

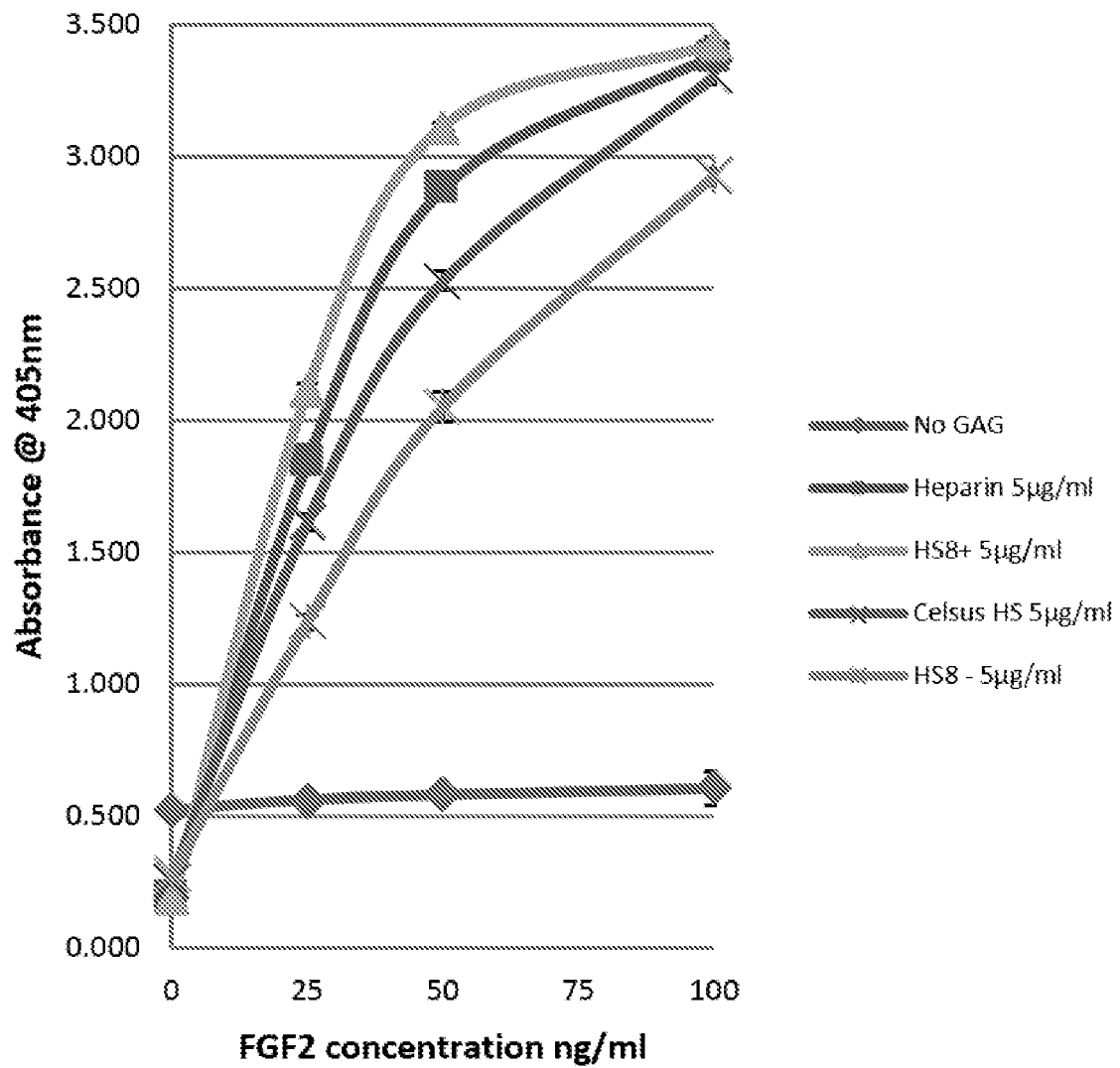


Figure 1

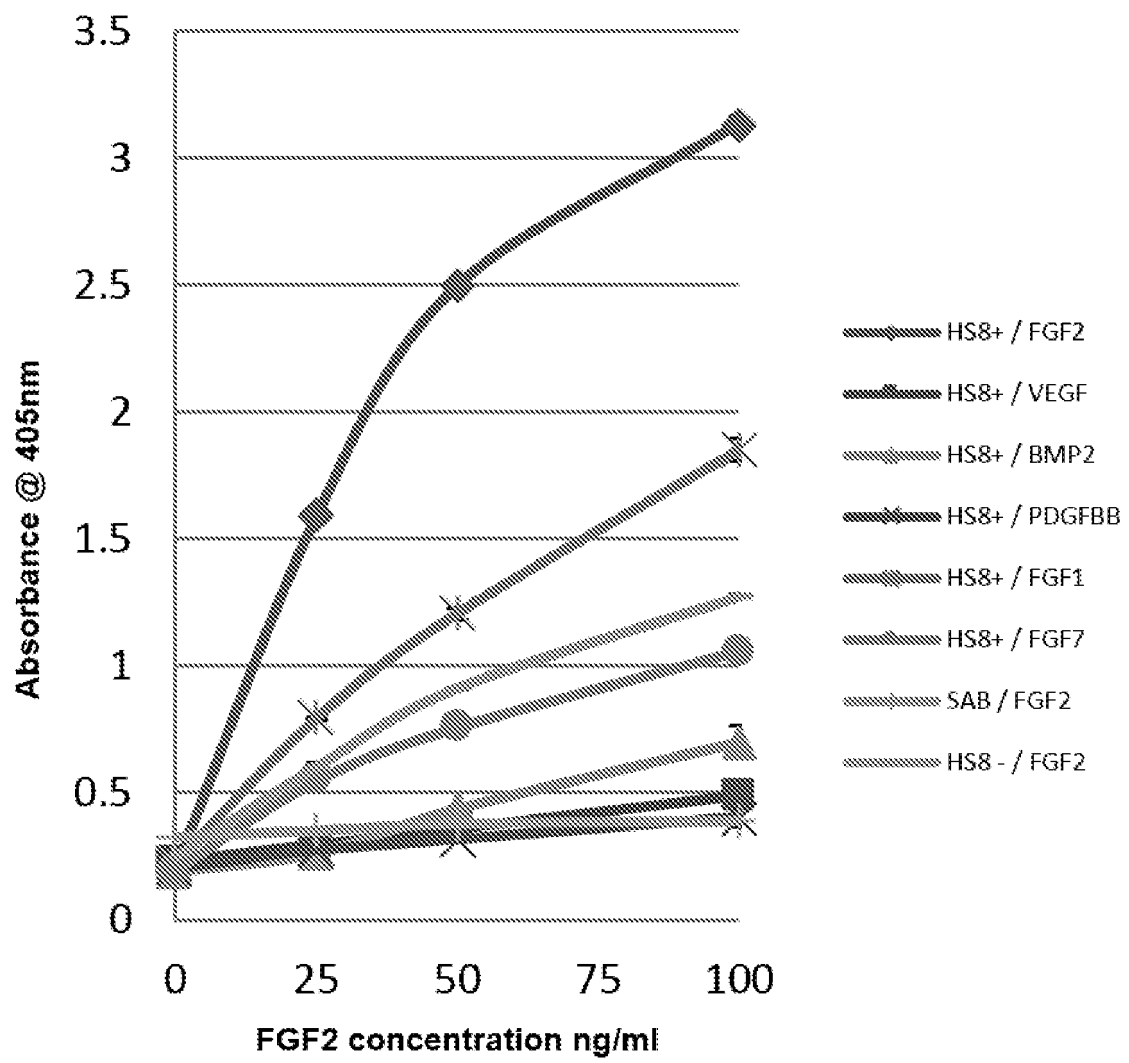


Figure 2

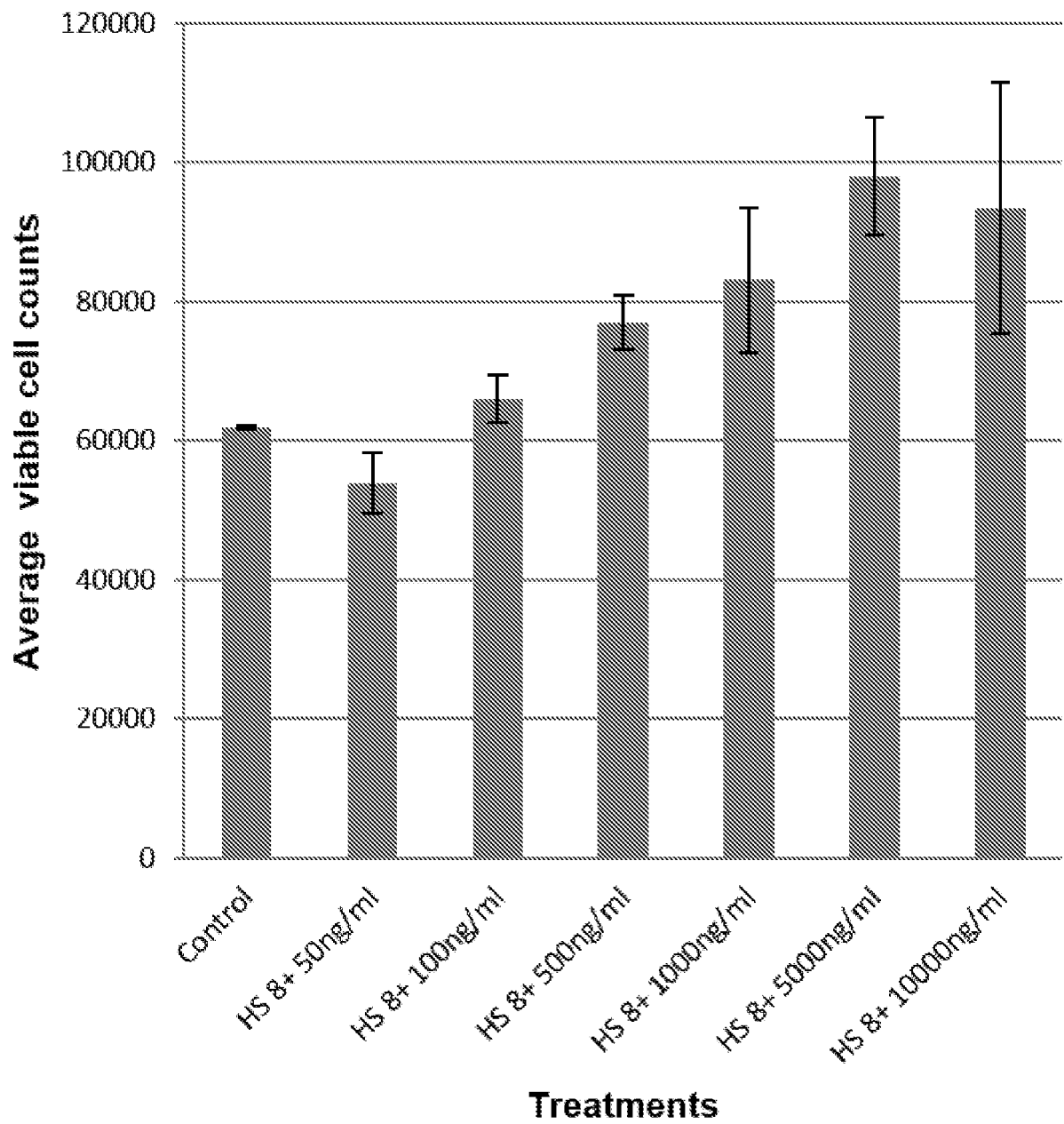


Figure 3

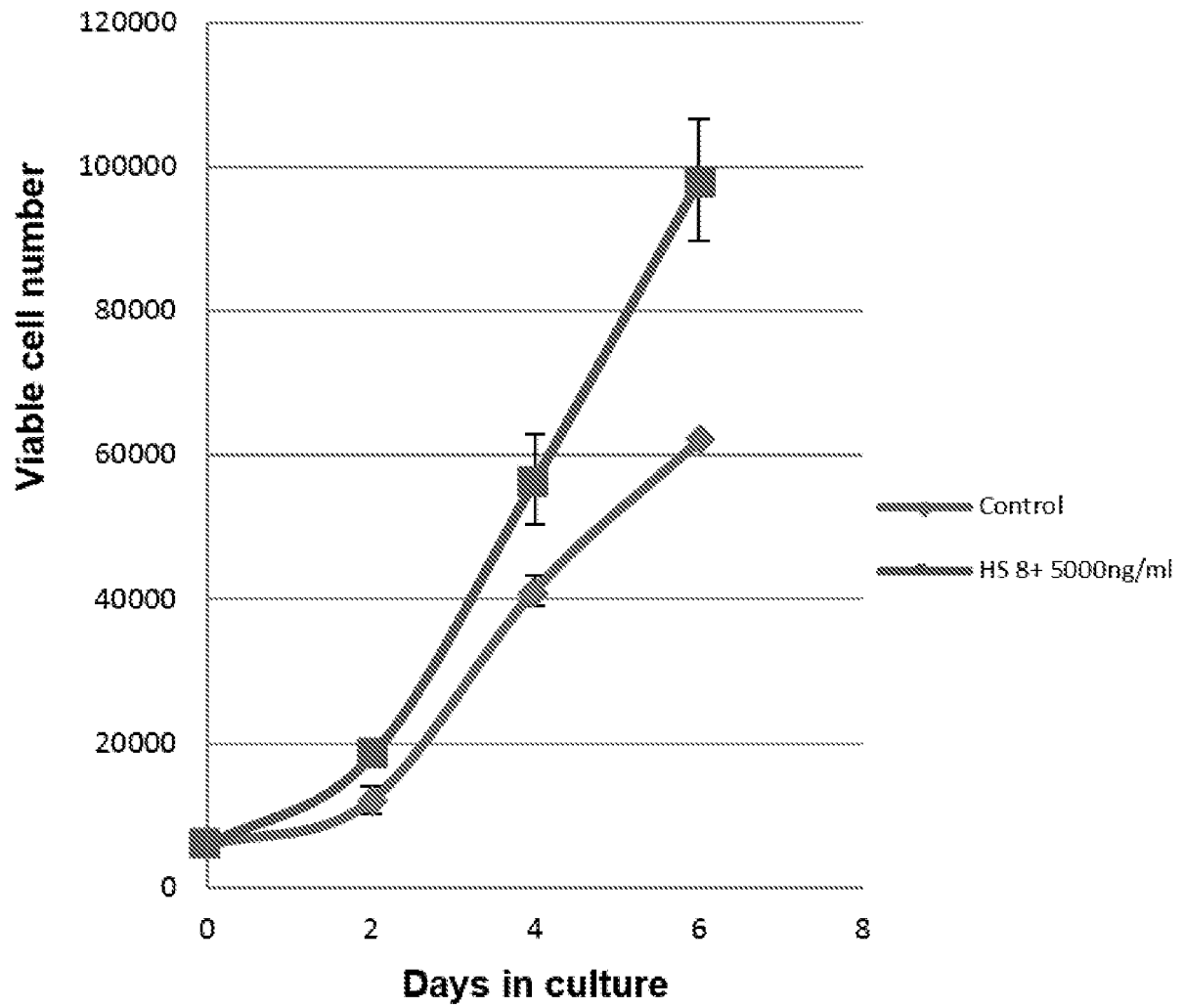


Figure 4

	Residue/ Size	Sequence	Reference
1	248-254/ 7aa	²⁴⁸ YKRSRYT ²⁵⁴ -paper Have to be ²⁴⁸ YRSRKYT ²⁵⁴	Lee <i>et al</i> , 2007
2	261-277/17aa	²⁶¹ KRTGQYKLGSKTGPGQK ²⁷⁷	
3	260-277aa/18aa	²⁶⁰ LKRTGQYKLGSKTGPGQK ²⁷⁷	Hileman <i>et al</i> , 1998
5	235-262/ 28aa	²³⁵ FFFERLESNNYNTYRSRKYTSWYVALKR ²⁶²	Baird <i>et al</i> , 1998
6	157-172/ 16aa	¹⁵⁷ GHFKDPKRLYCKNGGF ¹⁷²	Gandhi <i>et al</i> , 2008
8	185-194/ 10aa	¹⁸⁵ VREKSDPHIK ¹⁹⁴	Kinsella, <i>et al</i> , 1998
9	250-259/ 10aa	²⁵⁰ SRKYTSWYVA ²⁵⁹	
10	260-273/14aa	²⁶⁰ LKRTGQYKLGSKTG ²⁷³	
11	260-280/21aa	²⁶⁰ LKRTGQYKLGSKTGPGQKAIL ²⁸⁰	Ashikari-Hada <i>et al</i> ,2004
13	168-169,223,261-277-20aa	¹⁶⁸ KN ¹⁶⁹ ²²³ R ²⁶¹ KRTGQYKLGSKTGPGQK ²⁷⁷	Ori <i>et al</i> , 2009, Faham <i>et al</i> , 1996, Thomson <i>et al</i> , 1985 and Baird <i>et al</i> , 1998
14	235-262/28aa	²³⁵ FFFERLESNNYNTYRSRKYTSWYVALKR ²⁶²	
15	216-225/10aa	²¹⁶ LAMKEDGRLL ²²⁵	

