The natural human IgG1 mAb Pritumumab targets cell surface expressed vimentin and inhibits tumor growth

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Cancer patients generate tumor-specific B lymphocytes which can be isolated to develop human mAbs against tumor-associated antigens. Pritumumab (also referred to as CLNH-11, CLN-IgG, or ACA-11) is a classic example of a natural human anti-cancer antibody. It is a natural human IgG1 kappa antibody developed by human hybridoma technology, using B lymphocytes isolated from a regional draining lymph node of a patient with cervical carcinoma. Phase II clinical trials with pritumumab has demonstrated some success as a therapeutic antibody for glioblastoma. Here we demonstrate pritumumab binds cell surface expressed vimentin, also referred to as ecto-domain vimentin (EDV). Vimentin is an intracellular cytoskeletal protein overexpressed during epithelial-to-mesenchymal transition (EMT), a process integral to cancer cell metastasis. The potential of pritumumab as a therapeutic antibody targeting glioblastoma was evaluated. We demonstrate pritumumab binding to patient glioblastoma cells and antibody binding to these cells induces antibody-dependent cell-mediated cytoxicity (ADCC). Furthermore, pritumumab effectively inhibited glioma tumor growth in a xenograft mouse model. Overall, these data provide pre-clinical validation of pritumumab mAb as a therapeutic for glioblastoma.