Could a cure for cancer lie within cancer?

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90% of all cancer-related deaths occur when cancer spreads to other locations in the body (metastasis), or when cancer-free patients relapse. Currently, effective therapies against metastasis and relapse are lacking, and the treatments in use have very harsh side-effects and little success. My goal is to develop a vaccine that stops cancer from spreading or returning, which could significantly increase the life expectancy of cancer patients.

Tumours are complex structures, which not only contain cancer cells, but also cells from our immune system. These are very specialised cells that protect our body from disease by specifically killing harmful invaders. Every immune cell has a specific job to do. For my project, the immune cell of interest is called a dendritic cell. These cells create an immune memory, so if the same invader comes back, our immune system is much better and faster at getting rid of it. Dendritic cells also exist inside of tumours, and we hope to use their special function to create an immune memory response against cancer. By isolating the right type of dendritic cell from tumours, and using them to vaccinate tumour-bearing mice, tumour growth is slowed down and the mice are protected against cancer. These dendritic cells can create an immune memory against the tumour, so that when the tumour tries to come back, our immune system can react quickly and stop it.

Currently, our new anti-cancer vaccine showed positive results in mice. The next step is to translate these findings to the clinic. My PhD project is focusing on optimising dendritic cell vaccination strategies and on understanding whether the effects we see in mice can be mimicked in patients. Hopefully, within some years our dendritic cell vaccination will improve and lengthen lots of lives.