Antibodies are molecules of great scientific and pharmaceutical interest because of their highly specific binding against certain antigens. In the last 30 years monoclonal antibodies underwent several modifications to give rise to chimeric, humanized and fully human antibodies. The most widely used method for the production of human antibodies is the Phage Display technology. In this technique, a gene encoding a protein of interest (i.e., an immunoglobulin gene) is inserted into the bacteriophage genome, resulting in the production of hybrid phage particles that display the exogenous protein in fusion with one of its coat proteins. Phage can then be selected for high affinity ligands in a process named biopanning. In the Antibodies Phage Display system there are two main possible configurations for display: Single-Chain Fv (ScFv) and Fab. Here, we have developed a new vector for the display of Fab fragments. Using this vector, the antibody fragments may be display as chimeric (mouse-human) or fully human Fab fragments. To minimize loss of the antibody repertoire during library production, we screened available mouse and human immunoglobulin databases to identify and selected the restriction enzymes that do not cut these genes. These restriction sites were used to design our phage display vector. This new developed vector will be utilized for the construction of an immune library directed against one of the isoform of the Vascular Endothelial Growth Factor (VEGF). This growth factor is essential for the formation of blood vessels by angiogenesis. The formation of new blood vessels from pre-existing ones is an important physiological and pathological processes, such as cancer and retinopathies. Because VEGF is the main molecular factor responsible for the formation of new blood vessels, most of the angiogenic drugs available in the clinic today are directed against VEGF or its receptors. However, although anti-VEGF therapies are effective, they are not yet ideal due to undesirable side effects and drug resistance. Antibody selective for the different VEGF isoforms may be a novel alternative to improve on angiogenic therapies.

Keywords: Phage Display; Monoclonal antibodies; VEGF

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