

Organoid medicine tackles Crohn's Disease.

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Scientists from the Cincinnati Children's Hospital Medical Centre have used human organoid tissue to repair damaged bowel in rats¹. Their (not-yet-reviewed) preprint marks the first time organoids have been used to repair damaged intestinal tissue in vivo.

Organoids, a new model for testing therapeutics.

Intestinal organoids, colloquially termed mini-guts, are rice-sized growths of human tissue cultured in Petri dishes. They are a suitable model for testing the effects of unproven drugs in human tissue before clinical trials begin.

Organoids are a type of personalised medicine. Cells can be taken from a patient, induced to become stem cells, and grown as organoids. Researchers can reintroduce this lab-grown tissue into the donor without fear of rejection by the immune system ^{2,3}.

This process uses the donor's adult cells to produce the organoid, thus avoiding the ethical issues surrounding embryonic human stem cells in this research. Now, organoids could potentially be used as regenerative therapy for inflammatory diseases such as Crohn's Disease and to repair other tissues like the liver ⁴ and salivary glands ⁵.

The low-down on Crohn's Disease.

Crohn's Disease is an inflammatory bowel disease that can affect the entire digestive tract. Symptoms include abdominal pain, diarrhoea, fatigue, and weight loss. Most therapies for Crohn's Disease target the underlying problem—chronic inflammation in the intestinal tract. The root cause of this inflammation is not fully understood but likely involves genetic and environmental factors.

Therapeutics for Crohn's Disease can be divided into three categories: ⁶.

- Anti-inflammatory - aminosalicylates or corticosteroids
- Immunosuppressants - azathioprine or methotrexate
- Biologics - usually monoclonal antibodies targeting TNF-alpha (infliximab, adalimumab) or integrin (vedolizumab).

For the complete remission of Crohn's Disease, two clinical parameters should be resolved.

- Chronic inflammation must be brought under control.
- Damaged intestinal tissue is restored to health.

The Cincinnati group's organoid paper has shown that the second part of the Crohn's disease problem may have a solution. Research, as they say, is ongoing ...

References

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