

ECMIS 03/06/19
BJARNE VERMEIRE

Intestinal enteroids as a model system to explore host-pathogen interactions

Features of current models for host-pathogen interaction studies in the intestine

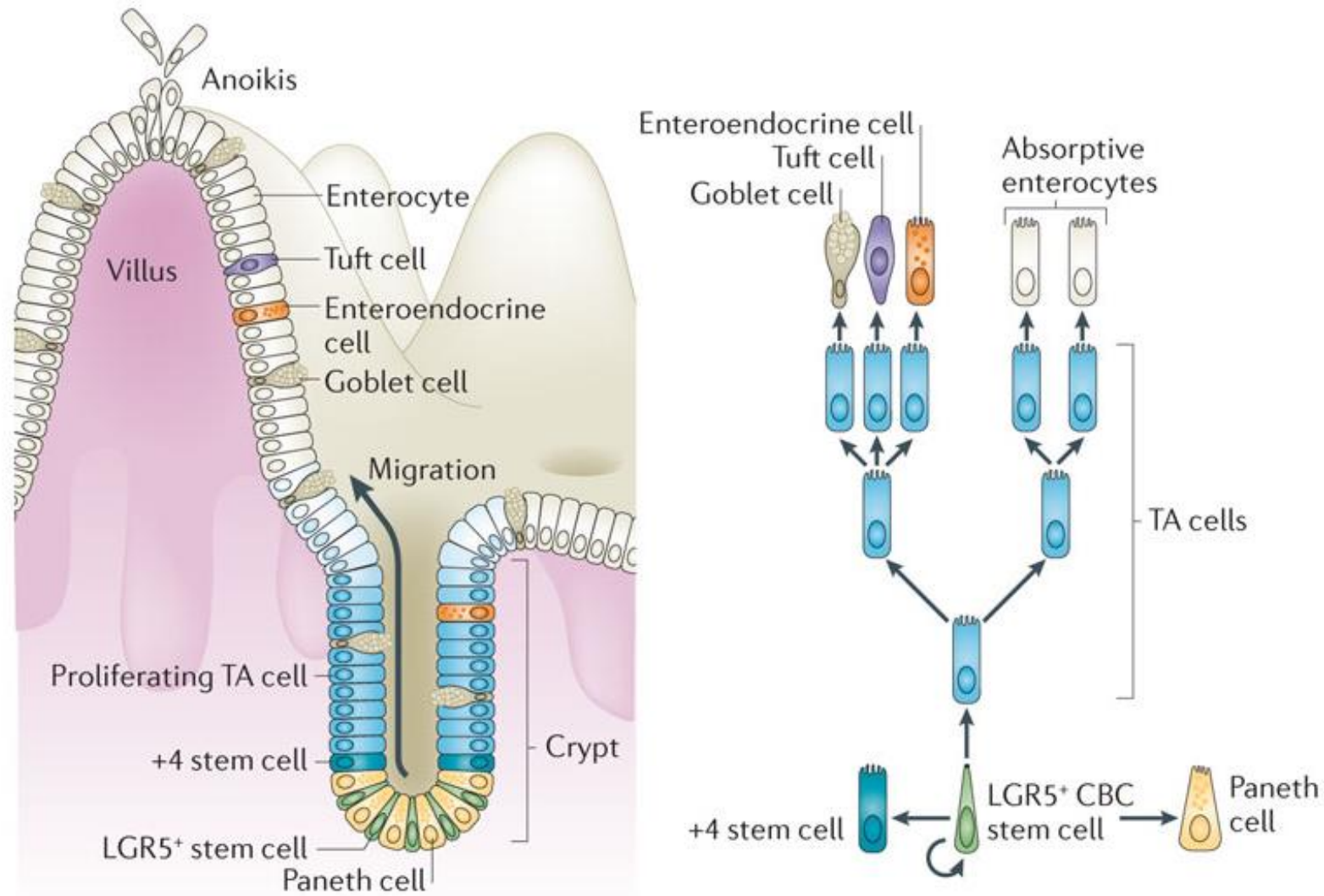
Explants:

- Limited culture periods
- High labour load
- Recapitulate complexity

Cell lines:

