

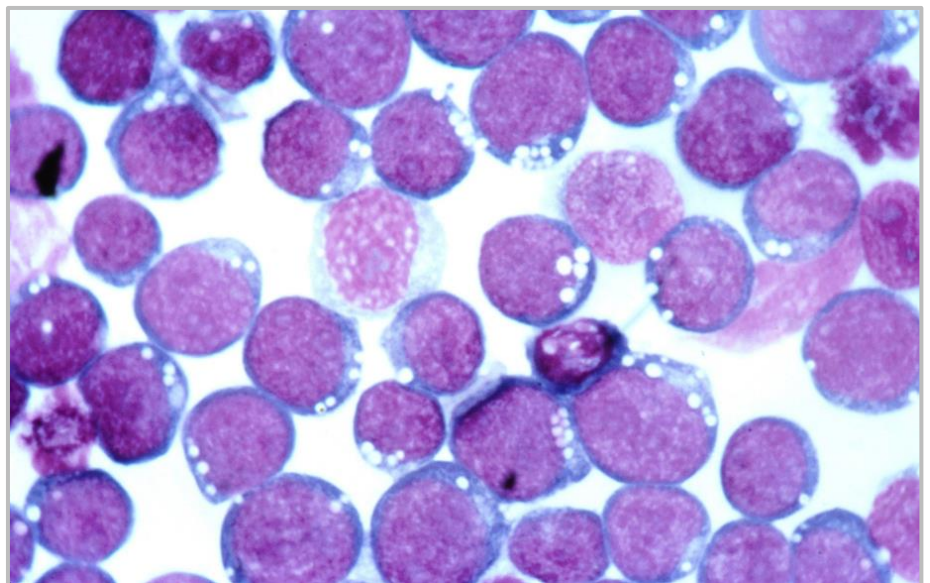
## TECHNOLOGY OFFERS

# Safe and Effective Preventative EBV Vaccine (P-1309)

*Epstein-Barr virus (EBV) particle based vaccines with an enhanced safety profile and without the side-effects*

### EXECUTIVE SUMMARY

Epstein-Barr virus (EBV) is the most common etiological agent of infectious mononucleosis (IM) and a major cause of virus-associated human cancers, predominantly lymphomas and carcinomas. EBV infection mostly occurs in early childhood and remains usually asymptomatic. This invention provides a safe Epstein-Barr Virus vaccine, which does not introduce chromosomal instabilities associated with cancer development. In particular, EBV particles in this vaccine do not enter the cytosol and/or nucleus of cells, making it significantly safer than existing alternatives. These VLPs are also highly effective and elicit a potent cytotoxic CD4-positive T-cell response. Due to the lack of viral DNA, the VLPs have a superior safety profile



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#### Category

Vaccine

#### Indication

Lymphomas,  
carcinomas

#### Development stage

Pre clinical

#### Seeking

Development partner

### BENEFITS

- Vaccine for prevention of EBV-associated malignancies
- Induces strong immune response
- Removes side effects associated with current EBV vaccines
- Improved safety profile

## TECHNOLOGY BACKGROUND

Experts estimate that an EBV vaccine could prevent 2% of all cancer cases worldwide. Until now no method for producing a safe and efficient vaccine against EBV has been developed. This vaccine uses “virus-like particles” (VLP), devoid of detectable genetic material, to mimic an EBV infectious particle. While these particles prompt the body to mount an immune response they are themselves innocuous, thus making the vaccine much safer.

## DEVELOPMENT STAGE

Convincing *in vitro* and *in vivo* data are available showing the absence of chromosomal instability after treatment with the new generation VLP. Animal studies looking at safety and efficacy of the VLPs are currently being conducted.

## APPLICATIONS

The vaccine can be used prophylactically. DKFZ is currently seeking a commercial partner to develop this technology under an exclusive license and/or collaboration agreement to commence clinical trials.

## INTELLECTUAL PROPERTY

- International Patent application “Improved EBV Vaccine” filed as WO2018087296A1. Filed in Europe (EP3538145A1), China (CN110214024A) and USA (US20190282691A1).
- Related patent family WO2013009836A1. “Second generation virus-like particles from Epstein-Barr Viruses for vaccination purposes”. Granted in CN, DE, ES, FR, US

## PUBLICATIONS & REFERENCES

- Shumilov, Anatoliy et al. “Epstein-Barr virus particles induce centrosome amplification and chromosomal instability.” Nature communications vol. 8 14257. 10 Feb. 2017, doi:10.1038/ncomms14257
- [DKFZ press release](#) dated January 8 in 2019: “New vaccine strategy against Epstein Barr virus”.

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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