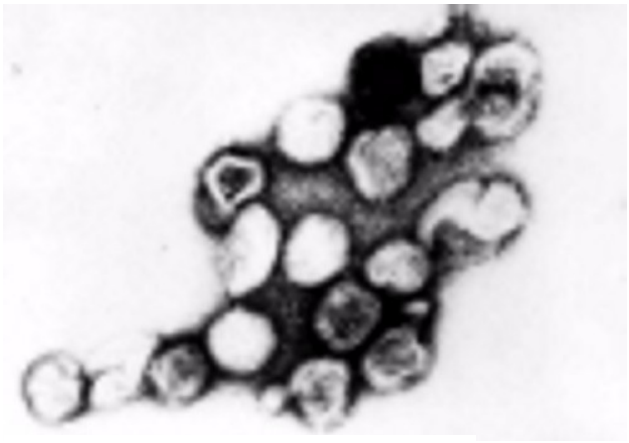
# Rubella Vaccine Information Paper

*A licensed vaccine developed by DoD and its partners*

UNITED STATES ARMY MEDICAL RESEARCH AND MATERIEL COMMAND

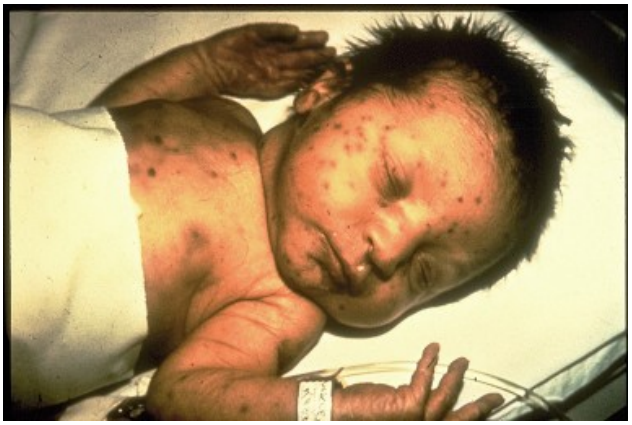
**Product Name:** Rubella Vaccine
**Commercial Name:** Meruvax (now Meruvax II)
**Date of U.S. Licensure:** 1969
**Type of Product:** live-attenuated viral vaccine
**Company of Manufacture:** Merck Sharp &Dohme

**Target Microorganism/Associated Disease:** German researchers first identified the disease "German measles" -- later known as "rubella" from the Latin "rubellus" meaning "reddish" -- as distinct from measles in 1814. Rubella is caused by a single-stranded RNA virus which spreads person-to-person (humans are the only known host) via respiratory droplets. The rubella virus causes fever and rash, which is followed by long-term joint pain and inflammation in rare cases. However, in early gestation rubella infection can result in serious fetal malformations (hearing impairments, heart defects/inflammation, mental retardation, brain inflammation, enlargement of the spleen and liver, low blood platelets).



*Transmission electron micrograph of rubella virus*

**Reasons for Development:** Prior to 1969, military recruits and military hospital workers (particularly females of childbearing age) were at risk for rubella infection. Beginning in 1947, pregnant women exposed to rubella were given convalescent serum or immune serum globulin to prevent fetal infection. A rubella pandemic that hit Europe in 1962, then caused 12.5 million cases of rubella and 2,000 cases of rubella encephalitis in the U.S. from 1963-4, with 30,000 afflicted infants (1% of all pregnancies, with 6,250 spontaneous abortions and 2,100 excess neonatal deaths) prompted rubella vaccine efforts.



*Infant with congenital rubella syndrome*

**Role of Department of Defense in Vaccine Development:** In 1962, COL Edward Buescher, COL Malcolm Artenstein, and CPT Paul Parkman of the Walter Reed Army Institute of Research (WRAIR) isolated the rubella virus from a recruit hospitalized at Fort Dix during an adenovirus outbreak investigation using virological techniques pioneered by scientists at WRAIR. (Weller and Neva also isolated the rubella virus at Harvard University in 1962). Parkman then moved on to the Food and Drug Administration, where, together with Dr. Harry Meyer, he used the isolated HPV-77 virus grown in duck-embryo culture to create Meruvax, (Merck)-- one of three rubella vaccines licensed in the U.S. in 1969. (A different viral strain [RA 27/3] was used as the basis of Meruvax II beginning in 1979.) Dr. Stanley Plotkin, a research physician at the Wistar Institute in Philadelphia, developed the RA 27/3 rubella strain (isolated from a fetus legally aborted in 1965) which became part of the Measles, Mumps and Rubella live virus vaccine II (MMRII, licensed in the U.S. in 1979, and recommended as a preferred agent for U.S. children in 1980). The impact of the rubella vaccine has been dramatic. During the 3 years before the vaccine was brought to market in 1969, 47,745 cases of rubella were recorded in the U.S; as of 2005, rubella virus infection has been eliminated in the U.S.

**Rubella vaccine references**:

ACP Medicine: Ch7 (Infectious Diseases), XXIX Measles. Mumps, Rubella, Parvovirus, Poxvirus

Artenstein AW, Opal JM, Opal SM, Tramont EC, Peter G, Russell PK. History of U.S. military contributions to the study of vaccines against infectious diseases. Military Medicine, in press.

Brown, David. Rubella virus eliminated from the United States. The Washington Post, 21 March 2005.

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Grabenstein, JD. Immunofacts: Vaccines and Immunologic Drugs. St. Louis, Missouri:Wolters Kluwer Health, Inc., 2005