This article details the exciting discovery that the widespread fungus *Mortierella Alpina* is a potent ice nucleator. The results of the work will certainly be of interest to researchers concerned with the environmental consequences of highly efficient ice nucleators, such as the potential for stimulating glaciation in clouds. The techniques used to arrive at this finding on *M. alpina* being an exceptional ice nucleator are are well described, and will direct future researchers interested in probing for further biological ice nucleators in the environment. Issues I would like to see addressed are:

- The phrase ice nucleation active (INA) is used at numerous points throughout paper, beginning at the abstract (page 12698, line 6). However, the successful experimental observation of heterogeneous ice nucleation in the immersion mode is dependent on the concentrations of the nucleating material employed, and the temperature range which can be probed, as subject to instrumental limitations. While I would prefer the use of more concise language (e.g. "efficient ice nucleators" rather than "ice nucleation active"), as this phrase appears so widely throughout the paper, a concise definition of what is meant by INA from its first occurrence would be easier than having to reword throughout.

- One of the key results highlighted by the authors is that the ice nucleating particles produced by the fungus seem to be < 300 kDa in size. However, there is very little discussion on the centrifuge ultrafilters used in the study (e.g. section 2.6). For instance, can the authors provide information on how wide the pore size distributions on these filters are? A discussion of this, perhaps as part of the experimental section, would be useful to give an idea as to how constrained this estimate on the protein size is.

- Page 12702 line 6: For those not familiar with the experimental setup, can you describe what is meant by the "head" in this sentence? At what point in the temperature ramp was the temperature variation measured? Does the value of ±0.2°C for the temperature variation across the "head" translate into a droplet-to-droplet temperature uncertainty of ±0.2°C?

- Figure 2 and Figure 3: Error bars in both temperature and the concentration of active ice nuclei should be shown. A discussion of the main uncertainties in the analysis used to produce this graph would also be useful in the main text.

- Page 12710 line 21: I'm unclear on exactly how the authors reach the conclusion that *M. alpina* seem to form only a "single activity class"? Could the authors elaborate?

Other comments/typos

- Page 12708 line 14: Typo in the word significantly here.

- Page 12704, line 19: I suggest it is worth spelling out for the reader why a 0.1 µm filter was used here.

- Page 12709 line 9: Can the authors explain for readers interested in the study, but not necessarily possessing a background in biology, what "arbuscular mycorrhizal fungi" is?