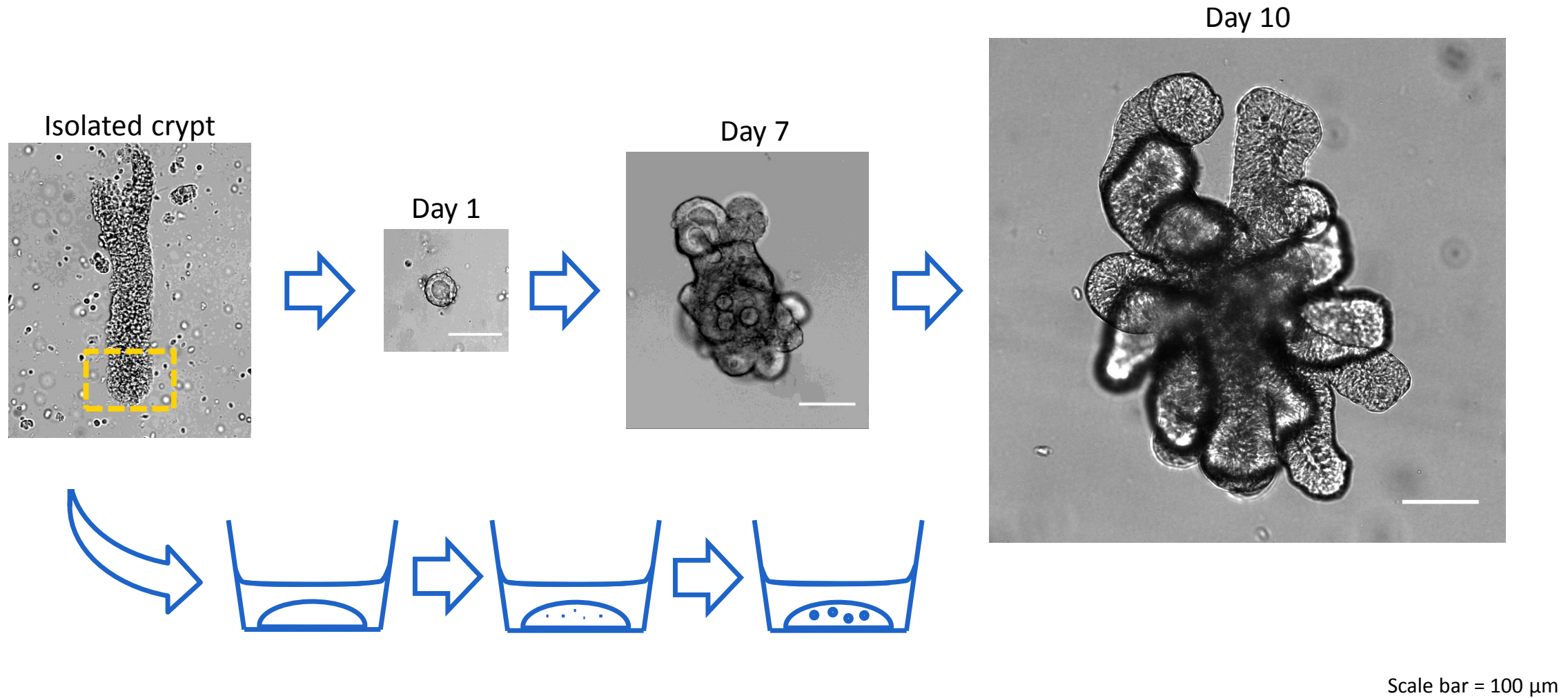
- Need for immortalized cells
- Lack complexity
- Low labour load
- Cheaper

The intestinal epithelial crypt



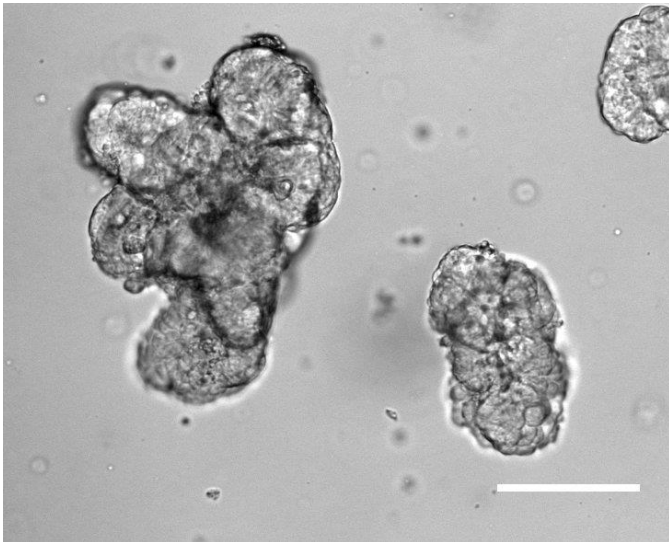
Barker, N. *et al.* (2008)

