Supporting Information

Surface functionlization of natural lignin isolated from *Aloe barbadensis* Miller biomass via atom transfer radical polymerization to enhanced anticancer efficacy

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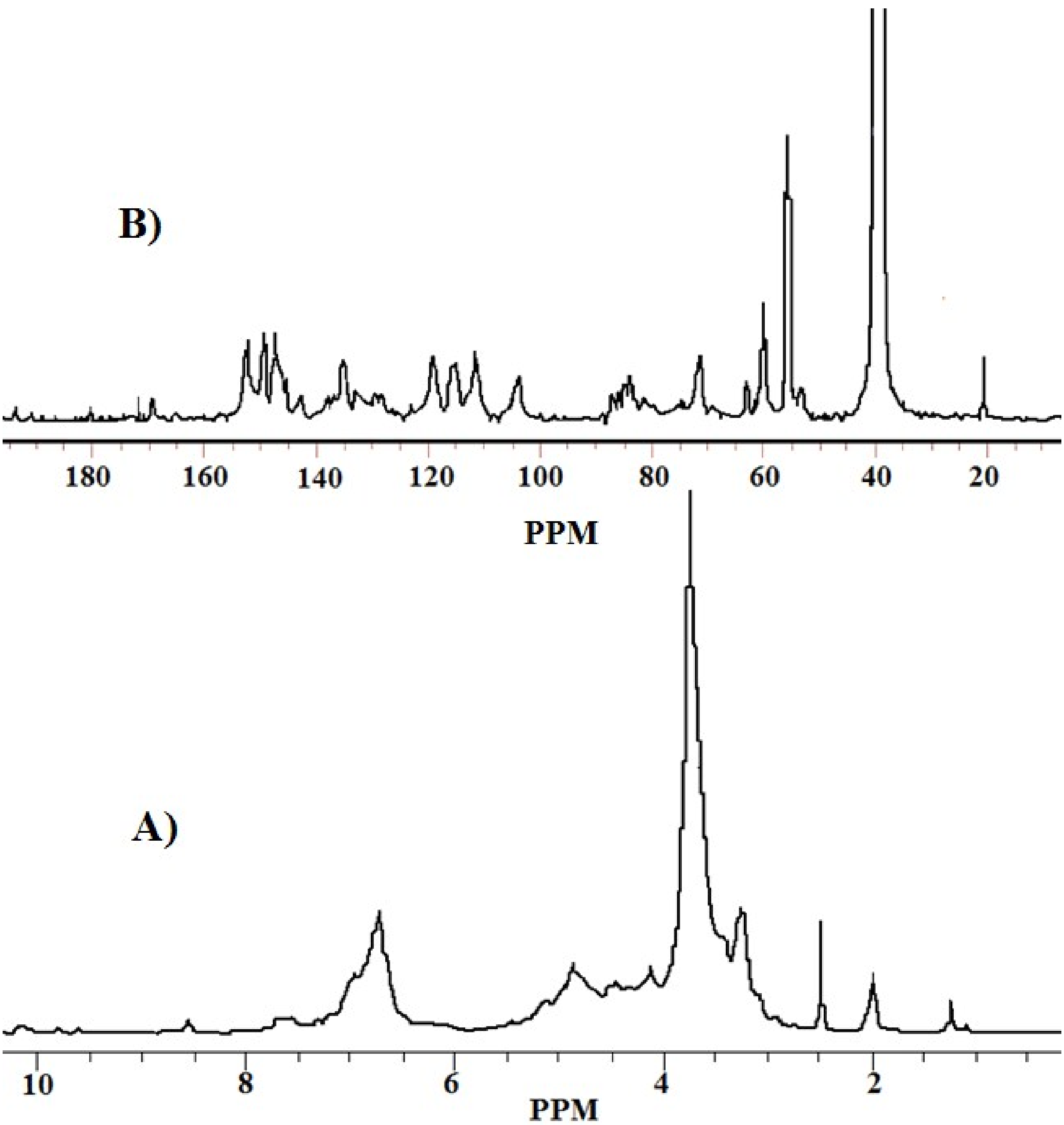

