Reviewer's report

Title: A new paradigm in respiratory hygiene: modulators of airway secretions to improve cough interaction.

Version: 1 Date: 26 February 2005

Reviewer: Terry Dwyer

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General
This manuscript by Zayas, Dimitri, Zayas and King represents a novel and highly imaginative approach to mucus clearance in airway disease. Accretions of mucus were simulated by locust bean gum solutions of various concentrations, which were characterized [1] according to their ability to be transported by cilia, [2] their spinnability, [3] their clearance from a simulated cough machine and [4] their ability to be aerosolized by the simulated cough machine. The gum solutions were modified in two ways, one to crosslink the carbohydrate side groups and a second to alter the calcium concentration, and hence the ionic screening of charges on the side groups. The novel, and unanticipated finding was that a degree of increased crosslinking that was sufficient to increase spinnability, also increased cough clearance and the size of the aerosol particle.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)
1. An abstract is required.
2. The two agents must be identified, particularly because they are stated to be FDA-approved for use in humans. So they must be agents commonly known to the medical community.
3. The statistical comparisons must be of a multiple comparison type. The same data are compared two at a time within themselves, and this is not the purpose of the student T-test. Tukey or Neuman-Keuls are two possible tests.
4. The statistical test results do not merit a table to themselves, but should be incorporated in the figures showing the actual data. For instance, Table 2 could be incorporated into Figure 3 as asterisks, daggers and the like.
5. The number of observations must be reported.
6. The data for the spinnability must be shown, and not just the significance, as is now done in Table 1.
7. The significance for the data in Figure 2 must be shown.
8. The findings represented in Figure 4 are truly impressive. Unanswered is the question whether the gum mixture ever made it out of the machine; quantifying what is on the target, on the surrounding space and that which is left in the machine is thus a must.
9. What did "C" do? You say it changed the results, but not whether transport velocity increased or decreased.

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. The authors' affiliations are not listed, nor are the sources of financial support.

Discretionary Revisions (which the author can choose to ignore)
1. The Mucolysis Figure 1 should include the crosslinking actions discussed in this manuscript.
2. Sodium borate crosslinking seems to do the opposite as the agent tested here; if so, why?
3. Pick a tense and stick with it; the methods are sometimes in the past tense, and sometimes in the present tense.
4. The discussion is repetitious; I would prefer that you say more about the subject, and not just repeat the important points.

**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:** No

**Declaration of competing interests:**

I declare that I have no competing interests.