

Johns Hopkins Engineering

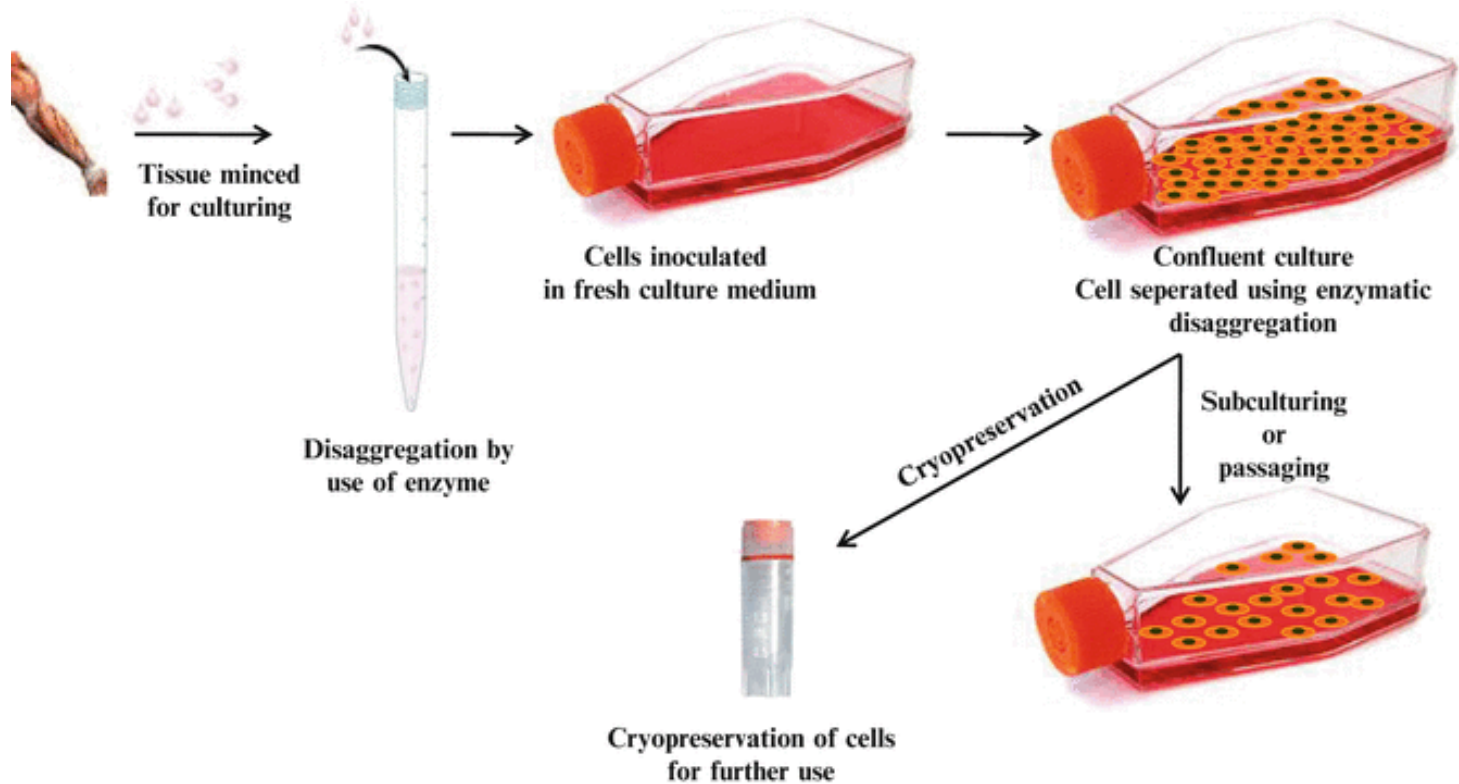
Methods in Neurobiology

Introduction to Cell Models

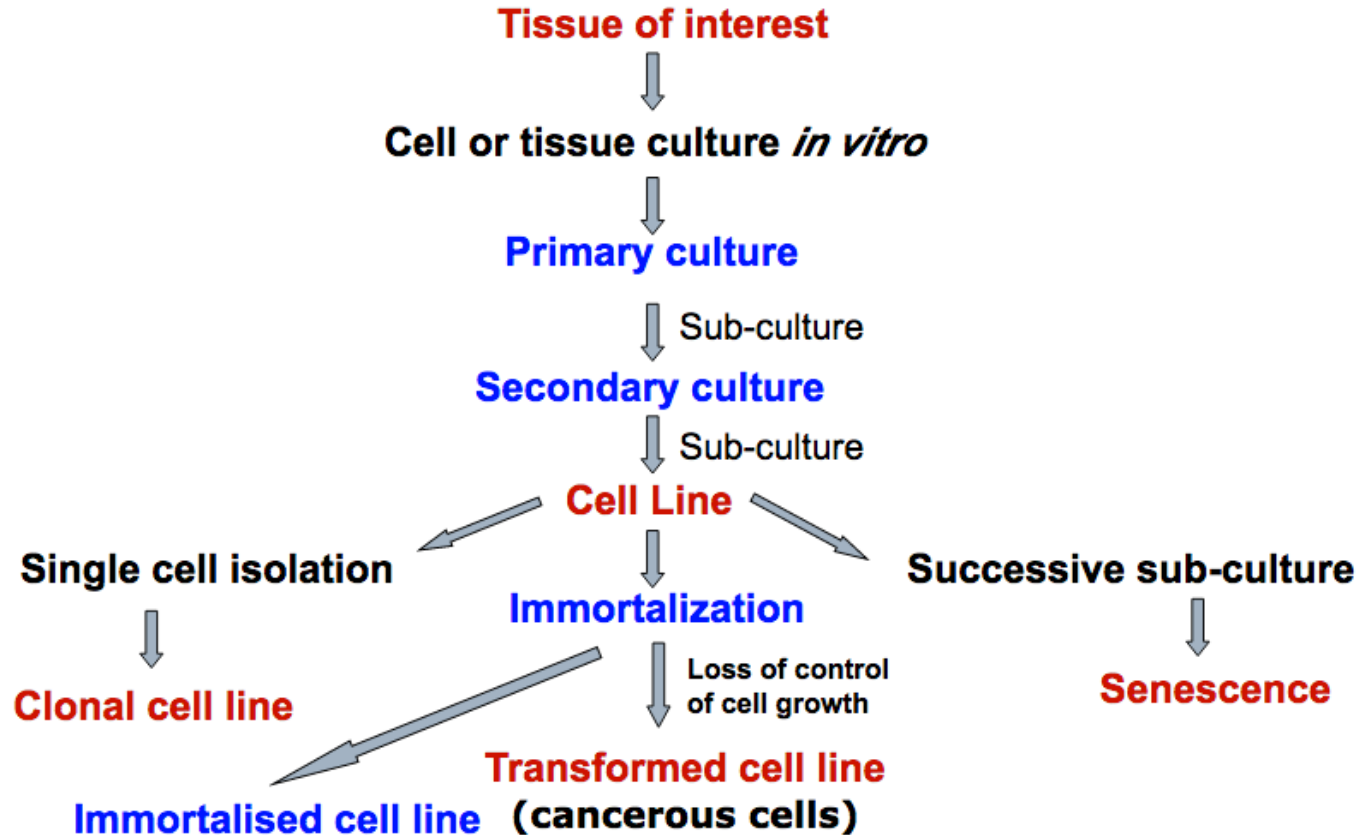


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Primary cell cultures

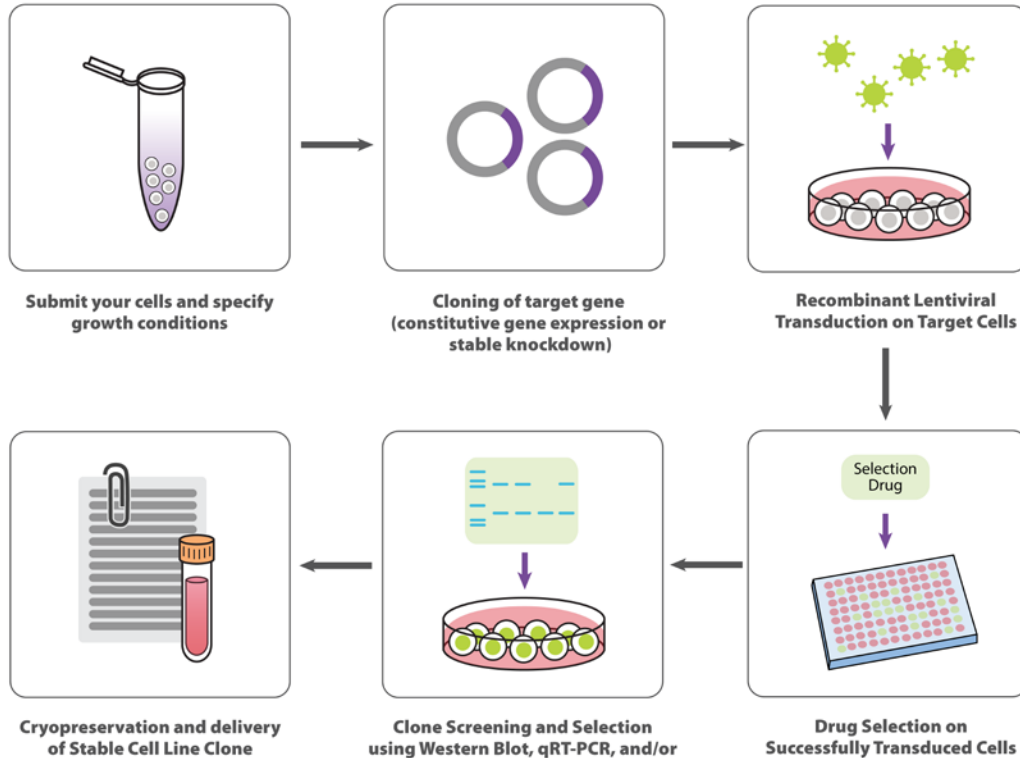


Primary cell cultures vs established cell lines



Making stable cell lines

Stable Cell Line Generation



Primary cell cultures vs established cell lines

	Primary cell culture	Cell line culture
Definition	Cells : directly from a donor organism	Cell line : subcultured indefinitely
Advantage	<ul style="list-style-type: none">•Best experimental <i>in vitro</i> models•Retain characteristics of normal cells	<ul style="list-style-type: none">•Easy to maintain in culture•Easy to obtain large quantities•Typically easy to manipulate