Figure S1. ^{1}H (A), ^{13}C (B) NMR spectrum of commercial lignin

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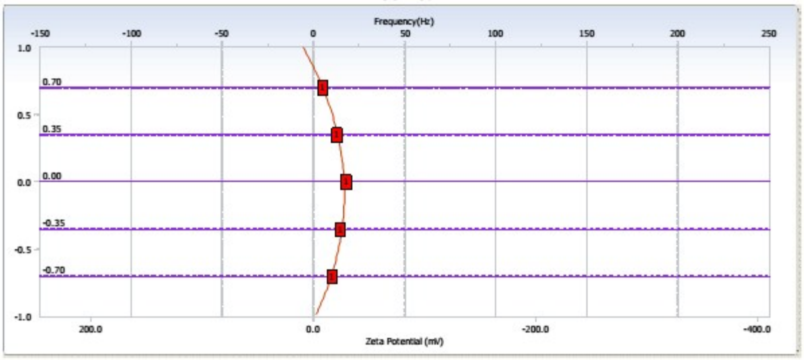
Delsa™ Nano
Common

EOS Plot / Distribution Graph S/N : 116109

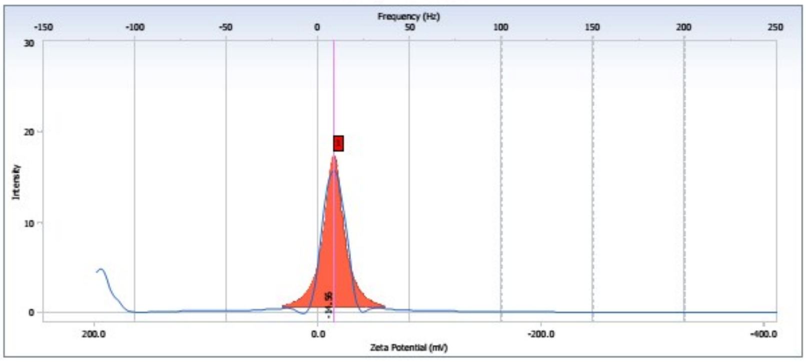
User	: Common	Group	:	Repetition : 1/1	
Date	: 7/22/2015	File Name	: chem_20150722_163559		
Time	: 16:35:59	Sample Information	: lig		
SOP Name	: Water			Security	: No Security

Version 2.21 / 2.03

EOS Plot



Mobility Distribution



Measurement Results

Zeta Potential	: -14.56	(mV)	Doppler shift	: 8.87	(Hz)
Mobility	: -1.135e-004	(cm^2/Vs)	Base Frequency	: 111.6	(Hz)
Conductivity	: 1.6487	(mS/cm)			
Zeta Potential of Cell			Diluent Properties		
Upper Surface	: -23.67	(mV)	Diluent Name	: WATER	
Lower Surface	: -12.99	(mV)	Temperature	: 25.0	(°C)
Cell Condition			Refractive Index	: 1.3328	
Cell Type	: Flow Cell		Viscosity	: 0.8878	(cP)
Avg. Electric Field	: -16.17	(V/cm)	Dielectric Constant	: 78.3	
Avg. Current	: -1.33	(mA)			

Fig S2. Zeta pontential value of isolated Lignin

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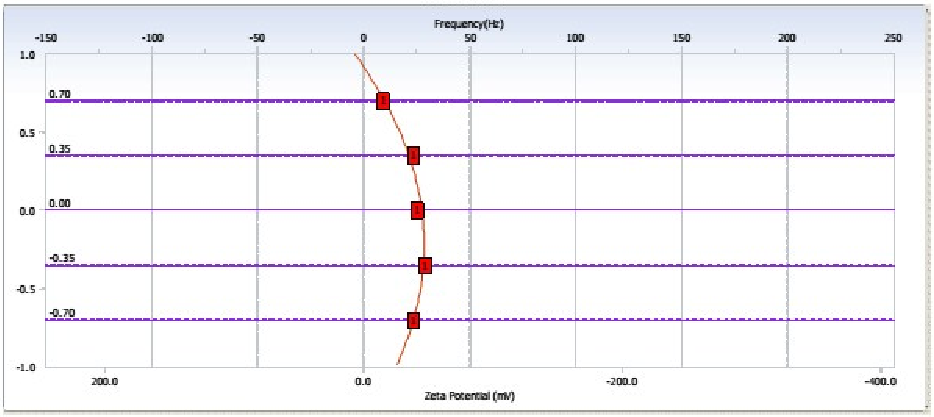
EOS Plot / Distribution Graph   S/N : 116109

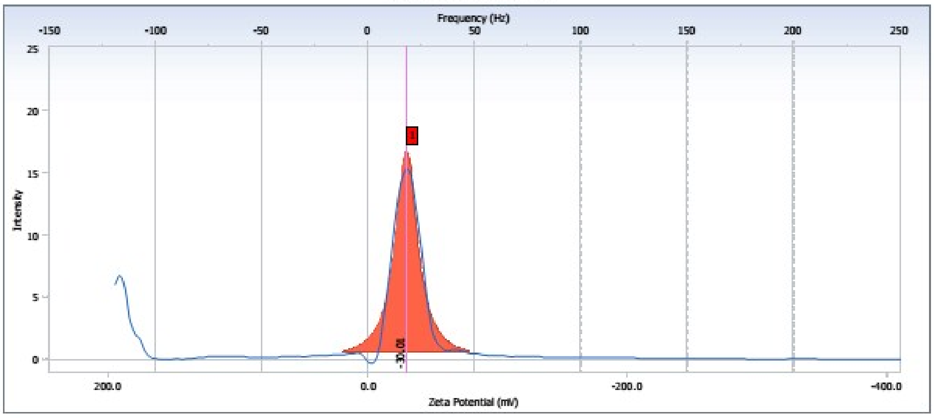
User	: Common	Group	:	Repetition : 1/1	
Date	: 8/19/2015	File Name	: chem_20150819_120608		
Time	: 12:06:08	Sample Information	: dl-Lig-PH LIG-g-MA		
SOP Name	: Water			Security	: No Security

Version 2.21 / 2.03

EOS Plot



Mobility Distribution



Measurement Results

Zeta Potential	: -30.01	(mV)	Doppler shift	: 18.32	(Hz)
Mobility	: -2.340e-004	(cm²/Vs)	Base Frequency	: 112.2	(Hz)
Conductivity	: 1.2363	(mS/cm)			

Zeta Potential of Cell			Diluent Properties		
Upper Surface	: -36.72	(mV)	Diluent Name	: WATER	
Lower Surface	: -5.18	(mV)	Temperature	: 25.0	(°C)
Cell Condition			Refractive Index	: 1.3328	
Cell Type	: Flow Cell		Viscosity	: 0.8878	(cP)
Avg. Electric Field	: -16.20	(V/cm)	Dielectric Constant	: 78.3	
Avg. Current	: -1.00	(mA)			

