

2.1 Materials

2.1.1 Polymer/oligomers

Chitosan oligomers (3-6 kDa, 97 % deacetylated) and chitosan polymer (~100 kDa, 97 % deacetylated) were a gift from Primex (Norway). PEI (~25 kDa, product code: 40,872-7) was obtained from Aldrich (USA). Monomethoxy poly(ethylene)glycol (mPEG; 5 kDa, product code: 81323) was obtained from Fluka (UK). mPEG amine (5 kDa, product code: 1P4M0H02) and fluorescein-PEG-succinimidyl ester (4 kDa, product code: 1K4MOFO2) were obtained from Nektar (USA).

2.1.2 Cell Culture

Cell lines: COS-1, COS-7 (both monkey kidney fibroblast) and Caco-2 (colon carcinoma) cells were supplied by American Tissue and Cell Culture (ATCC; UK). DU145, PC3, (both prostate cancer cell lines) and MCF-7 (breast cancer cells) were a gift from Tenovus Cancer Research, Cardiff, UK. U937 (leukaemia) cells were a gift from Stuart Jones (Cardiff University College of Medicine, UK).

Cell culture reagents: RPMI 1640 (L-glutamine) and Dulbecco's modified Eagle's medium (DMEM) with or without the pH indicator phenol red was obtained from Invitrogen Life Technologies (UK). Virkon was purchased from Antec Int. (UK). Disodium hydrogen orthophosphate, sodium dihydrogen orthophosphate, sodium chloride and sodium hypochlorite were bought from Fisher (UK). Foetal bovine serum (FBS), penicillin/streptomycin (pen/strep; 5000 Units/ml, 5000 µg/ml) and trypsin/ethylene diamine tetraacetic acid (EDTA) (0.05 % (w/v) 0.53 mM) without magnesium and calcium chloride were obtained from Invitrogen Life Technologies (UK). Medical grade CO₂, N₂ (all 95 % v/v) and liquid nitrogen were supplied by BOC (UK). Trypan blue solution (0.4 % w/v), phorbol 12-myristate 13-acetate (PMA), 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl-2H-tetrazoliumbromide (MTT) and sterile dimethyl sulphoxide (DMSO) were from Sigma-Aldrich (UK), copper II sulphate from BDH (UK). Pipettes (5, 10, 25 ml), bijous (~7 ml) and universal containers (~25 ml) were obtained from Elkay (Ireland). Cells were incubated in a Galaxy S incubator (Wolf laboratories; UK) or a Procell incubator (Jencons PLS; UK). Sterile cell manipulations were performed in a class II laminar flow hood from Bioair (Italy) or Servicare (UK).