Figure 5

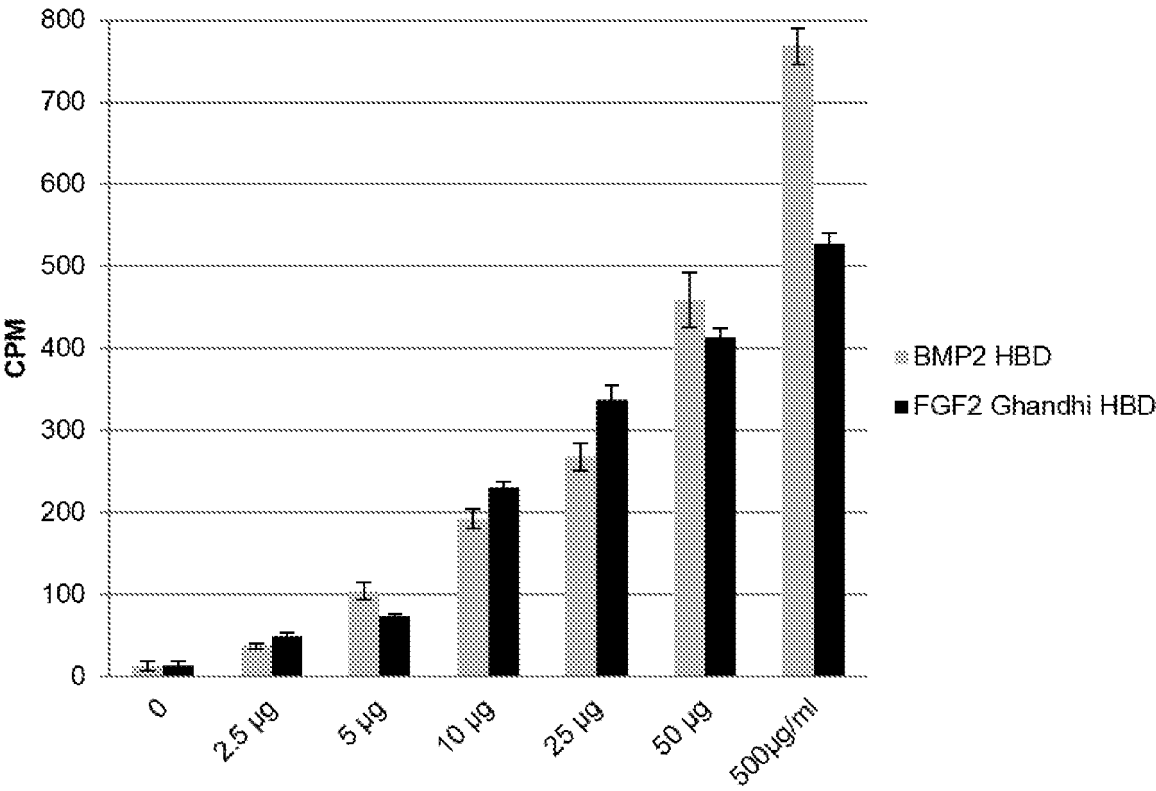
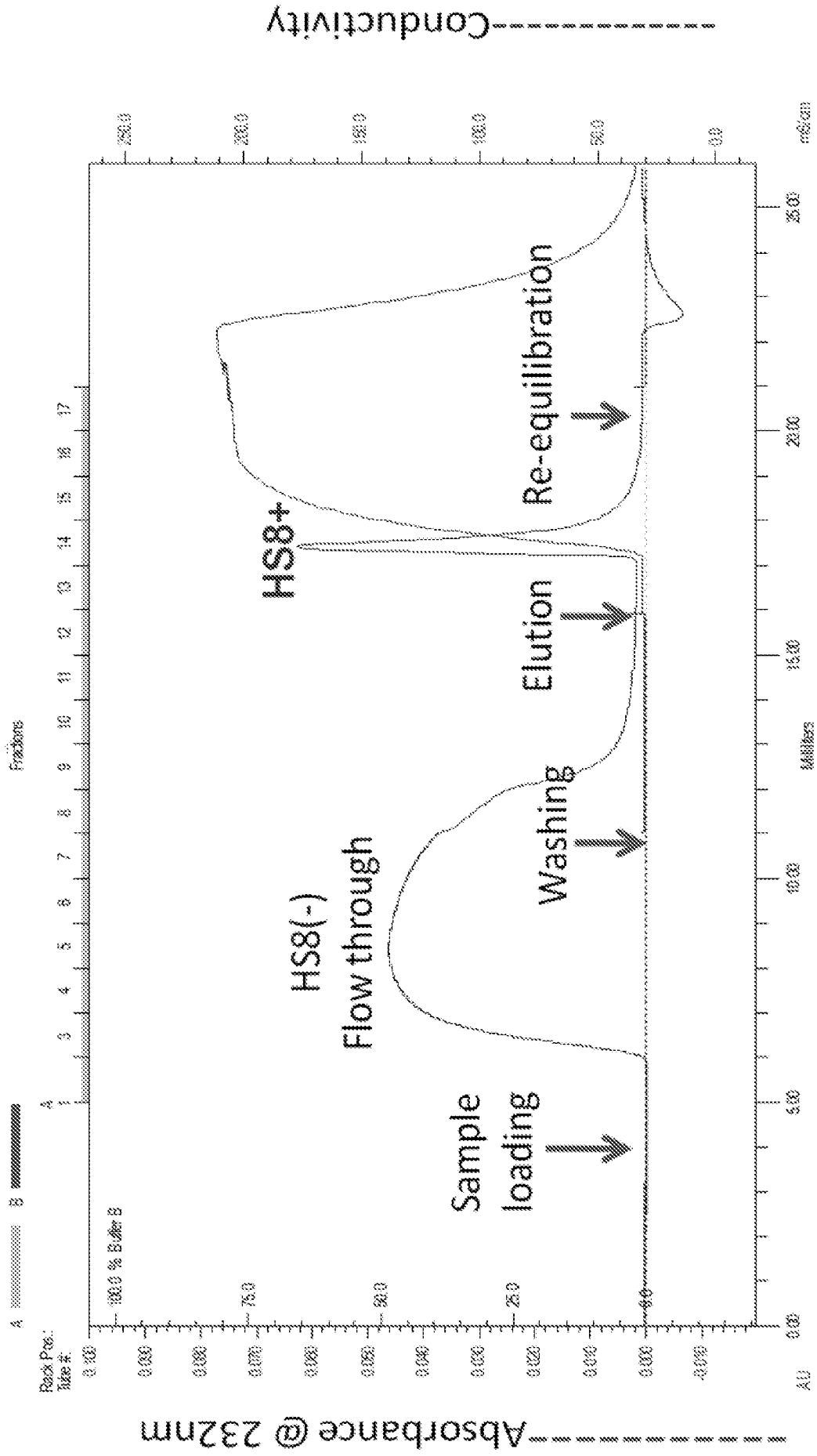


Figure 6A



Fraction number

Figure 6B

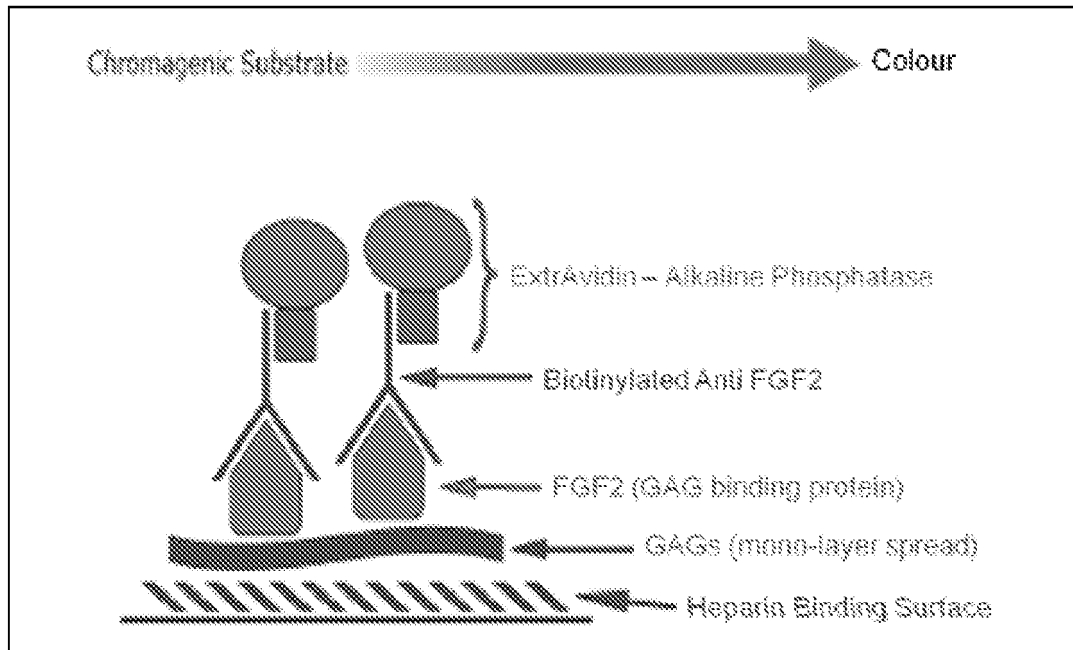


Figure 7

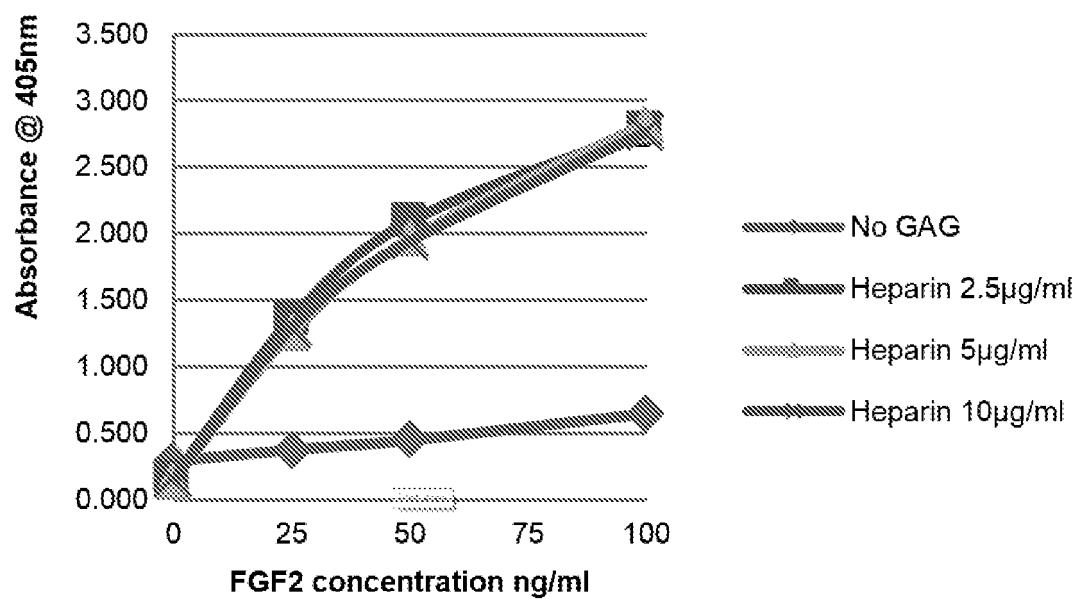


Figure 8A

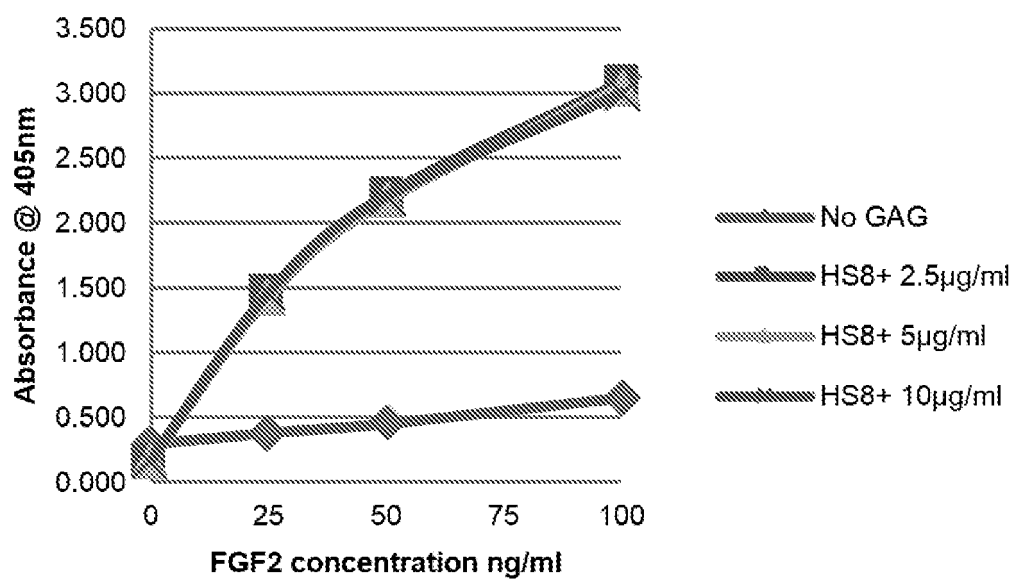


Figure 8B

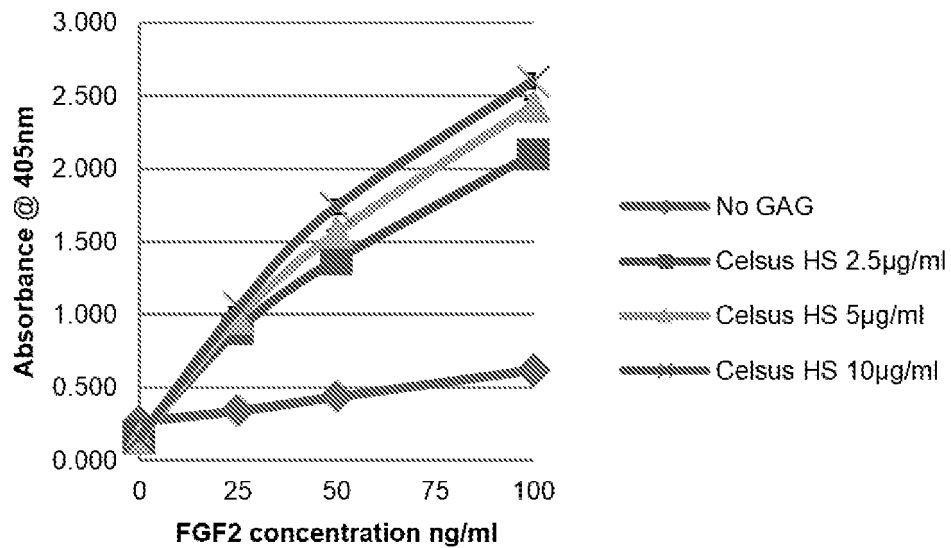


