AJAY PRADHAN received his Master of Science degree in Biotechnology from North Eastern Hill University, Shillong, India in 2007. He worked as Senior Research Biologist in a Drug Discovery Company (TCG Lifesciences, India) from 2007-2010. He has been a doctoral student at Örebro University since 2010. In 2013, he was awarded a licentiate degree in Biology.

Sex differentiation is a complex process, which begins during the fetal stage where an undifferentiated or bipotential gonad develops either into a testis or ovary. Mammals including humans have XY sex chromosomes where females are homogametic with XX chromosomes and males are heterogametic with XY. The Y chromosome bears the SRY gene that is known to be the master regulator for driving the male differentiation pathway. Zebrafish lacks sex chromosomes and no master regulator gene has been reported. This thesis demonstrates the complexity and involvement of different factors and genes in zebrafish sex differentiation. Unraveling the molecular basis of zebrafish sex differentiation will help to apply this already accepted model organism in the field of human reproductive research. Sexual behavior is another aspect that has been addressed in this thesis. Sex differentiation and sexual behavior is intricately linked to one another. Proper development of brain ensures proper sex organ functioning and vice versa. Males and females display different sexual behavior and show difference in disease susceptibility with males showing high degree of proneness to schizophrenia and Parkinson’s while females are more prone to Alzheimer’s and depression. Some of the brain dysfunctions have been speculated to be due to increased pollution. This thesis gives an insight into the possibility of manipulating and using zebrafish to study behavioral effects.