

## TECHNOLOGY OFFERS

# A universal cell-based vaccine platform (P-1367)

*A novel cell based vaccine platform to modify antigen presenting cells (APCs) to present MHC-I and/or MHC-II peptides*

## EXECUTIVE SUMMARY

While cancer vaccines have been investigated for many decades, to date only one has been approved in the USA as a treatment for existing cancer, whilst most have failed. Recent clinical studies demonstrate the beneficial effect of immunization with several peptide combinations. However, immunotherapy using a several peptides is expensive and laborious. The invention addresses this issue through a novel genetic platform capable of universal application. The technology is a cell based vaccine that has been shown to be effective against metastatic melanoma, which is one of the most lethal malignancies, with median survival of less than a year.

The vaccine platform is very effective in generating a potent anti-tumor effect due to multiple antigenic presentations and can potentially be applied to all proliferative diseases.



VIRIN

### Category

Vaccine platform

### Indication

All proliferative diseases

### Development stage

In vivo Proof-of-Concept for melanoma

### Seeking

Licensing or Development partner

## BENEFITS

- Platform technology which has versatile application for many diseases
- Both MHC molecules can be presented thus making the vaccine more effective
- A wide range of constructs have already been developed

## TECHNOLOGY BACKGROUND

This technology is a cell based vaccine platform that provides a method to increase the activation the immune response by modifying the expression of antigen presenting cells (APC).

The technology is modular and can be applied on multiple cancers, infectious diseases or other proliferative diseases. A wide range of MHC-I and MHC-II constructs are already developed which enables investigation of other potential combinations to increase further the efficiency of immunotherapy. MHC I and II chimeric constructs are designed before they are co-inserted into APCs thus generating an enhanced immunity response.

This novel genetic platform has been shown to induce specific CD8+ cytotoxic immune response by DCs vaccination against melanoma.

## DEVELOPMENT STAGE

The vaccines which contain MHC-I and MHC-II chimeric constructs were injected into mice transplanted with melanoma cells. A significant inhibition of tumor growth, pro-longed survival and in some cases complete prevention of tumors growth in 5 out of 8 mice was observed following vaccination.

## APPLICATIONS

The method can be used in the context of tumor diseases, infectious diseases or other proliferative diseases. The constructs can be applied in multiple combinations and thus are versatile and easily adaptable.

## INTELLECTUAL PROPERTY

Priority patent application "Cancer immunization platform" EP18164740.5 was filled at the European Patent Office 28 March 2018 and a PCT application WO2019185615 on 26 March 2019.

## PUBLICATIONS & REFERENCES

- Sharbi-Yunger, A. , Grees, M. et al. (2019), A universal anti-cancer vaccine: Chimeric invariant chain potentiates the inhibition of melanoma progression and the improvement of survival. *Int. J. Cancer*, 144: 909-921. doi:10.1002/ijc.31795

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## ABOUT THE DKFZ INNOVATION MANAGEMENT

Working at the interface of research and industry, the Innovation Management of the German Cancer Research Center (DKFZ) helps to get new cancer medications, diagnostic tests, and research instruments onto the market as quickly as possible.

The DKFZ with its more than 3,000 employees is the largest biomedical research institution in Germany. At the Center more than 1,300 scientists investigate how cancer develops, identify cancer risk factors and endeavor to find new strategies to prevent people from getting cancer. They develop novel approaches to make tumor diagnosis more precise and treatment of cancer patients more successful. DKFZ is a member of the Helmholtz Association of National Research Centers, with ninety percent of its funding coming from the German Federal Ministry of Education and Research and the remaining ten percent from the State of Baden-Württemberg