



Three single-dose trials in horses demonstrate fertility control with SpayVac

There are currently over 81,000 feral horses (*Equus ferus caballus*) and burros (*E. asinus*) on U.S. public lands managed by BLM, but the appropriate management level is set around 25,000. Concerns about the impacts that these free-ranging horses have on shared rangelands has prompted the Bureau of Land Management to remove over 55,000 horses to off-range holding facilities, where costs exceed \$50 million per year. Certain Native-American lands have an equal or larger population of wild horses. The United States may have the largest population of wild horses and burros in the USA. Hop



- 12 captive mares were given a single injection of SpayVac, which dropped pregnancy rates to 0, 17, 17 and 17% for 1 to 4 years post-treatment, respectively, compared to 75, 75, 88 and 100% for untreated mares. [Killian et al.](#), 2008 provides additional details about this study.
- 14 captive mares were given a single injection of SpayVac, and 3-4 months post-vaccination, 93% of the mares stopped cycling compared to control mares that continued to cycle. This study was also designed as a safety trial and demonstrated no adverse health effects to any treated mares – vaccine effects were solely localized to the ovaries ([see Bechert et al.](#), 2013 for more information).
- 30 feral mares maintained in holding facilities were given a single injection of SpayVac, and fertility rates in the treated group dropped to 13, 47, and 43% compared to 100, 98 and 100% in controls for 1 to 3 years post-vaccination, respectively ([see Roelle et al.](#), 2017 for additional details).

DEER





Deer in urban and suburban areas can contribute to animal-vehicle collisions, disease transmission, and damage to vegetation. Immunocontraception is an attractive management tool for these populations. Three SpayVac trials in deer demonstrated fertility control:

- 41 free-ranging fallow deer (*Dama dama*) were vaccinated with a single injection of SpayVac, and none of them became pregnant for 3 years following treatment compared to 97% of untreated deer found pregnant each year year (see [Fraker et al., 2002](#) for details).
- 38 free-ranging white-tailed deer (*Odocoileus virginianus*) were given a single injection of SpayVac, and none of them became pregnant during the first 2 years after vaccination compared to 78% of untreated deer found pregnant each year (see [Locke et al., 2007](#) for details).
- 5 captive white-tailed deer were given a single injection of SpayVac, and none of them became pregnant during the next 3 years of the study compared to 100% of the control deer (see [Miller et al., 2009](#) for the full report).

OTHER SPECIES: SEALS, ELEPHANTS, MACAQUES





SEALS

Although grey seals (*Halichoerus grypus*) were hunted earlier, pup production on Sable Island in Nova Scotia has been increasing exponentially at an annual rate of 12.8% for the past four decades (Bowen et al., 2003, *Journal Marine Science* 60(6): 1265–1274).

SpayVac immunocontraception offers a humane alternative to culling to control these populations. One-hundred one (n=101) wild female grey seals were treated with a single injection of SpayVac, and fertility rates dropped from an average of 70% for controls to 12% for treated animals for 10+ years with a single-dose. See [Brown et al. 1997](#) for details about the initial 5-year study.

ELEPHANTS

As free-ranging populations of African (*Loxodonta africana*) and Asian elephants (*Elephas maximus*) become increasingly confined to smaller ranges, concerns grow about human–elephant conflicts and negative impacts on flora and fauna. A group of 6 captive African elephants were vaccinated with a single injection of SpayVac, and pZP antibody titers were first detected 4 weeks post-vaccination but did not peak until 1 year, after which they remained consistently elevated through 7+ years. Additional research is needed to determine actual contraceptive efficacy in these animals and how SpayVac could work in Asian elephants. See [Bechert and Fraker, 2016](#) for details about this promising initial trial.

MACAQUES

THE SPAYVAC TECHNOLOGY ADVANTAGE

The Key is Antigen Presentation to Immune Cells



SpayVac is formulated in patented, leading-edge delivery platforms that are the cornerstone of our vaccine development pipeline. The platform, exclusively licensed from IMV Corp for use in wild animals, is called VacciMax. It is a patented vaccine delivery formulation that provides controlled and prolonged exposure of antigens plus adjuvant to the immune system. The result is a strong, specific, and sustained immune response with the capability for single-dose effectiveness. It offers a robust and scalable engine for delivering many different targets that activate and direct immunocontraception in a controlled, impactful way.

