

Research Assessment #3

Date: September 18, 2020

Subject: OMICS-based personalized oncology

APA Citation:

Hayes, D.F. OMICS-based personalized oncology: if it is worth doing, it is worth doing well!. *BMC Med* 11, 221 (2013).

<https://doi.org/10.1186/1741-7015-11-221>

Assessment:

In today's world, the personalization of medicine has never been more important. The fact that each patient is different and should be treated accordingly is repeatedly suggested throughout, and it is an idea that many medical professionals are still trying to figure out the parts of. How can we effectively and correctly diagnose patients, and be able to better provide treatment options based on the individual medical history of the patient?

In oncology, one of the personalizations of medicine is also known as omics. Omics sciences are a field of science that categorizes the study of biological factors, and it also includes the study of biotechnology. Typically, tumor biomarkers tests are used to test for tumor biomarkers, which are then used to provide specific information, leading to a diagnosis (Hayes, 2013, p. 1). These tests have been helpful in diagnosing conditions such as breast cancer, but according to Hayes (2013) they have not been able to consistently be used much in the treatment of cancer patients. How can these tests be improved so that they can be more widely used?

According to the article, "in papers published simultaneously in *BMC Medicine* and *Nature*, McShane and colleagues have proposed a checklist of criteria that should be followed by investigators planning to conduct prospective clinical trials directed towards generating evidence... [of] whether a tumor biomarker test has clinical utility," (Hayes, 2013, p. 1). The necessity of this checklist is also reiterated in page 2, where the author goes into detail about why the checklist should be implemented in the development of the tumor biomarker tests. Additionally, the process for creating these tests is very complex, as it should be, to avoid any mistakes. However, other researchers are trying to come up with another testing procedure that can be used to make some tumor biomarker tests. It is specified that the intricate process used to create the tumor biomarker tests is somewhat similar to the scientific method, in that there are stages of a hypothesis, objectives, testing and trial observations, and a conclusion, although the process described in creating tumor biomarker tests goes into much more detail. Could it be possible to create new models similar to the one being used currently for developing tumor biomarker tests?

The objective of the tests are to be able to better understand and test for the tumor biomarkers. One idea that may be applicable in finding a new testing process or a new tumor biomarker test is by first conducting research on the genomic coding of the cancer cells. I'm not really very sure about all of the complete information on how exactly the tests would work, but by conducting research on the genomics of the cancer cells, we would then be able to get a lead in how we can correct the mutation. Cancer can be caused by a mutation in the cells. Once the mutation is identified, we can use that information to create a

similar test that would try to identify that same genomic sequence in a person's cells. For example, if a patient has a specific type of cancer such as skin cancer, which can sometimes be hard to diagnose, we can use the findings of similar patients who also had skin cancer to test for skin cancer in the patient. This is one application. Another application might be to test if the cancer is metastatic, or has spread to the different parts of the body. If there is a genetic mutation detected in one part of the patient's body that has cancer already, we can use a test with the similar genetic coding to see if it has spread to other parts of the body. The tumor biomarkers have so much potential to be used for more genetic testing and cancer testing. In the future, with more research and evaluation, we will be able to make personalized medicine more available through the use of these tumor biomarkers.