Fig S3. Zeta pontential value of LIG-g-MA halo-nanocarrier

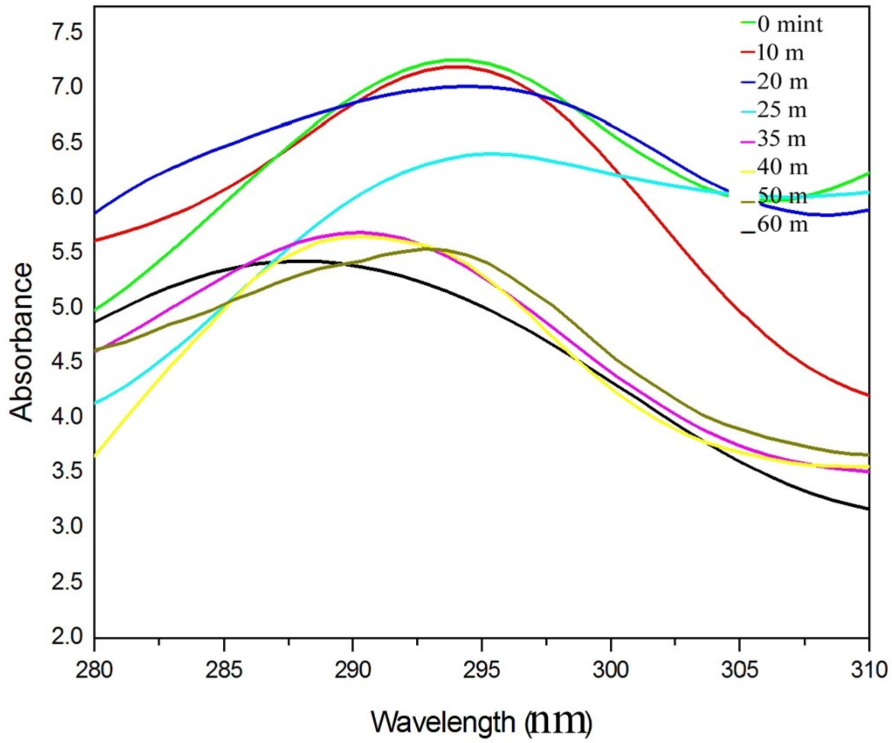


Fig S4. Encapsulation effiecy of LIG-g-MA halo-nanocarrier

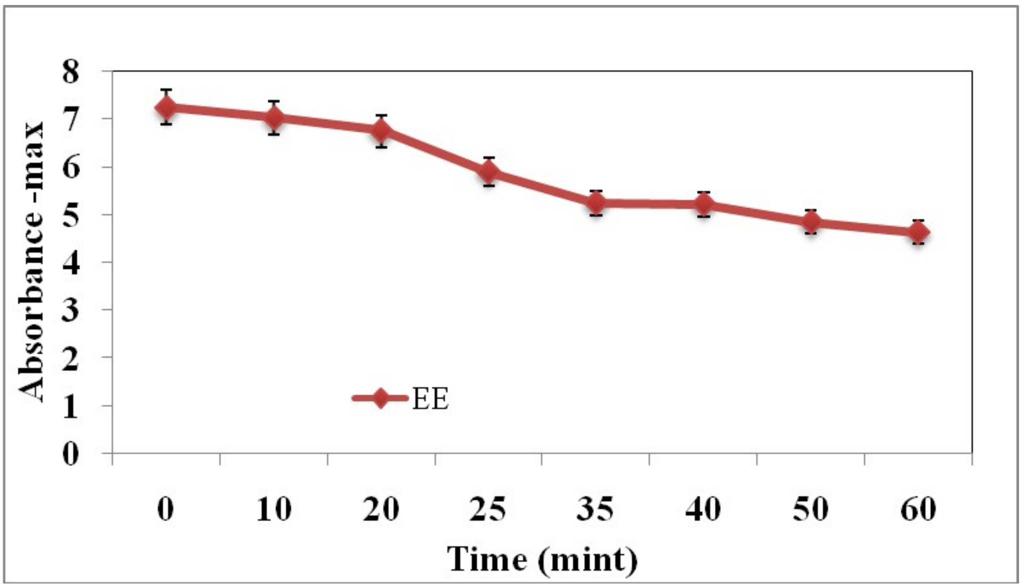


Fig S5. Encapsulation efficiency of LIG-g-MA holo-nanocarrier at different time intervals

