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RED COLLAR CAMPAIGN: HELPING TO CONTROL RABIES IN A HUMANE, EFFECTIVE AND SUSTAINABLE WAY.

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An estimated 55,000 people die of rabies every year1, and 99% of these are caused by bites from rabid dogs.2 The global economic burden of rabies is estimated to be 4,000M USD/year3. Mass dog culls are organized by governments in misguided attempts to control the disease and limit outbreaks however this approach has repeatedly been shown to be ineffective for rabies control4. These culls include gassing, shooting, electrocution, beating, and poisoning, cause the needless death of millions of dogs each year, furthermore such inhumane methods are condemned internationally5. Conversely, evidence shows that vaccinating at least 70% of a dog population annually creates a barrier of healthy immune dogs that stops the disease from spreading.2 On World Rabies Day 2011, WSPA launched the Red Collar Campaign (RCC), which is a global campaign to end the inhumane culling of dogs in the fight against rabies. Our goal is to convince and assist governments to control rabies in an effective, humane, and sustainable way through mass vaccination without the inhumane culling of dogs. Latin America (LA) is an example of best practice in rabies control as it has been committed to dog vaccination since the 80´s. Using this approach, dog rabies cases in LA declined from 25,000 in 1977 to 196 in 2011, a decrease of 99% and subsequently , human rabies also fell to only 15 in 2011, a decrease of 96%.6 Thus, mass vaccination of dogs has become an essential component in rabies control by halting disease spread, alongside pre and post-exposure prophylaxis, surveillance and informational campaigns. This commendable work reveals the importance of creating political will and provides inspiration to other regions to change their policy and practice. In 2008, a rabies outbreak occurred in the previously rabies-free island of Bali, Indonesia, leading to a widespread dog cull. In 2010, in response to this unnecessary killing, WSPA worked together with the Bali Animal Welfare Association (BAWA) and convinced Bali's government to stop killing dogs and implement the first islandwide mass dog vaccination, reaching 70% coverage and saving over 300,000 dogs from a needless death. During this vaccination period, human rabies cases decreased by 35%, and dog cases by 76%.6 The Disease Investigation Centre in Bali reports that people in Indonesia now believe in the power of vaccination and the systems and procedures developed during WSPA and BAWA´s work in Bali are being adopted as national guidelines. In November 2011, WSPA supported the Bangladeshi government to carry out a pilot dog vaccination project in Cox's Bazar, vaccinating more than 70% of the dog population in two weeks. WSPA is now working with the Government to develop a national action plan for eliminating rabies through mass dog vaccination. WSPA's RCC has continued to gather global momentum since these successes, providing further evidence for the contribution of positive animal welfare to human health. 1. Knobel, D.L. et al. Re-evaluating the burden of rabies in Africa and Asia. Bulletin of the World Health Organization 83, 360-368 (2005) 2. World Health Organization *Rabies Fact sheet No.99*, updated Sept 2010. Accessed July 2012www.who.int/mediacentre/factsheets/fs099/en/ 3. Hampson K et al. Reassessment of the Global Burden of Canine Rabies: Human & Animal Costs. Presented by S Cleaveland to OIE Global Conference on Rabies Control: Towards sustainable prevention at source, 7-9 September 2011. Accessed July 2012 www.oie.int/eng/A_RABIES/presentations_rage/S3- 1%20 SocioeconomicBurden_DrHampson.pdf 4. WHO (2005) Expert consultation on rabies: First report. Technical Report Series 931 Geneva: WHO 5. World Organisation for Animal Health (OIE), Terrestrial Animal Health Code chapter 7.7 Stray dog control. Accessed July 2012 http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_1.7.7.htm 6. Tamayo HS. Elimination of human rabies transmitted by dogs in the Americas: Achievements. Presentation to OIE Global Conference on Rabies Control: Towards sustainable prevention at source, 7-9 September 2011. Accessed July 2012 www.oie.int/eng/A_RABIES/presentations_rage/S1- 5%20CaseReport%20America_DrTamayo.pdf 7. World Society for Protection of Animals (WSPA). *Case study- Rabies control: Dog welfare and disease prevention,* 2012. Accessed July 2012 www.wspainternational. org/red-collar/case-studies/default.aspx

PT.001
IN VITRO AND IN VIVO INHIBITION OF RABIES VIRUS REPLICATION BY RNA INTERFERENCE.

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Rabies is a zoonotic disease that affects all mammals and leads to more than 55,000 human deaths every year3, caused by rabies virus (RABV) (Mononegavirales: Rhabdoviridae: Lyssavirus). The search for antivirals against rabies is one of the frontiers in the field but, despite a protocol (the Milwaukee Protocol) based on ketamin, ribavirin, midazolam and amantadin was successful after the treatment of a human patient,4 it was shown as not reproducible. RNA interference is an alternative as antiviral technology against RABV already shown as effective in vitro in cell cultures 1,2, but no reports on its in vivo use exist hitherto. The aim of this study was to assess the decrease in the titer of rabies virus both in vitro and in vivo using short-interfering RNAs. To this end, three siRNAs were used with antisense strands complementary to rabies virus nucleoprotein (N) mRNA. BHK-21 cells monolayers were infected with 1,000 to 0.1 TCID50 of PV and after 2 hours the cells were transfected with each of tree RNAs in separate using Lipofectamine-2000™. All three siRNAs reduced the titer of PV strain in a least 0.72 logTCID50/ml and no cytotoxic effect was observed in the monolayers treated with Lipofectamine-2000™. Swiss albino mice infected with 10.000 to 1LD of PV strain by the intracerebral route were also transfected after two hours of infection with a pool 3 siRNAs with Lipofectamine-2000™ by the intracerebral route, resulting in a survival rate of 30% in mice inoculated with 100 LD50, while the same dose led to 100% mortality in untreated animals. Lipofectamine-2000™ showed no toxic effect in control mice. These results suggest that intracerebral administration of siRNAs might be an effective antiviral strategy for rabies. The authors are grateful to FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo), Grant # 2008/51519-8, and Pasteur Institute of São Paulo for the financial support. **References** 1.Brandão PE et al. Short-interfering RNAs as antivirals against rabies. BJID, v. 11, p. 224, 2007. 2. Israsena N et al. Inhibition of rabies virus replication by multiple artificial microRNAs. A Res; v. 84, n. 1, p. 76, 2009. 3. WHO Expert consultation on rabies, p.2, 2005. 4. Willoughby Jr et al. Survival after treatment of rabies with induction of coma. New England Journal of Medicine, v. 352. n. 24, p. 2508, 2005