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## Could nature turn a hare into a jackalope?

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### Abstract

The jackalope is a chimera of a hare and antelope found in North American folklore, taking the entirety of hare features with the addition of antelope horns. Biological processes which could naturally give rise to horn like protrusions on a hare were explored, namely cottontail rabbit papilloma virus and cutaneous horns. While these methods may give rise to horn like growths, it is impossible to control their number and location such that a 'true' jackalope appearance i.e., two horns on the top of the head, is achieved.

**Keywords:** *Mythology; Biology; Dermatology; Jackalope*

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### Introduction

Jackalopes are a creature from North American folklore, they take the form of a hare, *Lepus sp.* (known as a jackrabbit in North America) with antelope horns – hence the blended name. Despite the fact that so-called jackalope taxidermies have fooled many an unsuspecting child (and even some adults) these are of course mythical creatures.

Although the jackalope is a North American creature there are no extant antelopes in this region. Aesthetically similar species exist in the form of pronghorns (*Antilocapra americana*) which are often colloquially referred to as 'American antelopes' [1]. They sit in the same infraorder as true antelopes (*Pecora*) and could form the basis of the -lope suffix in the mythical name [1].

The 'modern' jackalope has its origins in a joke taxidermy constructed by Douglas Herrick in the 1930s. Herrick affixed a pair of deer antlers to a hare he'd hunted and then sold it to a local hotel as a jackalope, where it gained prominence as a tourist attraction and subsequent jackalope taxidermies were produced [2].

This paper is not concerned with addressing these inconsistencies and contradictions beyond acknowledgment; whether this fictitious creature has true horns or antlers has no bearing on the following discussion. The main focus of this paper is instead an

exploration into the biological processes which could potentially cause a real hare to grow horns or some aesthetically similar facial protrusions. A brief species-wide view is then taken to consider the spread to other individuals.

### Cottontail rabbit papilloma virus

Current depictions of jackalopes are rooted in the 1930s faux taxidermy emergence but reports and depictions of a horned rabbit or hare have existed long before this. Cottontail rabbit papilloma virus (CRPV) or Shope papilloma virus, named for its discoverer Richard E. Shope, was identified in the 1930s following reports from hunters of horned rabbits [3]. Despite the name, CRPV is not specific to cottontail rabbits (*Sylvilagus floridanus*) and affected individuals can be found across the *Leporidae* family [4].

Papillomas are (usually) benign tumours that grow from epithelial tissue to form a keratinized protrusion from the skin [5]. In CRPV these papillomas are often large enough that their conical shape can be described as a horn, however, although they can grow on the brow of the head they do not exclusively grow here [4, 6]. These growths often form in clusters resulting in a growth more reminiscent of konpeitō candies [7]. This means that although it is *possible* for an infected hare to have two single 'horn' papillomas on their brow, it is extremely unlikely and so this is

not a promising method for gaining the appearance of a jackalope.

In addition to this, CRPV triggers an immune response in the affected individual and may resolve without external assistance in a few months [6]. This means even in 'successful' jackalope doppelgangers there may not bear a long-term/consistent appearance.

### Cutaneous horns

Cutaneous horn is a term used to describe a conically shaped keratin protrusion from the skin – it does not indicate a specific underlying pathology [8]. Documented cases of these protrusions date back several hundred years and, especially historically, have been met with suspicion due to their aesthetic similarity to animal horns [9]. This visual similarity to animal horns makes them very suitable for the faux jackalope purposes of this paper. However, as in the case of CRPV these protrusions are not limited to the brow of the head and can occur all over the body – most commonly in sun-exposed areas [8].

These are most well studied in humans and underlying conditions include verruca, basal cell carcinoma, trichilemma, epidermoid carcinoma [10]. The factors that determine whether these various conditions go on to form a cutaneous horn are as yet unknown [9].

By some definitions, these protrusions are considered cutaneous horns when their height exceeds at least half their width [8]. For a more 'authentic' animal horn appearance a protrusion with a height greater than its width is necessary, often termed a *giant* cutaneous horn. Unfortunately, these giant cutaneous horns are associated with more inflammation and pain than their shorter counterparts [9].

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Although members of the *Leporidae* family have been recorded with various skin lesions, some of which have been associated with cutaneous horns in humans [11], a search of the literature revealed no mention of these progressing into cutaneous horns like those described above.

### Inheritance

Both of the cases above describe scenarios in which the 'horns' developed by the hares are acquired characteristics. In the case of CRPV this is due to transmission of the virus via arthropod vectors (mosquitos, ticks) [6]. And, although the exact mechanism for cutaneous horn formation is yet to be elucidated it relies, on some level, on somatic mutation. Regardless of *how* these acquisitions occur only variation present in the germline is passed on to the next generation and these do not fit that criterion [12]. This means any successful incidence of a hare appearing as a jackalope would have to occur individually.

### Conclusion

While it is possible for hares to develop structures resembling horns, particularly due to CRPV, in a natural situation it is not possible to ensure these grow at the brow of the head or that only two grow, such that they most closely resemble animal horns. The protrusions from a cutaneous horn would be more similar in outward appearance but there is no evidence of these occurring on members of the *Leporidae* family and as the mechanism for their formation is unknown it would not be possible to induce this. If either scenario ever resulted in a hare aesthetically similar to the mythical jackalope it would be the only individual or one of very few because the horns would represent acquired characteristics and thus not be heritable.

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