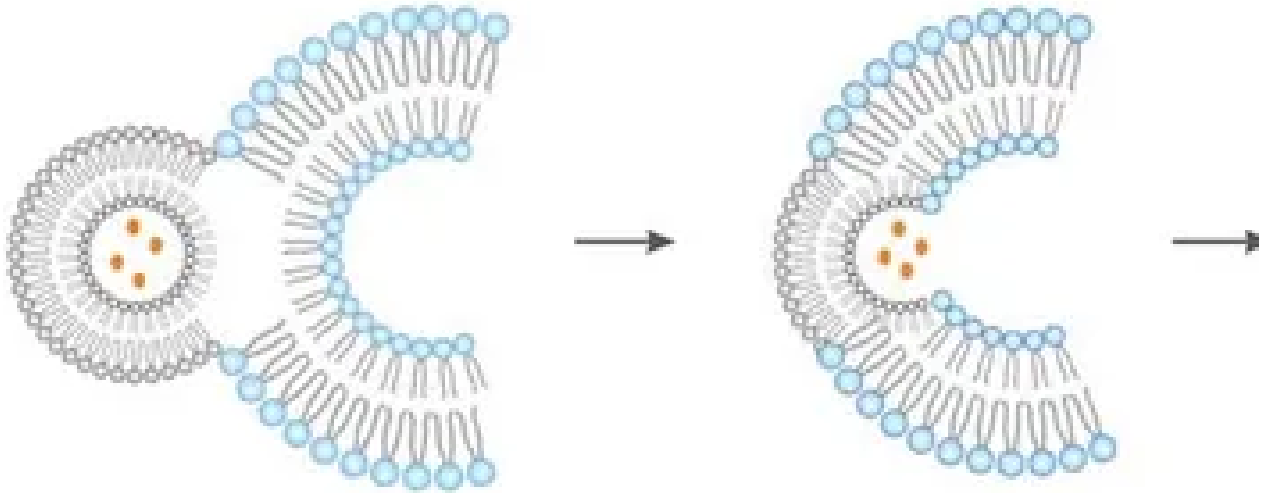
Why this matters:





The proprietary advantage starts with a groundbreaking delivery formulation that is a powerful mechanism to present the pZP antigen in the case of SpayVac to the animal's immune system, and sustain this presentation over a long timeframe. This platform utilizes a proprietary, extraordinarily stable “NO-RELEASE” delivery system utilizing highly engineered liposomes, which mitigates the propensity for antigens to break down, thereby extending the stimulation of the immune response.

What is a liposome?



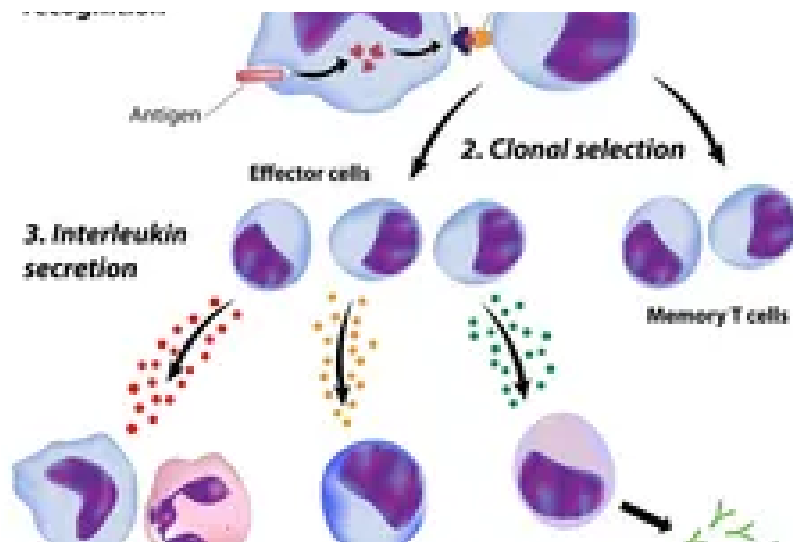
A **liposome** is a small sphere, made out of the same material as a cell membrane. Liposomes can be filled with drugs, and used to deliver antigens for vaccines. There are many advantages of liposomes. The biggest advantage is the cell membrane and the liposome membrane consist of the same phospholipid bilayer. This biocompatibility makes the targeted cells readily available to accept the active content (pZP in the SpayVac).