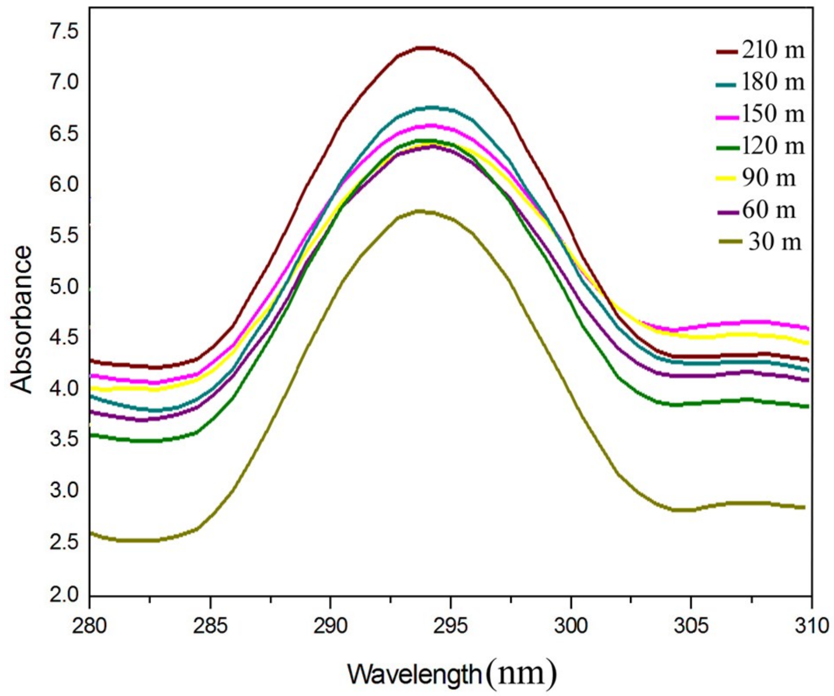


Fig S6. *In-vitro* drug release of LIG-g-MA halo-nanocarrier at pH 2.4 medium

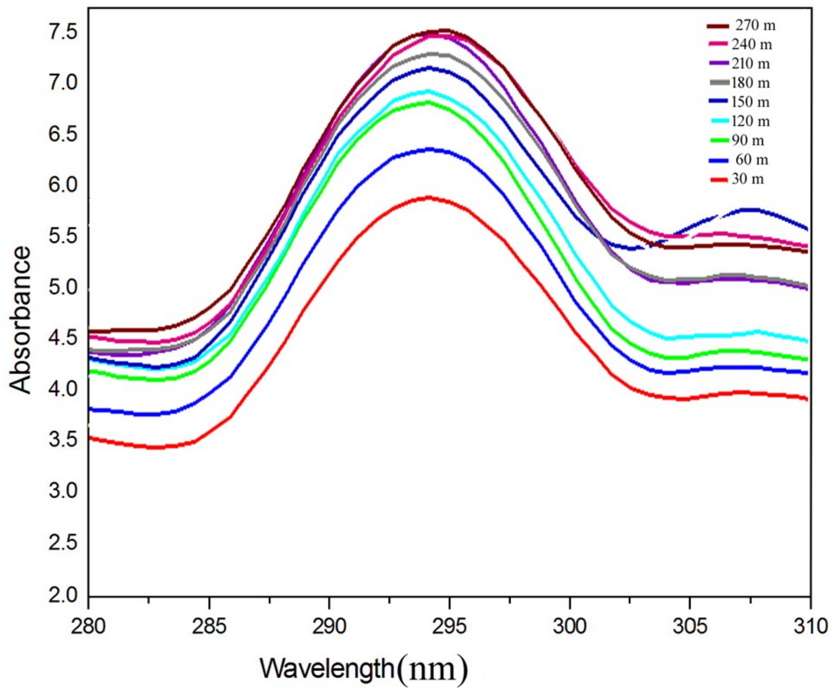


Fig S7. *In-vitro* drug release of LIG-g-MA halo-nanocarrier at pH 6.8 medium

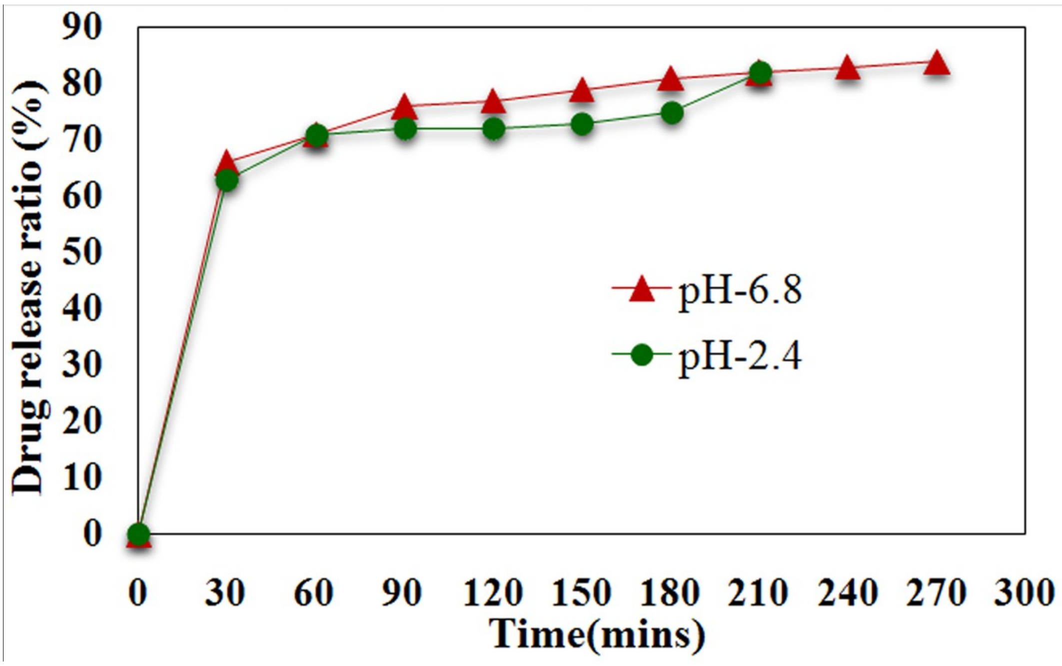


Fig S8. The study of *in-vitro* 5-FU release from LIG-g-MA holo-nanocarrier at pH 2.4 and 6.8 medium

