



Fig. s1

Differential conditioning decorrelates the response patterns elicited by rewarded and non-rewarded varieties.

The Pearson's correlation coefficient between the response patterns elicited by flowers from the PH and the PP variety blends is lower for PH+/PP- trained bees along the whole duration of the olfactory stimulus. The Pearson's correlation coefficient was calculated, frame-by-frame for all possible pairs of PH and PP flowers (36 combinations per frame). The 36 correlation values obtained in each individual bee were averaged to get a unique value per bee that represents a general correlation between PH and PP blends. The traces represent the mean  $\pm$  SEM of these values across bees. Black line: PH+/MO,  $n=10$  and blue line: PH+/PP-,  $n=7$ .

Table s1

PCA of snapdragon odors.

A population of 99 flowers from the PH cultivar and 44 flowers from the PP cultivar were subjected to principal components analysis on the basis of their odor component content (acetophenone, trans-methyl cinnamate, ocimene, linalool, methyl benzoate and myrcene). The first two principal components explain 70% of the variance. The outcome of the analysis was further subjected to “Varimax” rotation. The table shows the loading of each of the original 6 factors onto the first two principal components.

	<b>Factor 1</b>	<b>Factor 2</b>
<b>Acetophenone</b>	0.846	-0.179
<b>Trans Methyl Cinnamate</b>	0.778	-0.121
<b>Ocimene</b>	0.835	0.330
<b>Linalool</b>	0.125	0.794
<b>Methyl Benzoate</b>	0.005	0.744
<b>Myrcene</b>	-0.421	0.781

Table s2

Matrix showing the similarity between activation patterns elicited by rewarded and non-rewarded blends and for both training conditions.

Correlation values were Fisher's Z transformed and used as measurement of similarity between patterns. 36 similarity values correspond to flowers from different cultivars (gray); 15 values for different flowers of the PH variety (light green) and 15 values for different blends of the PP cultivar (light orange). Since each blend was measured two times in each animal, we calculated the similarity between replicates of the same blend (dark green and dark orange). A matrix as the one the in figure was conformed for each animal. The values in the present table correspond to the average of all animals for training groups. The half matrix above the diagonal correspond to data from PH+/MO-trained bees (n=10) and the half matrix bellow the diagonal correspond to data from differentially trained bees PH+/PP- (n=7). The bottom table is the same as the top but just color-coded to show degree of similarity.

	PH1	PH2	PH3	PH4	PH5	PH6	PP1	PP2	PP3	PP4	PP5	PP6		
		1,245	1,290	1,195	1,488	1,397	1,109	1,227	1,009	1,132	1,073	0,733	1,067	PH1
PH1	1,313		1,069	1,176	1,347	1,309	1,102	1,263	1,131	1,299	1,291	0,803	1,012	PH2
PH2	1,187	0,959		1,471	1,298	1,200	1,379	0,994	0,909	0,989	0,934	0,662	1,007	PH3
PH3	1,191	1,107	1,440		1,293	1,516	1,275	1,110	0,962	1,142	1,052	0,710	1,073	PH4
PH4	1,029	1,104	1,205	1,242		1,400	1,177	1,140	0,976	1,165	1,055	0,692	0,978	PH5
PH5	0,936	1,112	0,985	0,990	1,747		1,695	0,906	0,817	0,962	0,862	0,646	0,950	PH6
PH6	0,886	0,857	1,114	0,896	0,840	1,447		1,577	1,572	1,735	1,654	1,039	1,147	PP1
PP1	1,020	0,928	0,685	0,533	0,853	0,629	1,634		1,327	1,513	1,574	1,166	1,278	PP2
PP2	0,814	0,857	0,535	0,428	0,731	0,579	1,514	1,063		1,145	1,717	1,063	1,375	PP3
PP3	0,809	0,906	0,667	0,527	0,976	0,595	1,286	1,180	1,262		1,274	1,088	1,232	PP4
PP4	0,728	0,953	0,632	0,519	0,881	0,625	1,179	1,267	1,247	1,072		1,361	1,003	PP5
PP5	0,515	0,490	0,446	0,297	0,534	0,405	0,806	0,851	0,805	0,823	1,252		1,594	PP6
PP6	0,973	0,878	0,861	0,675	1,014	0,774	1,231	1,164	1,132	1,249	0,966	1,850		

PH retest  
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any PH and PP blends  
two different PP blends  
PP retest

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similarity  
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