

Research Models  
and Services

Case study

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# Identifying candidates to detect aflatoxin and supporting commercial products: a monoclonal antibody case study

## Understanding the challenge

A government agency wanted to address an ongoing food safety challenge but faced difficulty locating reagents to test for grain spoilage. They asked Envigo to perform a series of fusions to identify potential candidates that could screen for various aflatoxins and help predict food spoilage prior to observing fungus on crops.

## Setting up the initial investigation

The Envigo team went into this project with high confidence as they had worked with this agency previously and had deep experience processing multiple clones. Due to the nature of the different aflatoxin antigens, the team first developed a custom protocol for presenting the antigen.

Over the course of several fusions and alterations of the immunization protocol, the team secured several potential candidates. To keep the candidates separate and further characterize their specificity during the limited dilution cloning process, clones were screened using multiple antigens with ELISA.

Working with the customer and their specifications, Envigo screened hundreds of clones, identifying and stabilizing 44 of the most promising ones. With the final selection, antibody material was made to each clone so the customer could further evaluate the product's potential use in both research and commercial settings.

## Addressing background issues with expert support

Early studies showed that the *in vivo* produced material showed elevated background to environmental fungus. In order to evaluate the background issues, Envigo undertook two approaches to understand and reduce the effects of the background issues. In the first study, the team produced the material in an immune compromised mouse in the presence of Teklad sterile feed and bedding to reduce background.

During the second study, Envigo pursued *in vitro* production in hollow fiber bioreactors. In this case, the cell line was inoculated into a small hollow fiber bioreactor. After several weeks, cells were obtained from the hollow fiber cartridge. These cells were then cloned and evaluated for antibody production by inoculating several small bioreactors under identical conditions. By adapting the cells to the dynamic nature of the bioreactor, a 3-fold increase in antibody titer was obtained.

## Enabling commercial success

From inception to the commercial products, Envigo delivered comprehensive solutions to maintain a continuous dialogue throughout the project and meet the customer's needs. Using the clones provided by Envigo, the customer's researcher has published several articles, enticing companies

to purchase the rights to clones for commercial use.

Today, the resulting tests are used extensively around the world to identify fungal contamination in a variety of crops, such as rice, wheat, corn, hops, barley, peanuts, citrus fruits, soybeans and sorghum. Due to the strong relationship developed in this series of projects over the last 20 years, Envigo continues to provide a significant portion of the monoclonal antibody production for these important food safety tests to monitor and detect aflatoxin.

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