

Human Fetal Cell Strains and Vaccinations

How did this process begin?

The two main human cell strains used in the vaccines listed on the right were obtained from fetal cells in the 1960's. The fetuses were intentionally aborted, but not for the purpose of harvesting cells or producing vaccines. After the abortion, scientists obtained cell samples. They did not induce the abortions. The WI-38 strain is from a fetus in Sweden of 3-months gestation and MRC-5 is from a 14-week-old fetus in the United Kingdom. Since then, cells have been grown in laboratory conditions. They can readily reproduce themselves. There will not be a need for additional fetal cells, and no new abortions will be performed for vaccine production.

Vaccines Developed Using Human Cells

- Hepatitis A vaccines
- Rubella vaccine (including MMR)
- Varicella (chickenpox) vaccine
- Pentacel Combination Vaccine
- Zoster (shingles) vaccine
- Adenovirus oral vaccine
- Rabies Vaccine

The Rubella virus used to make the vaccine was from an additional fetal cell source. Rubella exposure can cause life-threatening birth defects. The Rubella virus was taken from a fetus that was aborted due to exposure to the virus, then grown on the WI-38 cell line. The abortion was not conducted to isolate the virus. Now, this virus is the source of the only currently available rubella vaccine and has now prevented millions of cases of Rubella. The Rubella virus is self-propagating in WI-38 cells and there is no need to obtain new fetal cells.

Why are human cell strains used to make vaccines?

Unlike bacteria, viruses cannot reproduce on their own. Instead, they need human cells to grow, to be studied, and to be manipulated to create vaccines. The cells that are used to grow viruses must survive in a lab for a long time. Sometimes human cancer cells can be used, but since these cells have many genetic abnormalities, they introduce possible health risks. Currently, the only safe technology for producing vaccines to these viruses is using cells from one of two human fetal cell strains. Since the use of human cell strains, millions of cases of rubella, hepatitis A, varicella and rabies have been prevented.

Is this type of vaccine safe?

This type of vaccine has been used extensively for decades and been proven very safe. In fact, human fetal cells are much safer than using cells from animal tissues, which may contain particles that aren't safe for people.

Are there alternatives?

The Rabies vaccine has an alternative, called RabAvert. This vaccine was made with the same process, excepting using a fetal cell line from *rhesus macaque*, a type of monkey. Another viral vaccine, against Hepatitis B, is made using only molecular tools in a lab. While there are no other alternatives for any of the vaccines listed above, but the Center for Disease Control (CDC) recognizes the need. Ever since the benefits of stem cells were recognized, scientists have been searching for non-embryonic sources, but the technology is still a work in progress.

Is there religious guidance on this issue?

Vaccination is a powerful life-saving tool. In 2005, Pope Benedict XVI concluded that parents who chose not to give vaccines derived from fetal cells would be in "more proximate cooperation with evil," than parents who chose to accept vaccination.

References:

Consenting to vaccination for Rubella. CDC. 1994. <http://www.cdc.gov/vaccines/imz-managers/laws/rubella-cathnews.html>
Human Fetal Links with Some Vaccines. *National Network for Immunization Information*. 2008. <http://www.immunizationinfo.org/issues/vaccine-components/human-fetal-links-some-vaccines>
Infant Immunization: Catholic Parents' Guide. Henz, DJ. *COG for Life*. 2011. <http://www.cogforlife.org/catholicguide.pdf>
Moral Reflections on Vaccines Prepared from Cells from Aborted Human Fetuses. *Sacred Congregation of the Doctrine of Faith*. 2005. <http://www.immunize.org/concerns/vaticandocument.htm>
Vaccine Ingredients. *Children's Hospital of Philadelphia*. 2014. <http://www.chop.edu/export/download/pdfs/articles/vaccine-education-center/vaccine-ingredients.pdf>

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