Growth and development

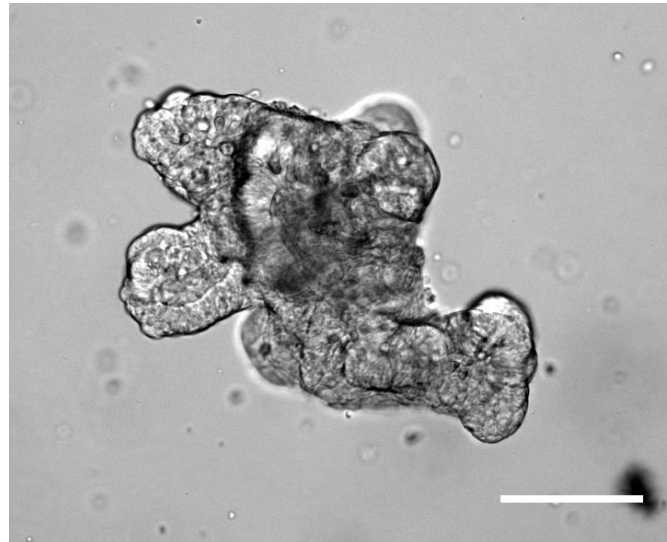


Growth and development along different small intestinal tissues

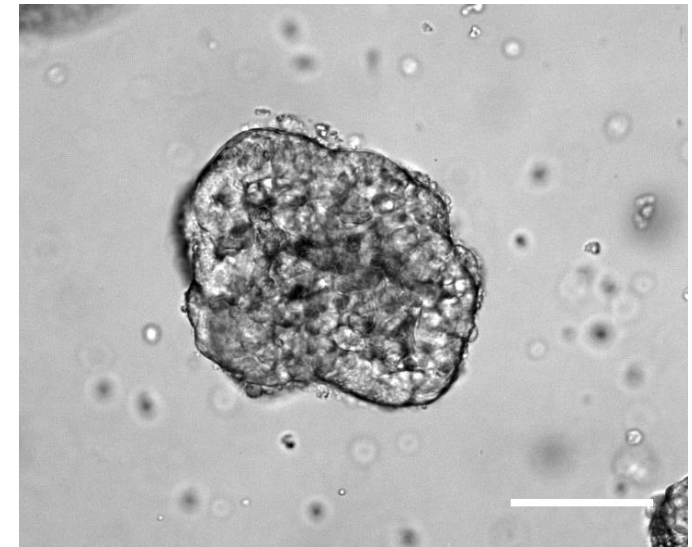
Duodenum



Jejunum

