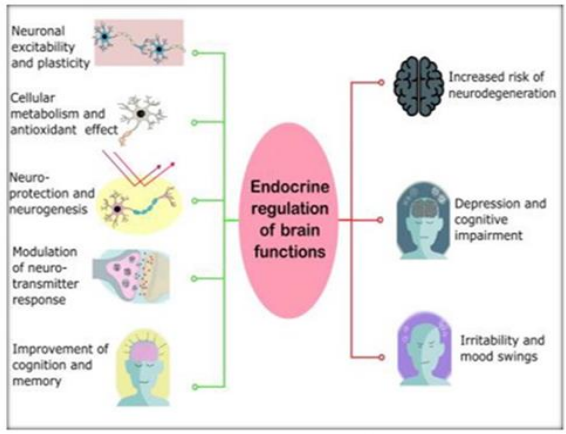


Neurological Disorders

Understanding the molecular biology of reproductive mood disorders in men and women

It is very well known that these hormones are involved not only in reproduction but also affect the brain functioning of both males and females. Many neural and behavioral functions are affected by these hormones such as mood, cognitive function, motor coordination, etc. These hormones protect the brain from injury, and stress; regulate brain aging, and are involved in the pathophysiology of certain brain diseases such as depressive disorders in both men and women. However, women throughout their life are exposed to changing levels of hormones such as during the menstrual cycle, pregnancy, and so on. During these fluctuations, some women respond differently and develop depression or dysphoria and other mood symptoms which could be devastating. A fundamental understanding of various mechanisms by which reproductive hormones regulate different brain functions could help in understanding the underlying mechanisms involved in some of these brain diseases.

Dr. Dubey's lab utilizes an interdisciplinary approach to investigate how reproductive hormones act on the brain and modulate various changes in brain function including changes due to aging, damage, trauma etc. This line of research could help in the identification of the important involvement of reproductive steroids in brain functions and could help in the identification of the cause of various neurological diseases particularly in women during their reproductive age. As a summary, following are the main areas of research that Dr. Dubey's laboratory is currently involved in: **Neuroendocrinology:** Her laboratory is interested in elucidating the involvement of reproductive steroids in brain functioning with a focus on endocrine-related mood disorders. **Disease Modelling (Disease-in-a-Dish):** Her laboratory generates disease-specific immortalized cell lines (LCLs), **Induced Pluripotent Stem Cell (iPSC)** lines and brain organoids to gain insights into the disease mechanism. **Molecular Neuroscience:** With a multidisciplinary approach, her laboratory investigates the molecular, cellular, and circuitry changes that form the basis of endocrine-related brain disorders.



Estrogen and Progesterone receptors in the brain

○ Estrogen Receptor
● Progesterone Receptor

Frontal cortex

Limbic system: Amygdala, Hippocampus, Thalamus, Hypothalamus, Ventral Tegmental Area

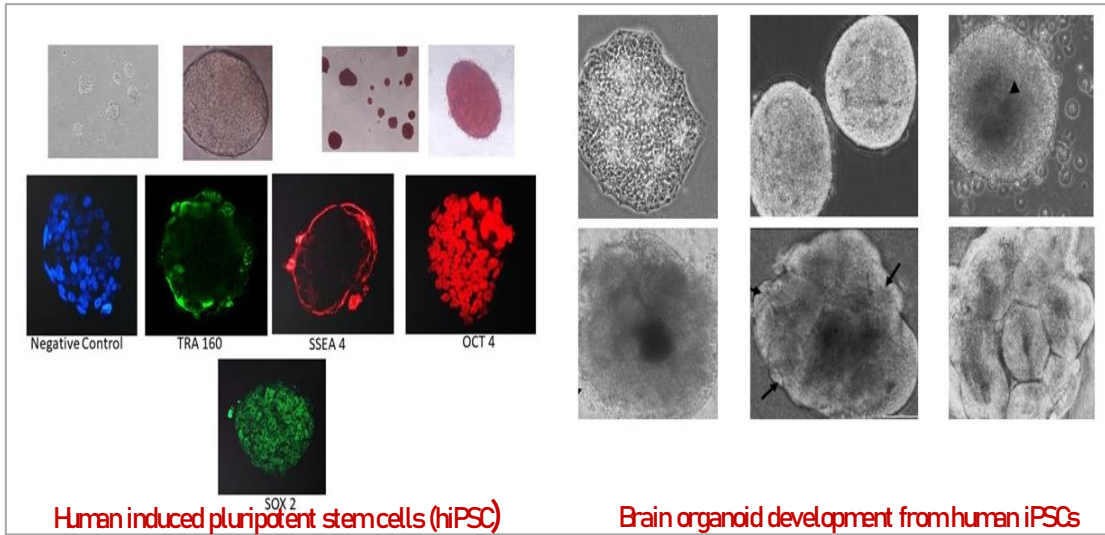
Brain stem and Cerebellum

few functions of reproductive steroids in the brain

- Neuroprotection and neurogenesis
- Neuroexcitability and neuroplasticity
- modulation of neurotransmitter response
- Improvement of cognition and memory
- Cellular metabolism and antioxidant effect

My interests

1. Endocrine regulation of brain functions
2. Understanding how modulations in the neuroendocrine system contribute in manifestation of "Reproductive Mood Disorders" in men and women
3. Identification of cause of various neurological diseases particularly in women during their reproductive age



In vitro cellular model used in the lab