ANTICANCER AGENTS

I. FIELD

[0001] Provided herein, *inter alia*, are methods for treating or managing certain cancers and malignancies using compounds that modulate the C-C chemokine receptor type 4 (CCR4), or pharmaceutically acceptable salts thereof. For example, provided herein are methods in which a CCR4 modulator is administered alone or in combination with one or more anti-cancer agents to treat certain cancers and malignancies. In addition, provided herein are pharmaceutical compositions for use in such methods.

II. BACKGROUND

[0002] Cancer is a major worldwide public health problem; in the United States alone, approximately 570,000 cancer-related deaths were expected in 2005. See, e.g., Jemal et al., CA Cancer J. Clin. 55(1):10-30 (2005). The incidence of cancer continues to climb as the general population ages and new forms of cancer develop.

[0003] The Epstein-Barr virus (EBV) is a ubiquitous herpesvirus first discovered as the causative agent of Burkitt's Lymphoma. EBV was subsequently found to have a very high prevalence, with over 95% of the adult population infected. Infections are generally asymptomatic, but EBV can be the cause of infectious mononucleosis. EBV-positivity has also been associated with a variety of cancers, including various lymphomas, nasopharyngeal carcinoma (NPC), and gastric carcinoma (Hjalgrim, H., Friborg, J. and Melbye, M. 2007. *Human Herpesviruses*).

[0004] For many years researchers have tried to boost the immune response to fight cancer. Though earlier interventions had limited success, the recent use of antibodies such as anti-CTLA-4 and anti-PD-1/PD-L1, also known as immune checkpoint inhibitors (CPIs), has resulted in meaningful antitumor immune responses in multiple types of cancer (Pardoll, 2012; Sharma, 2015; Shin, 2015).