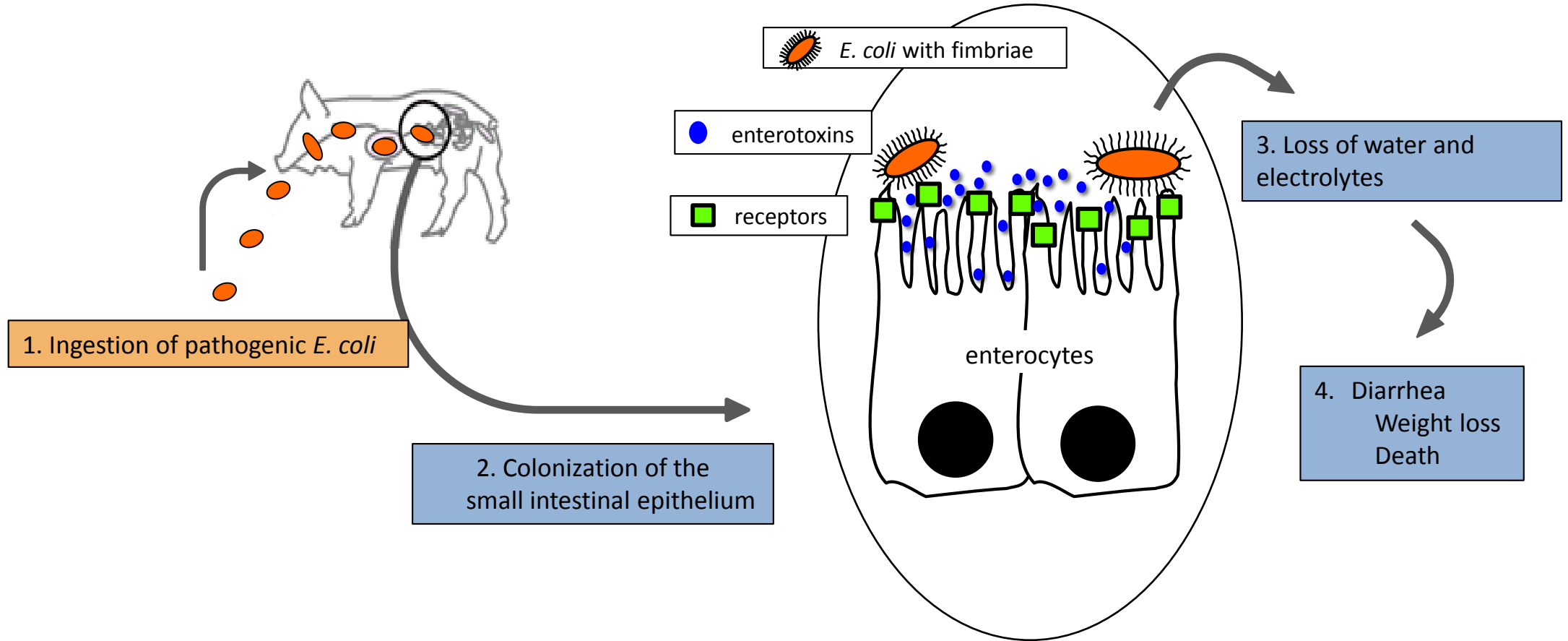


Ileum

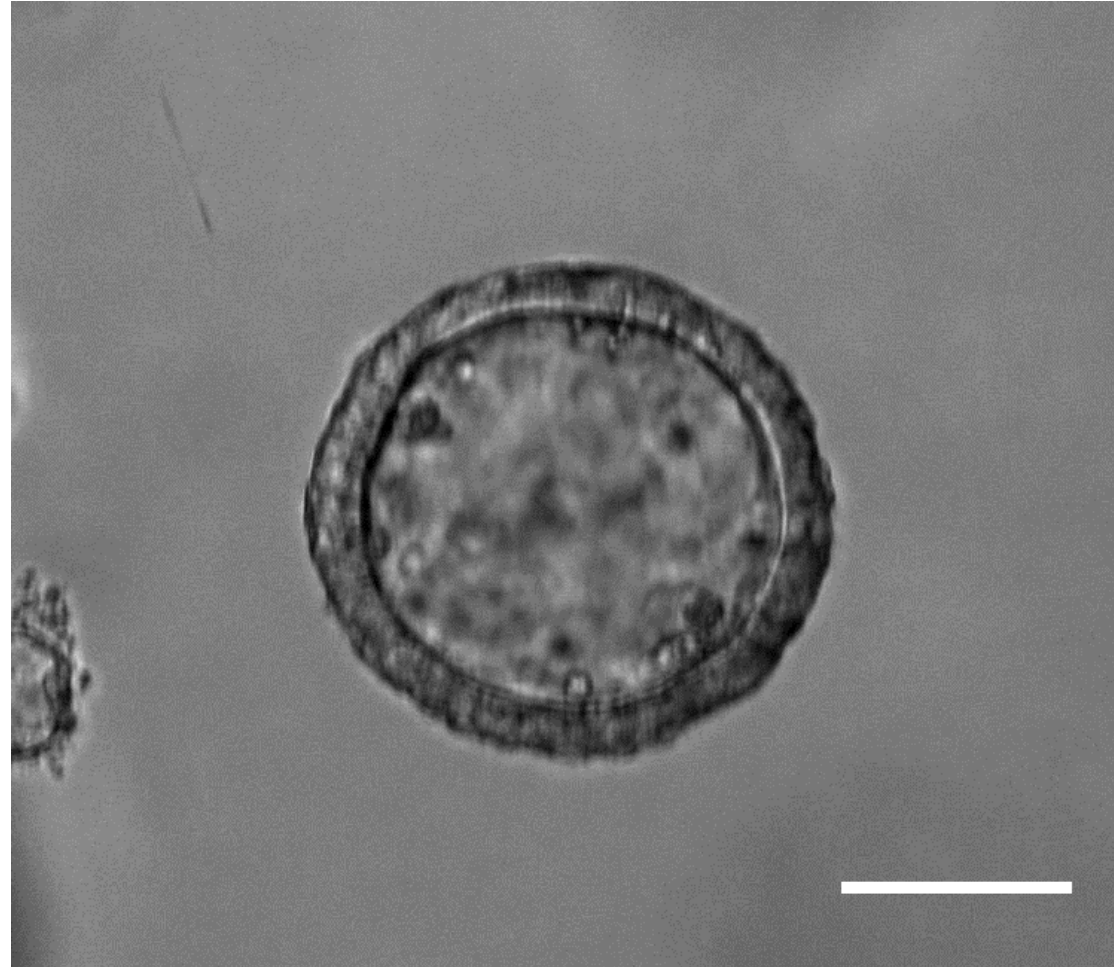


Scale bar = 100 μ m

Enterotoxigenic *E. coli*



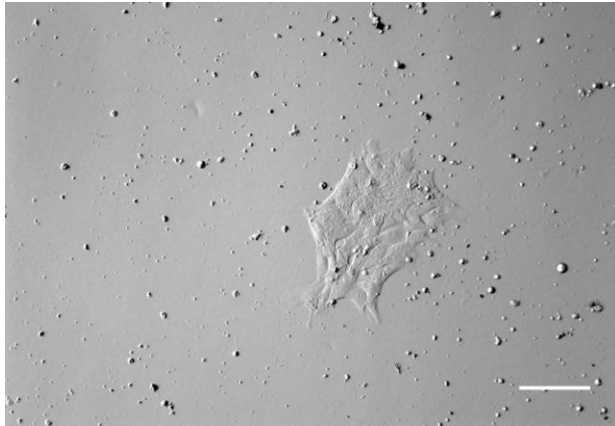