Disadvantage	<ul style="list-style-type: none">•Difficult to obtain•Susceptible to contamination	<ul style="list-style-type: none">•Cell line may change overtime•Unclear how well they represent function of original cell type

Examples of cell lines and primary cultures

Example of some cell lines used for *in vitro* culture

<i>Cell line</i>	<i>Species of origin</i>	<i>Tissue of origin</i>	<i>Cell morphology</i>
3T3	Mouse	Connective	Fibroblast
CHO	Chinese Hamster	Ovary	Epithelial
BHK21	Syrian Hamster	Kidney	Fibroblast
HeLa	Human	Cervical Carcinoma	Epithelial
MDCK	Dog	Kidney	Epithelial
MRC-S	Human	Lung	Fibroblast, Finite

Examples of tissues used for primary/secondary cultures

Brain	Neurons, Astrocytes
Liver	Epatocytes
Blood	Lymphocytes, Monocytes
Skin, Connective tissue	Fibroblasts
Intestine/Kidney	Epithelial
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References

Slide	Reference
2	Gupta V., Sengupta M., Prakash J., Tripathy B.C. 2017 Animal Cell Culture and Cryopreservation In: Basic and Applied Aspects of Biotechnology Springer Singapore https://link-springer-com.proxy1.library.jhu.edu/chapter/10.1007/978-981-10-0875-7_3
3	Slide Player (n.d.) Animal Cell, Tissue and Organ Culture. https://player.slideplayer.com/19/5728693/#
4	Custom Stable Cell Generation Service (n.d.). abm https://www.abmgood.com/Custom-Stable-Cell-Generation.html
5	Slide Player (n.d.) Mammalian Cell Culture https://slideplayer.com/slide/14035398/
6	Alberts B, Johnson A, Lewis J, et al. Molecular Biology of the Cell. 4th edition. New York: Garland Science; 2002. Studying Gene Expression and Function. https://www.ncbi.nlm.nih.gov/books/NBK26818/



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