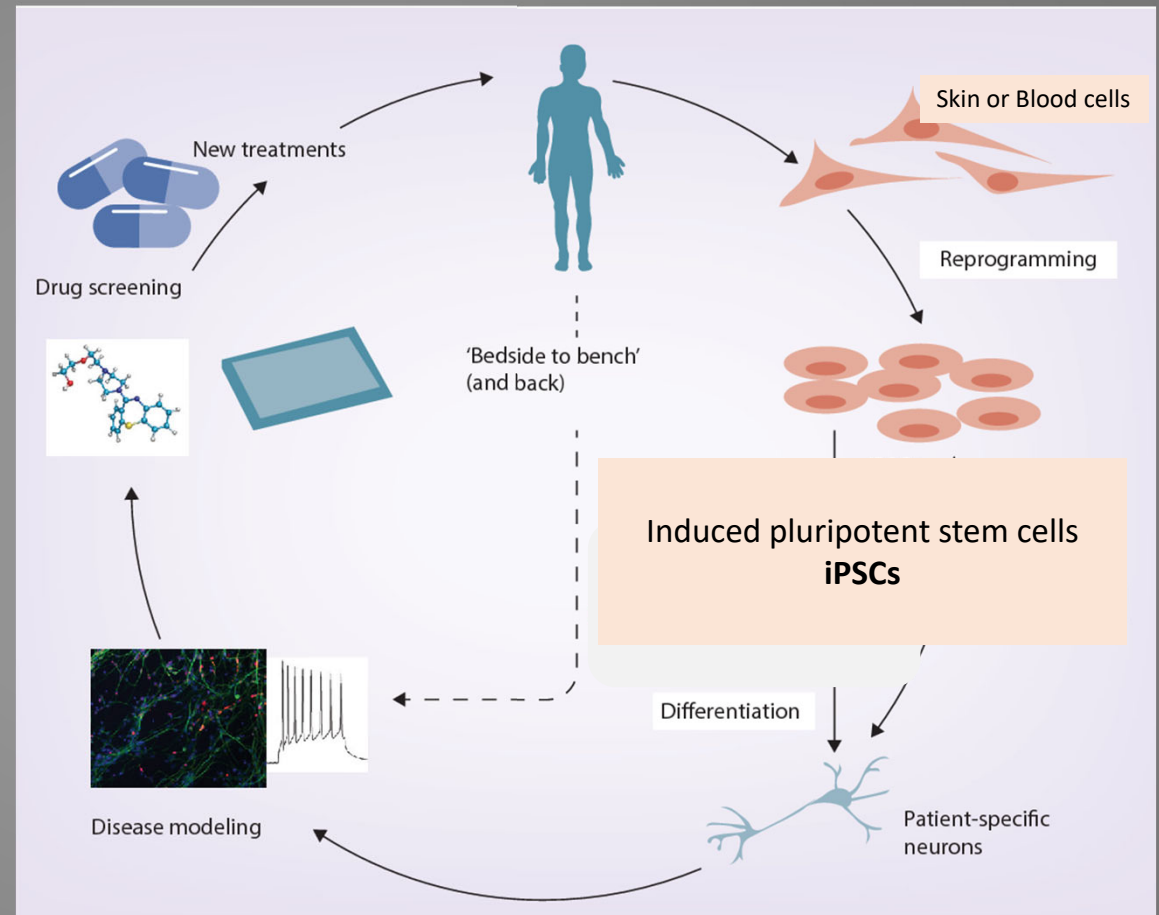


# Modeling brain development in Down syndrome with iPSCs

Anita Bhattacharyya, PhD.

