CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)

Teresa Lee; Angela Tsai

Project Number

22181

Project Title

The Myth of T-Cells

Abstract

Objectives/Goals

Varicella-Zoster Virus (VZV) is a human specific virus that commonly causes chicken pox in children. The effects of the virus are seen on the skin with red puffs. It can be deduced that here is something that transports the virus to the skin epidermal layer. T-cells are one of the most mobile cells in the body, earlier research has shown that T-cells can be infected with VZV, and may be associated with the speading of the virus. The purpose of our experiment was to determine whether or not T-cells may be infected with VZV and be the carrier of the virus to the epidermal layer.

Methods/Materials

Since T-cells are mobile and continuously circulate in the body, we hypothesize that virally infected T-cells may be able to transfer the virus to skin through blood circulatin. To explore this possibility, we injected T-cells in a SCID mouse's tail vein that contained grafted human skin tissue implants within its body. Were the hypothesis true, we would expect to observe that the skin graft is infected by the virus. Were it not true, the skin graft would be normal. T-cells infected with VZV were injected into the tail vein of a SCID-hu mouse. Immunofluorescent assay-infected T-cells were stained with antibodies to check the infection of the T-cells. Infectious focus assay was used to determinethe nuber of viral particles there were on the human implant. Also, the tissue section was stained to observe effects of viral infection on the skin and confirm infection.

Results

From the infectous focus assay, we found that the viral particles had replicated in the skin tissue. Also, from the tissue sections, we saw viral particles destroying the tissue. Then, from the immunofluorescent assay, we found the T-cells infected and that T-cells could be the carriers of VZV.

Conclusions/Discussion

We concluded that T-cells could be infected with VZV. After examining the infectious focus assay, the virus had reached its destination and infected the skin, since many viruses have been made in the implants. The way the T-cells found its way to the implant is analogous to the way T-cells infect the skin. VZV kills healthy skin cells in a series of stages that were visible in the tissue sections. After looking at the slides of the tissue sections, it provided more evidence that VZV had replicated in the transplant.

Summary Statement

To determine whether or not T-cells may be infected with Varicella-Zoster virus and be the carrier of the virus to the epidermal layer.

Help Received

Used lab equipment at Stanford University under the supervision of Dr. Ku, mother helped with the design of posterboard, neighbor helped us find a mentor

Preliminary