

# Catching up with cotton-top tamarins

## SCIENTIFIC NAME

*Saguinus oedipus*

## TAXONOMY

PHYLUM: Chordata

CLASS: Mammalia

ORDER: Primates

FAMILY: Callitrichidae

## Physical description

One can easily spot the aptly named cotton-top tamarin by the fluffy white hair atop its head. In stark contrast, their seemingly bare faces are black, while the rest of their bodies are covered with mottled gray-brown and white hair. Belonging to the smallest primate family, Callitrichidae, these New World monkeys have an average height of 9.13 in and an average weight of 19.9 oz in captivity. They are arboreal, with claw-like nails that allow them to cling to and run along branches and leap between trees. Cotton-top tamarins reach maturity at 16 months of age and live for an average of 13.5 years.

## Reproduction

Cotton-top tamarins have the highest fertility rate among primates. On average their litters consist of two to three offspring<sup>1</sup>; they most commonly give birth to one or two sets of non-identical twins annually. Interestingly, studies have shown that hematopoietic chimerism occurs during early fetal development, allowing for the exchange of stem cells between the twin blastocysts<sup>2</sup>.

Mothers often conceive again a few weeks postpartum. Because they must expend energy on gestation and lactation simultaneously, rearing offspring typically requires assistance from alloparents, related or unrelated individuals who provide additional care to infants after birth. Adult males and older siblings of both sexes perform parenting duties, including carrying infants and providing food after weaning. These 'cooperative breeders' therefore commonly live in family groups of 3–9 individuals<sup>3</sup>.

## Research resumé

In the late 1960s, 20,000–30,000 cotton-top tamarins were exported to the US from their native Northwest Colombia for

use in biomedical research. Since then, they have served as useful models for the study of colitis, colon cancer and other intestinal disorders, as well as Epstein-Barr virus (EBV). Colitis, which causes prolonged, repeated bouts of diarrhea, severe weight loss and even death, spontaneously arises in these monkeys in captivity. In one study of spontaneous pathology in captive primates, colitis was diagnosed in 21% of cotton-top tamarins<sup>1</sup>. Because this type of colitis is linked to an increased risk of developing a certain type of colon cancer, colonic adenocarcinoma, cotton-top tamarins provide a natural model for the development of this disease.

EBV is a member of the herpesvirus family that infects most people at some point in their lives. Infection with EBV usually causes no symptoms in infants or children, but in young adults, it causes proliferation of lymphocytes. EBV infection, which remains dormant inside the host's immune cells, has been implicated in the pathogenesis of several types of lymphomas.

Cotton-top tamarins injected with EBV develop lymphomas similar to those seen in immunocompromised humans, making the animal a useful model in the development of an EBV vaccine<sup>4</sup>.

## Endangerment

After cotton-top tamarins were declared endangered in 1973, the use of the species in research has diminished. Unfortunately, wild populations continue to decline. In a recent survey, researchers using a novel technique that involved the use of playbacks of tamarins' territorial vocalizations found that only an estimated 7,394 wild cotton-top tamarins remain in Colombia<sup>5</sup>. The decline has been attributed to the destruction of their native forest habitat.



Katie Vicari

1. David, J.M., Dick, E.J. Jr. & Hubbard, G.B. Spontaneous pathology of the common marmoset (*Callithrix jacchus*) and tamarins (*Saguinus oedipus*, *Saguinus mystax*). *J. Med. Primatol.* **38**, 347–359 (2009).
2. Sweeney, C.G., Curran, E., Westmoreland, S.V., Mansfield, K.G. & Vallender, E.J. Quantitative molecular assessment of chimerism across tissues in marmosets and tamarins. *BMC Genom.* **13**, 98 (2012).
3. Zahed, S.R., Kurian, A.V. & Snowdon, C.T. Social dynamics and individual plasticity of infant care behavior in cooperatively breeding cotton-top tamarins. *Am. J. Primatol.* **72**, 296–306 (2010).
4. Niedobitek, G. *et al.* Latent Epstein-Barr virus infection in cottontop tamarins: a possible model for Epstein-Barr virus infection in humans. *Am. J. Pathol.* **145**, 969–978 (1994).
5. Savage, A., Thomas, L., Leighty, K.A., Soto, L.H. & Medina, F.S. Novel survey method finds dramatic decline of wild cotton-top tamarin population. *Nat. Commun.* **1**, 30 (2010).