Cancerous immunoglobulins and potential clinical applications

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I. Abstract Body

Despite the known fact that immunoglobulins are expressed among cancer cells, their roles in cancer immunology are still not fully understood. In 1987, a monoclonal antibody, RP215 was generated and later shown to recognize mainly a carbohydrate-associated (O-glycan) epitope located in the variable regions of heavy chain immunoglobulins (designated in general as CA215) expressed on the surface of cancer cells, but not those from normal B cells. Biological and immunological studies of cancerous immunoglobulins have been performed extensively with RP215 as the unique probe. Both anti-immunoglobulins and RP215 were shown to induce apoptosis and complement-dependent cytotoxicity reactions to culturing cancer cells. In vivo nude mouse animal models also revealed dose-dependent reductions of implanted tumor upon injections of RP215. Gene regulation studies were performed by using semi-quantitative PCR with genes involved in immunoglobulins expressions and toll-like receptors. The binding of RP215 and anti-immunoglobulins to cancer cells was shown to affect similar levels of gene expressions with excellent mutual correlations ($R^2 \geq 0.90$). Human serum proteins which interact with affinity-purified CA215 and/or cancerous immunoglobulins were identified and found to consist of those with known pro-cancer or anti-cancer properties. These observations led to the hypothesis of dual functional roles of cancerous immunoglobulins in cancer cells. Interactions with relevant human serum proteins may be essential for proliferation/growth of cancer cells and may also be required to neutralize those hostile to cancer cells. In addition, RP215-based enzyme immunoassay kits are beneficial in monitoring serum levels of CA215 or cancerous immunoglobulins among cancer patients. Anti-cancer and pan-cancer nature of CA215 revealed that RP215 can be an ideal candidate for the development of anti-cancer drugs or therapeutic treatments. RP215-linked chimeric antigen receptor (CAR)-T cell therapy technology has been attempted for anti-cancer treatments, through a series of CAR construction and validations by cytotoxic cell killing and cytokine activity release assays. In conclusion, dual distinct functional roles of widespread cancerous immunoglobulins among cancer cells have been demonstrated for the potential applications of RP215 in therapeutic treatments of many human cancers.

II. publications

1. Lee G (2016) Distinct functional roles of cancerous immunoglobulins in cancer immunology. Integr Mol Med 3: DOI: 10.15761/IMM.1000238.
2. Lee G (2016) RP215-based Anti-Cancer Drugs. Int J Cancer Res Ther, 1(1): 1-8.
3. Lee G (2016) Anti-GnRH Receptor Monoclonal Antibodies Are Long Acting Analogs of GnRH. J Gynecol, 1(4): 000123.
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5. Gregory Lee, Cancerous Immunoglobulins and Potential Clinical Applications, book chapter, Nova Science Publishers, Inc., 2017, in press.
6. Gregory Lee, O-glycan-Associated Epitope of RP215 and its Chimeric Antigen Receptor for Cancer Therapy, Oncology & Cancer Research Journal, Oncology & Cancer Research Journal, 2017, in press.

III. Biography:

Gregory Lee was professor at University of British Columbia in Vancouver, Canada until 2012. He received his PhD in physical biochemistry from California Institute of Technology Pasadena, CA in 1972. His major research interest is in the field of biotechnology. He has generated numerous monoclonal antibodies for immunodiagnostic and therapeutic applications, including the early pregnancy detection, ovulation, myocardial infarction and cancer. During the last decade, he has been focused on research and development of the monoclonal antibody-based anti-cancer drugs (noticeably RP215 and GHR106) for immunotherapy of human cancer. He has been serving as editors of several international journals related to cancer research since 2012.

IV. Presenting author details



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