Reviewer's report

Title: Screening of the DNA mismatch repair genes, MLH1 and MSH2, in a Greek cohort of Lynch syndrome suspected families.

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Reviewer: Lovise Mæhle

Reviewer's report:

This paper is a description of mutation spectrum in colon cancer families defined by specific criteria. It is both a presentation of how many families fulfilling the criteria (Bethesda and Amsterdam) had a deleterious mutation and a description of the mutation spectrum in this Mediterranean island. The author's question and purpose should be stated as precisely in the abstract as in the last paragraph in the "Background" chapter.

The information we get is useful to clinical geneticists working in the cancer genetics field.

A major problem/limitation with the work is that only the two genes MSH2 and MLH1 are analysed. It is normal standard, even in the clinic these days in addition to analyse both MSH6 and PMS2.

In the second paragraph of the "Discussion" part new results are presented, not mentioned in "Methods" or "Results". This is probably the youngest patients from the 951 sporadic cancer group, but this is not stated.

One family is presented as being of special interest since two family members (not carrying the family mutation) have breast cancer and thyroid cancer respectively. The authors say that "this rises up a critical issue on whether breast cancer is part of Lynch syndrome". What they mean is probably that breast cancer observed in previous scientific reports in Lynch families may have been phenocopies, i.e. sporadic cancers not caused by the MMR gene mutation. The question of a specific cancer's relation to the MMR-mutation in the family can easily be overcome by examining the tumour tissue with immunohistochemistry analyses. Lack of gene product for the gene of interest indicates with high specificity if this tumour is caused by the mutation.

Immunohistogemistry as a cheap and useful tool to screen families where Lynch syndrome is suspected should be mentioned.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published
**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests.