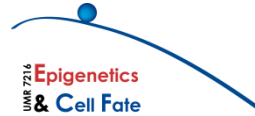


Stem Cells module

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Overview of the module

The objective of this graduate level course is to provide students with state of the art knowledge on animal stem cell research and on the potential application of stem cells to medicine, in the context of therapy and cancer.

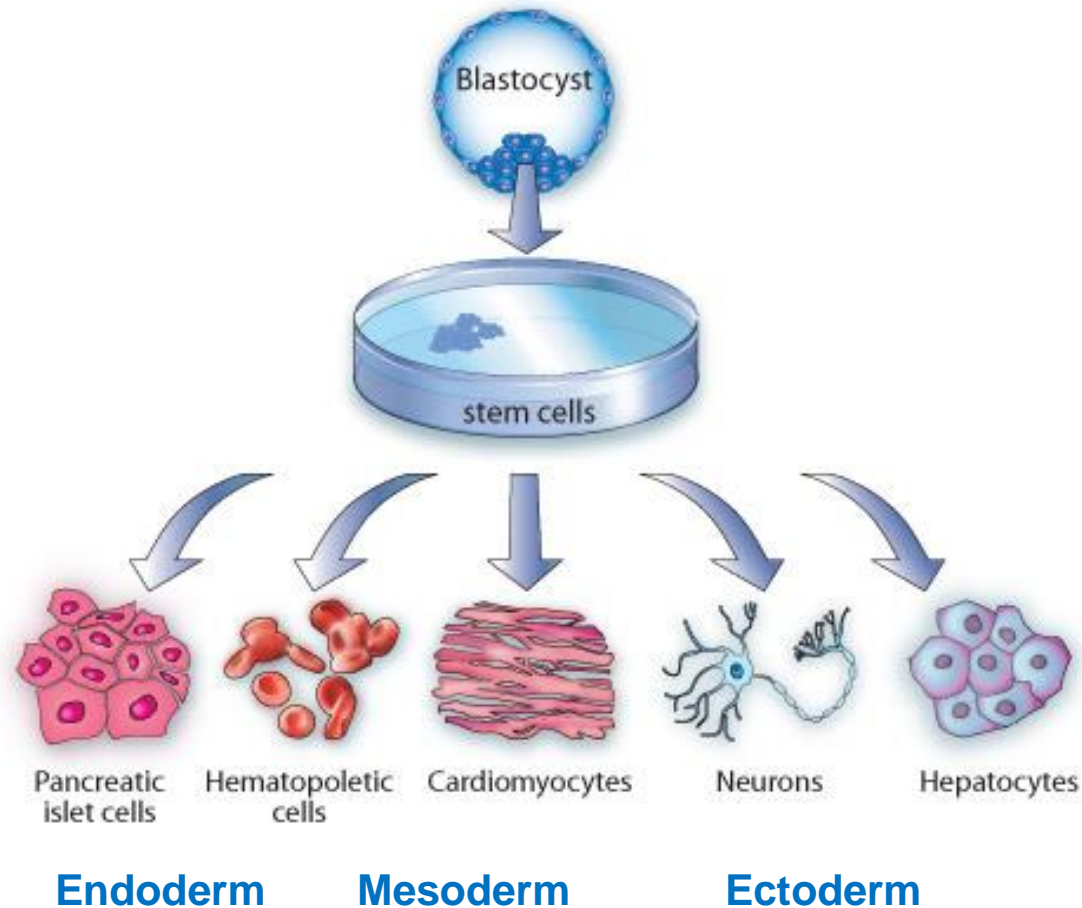
What are Stem Cells?

- Stem cells are relatively undifferentiated, **unspecialized** cells with no « specific » function.
- They can divide and make identical copies of themselves over and over again (**self renewal**).
- They can **differentiate** and give rise to a various range of specialized cell type.
- Stem Cells can be found at various stages of the life cycle.