Swelling assay – luminal secretion



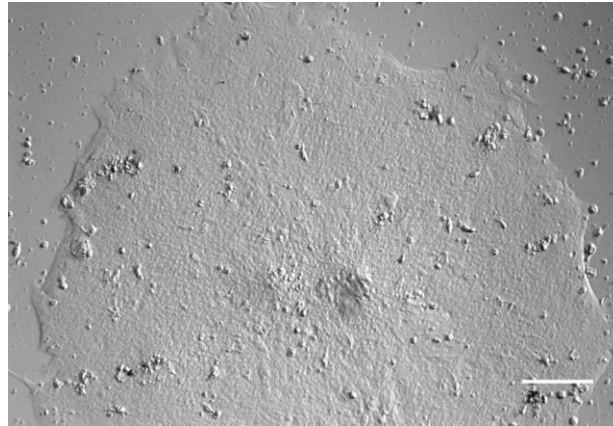
Scale bar = 100 μm

2D cultures - monolayers

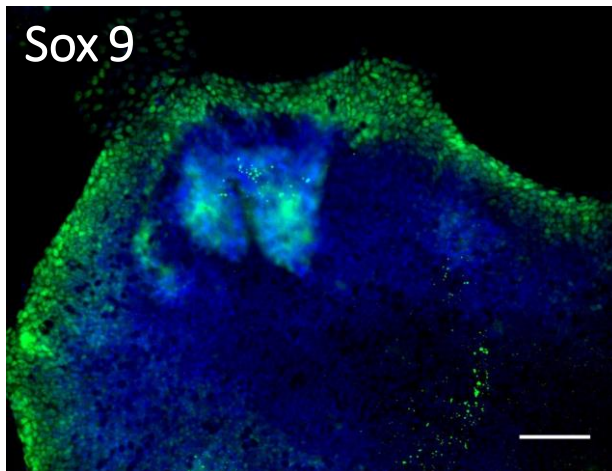
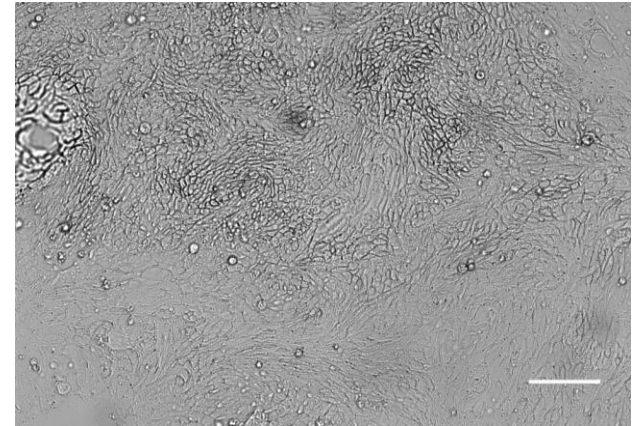
Day 1



