EPIGENETIC INHERITANCE OF TRAINED IMMUNITY IN MALE MICE

It is known that gametes pass on more than the DNA to the offspring, as environmental effects can cause epigenetic changes in the germline that influence the phenotype of the progeny. Now, an international team of researchers led by Mihai Netea (Center for Infectious Diseases of the Radboud University Medical Center in Nijmegen, the Netherlands) has shown that also effects on the innate immune system are passed on to next generations via the sperm cell. The team also involved researchers from Bonn, Lausanne and Athens (Katzmarski et al. Nature Immunology[1], published Oct. 18th, 2021).

The researchers infected male mice with *Candida albicans* before mating to healthy females. When infected after birth with *Escherichia coli* and *Listeria monocytogenes*, the progeny of these males had a significantly better resistance compared to progeny of uninfected males. This was due to the enhanced expression of the MHC class II complex and of genes involved in inflammation response in the myeloid effector and progenitor cell compartments in the bone marrow. Also, in sperm cells of males that were infected before mating, there were CpG methylation differences at transcription factor genes known to be important for myeloid cell regulation. How the epigenetic changes in the sperm get to the bone marrow is not understood, however.

Publication

[1] https://www.nature.com/articles/s41590-021-01052-7