PHARMALEX
CONFIDENCE BEYOND COMPLIANCE

Expression of cluster of differentiation (CD) markers in Mesenchymal Stem Cells (MSCs): specific modeling of the data to understand the impact of different factors on markers.

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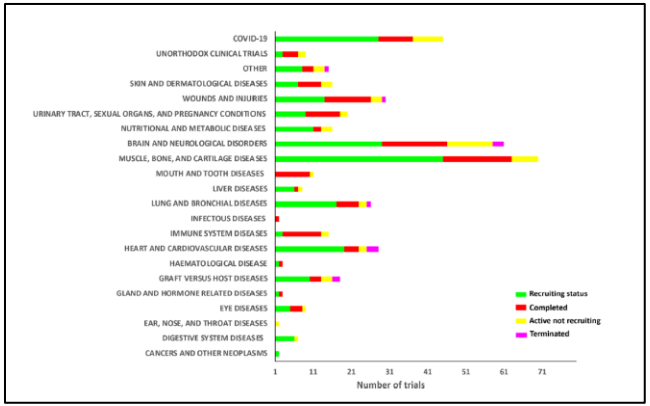
Mesenchymal stem cells (MSC)

- MSCs: stem cells derived from bone marrow that show ability to differentiate into several cell type like osteoblasts, chondrocytes, etc.
- Increasing number of clinical trials to treat various pathologies



Galderisi & al, 2021

- Still an emerging science
- International Society for Cell & Gene Therapy (ISCT) defined 3 criteria to identify MSC

Mesenchymal stem cells (MSC)

- MSC … ferentiate into s…
- Incre…
- Still a…
- Inter… eria to ident…

Table 1. Summary of criteria to identify MSC

Dominici M, et al, 2006

1	Adherence to plastic in standard culture conditions		
2	Phenotype	Positive (≥95% +)	Negative (≤2% +)
		CD105	CD45
		CD73	CD34
		CD90	CD14 or CD11b
			CD79α or CD19
			HLA-DR
3	*In vitro* differentiation: osteoblasts, adipocytes, chondroblasts (demonstrated by staining of *in vitro* cell culture)		

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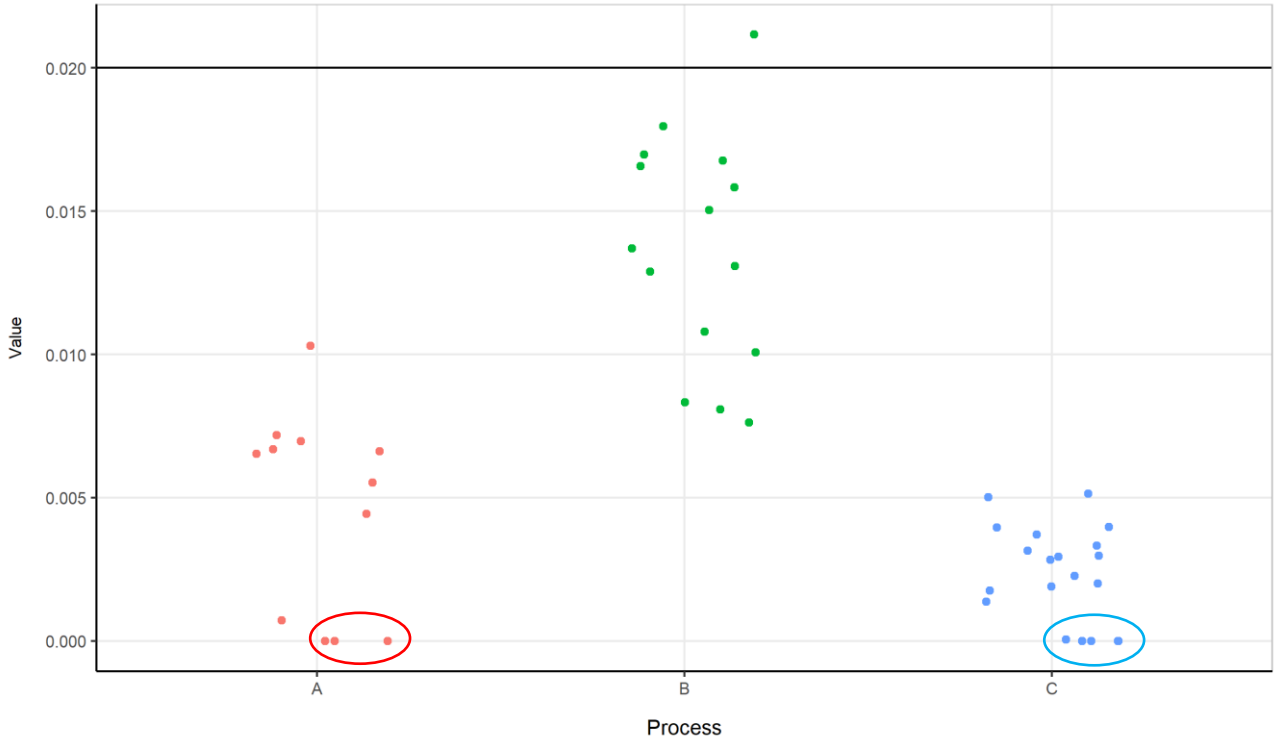
Data: negative CD markers