The major types of Stem Cells

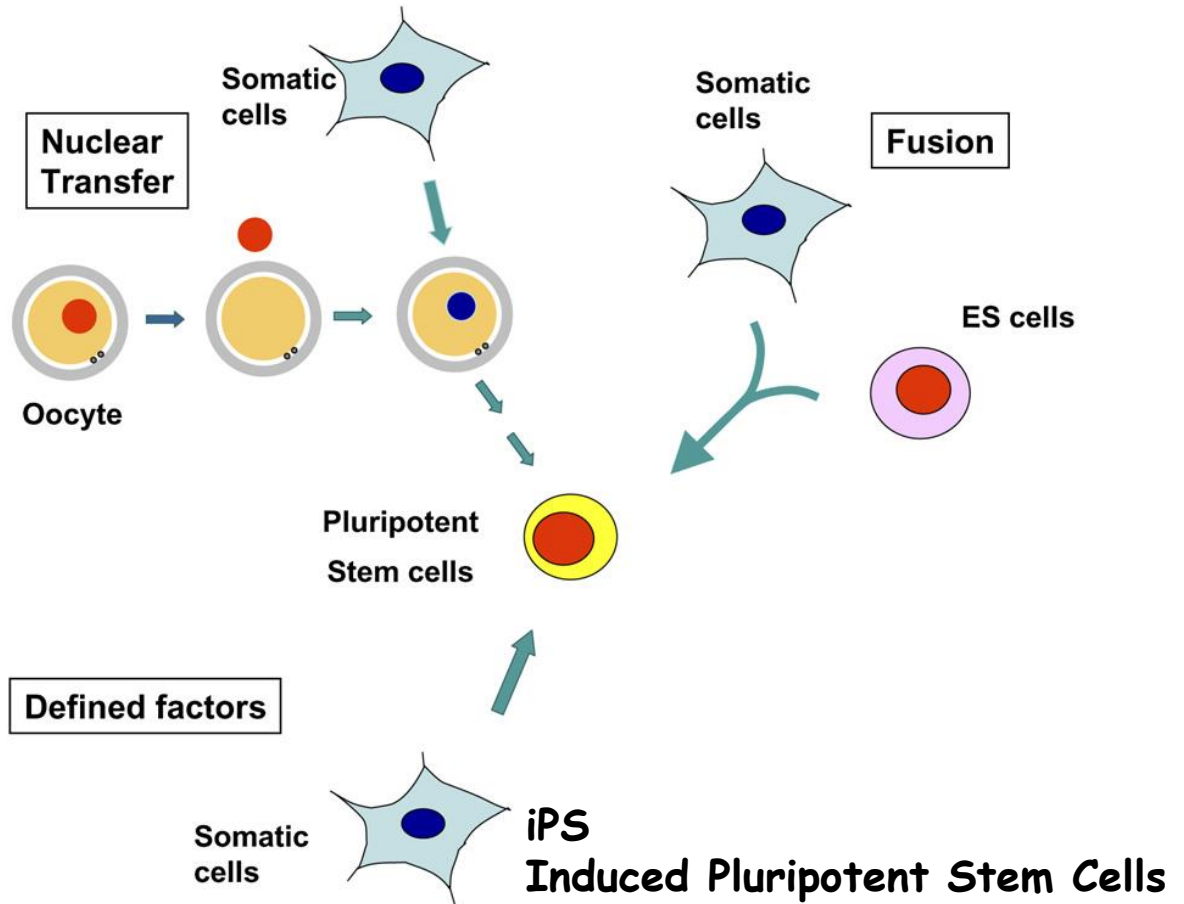
Embryonic stem cells:

- derived from blastocyst
- Are pluripotent: can differentiate into cells of any of the three germ layers



Induced pluripotent stem cells (iPS)

