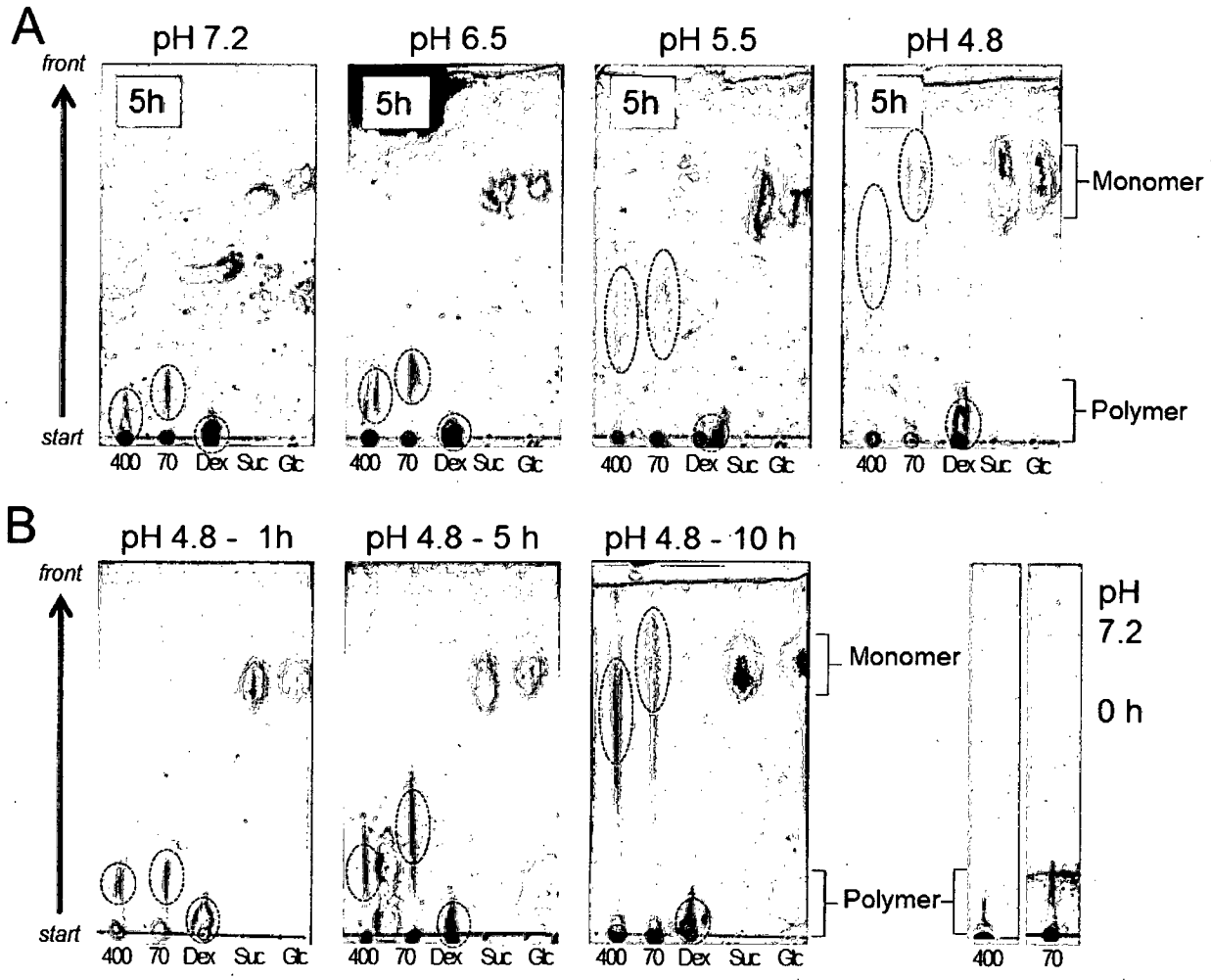

A
pH 7.2
pH 6.5
pH 5.5
pH 4.8
front
start
5h
Monomer
Polymer
400 70 Dex Suc Glc
B
pH 4.8 - 1h
pH 4.8 - 5 h
pH 4.8 - 10 h
pH 7.2
0 h

Figure 1

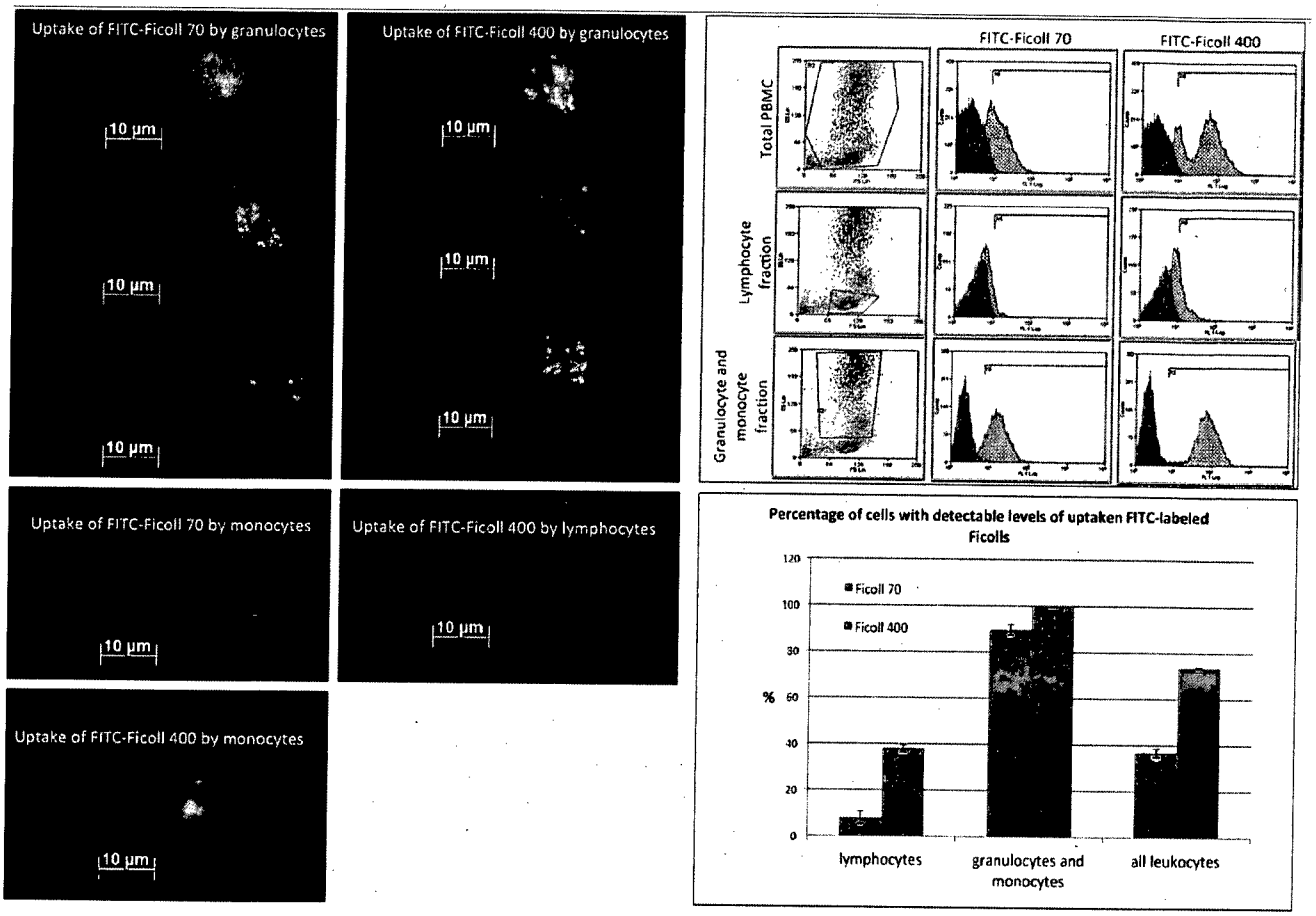

Uptake of FITC-Ficoll 70 by granulocytes
Uptake of FITC-Ficoll 400 by granulocytes
Uptake of FITC-Ficoll 70 by monocytes
Uptake of FITC-Ficoll 400 by lymphocytes
Uptake of FITC-Ficoll 400 by monocytes
10 µm
FITC-Ficoll 70
FITC-Ficoll 400
Total PBMC
Lymphocyte fraction
Granulocyte and monocyte fraction
Percentage of cells with detectable levels of uptaken FITC-labeled Ficolls
Ficoll 70
Ficoll 400
%
lymphocytes
granulocytes and monocytes
all leukocytes

