

Eppendorf Young Investigator Award 2012



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"This Award is a testament to the commitment and energy of my collaborators both in the UK and abroad. Our goal is to understand how cancers can become transmissible parasitic clonal cell lineages – and to save the Tasmanian devil from extinction."

Origins and Evolution of Transmissible Cancers

Each individual cancer is a clonal cell lineage that emerges through an evolutionary process when a single cell of the body acquires somatic mutations that drive proliferation and survival. As it develops, cancer can spread through the body to invade distant tissues. However, it does not normally spread or survive *outside* of the body. Clonally transmissible cancers are clonal cell lineages that survive beyond the deaths of their hosts by acquiring adaptations for transmission between hosts. Rare examples of cancer transmission between humans have been reported due to transfer of cancer cells *in utero*, by surgical injury, by experimental inoculation and by inadvertent transplantation of cancer cells with donated organs. However, there are only two known naturally occurring clonally transmissible cancers that have spread between multiple hosts and these are the transmissible venereal tumour of dogs and the facial tumour of Tasmanian devils. These two cancers are specialised parasitic clonal cell lineages that spread between individuals through physical contact and have survived long after the deaths of the animals from which they originally emerged.

The goal of my research is to understand how cancers can become transmissible and survive in multiple hosts. By studying the genetics and evolution of the canine and Tasmanian devil transmissible cancers I hope to understand the changes that allow cancers to survive long-term and to evade the immune systems of their hosts.

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