- *Data constrained between [0-1] intervals (%)*
- *Occurrences of points exactly equal to 0*
- *Specific model to account for that: linear model with logit link on the mean*

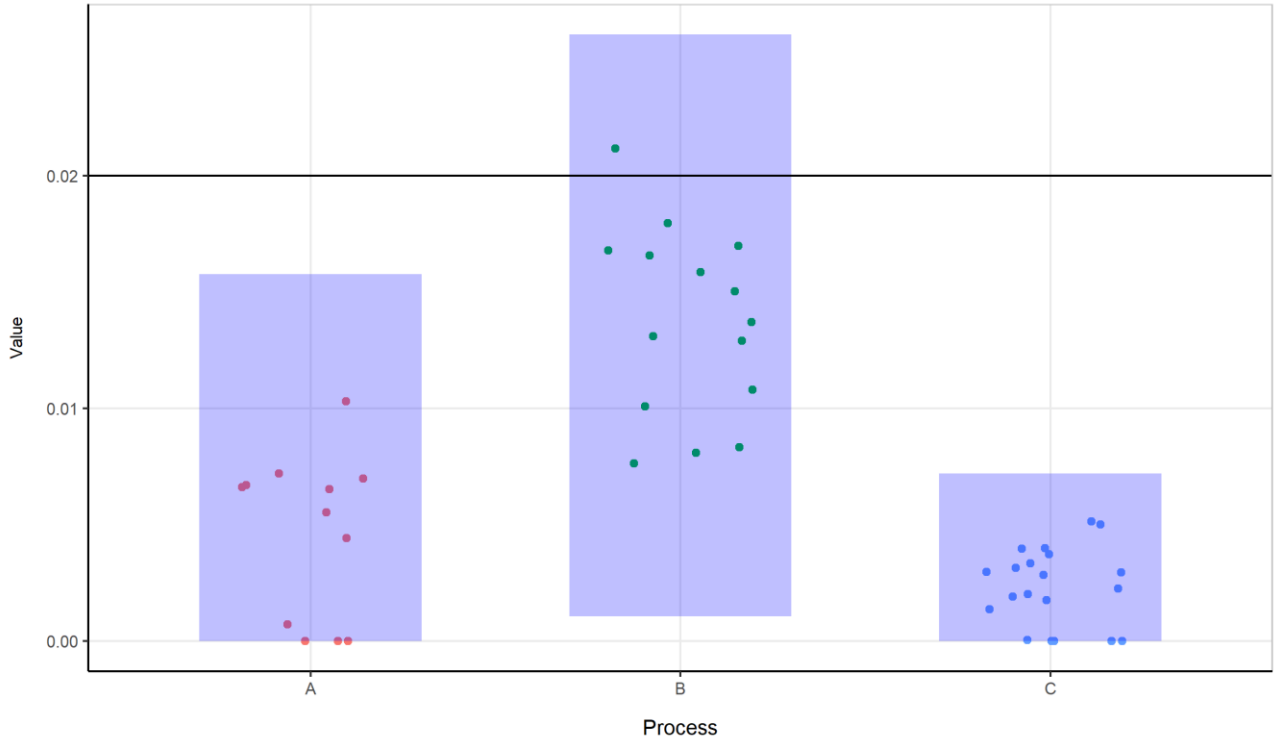
Applications of this approach

- Comparisons of processes, equipment, sources for MSC…
  - With regard to the criteria
  - Between themselves

- Criteria were defined in 2006 based on available data at the time
  - Relevance of those general criteria, are they true for every types of cells?
  - Existence of external factors influencing the criteria (e.g., age, expansion time/condition)

- Define more robust criteria based on observed data
  - Derive prediction intervals to set more realistic limits

Applications of this approach



References

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