Figure 2

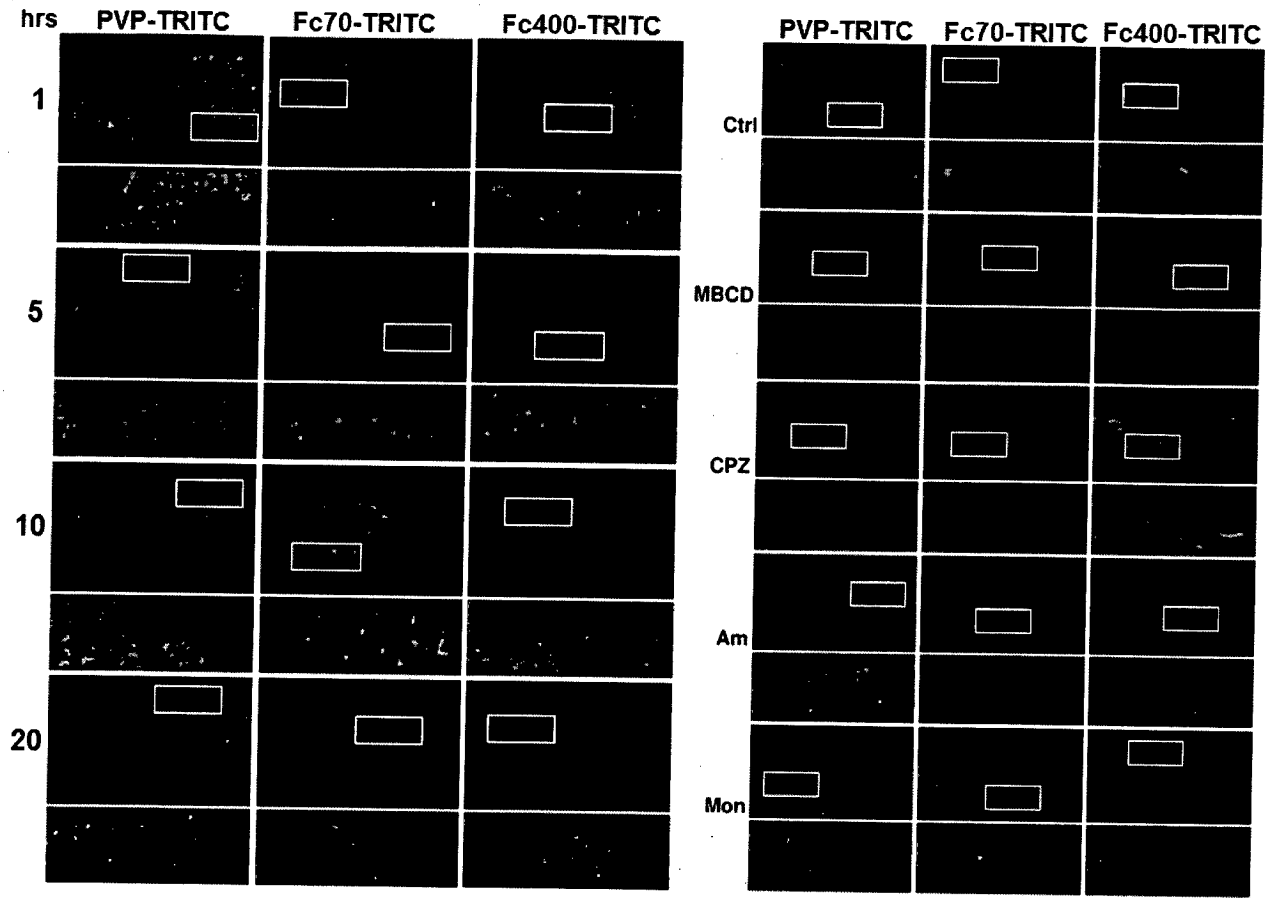

hrs
PVP-TRITC
Fc70-TRITC
Fc400-TRITC
1
5
10
20
PVP-TRITC
Fc70-TRITC
Fc400-TRITC
Ctrl
MBCD
CPZ
Am
Mon

