

A Possible Cure for Epidermodysplasia Verruciformis

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Introduction

- **Epidermodysplasia Verruciformis, AKA “Human Tree Disease”, usually results from a combined infection of HIV and HPV**
- **Through HIV or other reasons, a patient’s immune system is lowered, allowing for the warts to grow**
- **These warts can range from small, hardened ‘plates’ to large, gnarled horn-like structures**
- **These growths may become cancerous, and the disease itself may cause other forms of skin cancer**
- **No definitive cure has been made**

Attempted Solutions

- Surgery - required once every six months, removes most warts and growth but does not prevent their return
- Cimetidine - Shown to be ineffective after laboratory testing. Used for hives
- Acitretin (Vitamin A derivative) - Acitretin is noted for the possibility of severe birth defects. It may cause nausea, headache, itching, dry, red or flaky skin, dry or red eyes, dry or chapped lips, swollen lips, dry mouth, thirst, cystic acne or hair loss. Used in severe psoriasis.



Proposed Cure

Our cure is a CAR T-Cell infusion. This takes a donor's T-cells and multiplies them many times. CAR T-Cells are specialized T-Cells for cell mediated and antibody production. These CAR T-Cells would be put into the patient and would fight the cancer. Before the infusion, the patient would have a surgeon remove the warts.



HIV

- The main problem for EV patients is HIV
- Without the HIV (lowered immune system), the HPV could be dealt with by the body, but the HIV lowers the immune system to the point where the HPV gets out of control
- Our cure focuses on the HIV half, so the boosted immune system can handle the HPV and warts post surgery

Production

- T cells will be isolated from the donor's blood
- After 2 days, the T cells will be added to cell cultures loaded with the CD19 CAR T-cell
- The cells will be incubated for 24 h
- Cells will then be expanded for an additional 9 days.
- CAR T-cells will then be put into the patient to boost the immune system

Why it Will Work

It will strengthen the patient's immune system. Because this solution uses donors with the same blood type as the patient, there should be few negative reactions.

Similar attempts have worked previously in similar situations. For Example, EV is similar to cancer, and T-cell infusion has shown to have a positive effect on patients fighting cancer.

Testing Procedure

1. Infect a mouse with HIV (BLT mouse)
2. Give the mouse a T-Cell infusion
3. Test the T-cell levels of the mouse in 2 months to make sure the T-cells remained and allow the mouse to fight off the infection
4. If successful, repeat on human HIV patient
5. Proceed to EV patient if successful in human trials

Virtual Mentor/Credits

Gordon Lithgow, PhD of Genetics, Buck Institute

Links/Credit

- <https://www.youtube.com/watch?v=GIKe4aFzln0>
- https://en.wikipedia.org/wiki/Epidermodysplasia_verruciformis
- <http://www.cnn.com/2016/02/26/asia/bangladesh-tree-man-surgery/>
- <http://www.cancer.gov/about-cancer/treatment/research/car-t-cells>
- <http://emedicine.medscape.com/article/1131981-treatment>

**Thanks For
Watching**