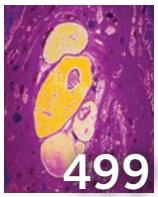
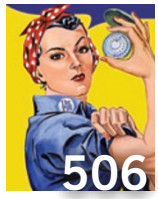


Papilloma pursuit:
Animal studies point to possible drugs against cervical cancer.

Just in time:
Adhering to strict drug regimens is made easier with technology.



The pill turns 50:
A reflection on oral contraceptives and potential improvements.

Vaccine contamination prompts safety review

When Eric Delwart couldn't find the right email addresses online to contact GlaxoSmithKline (GSK) in early February, he posted a good old-fashioned letter to the Belgian headquarters of the pharma giant to inform the company that one of its vaccines was contaminated with a pig virus.

Months earlier, Delwart, a viral genomicist at the University of California–San Francisco, and his colleagues began what they thought would be a run-of-the-mill experiment to sequence the viral nucleic acids in a suite of live, attenuated vaccines, including common shots for measles, rubella, yellow fever and four other viral diseases. They expected to find that there were no adventitious viruses in the vaccines.

They were wrong. The researchers discovered DNA from porcine circovirus-1 (PCV1), a nonpathogenic DNA virus that afflicts swine, in GSK's rotavirus vaccine Rotarix. "We were quite surprised," recalls Delwart, who also works at the Blood Systems Research Institute in San Francisco. After repeating the results in late January, Delwart felt obliged to inform the company, which performed additional tests and confirmed the contamination.

On 15 March, GSK informed the US Food and Drug Administration (FDA) of the impurity, and the company has since confirmed that PCV1 was present in the master stock of the vaccine—thus, Rotarix was probably contaminated during the earliest stages of development.

In their study, published last month, Delwart's team also found partial DNA and RNA sequences of foreign, noninfectious viruses in three other vaccines—a finding they anticipated prior to the test (*J. Virol.* doi:10.1128/JVI.02690-09, 2010). Unlike the rotavirus contamination, these other impurities are unavoidable by-products of the cells used to make each vaccine, Delwart says.

PCV1 is not the first intact viral sequence found in a vaccine, however. In the 1960s, researchers discovered simian virus-40 (SV40) in the polio vaccine as a result of the monkey kidney cells used to produce the shot. Some researchers have linked SV40 to human cancers, but those findings remain controversial (*J. Virol.* **77**, 5039–5045, 2003). In contrast, PCV1, which is ingested almost every time people eat pork, is not known to cause disease in animals or humans. As such, most researchers agree that Rotarix remains safe to use.

"As far as we understand right now, there is no evidence of any harm to people who have been exposed to this virus," says Neal Halsey, director of the Institute for Vaccine Safety at the Johns Hopkins Bloomberg School of Public Health in Baltimore. "However, it is still an unexpected contaminant. It wasn't planned to be in the vaccine, and, certainly, the manufacturer didn't know it was in the vaccine."

Erring on the side of caution, the FDA issued a statement on 22 March recommending a temporary hold on the use of the vaccine in the US, where Merck's RotaTeq is also available. The World Health Organization and the European Medicines Agency also reviewed the data and urged clinicians to continue to administer Rotarix in the developing world, where rotavirus-induced severe diarrhea kills more than 500,000 children each year.

An expert advisory committee, composed of representatives from the FDA, Centers for Disease Control and Prevention and the National Vaccine Information Center, as well as several doctors and a biostatistician, will convene in early May to further examine the Rotarix data and decide on the next steps for the vaccine. The committee will also discuss possible recommendations for the future use of technologies to screen vaccines and the biological materials used to make them.

Robert Jacobson, director of clinical studies for the vaccine research group at the Mayo Clinic in Rochester, Minnesota, believes genomic screening could become standard practice in vaccine development. "I do think there will be rapid adoption by industry and regulatory bodies to use this technique for aggressive monitoring of viral contamination in the future," says Jacobson, who is not part of the advisory committee. "I could see this method being used in blood banking, biological product development and even in food safety studies. There are going to be a lot of applications."

Megan Scudellari, Durham, North Carolina

istockphoto

Needle in a haystack: Sequencing detects viral contaminant in human vaccine.