Figure 3

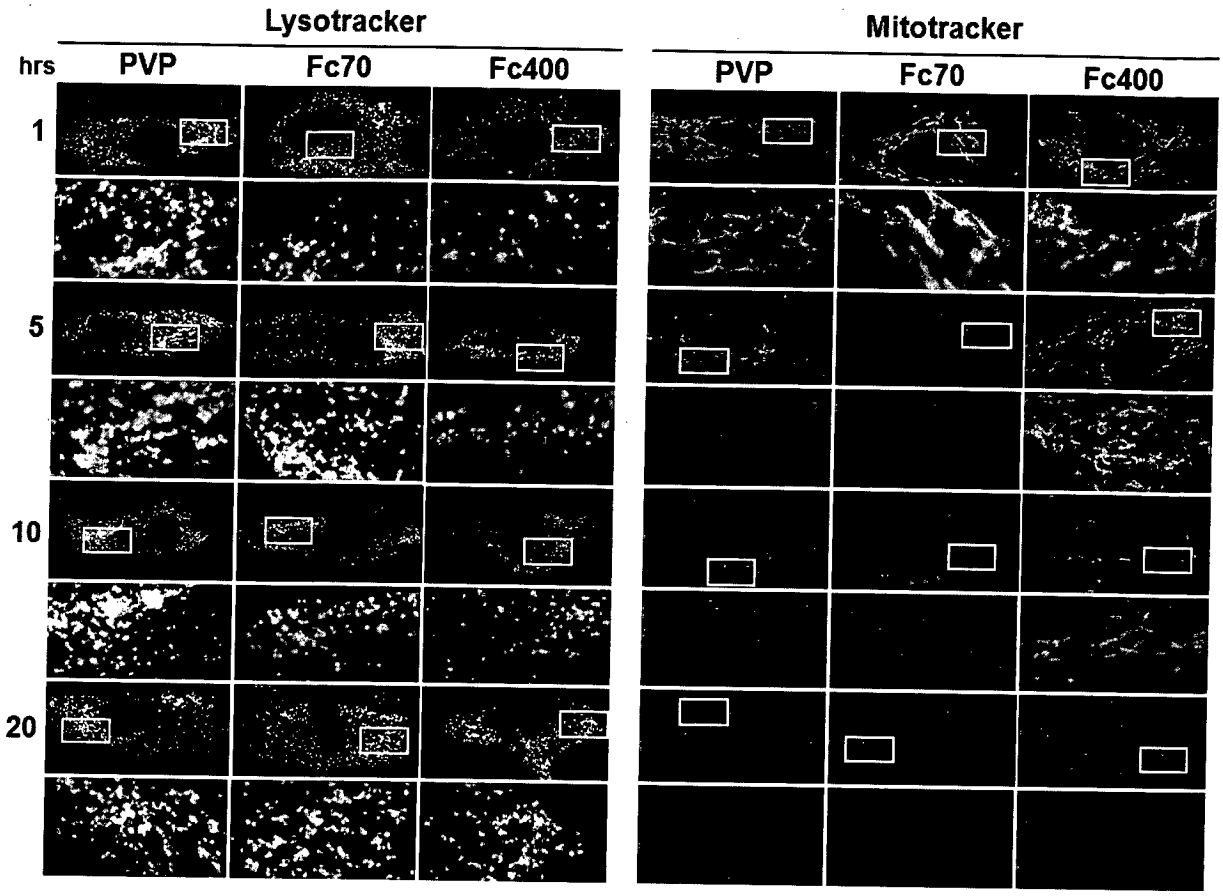

Lysotracker
Mitotracker
hrs
PVP
Fc70
Fc400
PVP
Fc70
Fc400
1
5
10
20

Figure 4

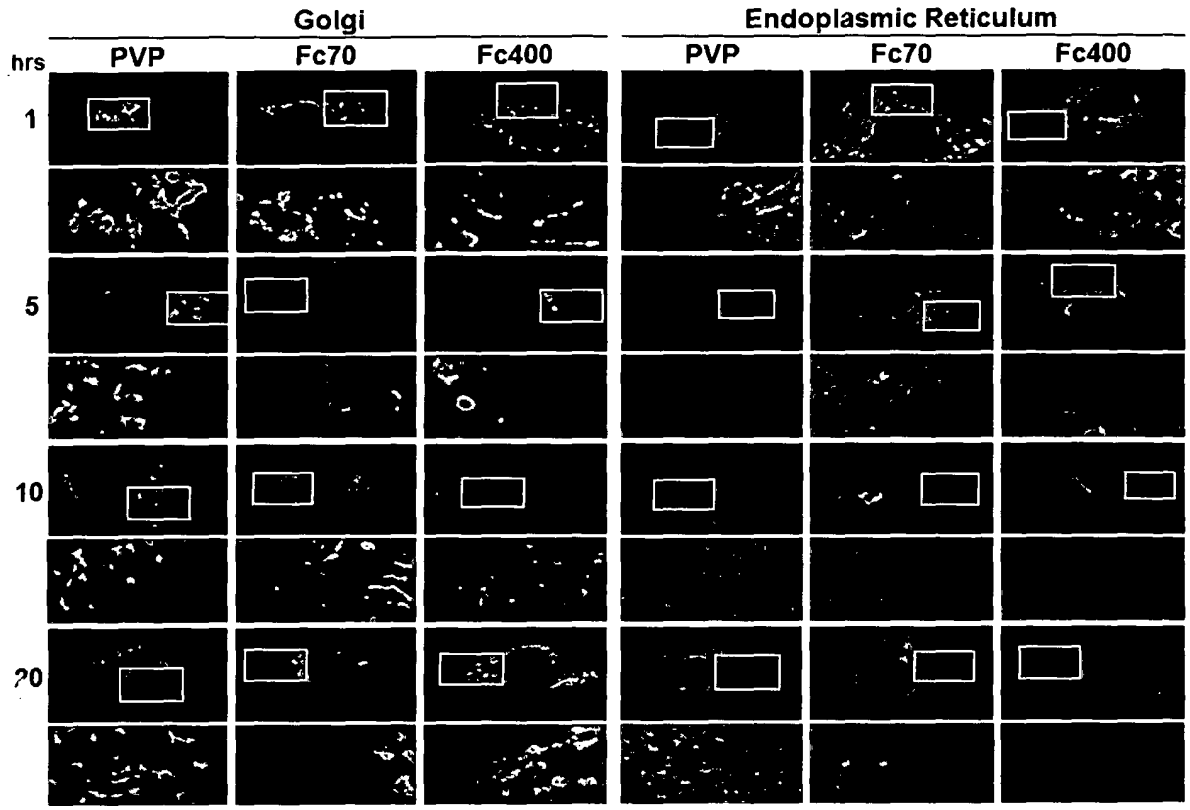

Golgi
Endoplasmic Reticulum
hrs
PVP
Fc70
Fc400
PVP
Fc70
Fc400
1
5
10
20

Figure 5

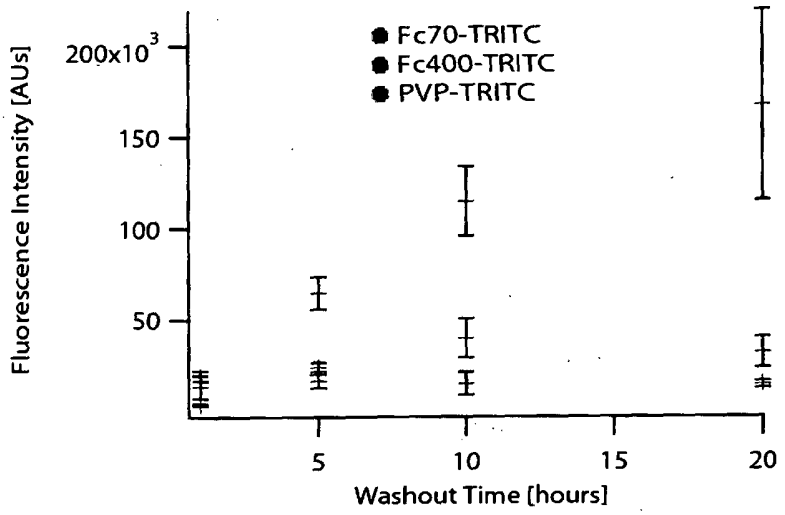


Figure 6

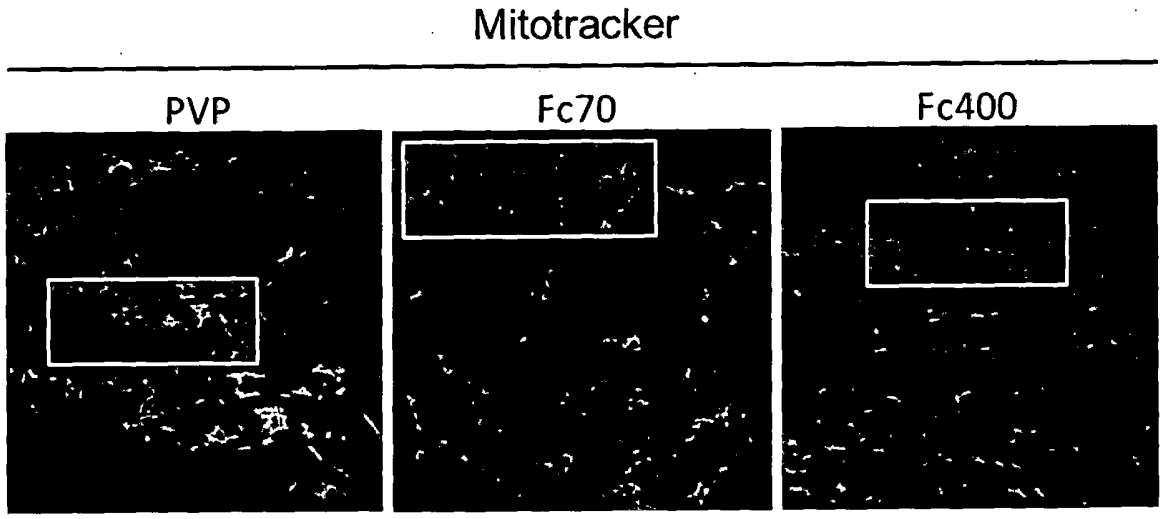


Figure 7

Possible Degradation Products of Ficoll under Physiological Conditions

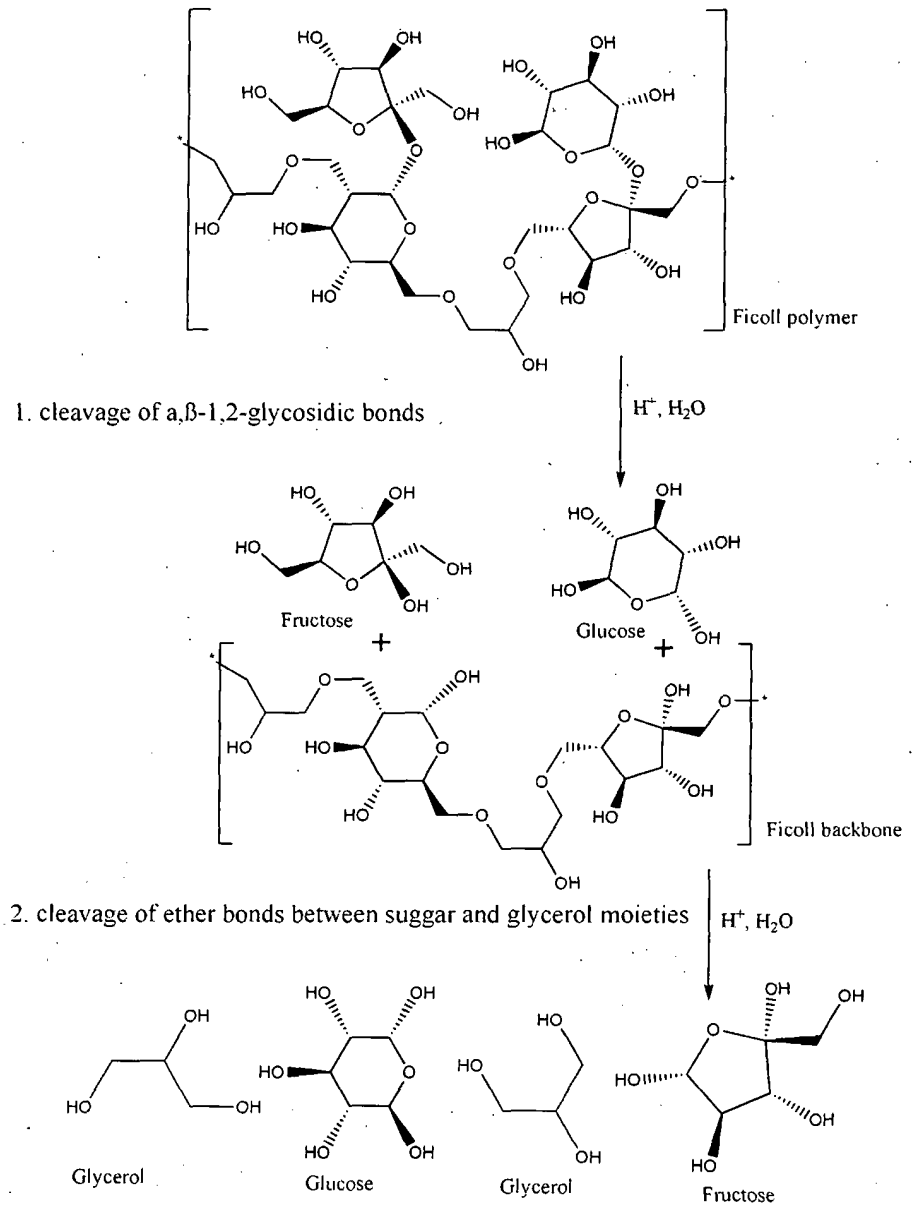


Figure 8

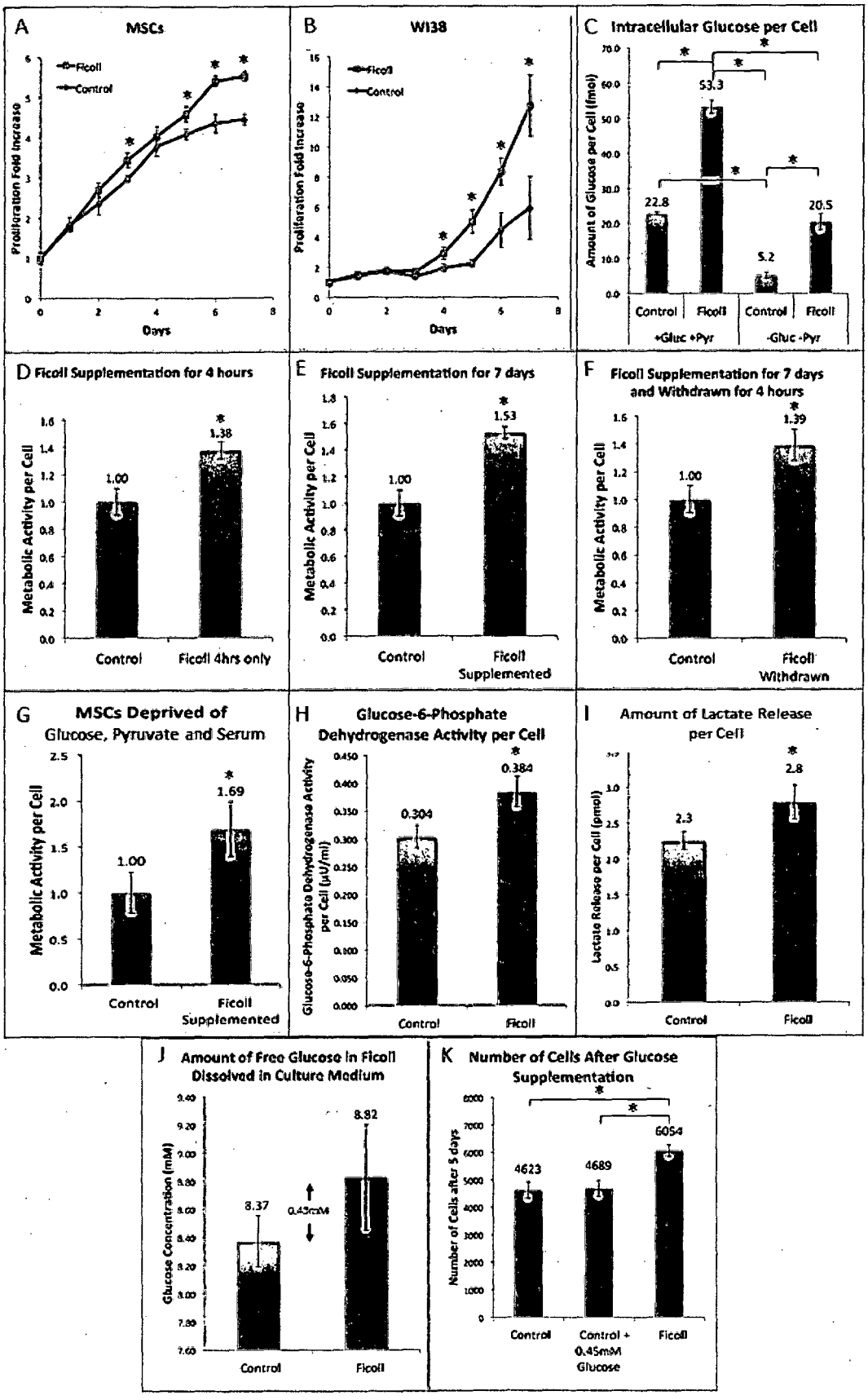

A MSCs
Ficoll
Control
Proliferation Fold Increase
