

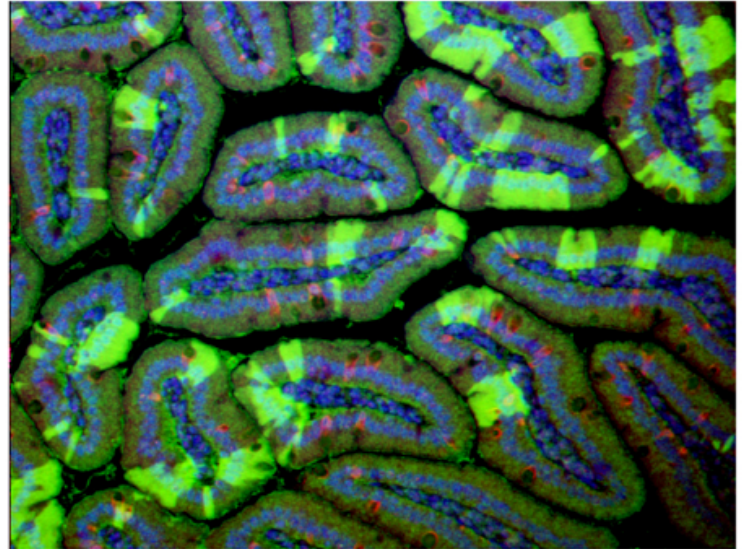
Short Bowel Syndrome: how can stem cells help?

What do we know?

Most nutrients and over 80% of the water in the food and drink are absorbed by our small intestines, so intestines that are too short or not functioning properly can cause serious malnutrition and dehydration.

Most cases of Short Bowel Syndrome (**SBS**) in infants and adults are caused from the surgical removal of large sections of the small intestine that are seriously damaged, malfunctioning or have died.

Current treatments often start with supplying nutrients directly to the blood stream (parenteral nutrition), but can also involve taking hormones and drugs or undergoing surgical procedures to lengthen or transplant the small intestine.



The fate of intestinal epithelial cells can be tracked using a technique called lineage tracing (green).

Photo: Dr Luke Boulter, MRC Centre for Regenerative Medicine, University of Edinburgh.

What are researchers investigating?

New drugs, hormones and other treatments encourage intestinal cells to compensate for lost regions by stimulating the remaining cells and tissue to increase water and nutrient uptake or encouraging intestinal stem cells to grow and multiply.

Stem cells may be able to repair damaged and diseased intestines and prevent surgical removals that lead to SBS.

In the future, transplantation of new intestine tissue grown in labs may be possible using adult stem cells from the intestine or pluripotent stem cells.

Researchers have found that using scaffolds for cells to grow on helps stem cells grow into the correct shape.

What are the challenges?

Often, SBS results from surgeries that address a diversity of complex medical issues. These issues may continue when treating SBS.

Most cases of SBS are unique, so treatments often must be tailored to each case.

Infants are at a critical stage in life and sensitive to treatments. Some SBS treatments that work for children and adults can't be used on infants.

Intestinal transplants are possible, but alternative treatments are continually sought because of many challenges, such as limited number of donors, possible organ rejection and a high potential for infections (because intestines contain bacteria).