

## Fight varroa: genomic characterization of honey bees selectively bred for Varroa-Sensitive Hygienic behaviour

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Due to the negative impact of Varroa destructor on honey bee health, uncovering the potential basis of varroa resistance has biological and economic implications. Honey bee resistance to varroa can occur naturally but at low frequencies. These resistant bees display an effective removal of varroa-infested pupae from capped brood, which limit varroa infestation rate and reproduction. This behavioural trait called Varroa-Sensitive Hygiene (VSH) has a genetic basis and so over the past several years, honey bee colonies have been successfully selected for their resistance to varroa. In order to find genes that are potential markers of this resistance and thus could be used to screen natural populations, we compared brain-specific gene expression profiles of bees selected for their high rate of hygienic behaviour (VSH+) to control bees displaying a normal hygienic behaviour (VSH-). For that purpose, we used the new honey bee oligonucleotide microarray, based on the recently sequenced honey bee genome which contains all the genes of the bee genome. 37 genes were significantly differentially expressed between VSH+ and VSH- bees. A relatively high proportion of them are involved in olfaction, which can be linked to the higher olfactory sensitivity of VSH+ bees. These genes are potential candidates for the behavioural tolerance and give clues about what makes these bees resistant to destructive mites.