Pluripotent stem cells can also be artificially derived from somatic cells



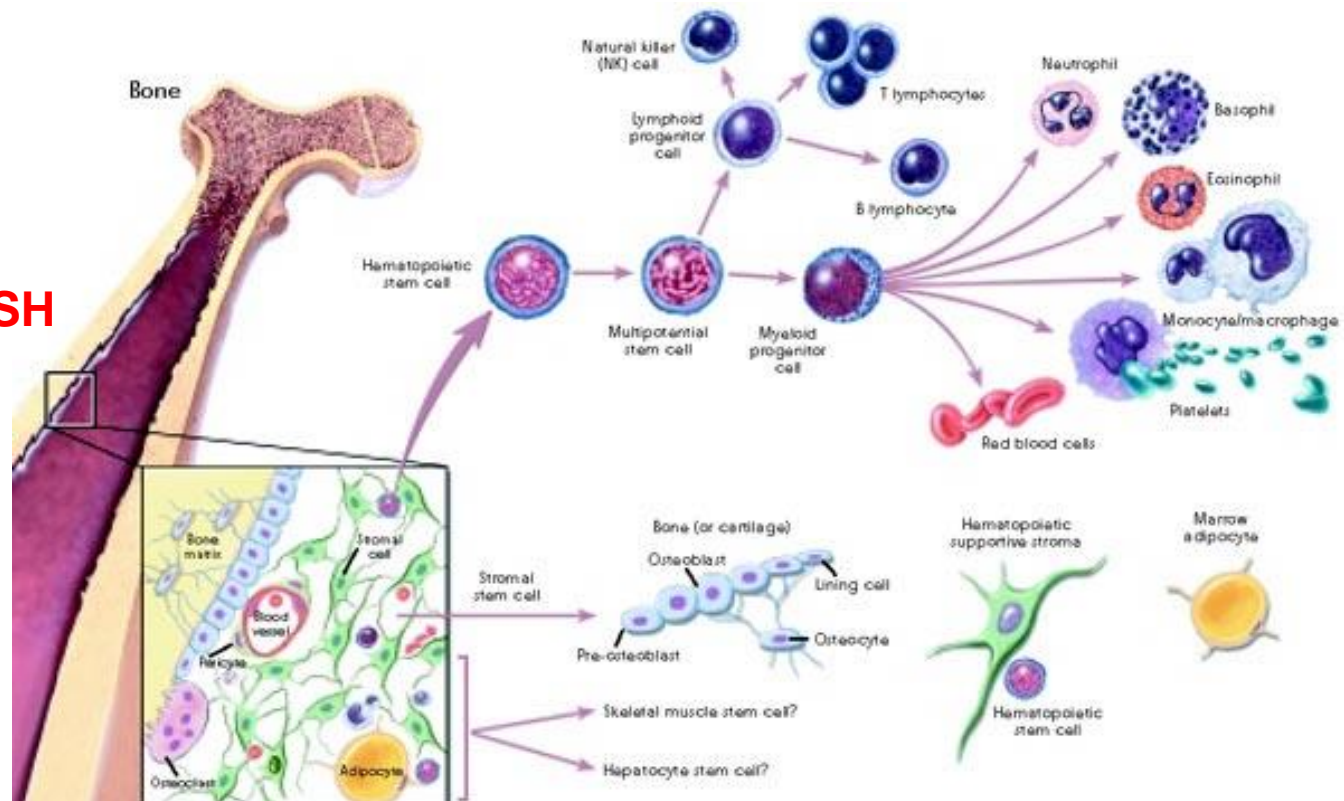
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Cécile Martinat
Pierre Savatier

The major types of Stem Cells

Adult stem cells:

- Stem cells have been found in the blood, bone marrow, liver, kidney, cornea, dental pulp, umbilical cord, skin, muscle, salivary glands...
- Are multipotent: can differentiate into a number of cells, but only those of a closely related family of cells
- Rely on a niche for maintenance and activation

