Bling for dogs helps fight global problem

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A stray dog in Nepal that was tagged by the Cornell team. Credit: Valerie Benka

In many parts of the world, transmission of rabies and other diseases in free-roaming dogs is a serious health problem – and not only for the animals.

Stray dogs in places like Turkey, India, Nepal, Romania and the southwestern United States pose a threat to animal and human health.

Communities worldwide are tackling the problem with effective, humane spay-and-neuter programs and rabies vaccination. But as success

grows, a new challenge is emerging. How can observers quickly and easily distinguish dogs that have been treated with contraception and rabies vaccines from those that haven't?

The answer, it seems, could be as simple as outfitting the animals with a little bling. Now, thanks in part to a Rapid Response Fund grant from the Atkinson Center for a Sustainable Future, Cornell researchers are collaborating with the Alliance for Contraception in Cats and Dogs to meet this critical need. An interdisciplinary team led by Cornell fiber scientist Margaret Frey, veterinarian Elizabeth Berliner, and electrical engineer Edwin Kan is improving the impact and cost-effectiveness of canine control programs by developing a cheap, sturdy, and highly visible dog ear tag for marking and monitoring treated strays.

"There's a lot of momentum right now to optimize rabies and population management programs," says Eloïse Cucui, a student at the College of Veterinary Medicine and member of the research team. "Many treatments are becoming low-cost and nonsurgical. As a result, there's an emerging need for a method of marking the animals that doesn't require anesthesia."

The new markers will help workers identify – quickly and at a distance – free-roaming animals that either have or have not received vaccines and birth control.

"The grant from the Atkinson Center allowed us to bring together materials, engineering and veterinary medicine experts to brainstorm and prototype a solution that is both cutting edge and inexpensive," says Frey.

The grant has allowed the team to evaluate potential tag materials for texture, weight, flexibility, breathability, antibacterial properties, fading in sunlight, durability, resistance to tearing, and cost. It has also helped

them explore different visual coding schemes to convey complex information about treated animals. The most promising option so far is a solution-dyed acrylic fabric; color pigments are put into a polymer solution before the fiber is created. The markers measure about an inch at their widest point, with multiple colors and shapes to code information such as timing of rabies vaccines and contraceptives.

Comfort and safety for the animals is also a prime consideration. The team evaluated different application methods to minimize discomfort for the animals and likelihood of infection. To apply small pieces of fabric to the ear, a device similar to a pricing gun is showing promise. A 16-gauge needle creates a tiny hole through which a fastener is threaded to hold the fabric tag in place. The needle is replaceable and the applicator is quiet, reducing stress in the animals.

Armed with this prototype, Cucui led initial trials with shelter dogs in Romania this summer that showed exciting potential. The applicator worked well in anesthetized dogs and did not cause infection or pain in dogs treated with antibiotics and analgesics. The next step will include longer field trials focused on tag durability, application in unanesthetized dogs, and community attitudes and acceptance. While the first phase of the project is focusing on ear markers for free-roaming dogs, a second phase will focus on cats.

"This technology can help solve a global problem more efficiently," said Cucui. "By ensuring that more animals receive appropriately targeted medical treatment, we can boost animal, human, and environmental health around the world."

Provided by Cornell University

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