Days
B WI38
Ficoll
Control
Proliferation Fold Increase
Days
C Intracellular Glucose per Cell
Amount of Glucose per Cell (fmol)
53.3
22.8
5.2
20.5
Control
Ficoll
Control
Ficoll
+Gluc +Pyr
-Gluc -Pyr
D Ficoll Supplementation for 4 hours
Metabolic Activity per Cell
1.00
1.38
Control
Ficoll 4hrs only
E Ficoll Supplementation for 7 days
Metabolic Activity per Cell
1.00
1.53
Control
Ficoll Supplemented
F Ficoll Supplementation for 7 days and Withdrawn for 4 hours
Metabolic Activity per Cell
1.00
1.39
Control
Ficoll Withdrawn
G MSCs Deprived of Glucose, Pyruvate and Serum
Metabolic Activity per Cell
1.00
1.69
Control
Ficoll Supplemented
H Glucose-6-Phosphate Dehydrogenase Activity per Cell
Glucose-6-Phosphate Dehydrogenase Activity per Cell (μU/ml)
0.304
0.384
Control
Ficoll
I Amount of Lactate Release per Cell
Lactate Release per Cell (pmol)
2.3
2.8
Control
Ficoll
J Amount of Free Glucose in Ficoll Dissolved in Culture Medium
Glucose Concentration (mM)
8.37
0.45mM
8.82
Control
Ficoll
K Number of Cells After Glucose Supplementation
Number of Cells after 5 days
4623
4689
6054
Control
Control + 0.45mM Glucose
Ficoll

