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Genetic, maternal and social effects on brood resistance in ants

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The phenotype of social animals can be influenced by genetic, maternal and environmental effects. In our long-term research program, we are investigating the genetic and environmental factors affecting social structure variation in ants. On the genetic side, we recently identified a large, non-recombining 'social chromosome' associated with social structure (the presence of one or multiple queens per nest) in *Formica selysi*. Nevertheless, many phenotypic traits that differ between individuals from the two social backgrounds also depend on the ontogeny and environment of individuals. We used cross-fostering experiments to investigate if the maternal origin of eggs and/or the social environment during development affected the survival and fungal resistance of ant brood. We found that the survival of newly eclosed, cross-fostered *F. selysi* workers varied greatly according to their maternal origin. However, the origin of care-giving workers significantly influenced the ability of cross-fostered workers to resist to a fungal entomopathogen, *Beauveria bassiana*. In particular, care-givers that were more resistant to the fungal pathogen reared more resistant workers, which indicates that social interactions during development influence individual immunity. Together, our research indicates a strong genetic control of social structure, coupled with indirect effects of the rearing group on the phenotype of emerging individuals.