# Inducing melanoma for cancer vaccine development

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Cancer vaccines are being investigated in early-phase clinical trials around the world, with many of those trials recruiting patients with melanoma. Although tumor regressions have been seen in 10% to 20% of patients with metastatic melanoma, the great promise of cancer vaccines - controlling tumor growth and cancer spread without serious side-effects - remains as yet unrealized.

This could be set to change with the publication of a new mouse model technology in Cancer Research, the journal of the American Association of Cancer Research, from a multi-national team led by investigators at the Brussels Branch of the global Ludwig Institute for Cancer Research (LICR).

"Melanoma has been a focus of cancer vaccine development because many melanoma-specific vaccine targets, so-called 'cancer antigens', have been defined," says the study's senior author, LICR's Dr. Benoit Van den Eynde. "However, we have a limited understanding of how most, but not all, melanomas evade an immune system that has been primed to detect and destroy cancer cells carrying one of these defined cancer antigens."

According to Dr. Van den Eynde, this is due in part to the lack of appropriate animal models in which detailed immunological analyses can be performed before and after vaccination. "The models we use to investigate cancer vaccines at the preclinical level either have a defined cancer antigen in a transplanted tumor, or they have an 'original' tumor

that doesn't have a defined antigen. However, in human clinical studies, we have original tumors with defined antigens. So there has been a need for a mouse model that more closely follows the human model."

Thus the Institute that first cloned mouse and human cancer antigens, allowing the rational design of cancer vaccines, has developed a model in which melanoma with a defined cancer antigen can be induced. The model has been engineered to have several mutations found to occur together in human melanoma, and so closely mimics the genetic profile of cancers treated in the clinic. The team, which is comprised of investigators from Belgium, France and The Netherlands, has already begun characterizing a cancer antigen-specific immune reaction observed before the mice were even vaccinated, which they hope will lead to a further understanding of spontaneous melanoma regressions.

Dr. Jill O'Donnell-Tormey, Executive-Director of New York's Cancer Research Institute, which was founded in 1953 specifically to foster cancer immunology research, believes that this model may yield information crucial for cancer vaccines for other tumor types and not just melanoma. "We have clinical trials for cancer antigens for sarcoma, for melanoma, and for breast, prostate, lung and ovarian cancers. We're learning a lot from these trials, but we could learn a lot more if we have a model like this, which selectively expresses each of our target antigens. Just one example might be the analysis of the immune response to cancer antigens during the early stages of cancer onset and progression, which might indicate if there is an optimum time for vaccination."

Source: Ludwig Institute for Cancer Research