Reviewer's report

Title: Essential oil of pinus koraiensis leaves inhibits cell proliferation and migration via inhibition of p21-activated kinase 1 pathway in HCT116 colorectal cancer cells.

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Reviewer: Cagri SAKALAR

Reviewer's report:

In this study, Authors demonstrated for the first time that EOPK reduced proliferation of HCT 116 cells through G1 arrest. Also, they showed EOPK inhibited cell migration and induced changes of actin cytoskeleton of HCT116 cells. They demonstrated that EOPK attenuates #-catenin, phosphorylation of AKT, and ERK by regulating PAK-1 inhibition.

The article implicates the anti-tumor effect of EOPK through a comprehensive analysis of phosphorylation of key factors in several signaling pathways and shows a connection between the function of PAK-1 and the effect of EOPK. Therefore, my opinion is that the article may be acceptable for publication with some revisions.

Major Compulsory Revisions:

1. Experimentally, the effect of EOPK was shown on colorectal cancer cells, however there is not a control cell line included. It would be useful to show the cytotoxic effect of EOPK on non-tumor cells such as normal colon epithelial cells or maybe fibroblasts.

2. Discussion part needs to be improved. Obtained data must be discussed more thoroughly. For example, is there a synergy between PAK-1 siRNA and EOPK and what might be the underlying mechanisms? A figure might be added to Show the interactions of key factors in signaling pathways.

Minor Essential Revisions:

1. Manuscript needs to be carefully revised and corrected in terms of language and grammar.

2. Abstract needs to be written in more coherent manner to reflect the findings of the paper more precisely.

3. In methods, Cell growth assay part needs to written using passive sentences.

Discretionary Revisions

1. Authors may show the degree of apoptosis using simple giemsa stainig or appropriate kits in cancer cells after treatment with EOPK.
2. The authors may demonstrate the cytotoxic effect of EOPK on cancer cells in short term culture (2 days) in addition to long term (5 day) culture.

**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:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

'I declare that I have no competing interests