6. Recommendations and future directions

The present study is focused on immunomodulation mediated anticancer potential of phytoconstituents from *Brugmansia suaveolens* and *Nicandra physalodes* (Family: Solanaceae). The use of plants' natural products in cancer treatment has received more attention in recent years due to their potentially wider safety margin and the potential to complement conventional chemotherapeutic drugs. Plant-based products have demonstrated anticancer potential through different biological pathways including modulation of the immune system. Immunomodulatory properties of medicinal plants have been shown to mitigate cancer cell growth. Different immune cell types participate in this process especially cytotoxic T cells and natural killer cells, and cytokines including chemokines and tumor necrosis factor-α. Our research findings have shown that *B. suaveolens* and *N. physalodes* from Solanaceae family possess bioactive immunomodulators with anticancer activity. We have isolated two lead compounds (SUPH036-022A and SUPH036 022B) from them which displayed the ability to regulate the immune system potential applicable in breast cancer treatment and lymphocytes activation properties, as well as future research direction in their use for cancer treatment.

As a lot of studies are needed to convert a lead into new medicine. As the isolated compounds showed potent immunomodulation mediated anticancer activity against breast cancer by stimulating the PBMCs of healthy human being. Further, the study can be proposed on other cancer types with their mechanism of action. Also the molecular tagging based studies can also be proposed to find out the exact molecular targets for these compounds. As in previous study the research was focused on the PBMCs of healthy human so the similar work can also be propose using the PBMCs of cancer patients to find how they respond to these compounds. If the proposed study showed the promising results in the PBMCs of cancer patients, this study will be continued further depending on the above research outcomes. In line of the above study we can take those novel anticancer molecule to clinical level.