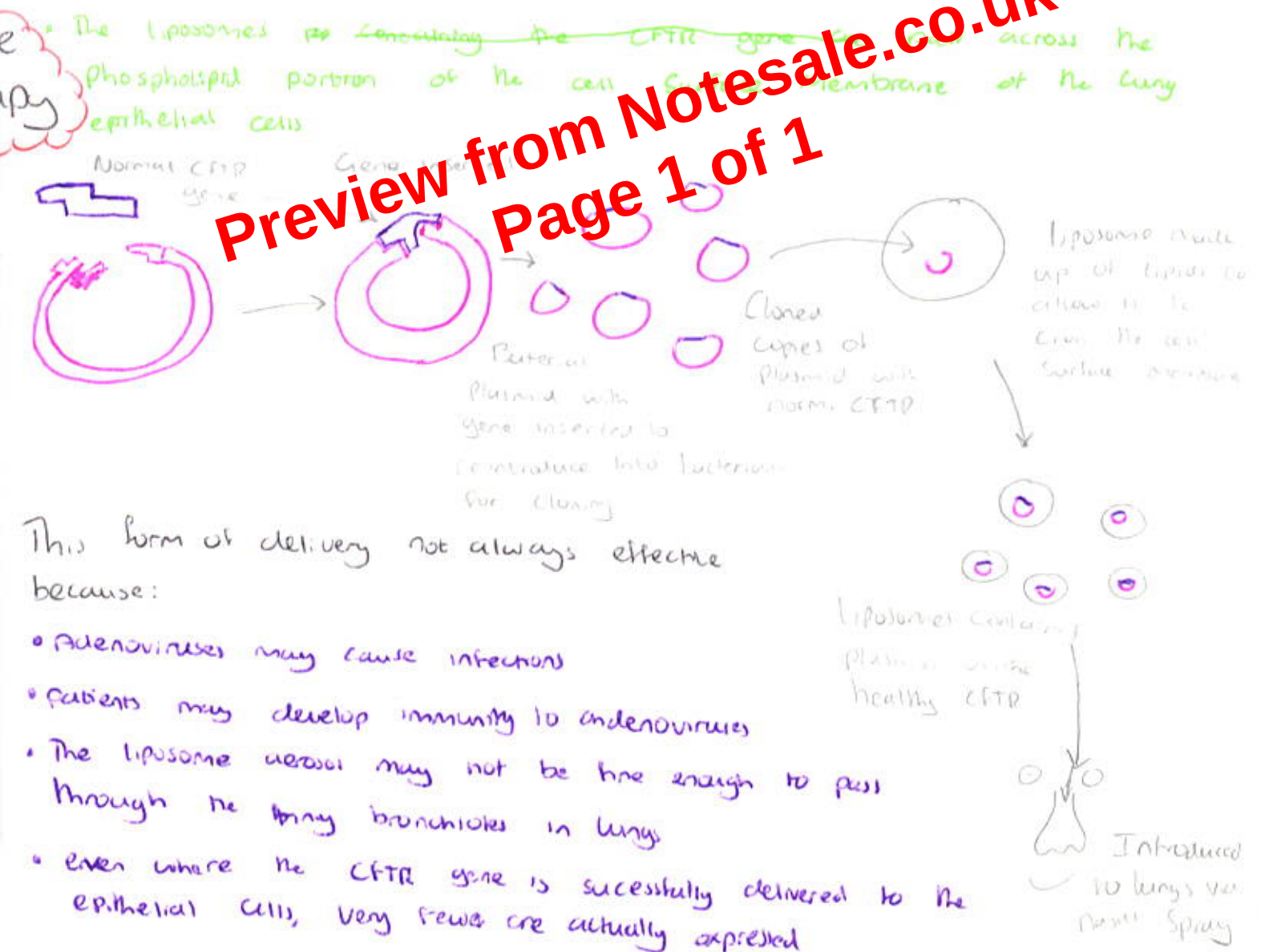


Wrapping the gene in lipid molecules

Genes are wrapped in lipid molecules because lipid molecules can diffuse through the phospholipids of cell surface membranes. The process of delivering the CFTR genes to their target cells is as follows:

- CFTR genes are isolated from healthy human tissue and inserted into bacterial plasmid vectors
- The plasmid vectors are reintroduced into their bacterial host cells and gene markers are used to detect which bacteria have successfully taken up the plasmids with the CFTR gene
- These bacteria are cloned to produce multiple copies of the plasmids with the CFTR gene
- The plasmids are extracted from the bacteria and wrapped in lipid molecules to form a liposome
- The liposome containing the CFTR gene are sprayed into the nostrils of the patient as an aerosol and are drawn down into lungs - during inhalation
- The liposomes ~~are~~ containing the CFTR gene cross the phospholipid portion of the cell surface membrane of the lung epithelial cells



This form of delivery not always effective because:

- Adenoviruses may cause infections
- Patients may develop immunity to adenoviruses
- The liposome aerosol may not be fine enough to pass through the tiny bronchioles in lungs
- Even where the CFTR gene is successfully delivered to the epithelial cells, very few are actually expressed