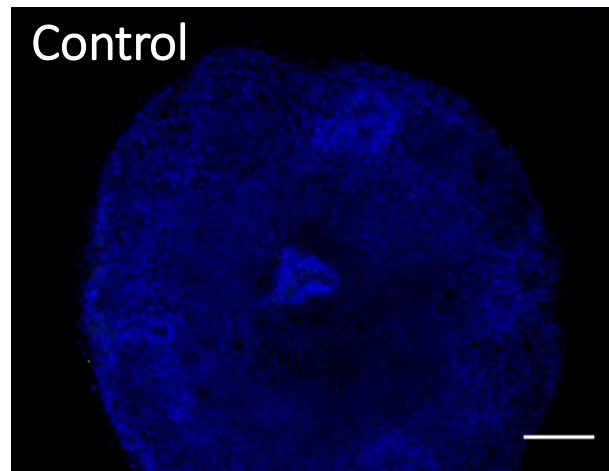
Day 4



Day 7

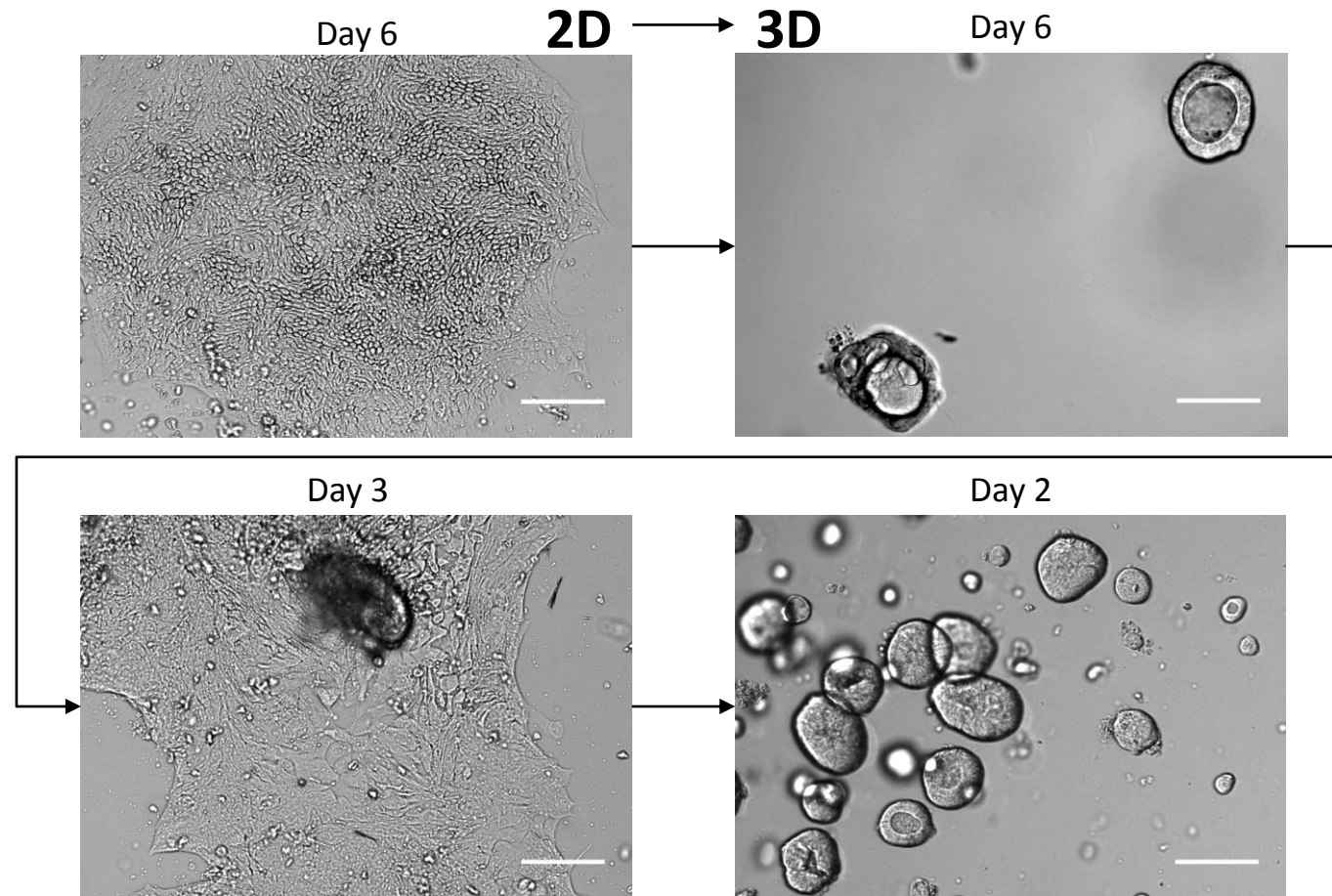


Sox 9
Hoechst



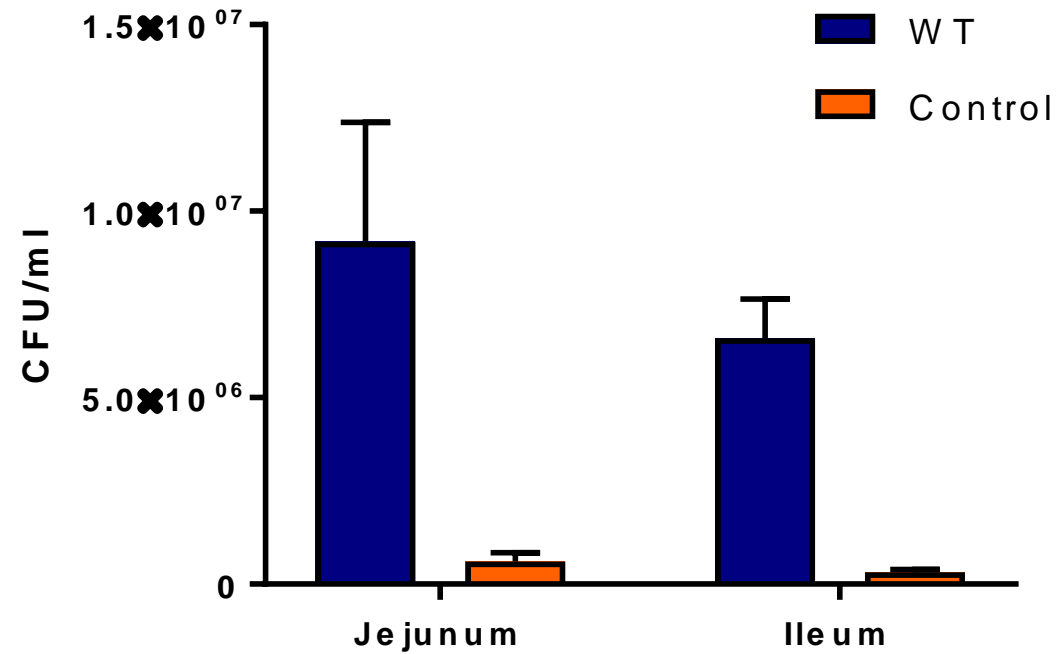
Scale bar = 100 μ m