Figure 9

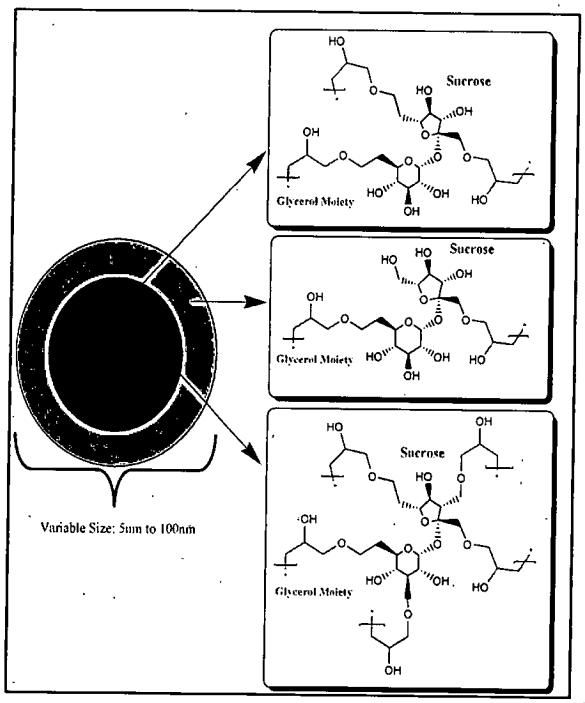
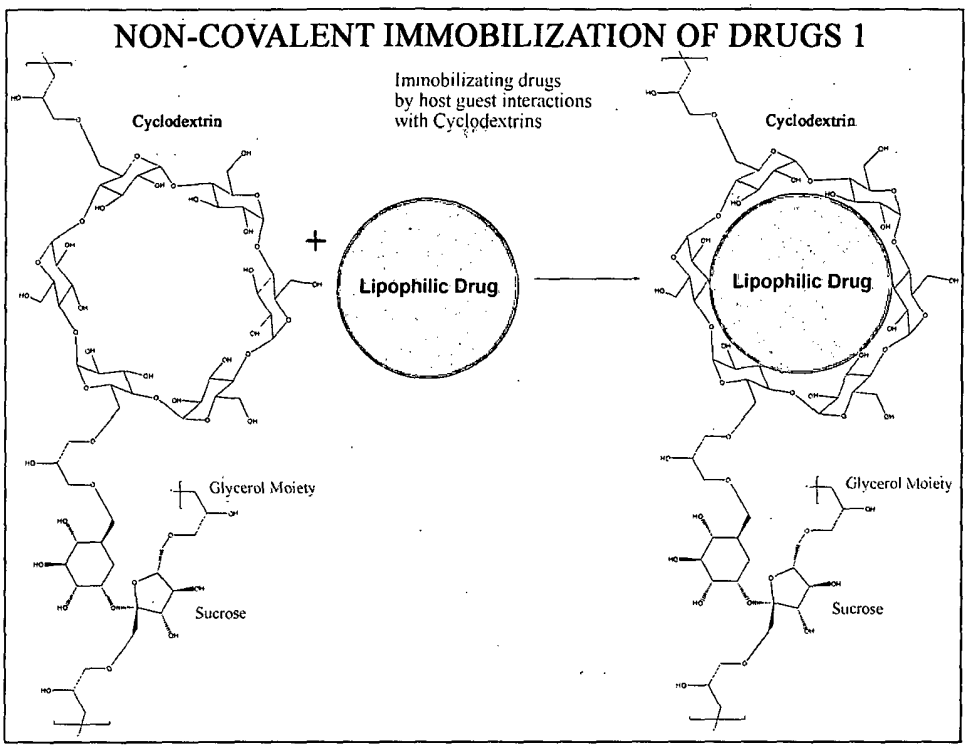

Sucrose
Glycerol Moiety
Sucrose
Glycerol Moiety
Sucrose
Glycerol Moiety
Variable Size: 5um to 100nm

Figure 10


NON-COVALENT IMMOBILIZATION OF DRUGS 1
Immobilizating drugs
by host guest interactions
with Cyclodextrins
Cyclodextrin
Lipophilic Drug
Cyclodextrin
Lipophilic Drug
Glycerol Moiety
Sucrose
Glycerol Moiety
Sucrose