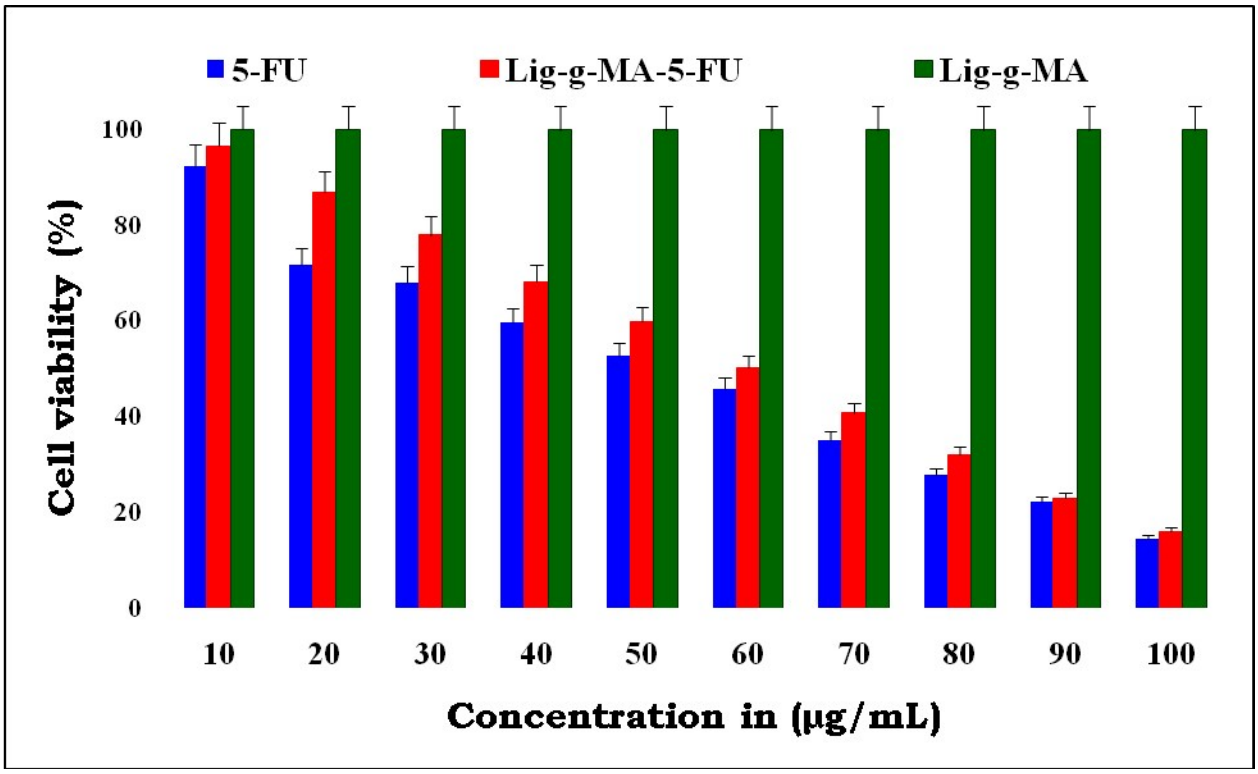


Fig S9. Cell viability studies of 5-FU, 5-FU loaded LIG-g-MA holo-nanocarrier and unloaded LIG-g-MA halo-nanocarrier against MCF-7 cells determined by MTT assay. The results represented as mean ± standard deviation of three individual experiments. The IC_{50} values of 5-FU and 5-FU loaded carrier against MCF-7 cells were μg/mL, respectively.