

## Additional information

### The Tasmanian Devil

The Tasmanian devil (*Sarcophilus harrisii*) is the largest living carnivorous marsupial on earth. It has been extinct on the Australian mainland for at least 400 years. When the European settlers came to Tasmania they paid a reward for every Tasmanian devil killed, because they feared their livestock was threatened by the devils. For the next 100 years the Tasmanian devils were nearly hunted to extinction. Attitudes towards the devils changed after the last Tasmanian tiger, a close relative of the Tasmanian devil, died in a zoo in Hobart in 1936. They have been protected by law since 1941 and the population recovered over the decades which followed.



Tasmanian devil ©JJ Harrison  
([http://en.wikipedia.org/wiki/File:Sarcophilus\\_harrisii\\_taranna.jpg](http://en.wikipedia.org/wiki/File:Sarcophilus_harrisii_taranna.jpg)). CC BY-SA 3.0

A new type of disease was first seen among Tasmanian devils in 1996. The Devil Facial Tumour Disease (DFTD) is an infectious tumour, which is contracted by the frequent biting among the devils. DFTD has a mortality rate of 100% and infects nearly every individual of a population. For this reason, the cancerous cells are grafted onto new tissue and not recognised by the immune system as foreign cells. The Major Histocompatibility Complex (MHC) gives the cells a unique surface structure, which is responsible for the immune recognition. Siddle et al (2013) found out that the tumour cells produced almost no MHC molecules because the corresponding genes were deactivated by mutation.



Tasmanian Devil with Devil Facial Tumour Disease (DFTD). ©Menna Jones  
(<http://dx.doi.org/10.1371/journal.pbio.0040342>). CC BY 2.5

There are several measures for the preservation of the Tasmanian devil. The first one is to establish an insurance population. Healthy devils are being caught and released in a tumour-free habitat that is isolated from other devil populations (e.g. on Maria Island). If the devil were to become extinct in the wild, the insurance population could be reintroduced into their former habitats.

Another measure is to kill infected Devils to prevent the disease from spreading. This is possible in isolated areas like small islands, but becomes practically impossible in a larger area such as the main island of Tasmania.

Thirdly, a vaccine against DFTD is being researched as of 2013. Injection of cancerous cells with activated MHC molecules could help the immune system recognize real DFTD cells which have only a trace of active MHC molecules.

#### Sources:

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- Yong, E. (ed. 2013): Vaccine hope for Tasmanian devil tumour disease. Nature. (<http://www.nature.com/news/vaccine-hope-for-tasmanian-devil-tumour-disease-1.12576>; 16.12.2013)