Stem cells grown as monolayer retain ability to form 3D structures

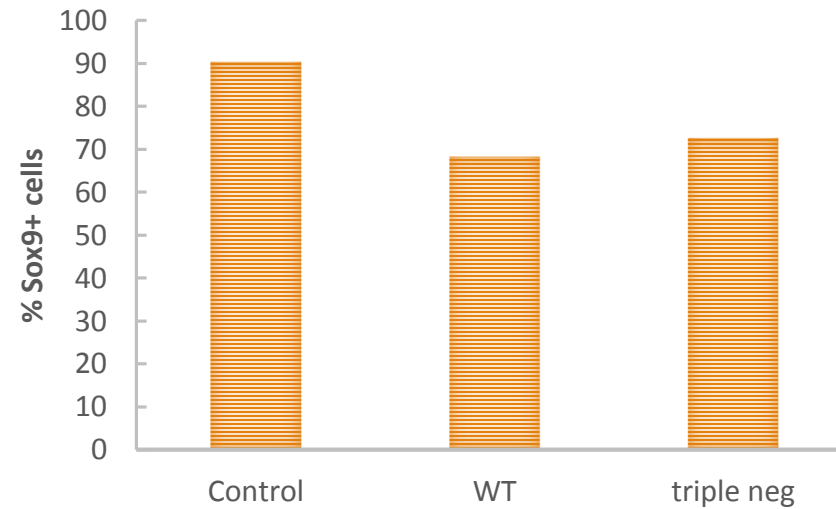
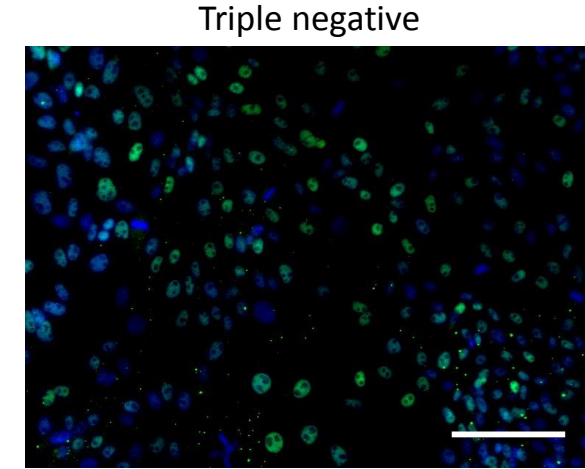
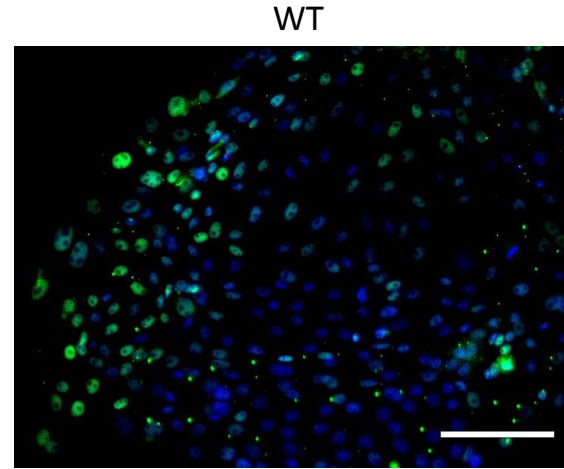
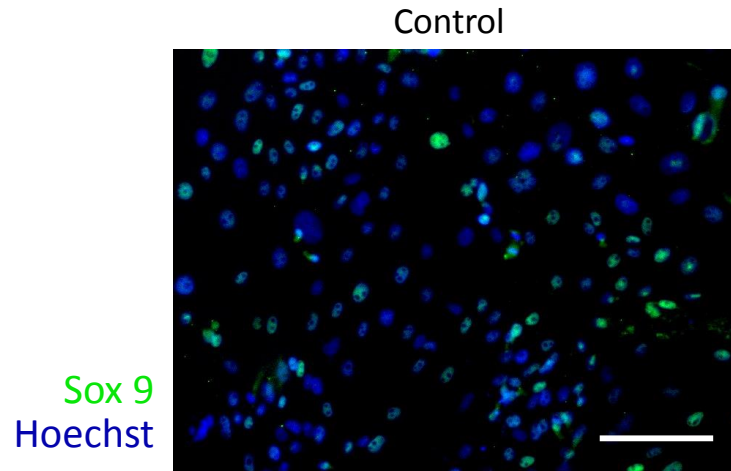


