Synthetic minimal cells are a class of small liposome bioreactors that hold vast potential in the areas of origins of life research as well as biotechnology. One hurdle to overcome in the use of these liposome bioreactors is how to efficiently export cell contents to the outer environment. Cell penetrating peptides (CPPs) have shown promise as membrane translocating chaperons. This experiment sought to determine whether CPPs could carry a protein cargo across the membrane of a synthetic minimal cell, and verify the efficacy of the cargo post translocation. We investigated the efficiency of the CPP by comparing fluorescence in liposome groups expressing CPP tagged mClover, a green fluorescent protein, with liposome groups expressing non-tagged mClover. We found that the CPP tagged mClover was able to exit the liposomes while the non-tagged protein remained within the liposomes. To verify the continued functionality of the CPP cargo we tagged a T7 RNA polymerase and used that enzyme in transcription reactions post membrane translocation. Finally, to investigate the method of CPP membrane translocation we introduced Calcein dye to the outer environment surrounding the liposomes, and tracked its movement while CPP tagged firefly luciferase exited the liposomes. We found that while the firefly luciferase efficiently exited the liposomes, Calcein was not able to enter. These findings point towards a passive diffusion of the CPP across membranes, as opposed to pore formation. The implications of these findings give researchers a tool to export proteins created within liposome bioreactors into the outer environment, which may prove to be important in areas such as drug delivery or environmental remediation.