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ABSTRACT

The present invention relates to a DNA vaccine for developing tumor-specific immunity. Specifically, the invention relates to a DNA vaccine comprising antigens recognized by $CD4^+$ helper T cells and $CD8^+$ cytotoxic T cells, respectively. Preferably, the antigen recognized by $CD4^+$ helper T cells is a molecule identified by the SEREX method and that recognized by $CD8^+$ cytotoxic T cells is a tumor antigen. Furthermore, so that the antigens recognized by $CD4^+$ helper T cell and $CD8^+$ CTL are expressed and presented on the same cell, the expression vectors preferably are immobilized on the same gold particle and administered into the cell by gene gun; however, this invention is not restricted thereto. The vaccine can also be used as a pharmaceutical agent.