Reviewer's report

Title: Twin discordance and disease: not just an environmental cause?

Version: 1 Date: 29 May 2012

Reviewer: Esteban Ballestar

Reviewer's report:

The manuscript by Czyz and colleague deals with the interesting topic of monozygotic twin discordance and the increasing recognition of epigenetics as a mechanism to explain this phenomenon. The review is well written and has a wide prospective on the potential factors to explain MZ discordance. It will appeal to a wide audience. My only concern is that the authors oppose environment with epigenetics, even in the title. I do think that environmental factors and epigenetic mechanisms are at different levels and cannot be compared with each other. In fact, a variety of environmental factors are a potential source to generate epigenetic changes (at least in part), and this should be clearer stated in the text. Epigenetic changes can occur as a result of environmental factors, stochastic changes or epimutations and as a result of mutations taking place at genes encoding elements of the epigenetic machinery. In this review the focus is therefore brought from the environmental level to another level, where environment is just another component. The text should be modified to clarify this issue. This change should also affect the title.

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.