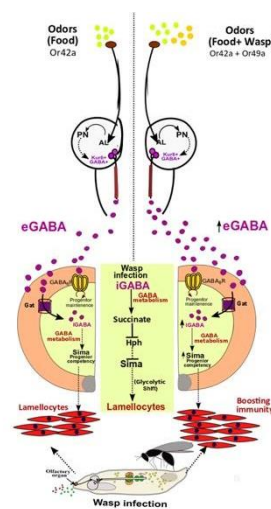


DBT-inStem scientists study metabolic control of cellular immune-competency by odours in *Drosophila*

New Delhi, Jan 15: The olfactory system that senses smell is an unique sensory modality that is utilized by animals to detect favorable and unfavorable environmental conditions. Positioning odours as an important step in the immune response, the laboratory of Tina Mukherjee in the Regulation of Cell Fate theme at DBT- Institute for Stem Cell Science & Regenerative Medicine (DBT-inStem) has provided evidence that specific odours can train the immune system to protect animals from infection.

Using fruit fly (*Drosophilamelanogaster*) as the system for study, the group reports (Madhwal et al., 2020) that during larval development, sensing of environmental-odours cues blood progenitor cells to generate a specialized immune cell type necessary to respond to parasitic wasp immune-challenge. The group went on to establish a link between neuronally released GABA derived upon olfactory stimulation, and its utilization by blood-progenitor cells as a metabolite. The work maps an axis starting from the release of GABA from the brain - triggered by smell - all the way to the activation of a molecular intermediate *Sima*, which capacitates blood-progenitor cells to differentiate.



In the fruit-fly, this systemic axis is particularly relevant for larvae dwelling in wasp-infested environments where chances of infection are high. This axis is thought to elevate immune-potential and prime animals to respond rapidly when infected with parasitic wasps. Overall, this study unravels the adaptive influence of environmental odor-experience on myeloid-progenitor metabolism, and shows how odor detection during animal development is utilized to establish a long-range axis in the control of blood progenitor competency and immune-priming.

Ref. Sukanya Madhwal, Mingyu Shin, Ankita Kapoor, Manisha Goyal, Manish K Joshi, Pirzada Mujeeb Ur Rehman, Kavan Gor, Jiwon Shim* and Tina Mukherjee*eLife 2020;9:e60376 DOI: 10.7554/eLife.60376

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