Induced pluripotent stem (iPS) cells

**Derivation of iPS cells**

- Oct4
- Sox2
- Klf4
- Nanog
- cMyc
- Lin28

**Differentiation of iPS cells**

- Endoderm (internal layer)
- Mesoderm (middle layer)
- Ectoderm (external layer)

Applications of iPS cell technology

- Induce pluripotency with defined factors
- Gene therapy to correct original defects if necessary
- Directed-differentiation towards desired cell type
- Regenerative medicine
- Toxicology, disease model, drug screening

Why are induced pluripotent stem (iPS) cells important?

- Potential to generate cells from all three embryonic germ layers, including cells of therapeutic importance
- Autologous cells could be derived from patients to repair their own damaged tissues; thus obviating the need for systemic immunosuppression following transplantation
- Also, obviate the ethical dilemma created by the need to destroy an embryo to generate human embryonic stem cells