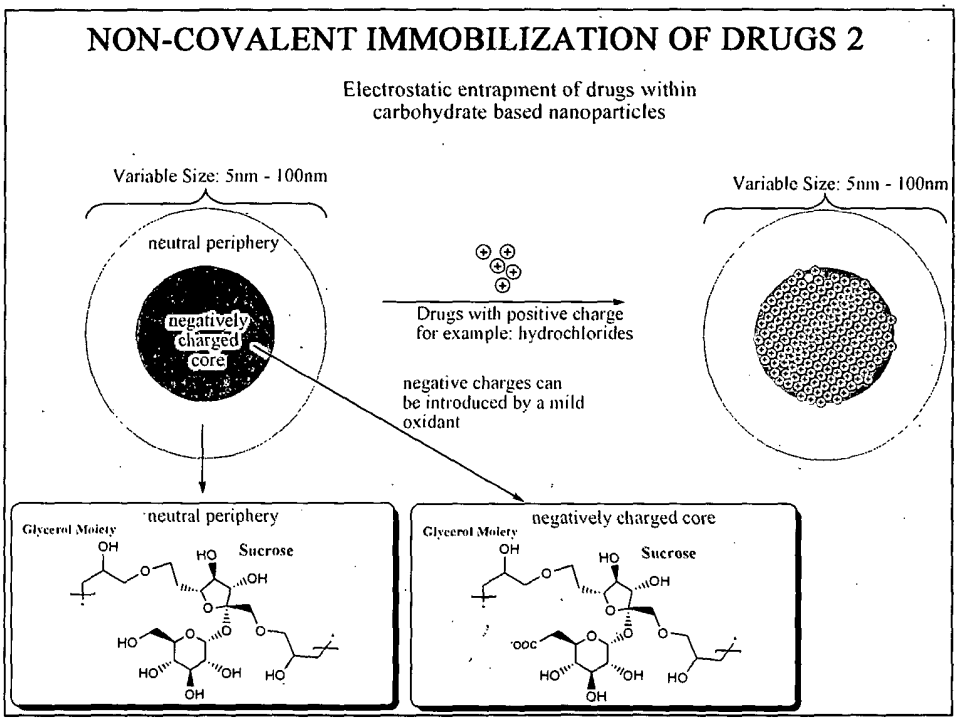

NON-COVALENT IMMOBILIZATION OF DRUGS 2
Electrostatic entrapment of drugs within
carbohydrate based nanoparticles
Variable Size: 5nm - 100nm
neutral periphery
negatively
charged
core
Drugs with positive charge
for example: hydrochlorides
negative charges can
be introduced by a mild
oxidant
Variable Size: 5nm - 100nm
neutral periphery
Glycerol Moiety
Sucrose
negatively charged core
Glycerol Moiety
Sucrose

Figure 11

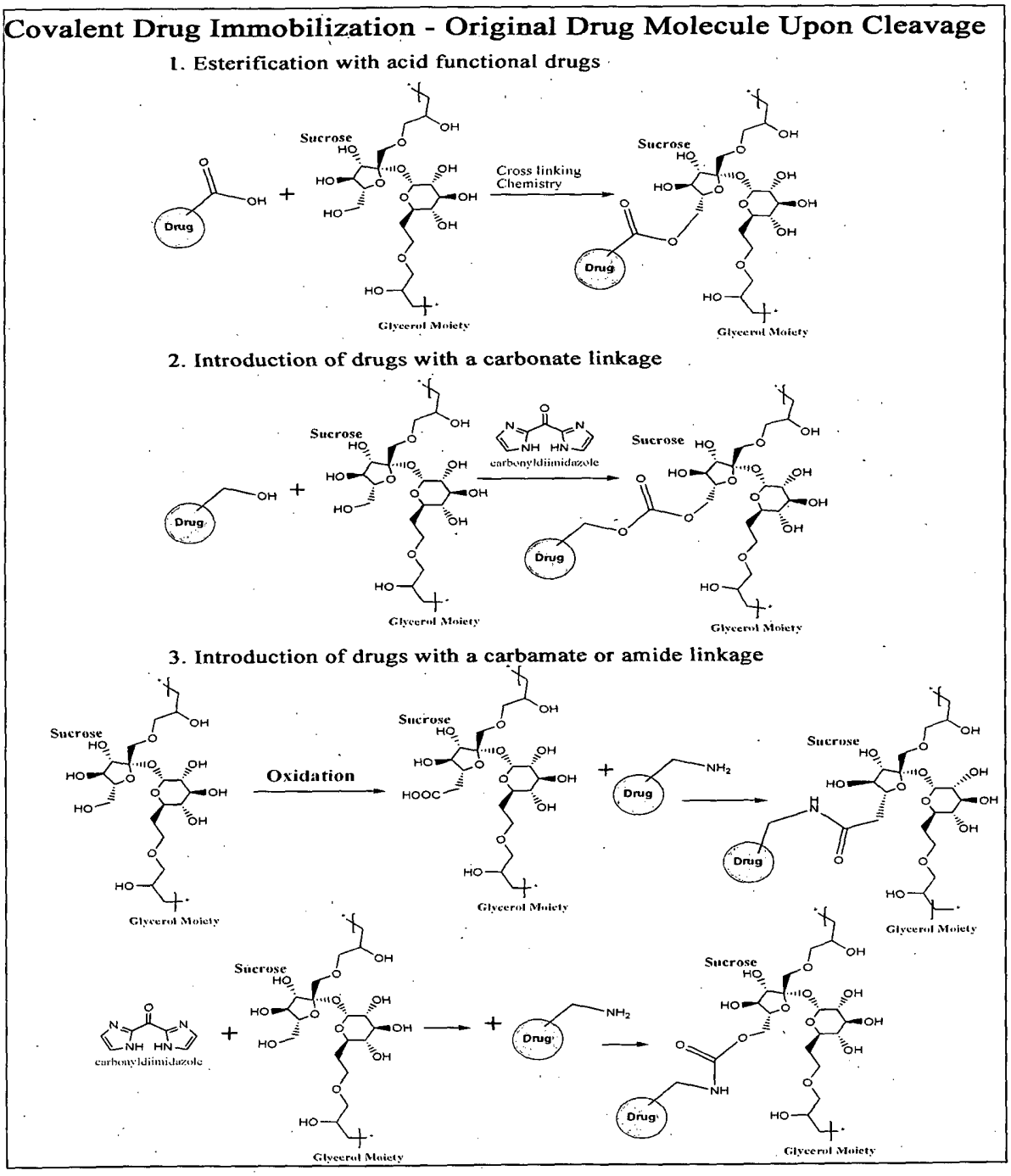

Covalent Drug Immobilization - Original Drug Molecule Upon Cleavage
1. Esterification with acid functional drugs
Sucrose
Drug
Cross linking Chemistry
Glycerol Moiety
2. Introduction of drugs with a carbonate linkage
carbonyldiimidazole
3. Introduction of drugs with a carbamate or amide linkage
Oxidation

Figure 12