Figure 8C

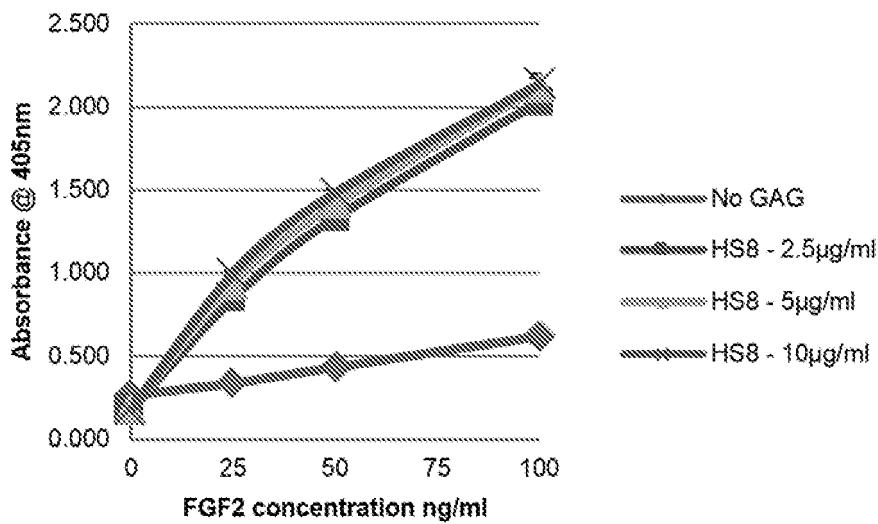


Figure 8D

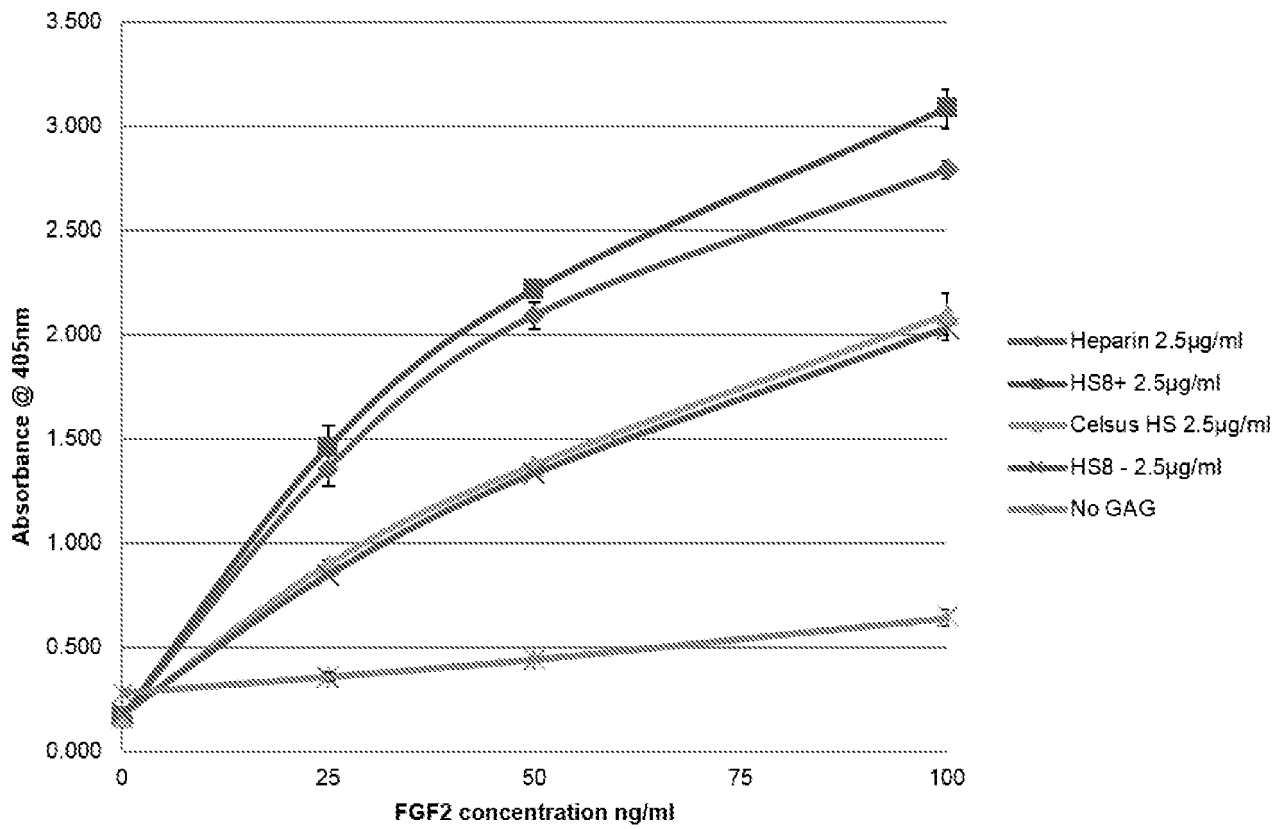


Figure 9

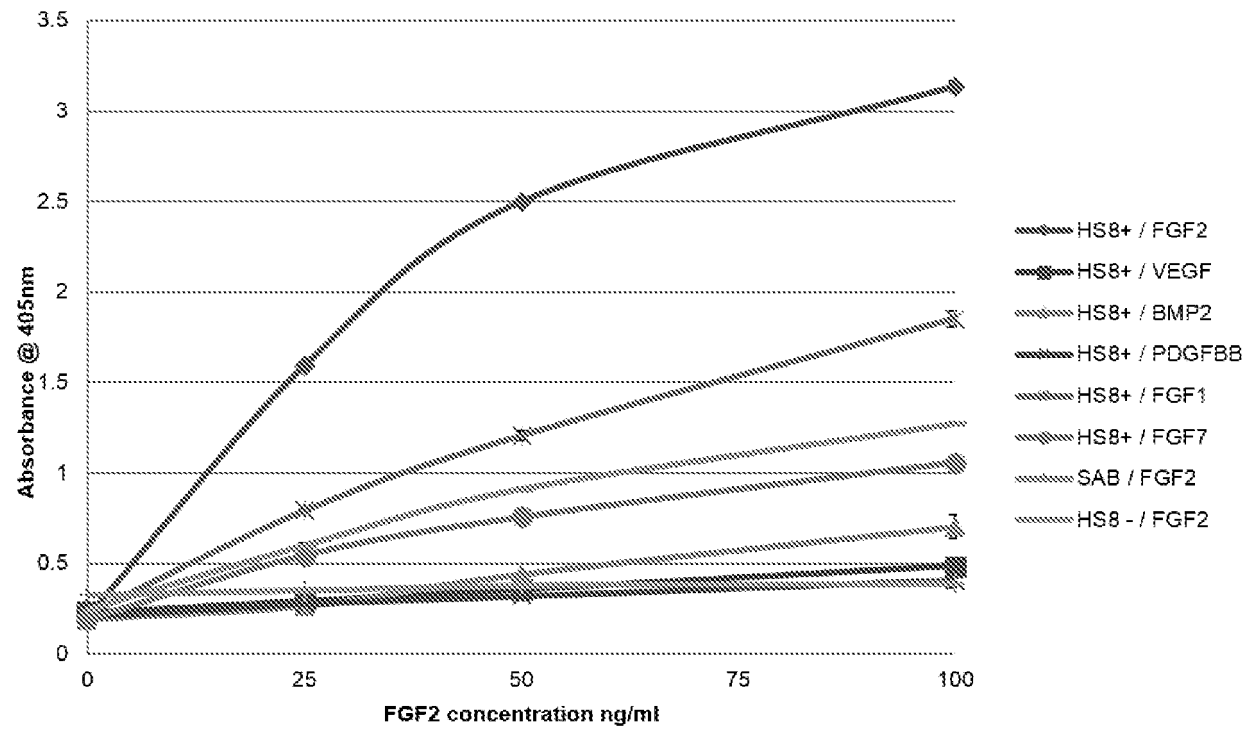


Figure 10A

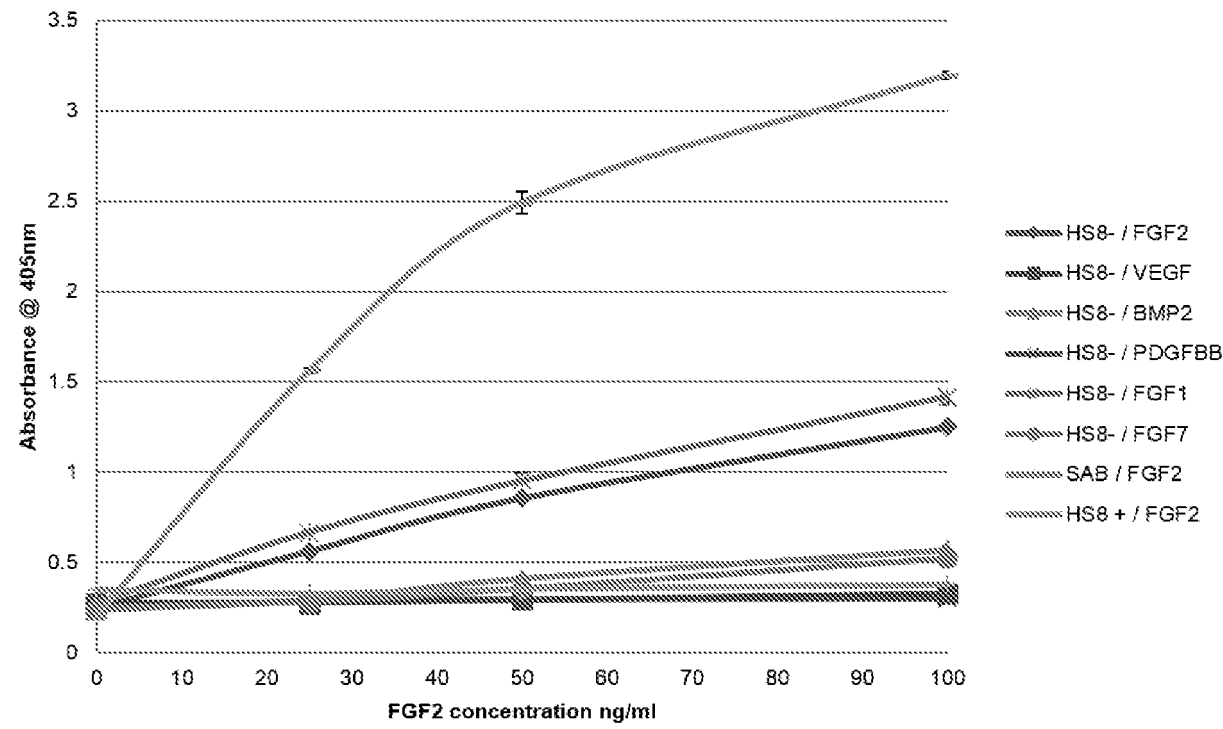


Figure 10B