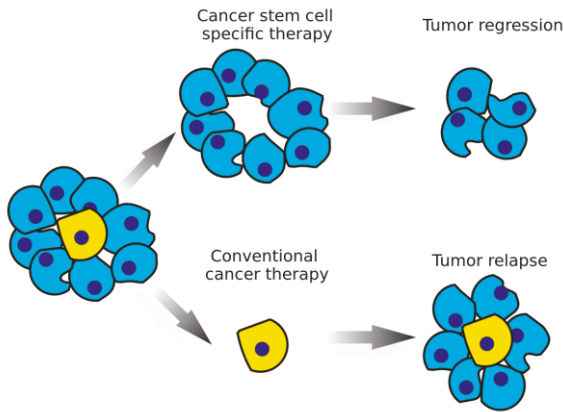
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Charles DURAND
Shahraghim TAJBAKHS



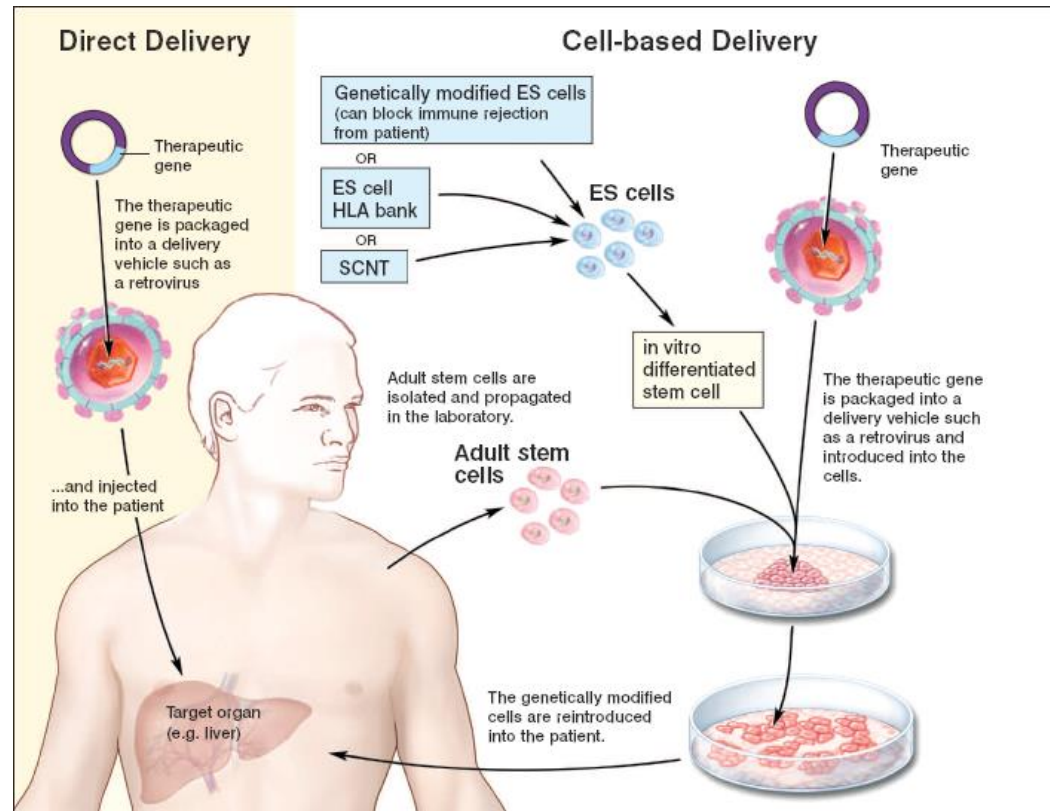
Cancer biology, regenerative medicine and cell therapy

Medical aspects of stem cell research:

- How stem cell research changed the way we think about cancer
- Recent efforts in cell therapies and stem cell based disease modelling



Covered by:
Fabrice Laval
Cécile Martinat



Why are stem cells interesting?

- Stem cells allow us to study how organisms grow and develop over time
- Stem cells can replace diseased or damaged cells that cannot heal or renew themselves: clinical applications.
- Stem cells (ES) can be genetically manipulated. Allow us to get a better understanding of our « genetic » machinery.
- Stem cells can be used to test different substances (drugs and chemicals) and model diseases.

Organization 2018

Journal Club in the morning
Courses in the afternoon

Evaluation based on Journal Clubs and a short final exam