

SOS-FERT project

USING "SIGNATURES OF SELECTION" TO DECIPHER KEY MECHANISMS REGULATING FE/MALE FERTILITY

Curative therapies for infertility are rare, because the complex network of mechanisms determining reproductive success is largely unknown. To decipher parts of this network we use worldwide unique mouse lines created by long-term selection (180 generations) for the integrative fertility traits "increased litter size and weight". These traits comprise core reproductive processes (i. a. gonad development, gamete recruitment, ovulation, fertilization and embryonic/fetal development). In the selection mouse lines, 45 years of litter size maximization have carved the causal alleles out of the genome as patterns of genetic invariance, the so-called "signatures of selection". We aim to detect these characteristic frequency patterns of alleles causal for the selected traits and identify the affected genes and pathways. We test if the genomic patterns resulting from selection for increased litter size (a primarily female trait) are also relevant for male reproductive physiology and performance. Finally, we employ comparative animal models to verify their general significance. With this project we will provide substantial new knowledge about the network of genes and pathways actually relevant for controlling central reproductive processes in mammals.