
Cellular responses to CAR T cell therapy and their effect on outcomes in patients with aggressive B-cell lymphomas

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Anti-CD19 directed CAR T cells have emerged as most effective treatment for patients with aggressive B-cell lymphomas, demonstrating unprecedented response rates. Three CAR T cell products are currently approved by EMA and are widely used in clinical practice. Between 2019 and 2023, approx. 1,900 patients in Germany underwent treatment with CAR T cells for malignant lymphoma. Besides the collection of autologous lymphocytes via apheresis, the complex manufacturing process includes genetic modifications of a patient's T lymphocytes to target and destroy specific tumor cells. Despite high potential for long-term disease control, CAR T cell therapy carries risks of severe side effects. Current treatment options for these side effects are rather reactive than predictive. A major challenge of CAR T cell treatment is the lack of reliable models to predict treatment outcomes and risks.

The CARE project aims to address these aspects by collecting and analyzing clinical and laboratory data to develop predictive models, particularly for the prediction of risks and inflammatory complications. Additionally, the researchers consider the functionality of CAR T cells, examining their immune profiles to define subpopulations. The ultimate goal is to develop two predictive models and identify top five biomarkers for each model that enhance risk stratification, paving the way for personalized and targeted treatment options for patients undergoing CAR T cell therapy.