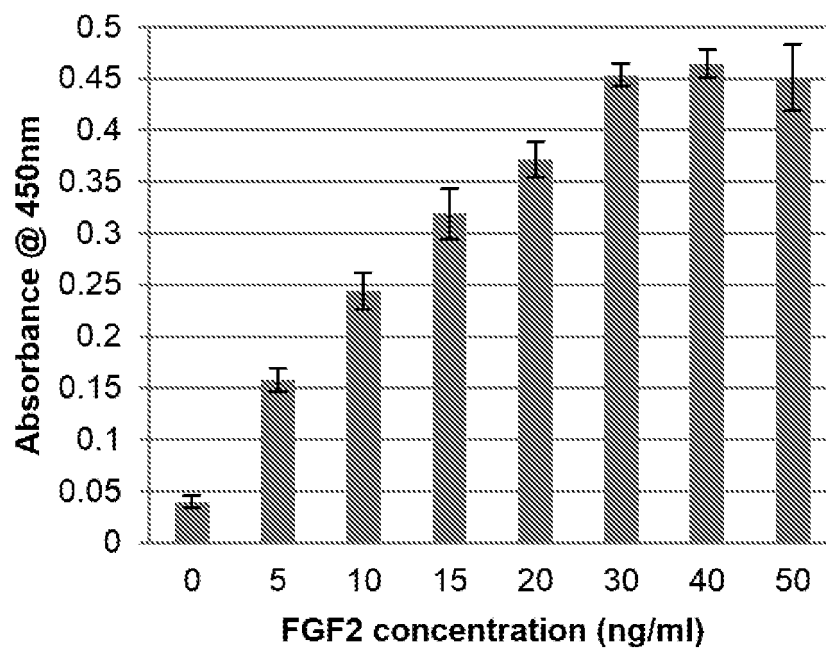


Figure 11A

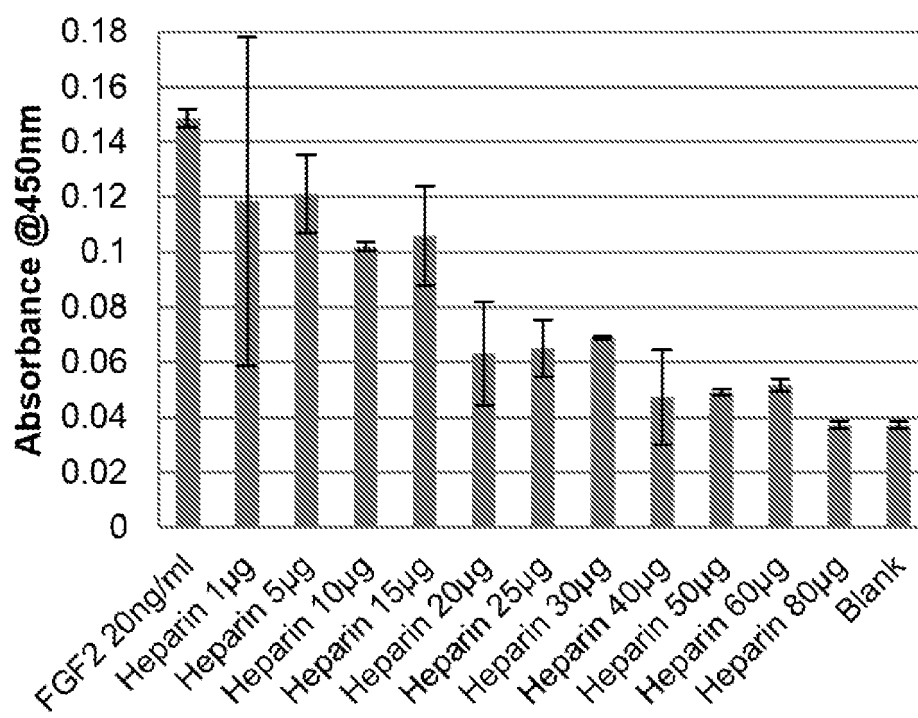


Figure 11B

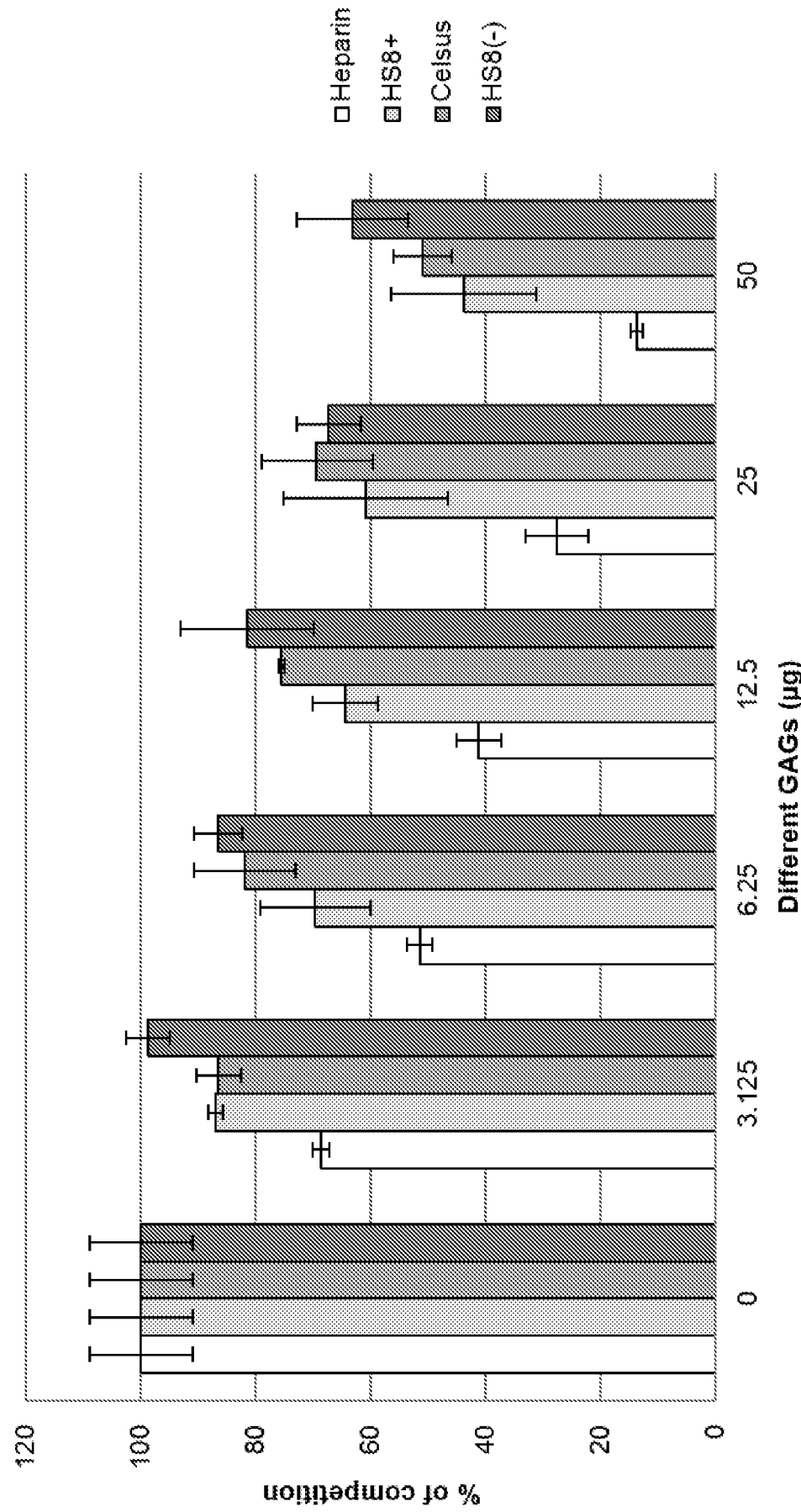


Figure 11C

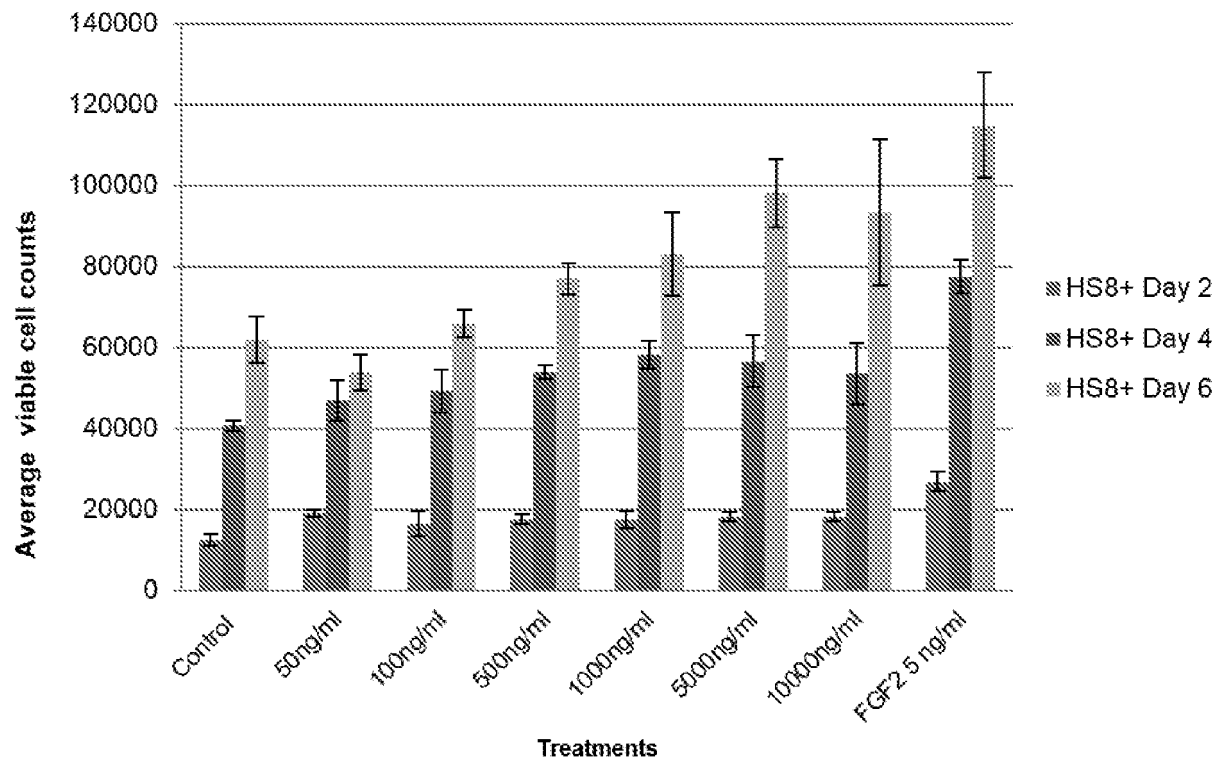


Figure 12A

