



# Developing the First Vaccine for Treating ALK-Positive Lung Cancer

Posted on October 31, 2019 - 2:19pm

By Juhi Kunde, MA, LUNGevity Science Writer

Approximately 5% of non-small cell lung cancer patients have tumors resulting from the fusion of the ALK gene with another gene (usually EML4). While there are a number of tyrosine kinase inhibitors (TKIs) approved to treat ALK-positive lung cancers, the cancer is likely to recur because of the development of resistance to them.

“In many types of lung cancer, immunotherapy, which harnesses the body’s natural ability to fight illness, is a useful treatment option. However, for ALK-positive patients, the immunotherapies that are currently available have not shown significant benefits,” explains Mark Awad, MD, PhD, clinical director of the Lowe Center for Thoracic Oncology Treatment Center at the Dana-Farber Cancer Institute in Boston. “We needed a different approach to help ALK-positive patients.”

Working with a close collaborator, Roberto Chiarle, MD, associate professor in the Department of Pathology at Boston Children’s Hospital, Dr. Awad was excited to learn that some ALK-positive lung cancer patients have immune systems that recognize the tumors as something the body needs to fight. “It meant that we could use that to our advantage. We could find a way to rev up the body’s natural immune system to not just “see” the tumor, but to also attack it,” says Dr. Awad.

Using mouse models, the researchers demonstrated that it was possible to use a vaccine to amplify the natural immune response against ALK-positive tumors. The researchers also saw improved outcomes



*Dr. Mark Awad*

when combining the vaccine with TKI therapies in mice.

With a 2018 LUNGeVity research grant funded by [ALK Positive](https://www.alkpositive.org/) (<https://www.alkpositive.org/>), a patient advocacy group dedicated to advancing research and advocacy to change the future of ALK-positive lung cancer, Drs. Awad and Chiarle are developing a therapeutic vaccine that could improve the survival rates for ALK-positive lung cancer patients.

Similar to a flu shot, the vaccine introduces pieces of the mutated ALK protein into a patient's body. These protein pieces are carefully selected to prepare the immune system to fight any cells with the mutated ALK protein. The immune cells then circulate through the body looking for and killing any cells that have the mutated ALK protein.

Because the mutated ALK protein is only found in cancerous cells, the researchers expect that side effects for patients using the therapeutic vaccine will be minimized. "We are hopeful that patients will be able to tolerate this treatment quite well. Of course, we won't know for sure until we conduct the phase 1 clinical trial to confirm the safety of the treatment," notes Dr. Awad.

The research team's next steps are to manufacture the vaccine and then begin the clinical trial (which will include about 20-25 patients) to demonstrate that the vaccine is safe for ALK-positive lung cancer patients. Because manufacturing the vaccine and conducting the clinical trial are expensive (it will cost approximately \$750,000 to manufacture the vaccine and another \$1 million to conduct the clinical trial), the researchers are discussing potential partnerships with pharmaceutical companies to manufacture and test the vaccine quickly and efficiently.

Drs. Awad and Chiarle are on the cusp of getting this vaccine to patients. They continue working to optimize the protein pieces chosen for the vaccine, improve their plan for the clinical trial, and acquire the necessary funding to begin the clinical trial as soon as possible.

"I am so impressed, and so grateful, for all the patients and their family members in advocacy groups, such as ALK Positive and LUNGeVity, for their efforts," said Dr. Awad. "By participating in clinical trials, providing biopsy and blood samples, and educating themselves and others, these groups have helped advance the field. Their involvement is really making a difference."

## Related Reading:

[Reflections on the 20<sup>th</sup> World Conference on Lung Cancer \(/news-blogs/blogs/reflections-on-20th-world-conference-on-lung-cancer\)](/news-blogs/blogs/reflections-on-20th-world-conference-on-lung-cancer)

[An Oncologist's Perspective on Biomarker Testing \(/news-blogs/blogs/oncologists-perspective-on-comprehensive-biomarker-testing\)](/news-blogs/blogs/oncologists-perspective-on-comprehensive-biomarker-testing)

[2018 ALK-Positive Lung Cancer Transformational Research Award \(/research/translational-science-research-grant-programs/2018-alk-positive-lung-cancer\)](/research/translational-science-research-grant-programs/2018-alk-positive-lung-cancer)



*Juhi Kunde, MA, is a science writer for LUNGeVity.*



**Blog category:** From the experts

- > Biomarker testing
- > Lung cancer types
- > Treatment

 Tweet

 Like 978

 Share

