Placenta forms the primary barrier between the maternal and fetal compartments throughout pregnancy. In human placenta, syncytiotrophoblasts form the key interface between maternal and fetal blood being the main barrier to vertical pathogens transmission. However, some microorganisms can evade protective mechanisms and gaining contact with the villous core causing vertical infections. Such vertically transmitted pathogens compromise the health of mother and have devastating impact on the developing fetus. Viruses, protozoa and bacteria as well as some helmints are well known agents capable of crossing the placental barrier.

Recently, there are growing number of reports documenting transplacental *Encephalitozoon cuniculi* transmission in a wide range of mammals. *E. cuniculi* belongs to microsporidia – widespread intracellular opportunistic pathogens known to infect most invertebrate and vertebrate species. Although the small intestine is the primary site of infection of these pathogens, *E. cuniculi* is able to infect wide spectrum of host cells, including macrophages, epithelial and endothelial cells, fibroblasts, astrocytes, kidney tubule cells as well as possibly other cell types, therefore they can be found in most tissues. According to studies of immunocompetent individuals, the exposure to microsporidia appears to be common among a healthy population. *E. cuniculi* infection most often occurs via fecal-oral route or by spores inhalation with dust, but pathogen can also be transmitted from person to person via organ donation. Transplacental *E. cuniculi* transmission has been confirmed in various animal species, from rodents to small primates, but not in humans so far. The effects of such transmission varied depending on the animal species, from asymptomatic in neonates to perinatal death due to placental dysfunction.

The main aim of this project is to investigate the possibility of *E. cuniculi* to infect human placenta. Since the exact consequences of such infection for placental function and human fetuses are difficult to estimate, organs collected in case of both term and preterm pregnancies will be tested tor *E. cuniculi* presence. Additionally, placentas with pathological changes and those collected from stillbirths will be analyzed, if available. Screening of placental specimens will be performed by using molecular methods, but infection will be confirmed by microscopy, as well. The results of this project will fulfil a critical gap in knowledge about the possibility of *E. cuniculi* to infect human placenta and could help to unravel whether this pathogen should be considered as one of the infectious agents posing a risk of vertical transmission in humans. By analyzing infection in the context of clinical data it will be possible to determine potential consequences for placenta function and fetus development. In practical terms, these results will give an indication if pregnant women should be routinely tested for *E. cuniculi* infection.