

**Module:**

**Biological Foundations of Mental Health**

Week 2:

Building blocks of the brain



Prof Jack Price

**Topic 3:**

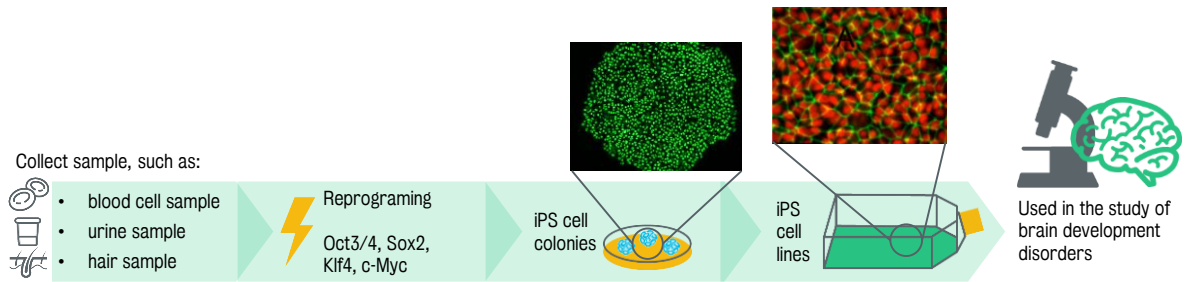
**Exploring mental health using  
stem cells**

Part 2 of 3

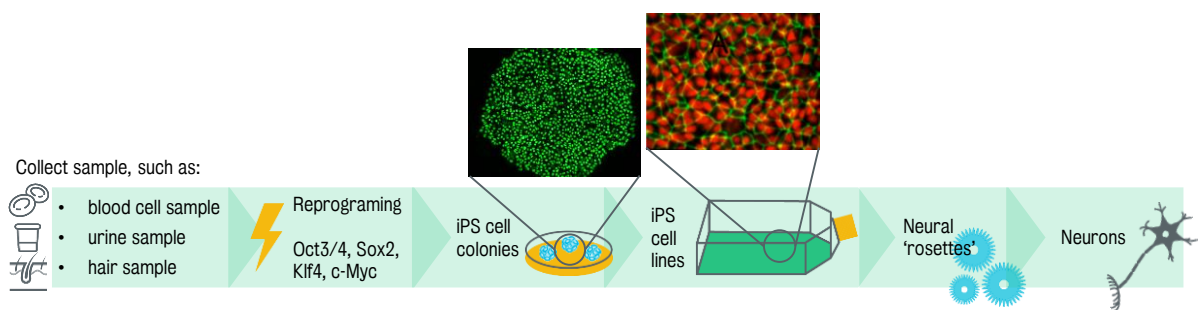
# Part 2

## Using iPS cell lines in the study of brain development disorders

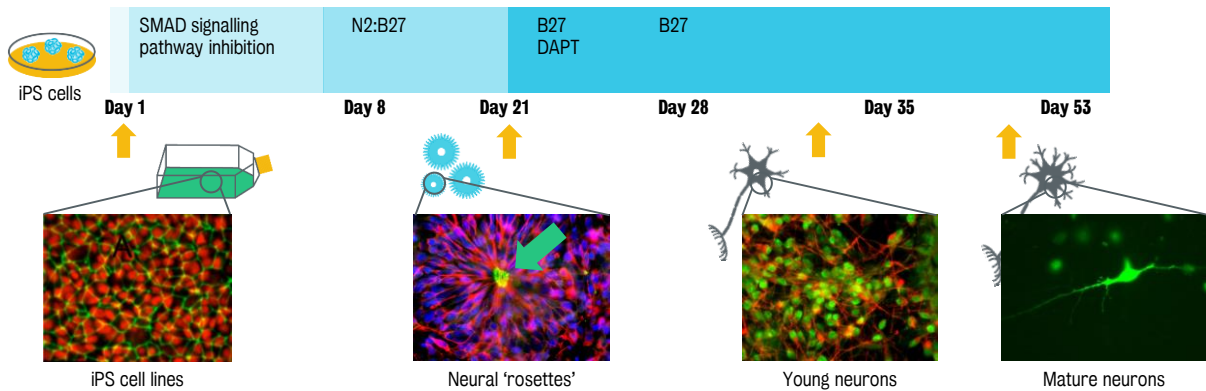
### How to make iPS cells (induced pluripotent stem cells)?



