



Università degli Studi di Napoli Federico II

PhD in Biotechnology - 38th cycle

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**dsRNA production and delivery system based on
Lactobacillus engineering: a new tool for
controlling the honey bee mite *Varroa destructor***

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Honey bee health decline represents a problem of global importance for the role of these pollinators on the environment and human economy¹. The reduced bee survival is the result of a multifactorial syndrome triggered by several stress factors; the major is *Varroa destructor*, a parasitic mite of honey bees which causes the shortening of life duration and the spread of viral pathogens². Chemical acaricides currently being used for its control are unsustainable from both an economic and environmental point of view, as they can have a negative impact on the honey bee and induce resistance in the mite³. Therefore, it is crucial to develop new bio-based control strategies. The dsRNA-based technology is a promising tool to control parasitic organisms, such as *Varroa*⁴. The main objective of this PhD project is to develop a new system for the production and delivery of dsRNA based on a non-proprietary bacterial strain, to be used to control the honey bee mite *Varroa destructor*. First, suitable targets for dsRNA-mediated control of the mite will be identified. Then, specific *Lactobacillus* strains will be selected and engineered to express dsRNA, and finally, its efficacy in controlling *Varroa* will be evaluated under laboratory and field conditions.

References

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