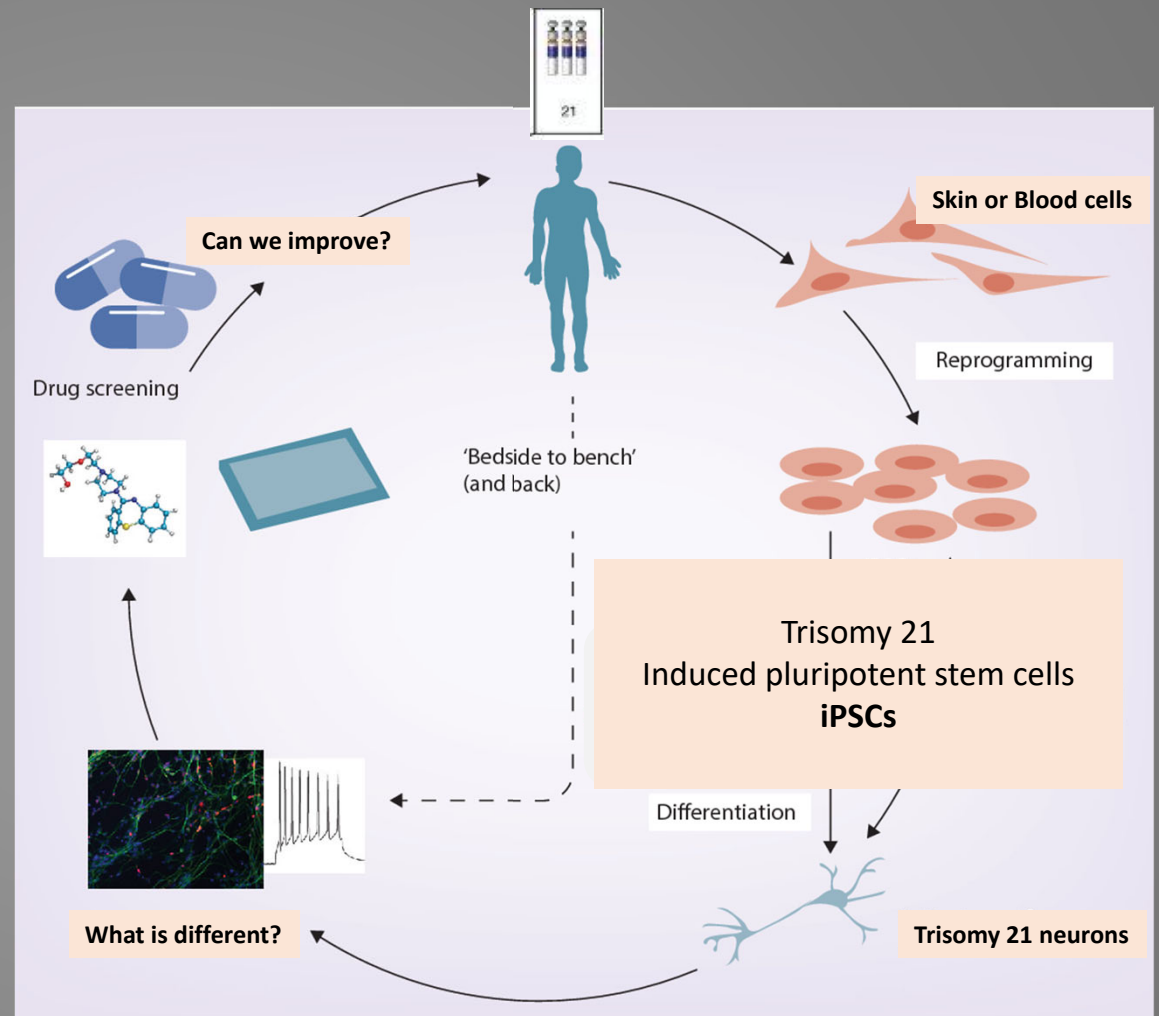
# Induced pluripotent stem cells - iPSCs

- ❑ Stem cells can be reprogrammed from patient's skin or blood cells.
- ❑ Induced pluripotent stem cells grow indefinitely.
- ❑ Induced pluripotent stem cells can be coaxed to turn into any cell type.



