# Vampire bats go with the flow

SCIENTIFIC NAME
*Desmodus rotundus*

TAXONOMY
PHYLUM: Chordata
CLASS: Mammalia
ORDER: Chiroptera
FAMILY: Phyllostomidae



## Physical description

*Desmodus rotundus* is one of only three species of bats that feed exclusively on blood. Commonly called vampire bats, these nocturnal flying mammals have a body length of roughly 3 in and a wingspan up to 15 in. They usually weigh 20–50 g and live up to 12 years in the wild. Their short fur is grayish on the underside of the body and darker gray to brown on the back.

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Vampire bats have short, conical muzzles with specialized thermoreceptors[1]. Their front teeth are designed for cutting, and their tongues have two lateral grooves. Each wing has a well-developed, clawed thumb. Unlike most other bats, vampire bats can maneuver on land, moving with a unique, bounding gait that is driven by the forelimbs rather than the hindlimbs, as the wings are much more powerful than the legs[2].

## Feeding behavior

These physical features are well suited to the bats' feeding behavior. Sleeping livestock are their primary food source. Vampire bats usually approach their prey from the ground. They land near the animal, approach it on all fours and use their clawed thumbs to climb onto it. Their thermoreceptors use infrared radiation to find a location where warm blood is flowing just beneath the animal's skin[3]. They create a small incision with their teeth and then lap up the blood with their tongue. Enzymes in their saliva prevent the blood from clotting while they feed. The bats usually drink for 20–30 minutes and remove about 30 ml of blood, which is not enough to harm the host; however, their bites can transmit infections and disease.

## Research résumé

One of vampire bats' unique feeding adaptations has become an important focus of biomedical research: the anticoagulant protein in their saliva that prevents blood from clotting so that the bats can drink their fill. Dubbed desmoteplase, *Desmodus* salivary plasminogen activator (DSPA) or draculin, this anti-clotting agent has been synthesized and is being studied to find out if it can help prevent or dissolve blood clots in humans[4]. If blood clots form and break loose, they may travel through the bloodstream and block vessels in the lungs or brain, leading to pulmonary embolism or stroke, respectively, and potentially resulting in death. Clinical trials continue to evaluate desmoteplase as a treatment for pulmonary emboli and stroke[5]. Initial trials showed that the drug broke up blood clots quickly, restoring blood flow and improving clinical outcome[6].

Bats—regardless of their feeding habits—are valuable in other areas of research as well. The genomes of two bat species, the fruit-eating *Pteropus alecto* and the insectivorous *Myotis davidii*, were recently sequenced and analyzed[7]. The results provide insight into immunity and flight. The bats carry lethal viruses, such as Ebola and SARS, but don't often succumb to disease; understanding the adaptations that contribute to their resistance may lead to better treatments for human diseases.

Additionally, bats have extraordinarily long lives compared with other mammals. Typically, lifespan correlates with size in mammals: smaller mammals have shorter lifespans and larger ones live longer. Several explanations have been proposed for bats' long lives: lowered energy expenditure thanks to hibernation and daily torpor; lack of predation pressure; and low reproductive rates. One study of Mexican free-tailed bats (*Tadarida brasiliensis*) and cave myotis bats (*Myotis velifer*) suggests that preservation of protein structure is essential to bats' long lifespans[8].


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