### Reasons human cells are used in vaccine research and development:

- To develop a vaccine that can be produced on a large scale, researchers must **grow viruses or bacteria in large quantities** and with great consistency.
- Bacteria can be grown in a laboratory, but viruses **need living cells to infect so they can make copies of themselves**.
- Viruses tend to grow **better in cells from humans** than those of other animals.
- **Human cells** can be maintained for long periods of time at low temperatures, enabling scientists to use the **same cell lines from many decades ago**.

### No additional or “new” human tissue or cells are needed to produce life-saving vaccines.

- Once cells are prepared from their original source, they **can be maintained indefinitely in the laboratory** through a process referred to as “cell culture” or “cell passage.”
- Human cells obtained from the early 1960s and 1970s have grown in the laboratory and are used to make some vaccines today.

### Two main human cell lines have been used to develop some currently available vaccines.

- The “WI-38” cell line was developed in 1962 in the United States.
- The “MRC-5” cell line was developed in 1970 at the Medical Research Center in the United Kingdom.
- **Two fetuses obtained from abortions that occurred by maternal choice – one in England, one in Sweden – are the source of the human cell lines used in vaccine development.** Neither abortion was performed for the purpose of vaccine development.

### Vaccines do not contain aborted fetal tissue.

- **Laboratory-grown cells** from cell cultures are used in the manufacturing process, not human tissue.
- During the purification process, the **vaccine material is carefully separated** from the cells in which it was grown.

### Human cell DNA is not contained in final vaccine preparations (the vaccine in the vials or syringes given to vaccine recipients).

- Vaccine viruses are **purified during vaccine production**, leaving only highly fragmented and minimal components of DNA (only present in picogram quantities).
  - A picogram is one-trillionth of a gram (0.000000000001).
  - The small amount of fragmented material is **not able to cause damage or interact with our own DNA**.

### Vaccines developed using the WI-38 or MRC-5 human cell lines.

- **Hepatitis A** vaccines
- **Rubella** (also known as German measles) vaccine
- **Varicella** (chickenpox) vaccine
- **Zoster** (shingles) vaccine
- One of the **COVID-19** vaccines (viral vector vaccine)
- **Adenovirus** Type 4 and Type 7 oral vaccine*
- **Rabies** vaccine*

* Vaccine not routinely given

### The use of human cell lines is not limited to certain vaccines.

- Human cell lines are used to test and develop many common over-the-counter and prescribed medications, including antacids and cold medications:
  - Over-the-counter pain relievers like **Tylenol** (acetaminophen), **Advil/Motrin** (ibuprofen), and **Aleve** (naproxen)
  - Prescription drugs like **Lipitor**, **albuterol**, **Prilosec OTC**, **azithromycin**, **hydroxychloroquine** and **ivermectin**

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1. Children’s Hospital of Philadelphia, Vaccine Education Center. Q&A Vol 1, Summer 2022 DNA, Fetal Cells & Vaccines: What You Should Know
2. Ibid.