Our primary research interest aims at understanding molecular mechanisms governing control of gene expression during mammalian oocyte-to-embryo transition (OET). It is a fascinating process, which has important ties to biotechnology (most importantly stem cell research, generation of genetically modified organisms, and animal cloning) as well as to clinical practices (understanding molecular causes of infertility & improvement of artificial reproduction techniques).

Mammalian OET occurs as a highly orchestrated sequence of transitions. At the beginning, there is a highly specialized cell – the oocyte, which resumes and complete meiosis while being released from the ovary. During fertilization, a zygote is formed, which subsequently activates its genome in order to execute the genome-encoded developmental program. A successful zygotic genome activation (ZGA) is an essential event in the life of every sexually reproducing organism. Importantly, ZGA is closely associated with acquisition of pluripotency in embryonic cells, i.e. the ability of cells to differentiate into any body cell type.