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(54) Title: PRODUCTION OF CYTOTOXIC ANTIBODY-TOXIN FUSION IN EUKARYOTIC ALGAE

(57) Abstract: Methods and compositions are disclosed to engineer chloroplast comprising heterologous genes encoding target binding domain fused to a eukaryotic toxin and produced within a subcellular organelle, such as a chloroplast. The present disclosure demonstrates that when chloroplasts are used, toxins normally refractive to production in eukaryotic cells may be used to produce recombinant fusion proteins with binding domains that are soluble, properly folded and post-translationally modified, where the multifunctional activity of the fusion protein is intact. The binding domains may include those from antibodies, receptors, hormones, cytokines, chemokines, and interferons. The present disclosure also demonstrates the utility of plants, including green algae, for the production of complex multi-domain proteins as soluble bioactive therapeutic agents.