Studying evolutionary processes is not easy, largely (albeit not solely) because of their time scale. Many generations are often needed before we can observe large changes. Therefore, at least if we are more interested in organisms more complex than microbes, much time is required.
Fortunately, some animals have relatively short generation time. In the nematode *Caenorhabditis elegans*, the average time from egg to reproducing adult 20 ° C is only
only 2-3 days – so, within several years we can obtain several hundred generations of these worms. Furthermore, they can be stored for a long time in the freezer, then defrosted and "brought back to life" without problems. This creates an extraordinary opportunity to compare, in real time, the ancestors and their descendants younger by hundreds of generations. For better context - it is as if we have resurrected our ancestors from thousands of years ago.
Thanks to many years of research, it is also possible to manipulate the reproductive system of our nematodes. Their natural way of reproduction is mostly self-fertilization - the populations are dominated by hermaphrodites (individuals producing both eggs and sperm), with males appearing only occasionally (usually 1-2 per thousand individuals). However, by introducing appropriate mutations, we can obtain populations of males and females, which have to mate in order to reproduce. Other mutations, on the other hand, drive males completely out of populations, so that reproduction happens only by self-fertilization.
In this project, I will use *Caenorhabditis elegans* nematodes to study how the reproductive system affects the way populations adapt to various types of environmental conditions.