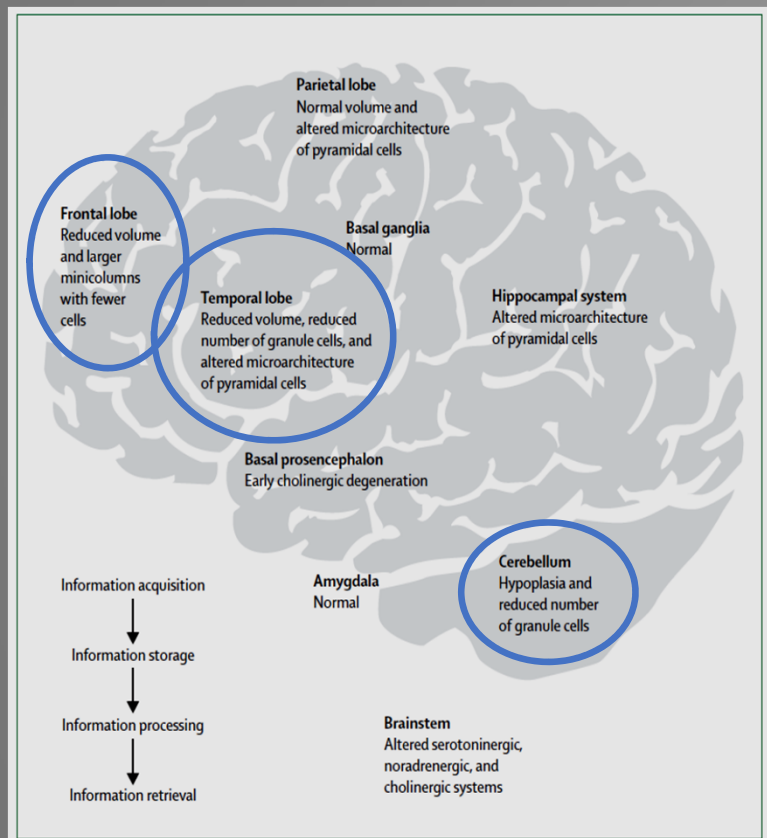
# Trisomy 21 iPSCs

- ❑ Reprogrammed from skin or blood from individuals with Down syndrome.
- ❑ Stored in the lab for future use.
- ❑ Can be turned into neurons to study brain development and function.



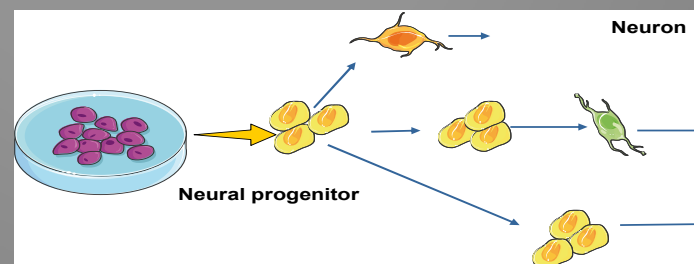
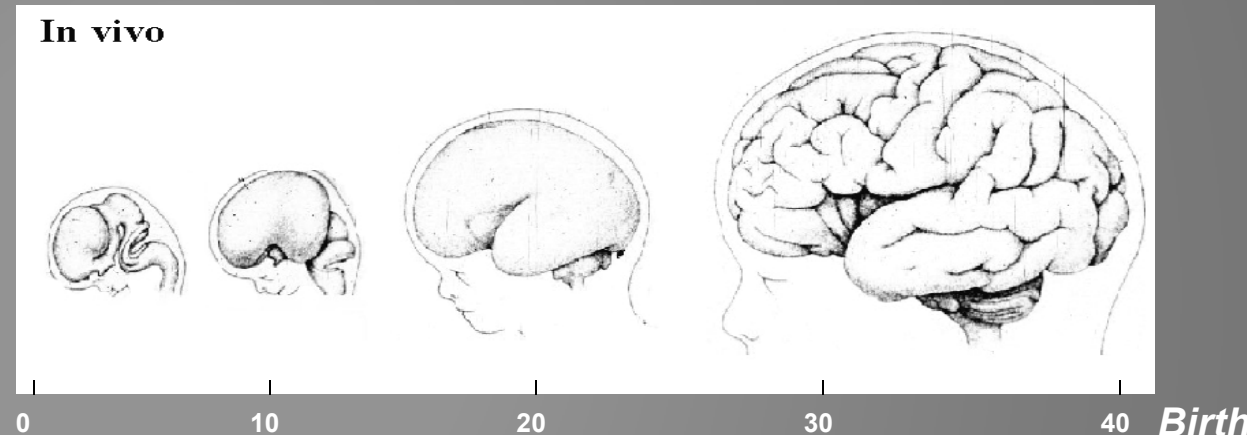
# Fewer neurons in brains of individuals with Down syndrome