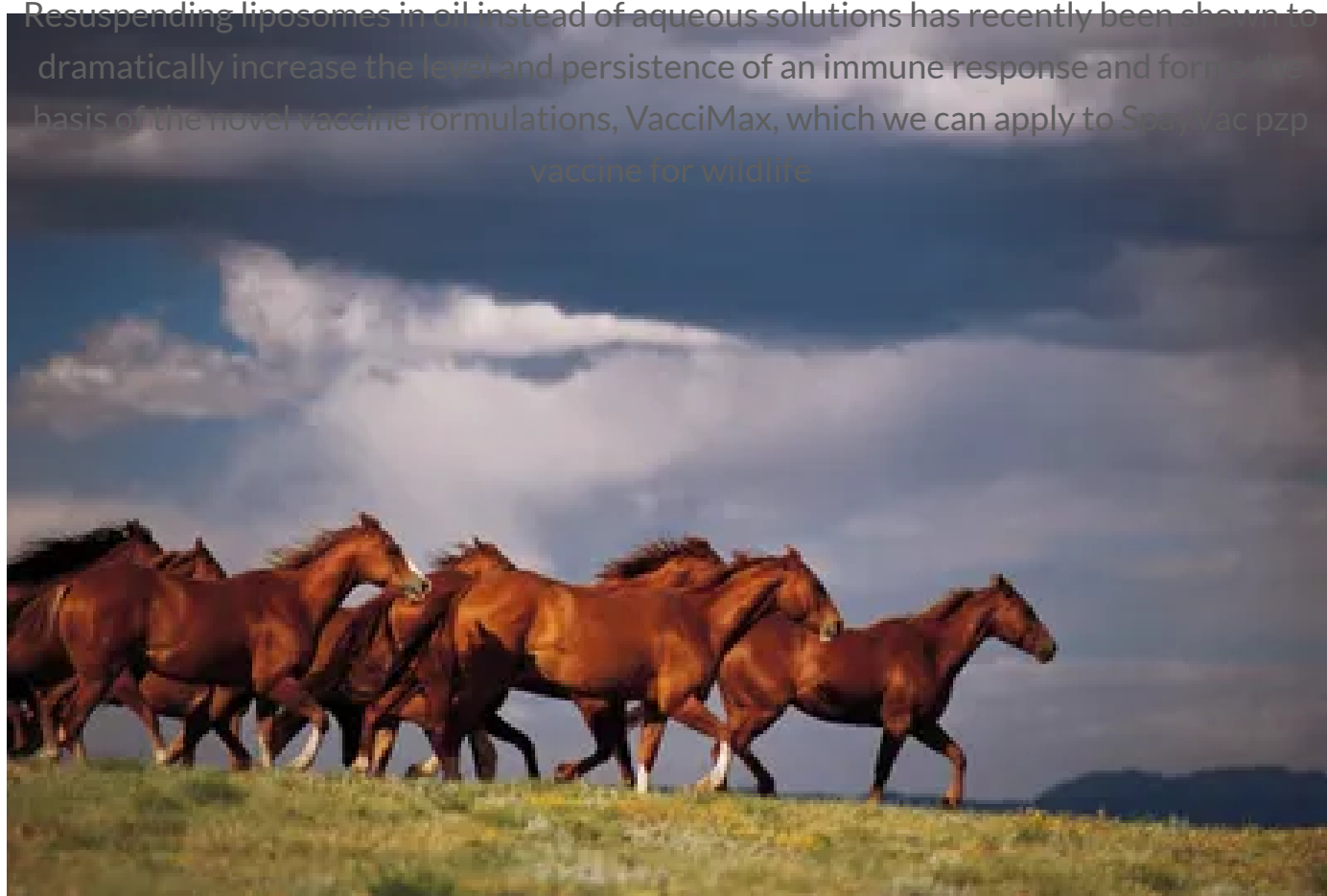
VacciMax is a patented vaccine delivery formulation that provides controlled and prolonged exposure of antigens plus adjuvant (immune system enhancers) to the immune system. The result is a strong, specific, and sustained immune response with the capability for single-dose effectiveness, which was proven in multiple trials with SpayVac.

The Superior Immune Response





Resuspending liposomes in oil instead of aqueous solutions has recently been shown to dramatically increase the level and persistence of an immune response and forms the basis of the novel vaccine formulations, VacciMax, which we can apply to SpayVac pzp vaccine for wildlife



Bibliography of Studies





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CONTACT US

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