## Using iPS cell lines to create neurons



## Neuralisation: Timeline



Cocks et al. (2014)

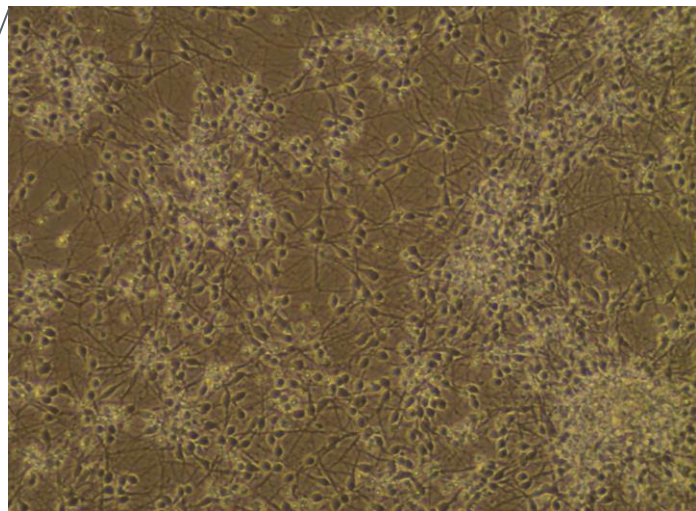
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## Neuralisation: Example

This technology allows us to look at human neural development in a cultural dish.



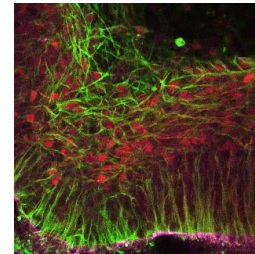
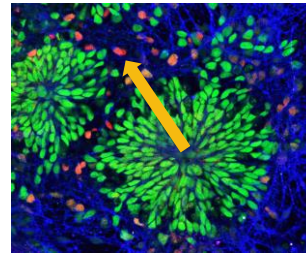
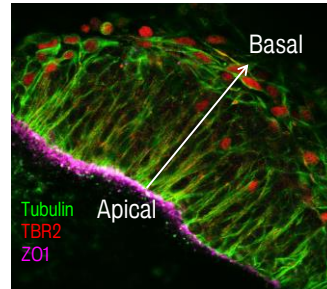
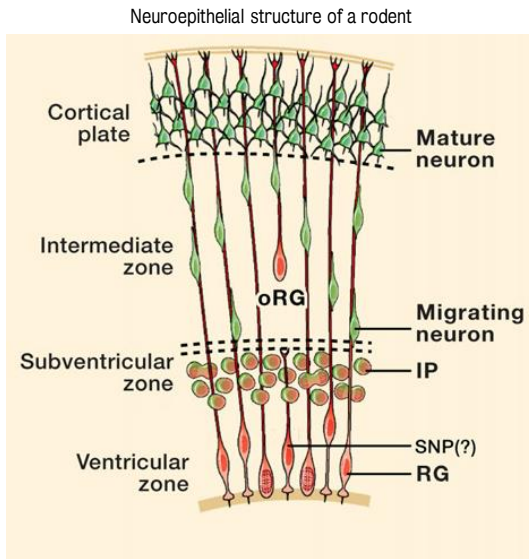
Cerebral cortical neurons derived from iPSCs

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## The histogenesis of IPS cells



Cocks et al. (2014), Lui et al. (2011)

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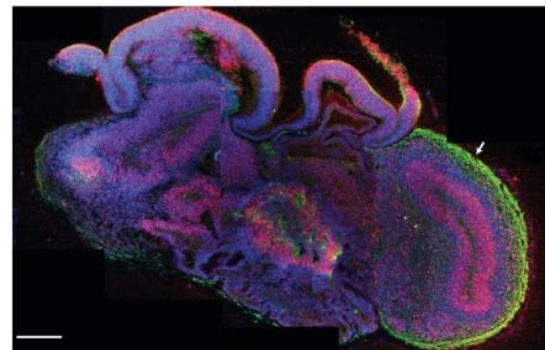
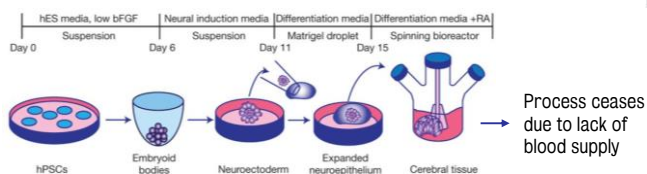
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## Cerebral organoid culture



Lancaster and colleagues (2013)

Regardless of all the challenges and limitations, these cells have a **capacity for histogenesis** remarkably larger than any other neural developing systems in vitro.



Cerebral organoid culture

Lancaster et al. (2013)

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# End of part 2