Cowan, *Scientific American* 1979



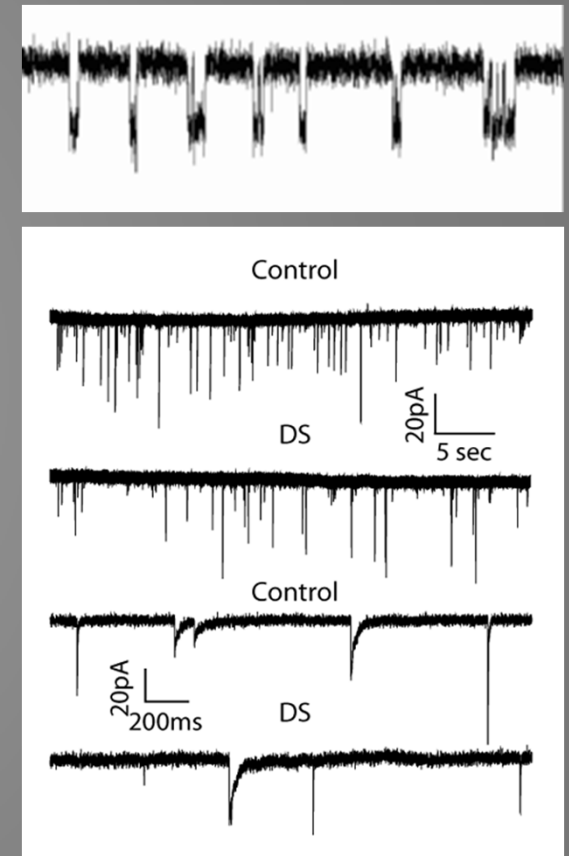
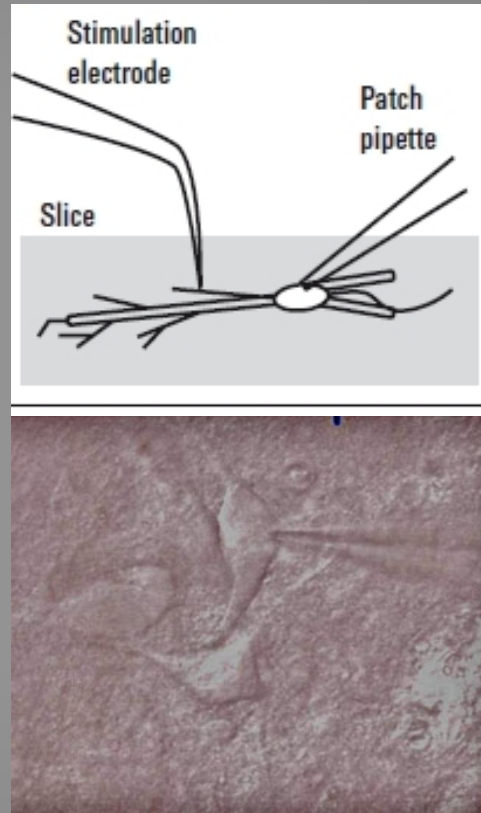
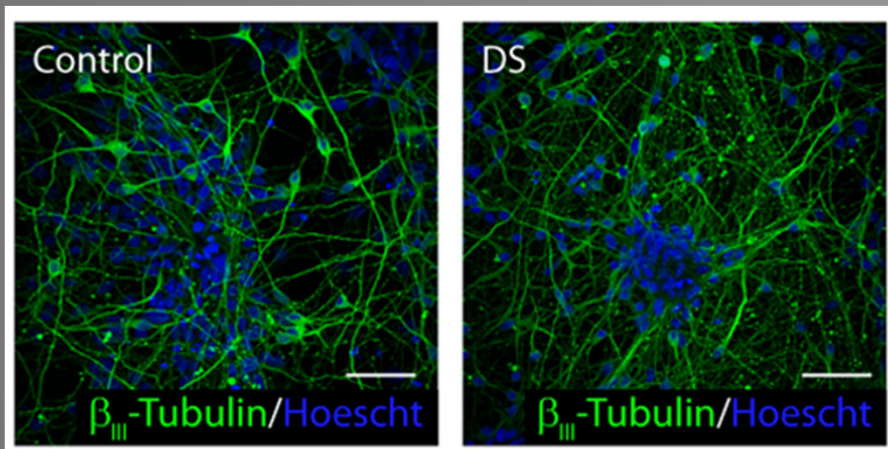
Lott and Dierksen, *Lancet* 2010

## In vivo





# Trisomy 21 neuron function



# Trisomy 21 iPSCs

- ❑ Reprogrammed from skin or blood from individuals with Down syndrome.
- ❑ Stored in the lab for future use.
- ❑ Can be turned into neurons to study brain development and function.

