Reviewer's report

Title: Colonic epithelial ion transport is not affected in patients with diverticulosis

Version: 1 Date: 28 February 2007

Reviewer: James M Mullin

Reviewer's report:

General

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

This is an interesting and worthwhile paper, but I have a few concerns. Most immediate is a clarification. The authors state that they are investigating biopsies of colon tissue taken from patients with diverticulosis, BUT:

1) are the biopsies per se taken immediately adjacent to or IN a diverticulus OR in areas with no diverticuli but in a patient that has diverticuli elsewhere; 2) there needs to be commentary concerning the degree of inflammation (if any) associated with the diverticuli. Both require careful clarification in the paper. I would even revise the title with regard to this clarification.

In addition, I am concerned about the reported conductances obtained on these biopsies using the "micro" Ussing chamber (MUAS) described here. The median conductance was approximately 75 mS/cm². I think this correlates to a transepithelial resistance of less than 20 ohms x cm². This seems VERY leaky for a colon mucosal preparation, which in the published literature averages closer to 100 ohms x cm². It makes me wonder how serious are the edge damage effects in the MUAS chamber. Edge damage SHOULD be magnified here because of the very small diameter of the aperture and the biopsy. If there is significant edge damage, how accurate are the readings reported here? I would like to see a very frank discussion of this in the paper. I would also like to see resistances reported in the abstract along with the conductances.

In these conductance values, given their very wide range, are there any outlier values that may need to be dropped, using e.g. the interquartile rule? This may seriously change whether statistical differences exist. With P values very close to 0.05 in some data sets, I would not be surprised. The advice of a statistician might be very helpful here.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. I would recommend providing a vertical point of ALL observed conductances for control and diverticular biopsies. Given the very wide range of values, readers would benefit by seeing this distribution. I would likewise report mean as well as median.

2. Grammar:
   a. page 3, line 1: difficult treatable TO difficult to treat
   b. page 3, line 6: diet poor on TO diet poor in
   c. page 3, 3 lines from bottom: hypothesis's TO hypotheses
   d. page 4, 3 lines from bottom: The sentence, "Media at the serosal...." does not make good sense.
   e. page 12, 5 lines from bottom: built-up TO build-up
   f. page 14, line 1: information in TO information on

3. On page 8, why would changes in SCC lead to changes in G? Why even think that, in a "leaky" epithelium with high paracellular permeability.

4. On page 10, paragraph 2, the authors make a good case for why biopsies are healthier physiologically than surgical tissue. I would add that biopsies are more readily available for a wider array of diseases, INCLUDING healthy controls (not available surgically).

5. Page 12, 3 lines from bottom. You should give a reference to short circuit conditions causing paracellular salt build up.

6. There is very little published about electrophysiology of diverticular disease colon. For this reason you should seriously include Mullin et al (2001) "Electrophysiological differences in normal colon mucosa from
diverticular disease vs cancer." Dig Dis Sci. 2000 Dec;45(12):2374-5, and contrast its findings to your own.

Discretionary Revisions (which the author can choose to ignore)

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Needs some language corrections before being published

Statistical review: Yes, and I have assessed the statistics in my report.