



Film Screenings

Stanley Plotkin: *Pioneering the use of fetal cells to make rubella vaccine*

Film Comprehension Questions

What are possible consequences if a pregnant person is infected with rubella during the first trimester of pregnancy?

Rubella virus causes the most severe damage during the first 12 weeks (first trimester) of pregnancy. Rubella infection can lead to miscarriage, stillbirth, and severe birth defects, such as loss of hearing, vision impairment, heart defects, and developmental disabilities.

Why did Dr. Plotkin choose to use human fetal cells instead of animal cells to grow the virus for the rubella vaccine?

Two important factors led Dr. Plotkin to use human fetal cells:

1. At the time when he was creating the rubella vaccine, a contaminating virus that could potentially cause cancer (called SV40) had been discovered in the animal cells used to grow the virus for polio vaccines. It turns out this virus did not cause cancer in vaccine recipients, but to avoid concerns about viruses contaminating the cells used to grow the virus, Dr. Plotkin looked to human cells. However, once born, we are introduced to infections, and some of the causative agents can stay in cells. On the other hand, because the womb is a sterile environment, fetal cells are typically free from viral contamination.
2. Viruses that reproduce in people are going to grow more efficiently in human cells, so using fetal cells offered this additional benefit to getting the virus to grow in a lab setting.

How does the process of attenuation (weakening the virus) work?

Scientists create a weakened version of a virus by making it grow in an environment in which it is not used to growing. By forcing the virus to reproduce in the new environment, the virus adapts to the new environment. Now, when given as a vaccine, the virus is less efficient at growing in human cells. As a result, an immune response develops without the typical effects of an infection. To review how attenuation works, check out the stand-alone version of the animation, [“Attenuation: How Scientists Make Live Vaccines.”](#) that was also shared in the film.

Why did Dr. Plotkin get a standing ovation at the 1969 National Institutes of Health meeting?

After Dr. Albert Sabin, developer of the oral polio vaccine, disagreed with the use of diploid cells in vaccines without evidence, Dr. Plotkin pointed to the data to show that the rubella vaccine was safe. The scientists in attendance gave Dr. Plotkin a standing ovation to demonstrate their respect for Dr. Plotkin’s data-backed position.

Why did Dr. Maurice Hilleman choose to use Dr. Plotkin’s vaccine?

While Dr. Plotkin’s human diploid rubella vaccine was being given in Europe, the U.S. originally used a rubella vaccine created by Dr. Maurice Hilleman that was attenuated in duck egg cells, in part due to public objection to the use of human fetal cells. However, the U.S. switched to Dr. Plotkin’s vaccine when Dr. Hilleman analyzed the data and determined the human diploid version was more effective and just as safe.

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