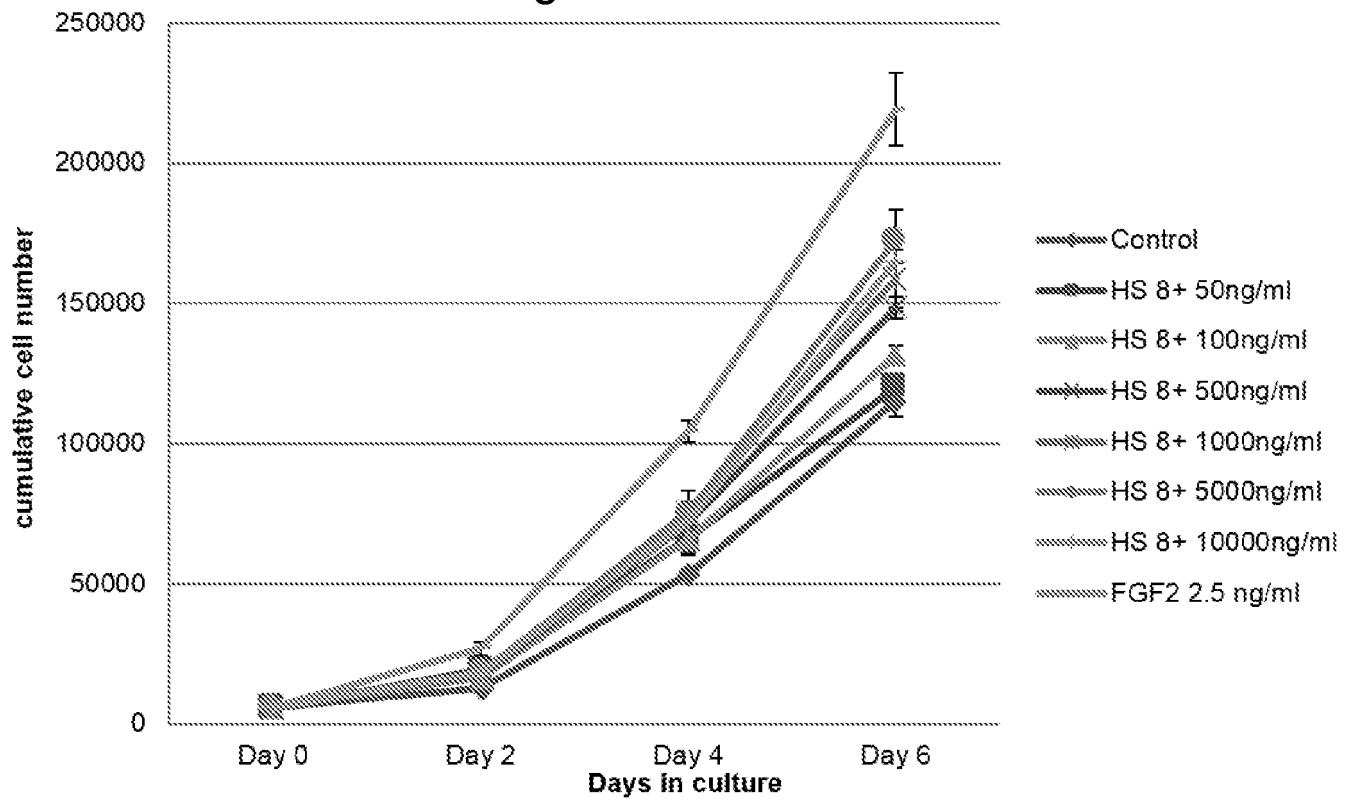


Figure 12B

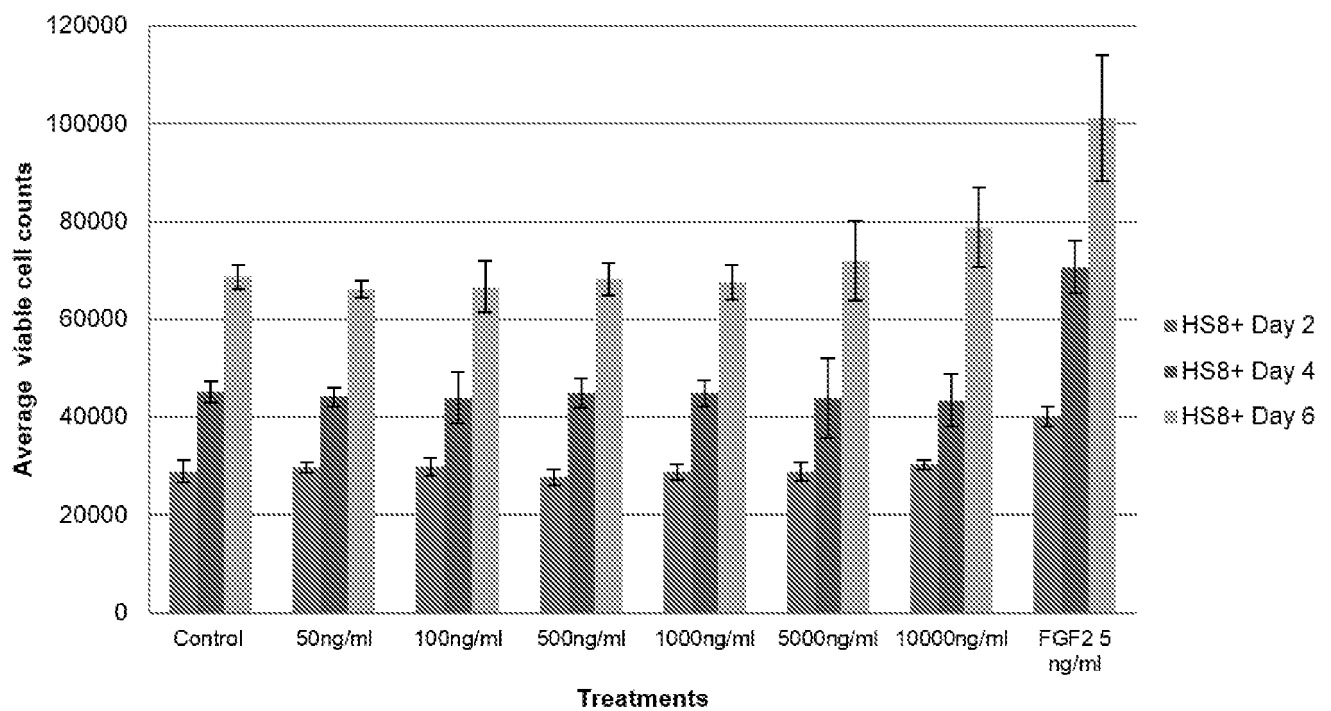


Figure 13A

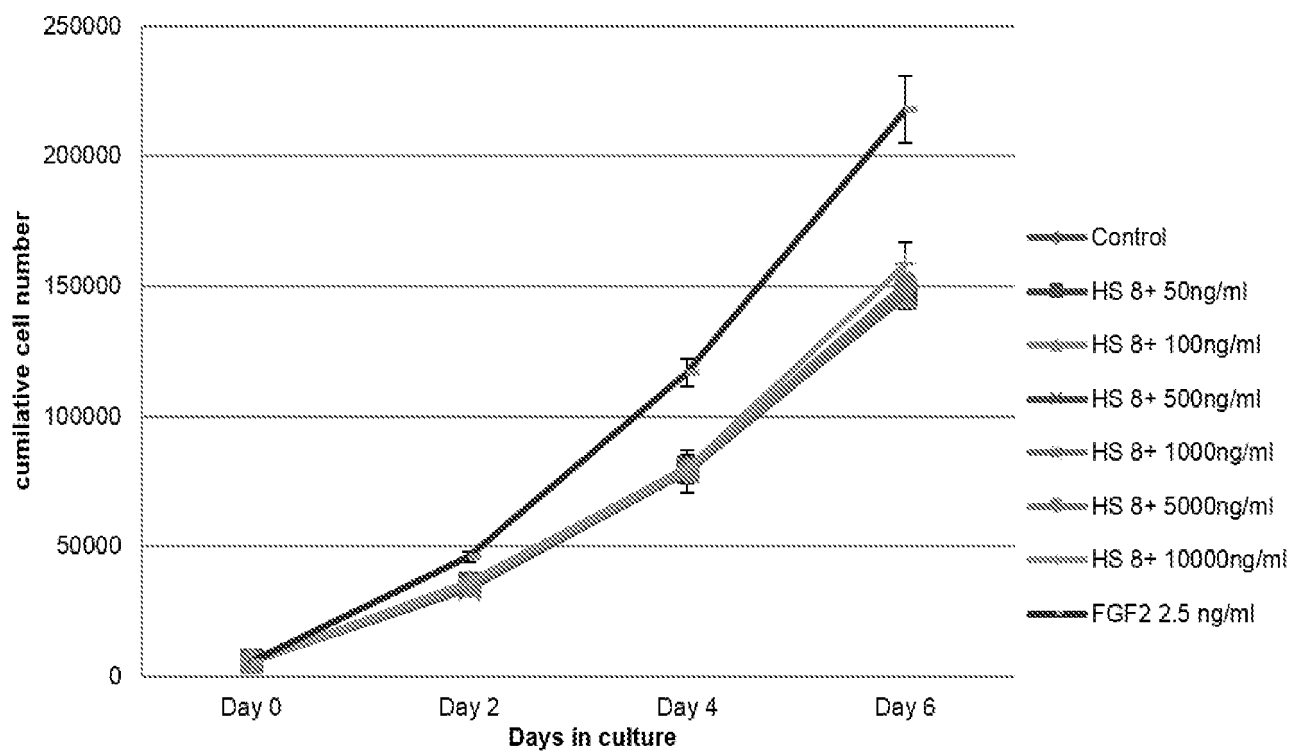


Figure 13B

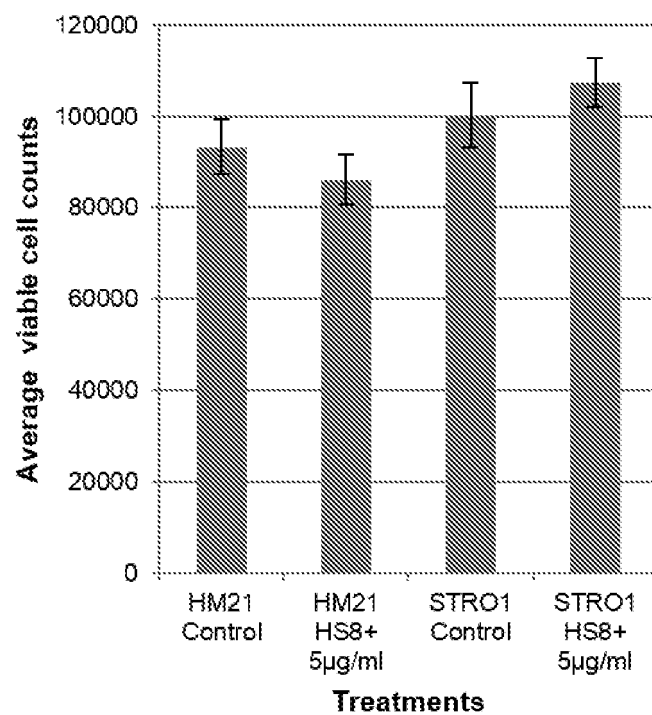
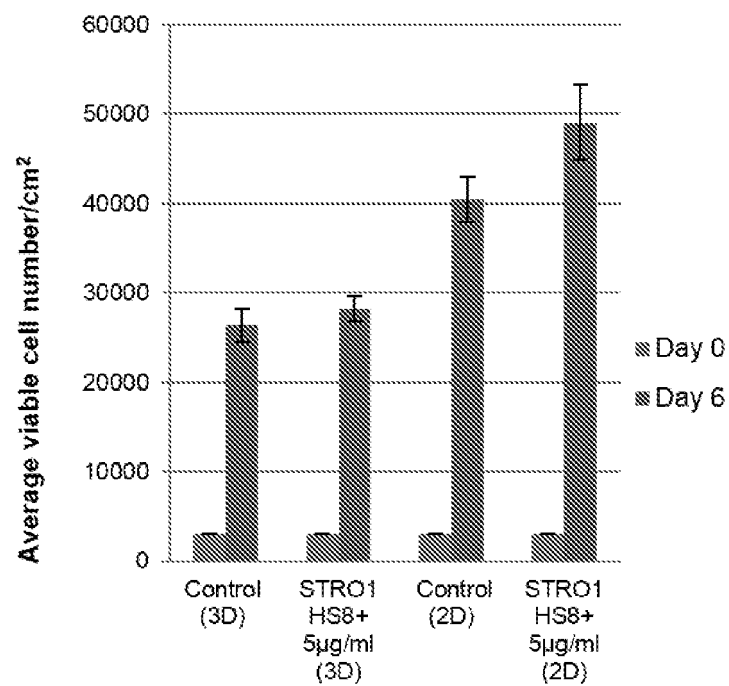


