ΔGr21a,AaGr1; ΔGr63a,AaGr3,GAL4/ΔGr63a,AaGr2*
Gr1 + Gr2 + Gr2 + Gr3 + Gr3	*w; ΔGr21a,AaGr3/ ΔGr21a,AaGr2; ΔGr63a,AaGr1,AaGr2/ΔGr63a,AaGr3,GAL4*