Scale bar = 100 μm

ETEC adhesion to enteroid monolayers



Effect of toxins on Sox9⁺ cells

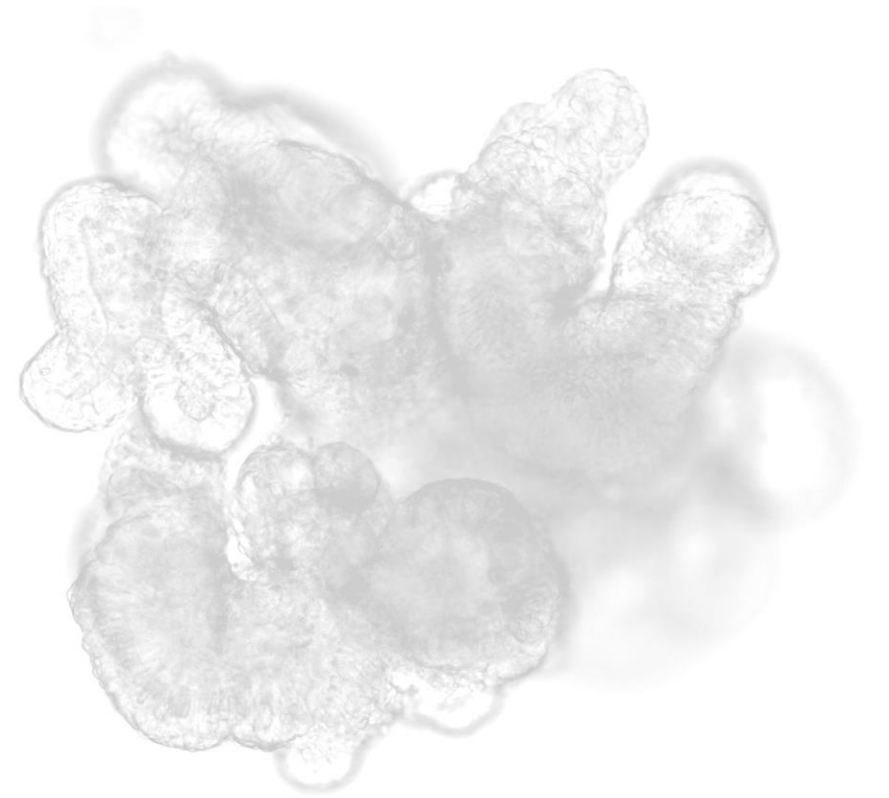


Scale bar = 100 μ m

Conclusion

Enteroids provide a robust and versatile model to study host-pathogen interactions:

- No need for immortalization
- Easy to maintain
- Recapitulate complexity of epithelial tissue



Acknowledgements

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