Figure 14A



3D - Media change every 3 days,
2D - Media change every 2 days

Figure 14B

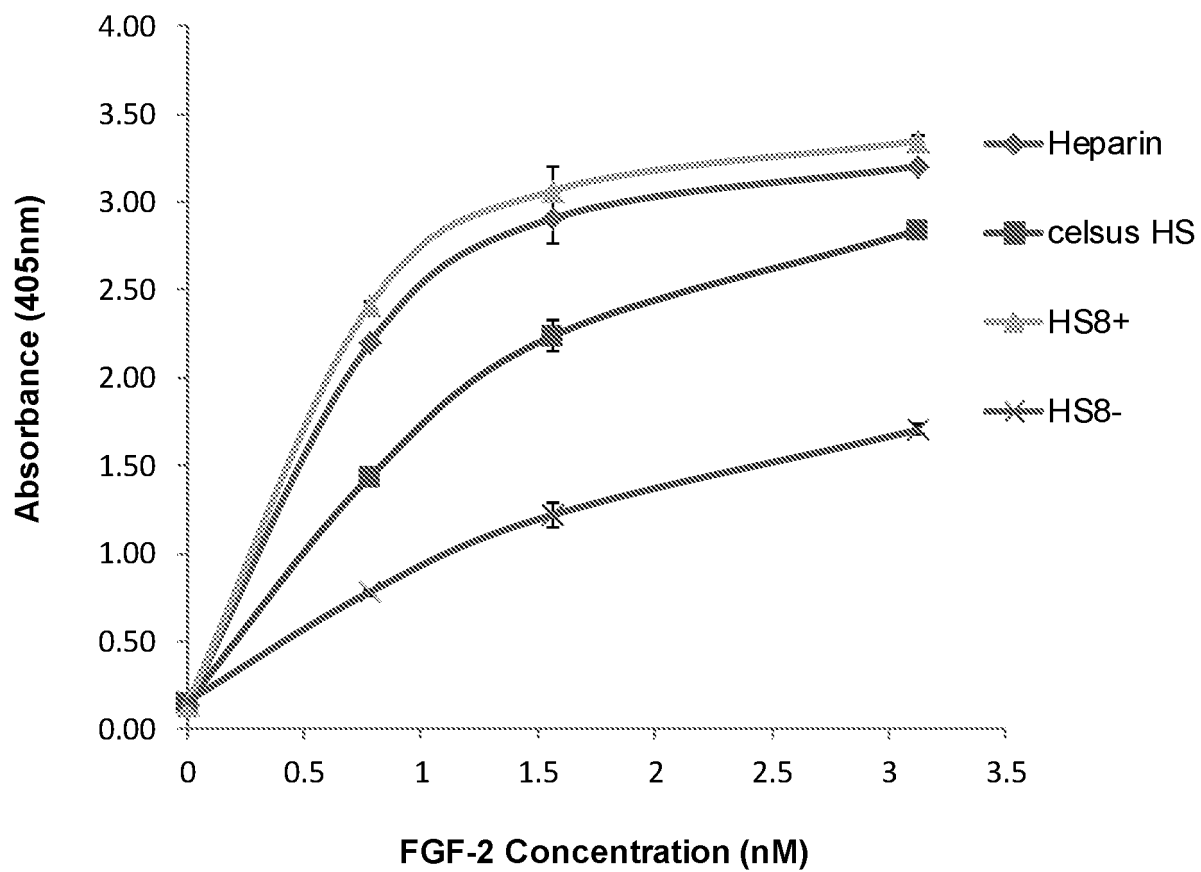


Figure 15

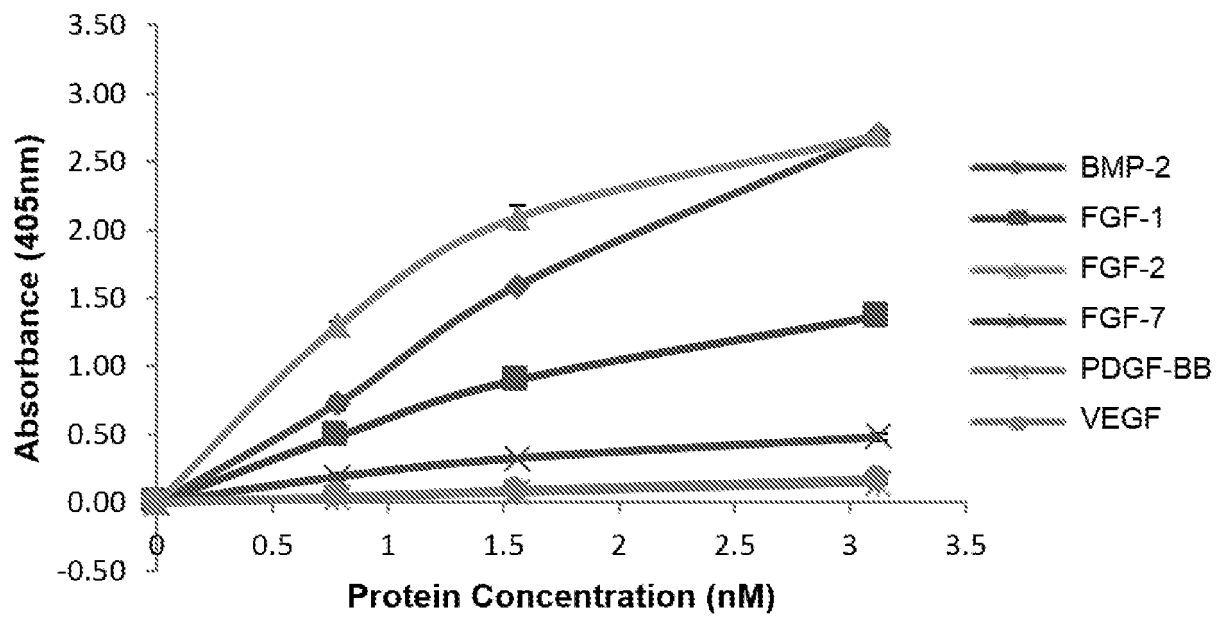


Figure 16A

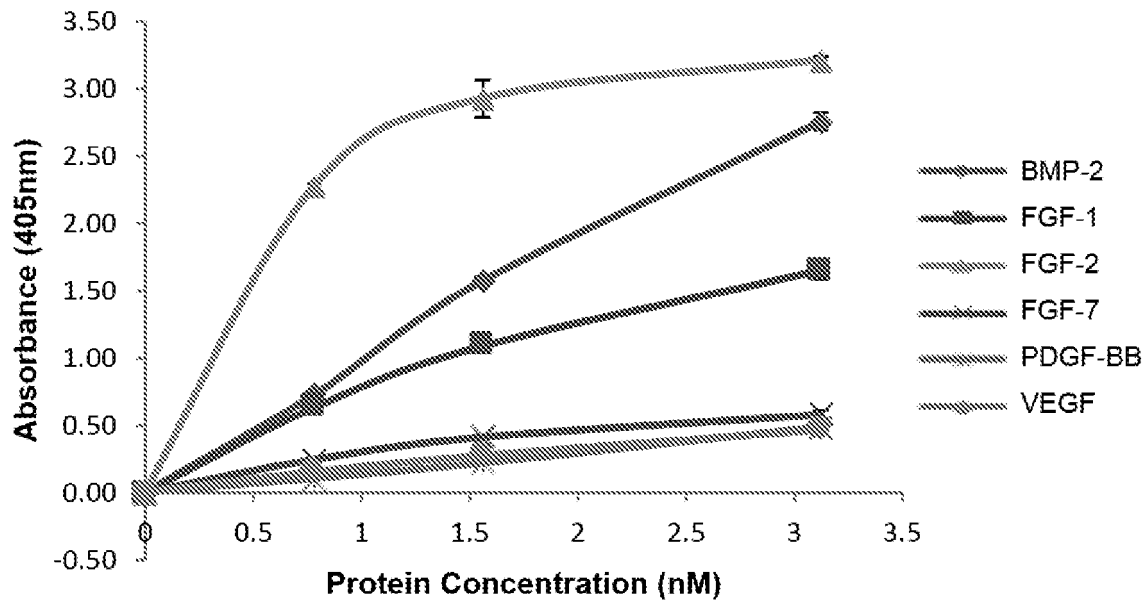


Figure 16B

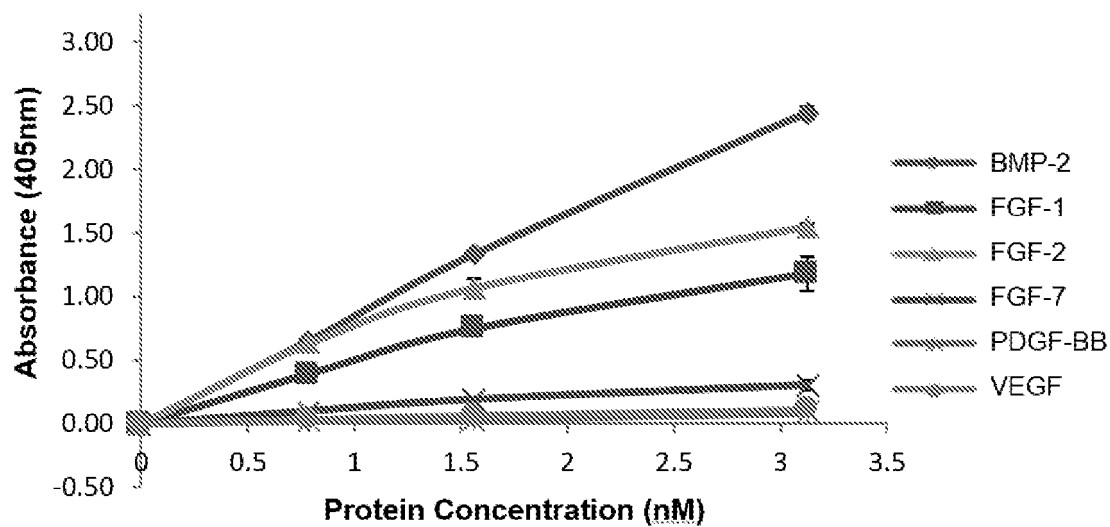


Figure 16C

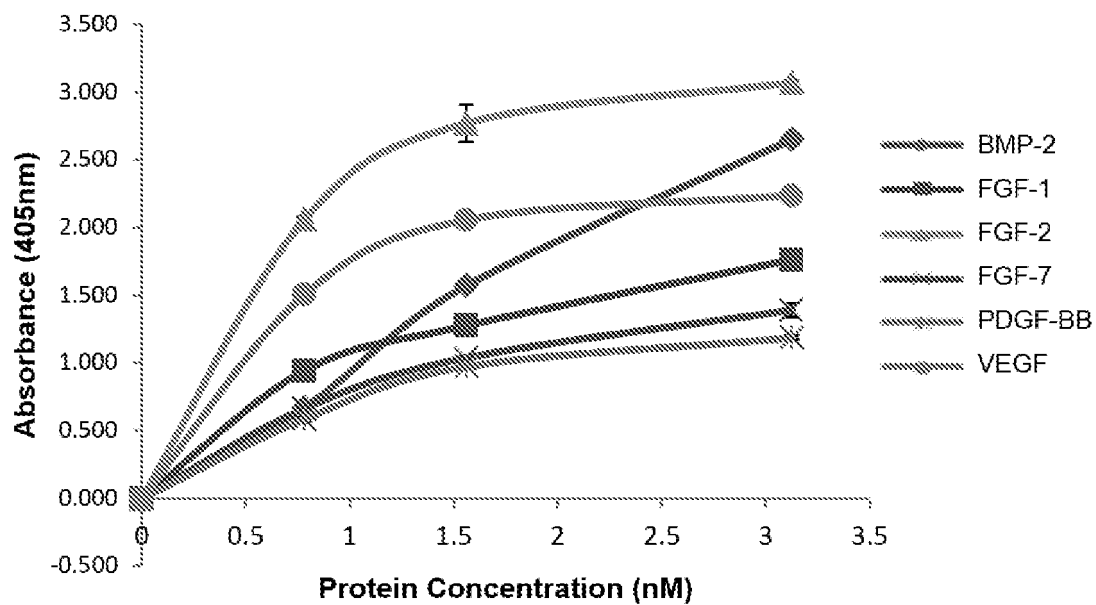
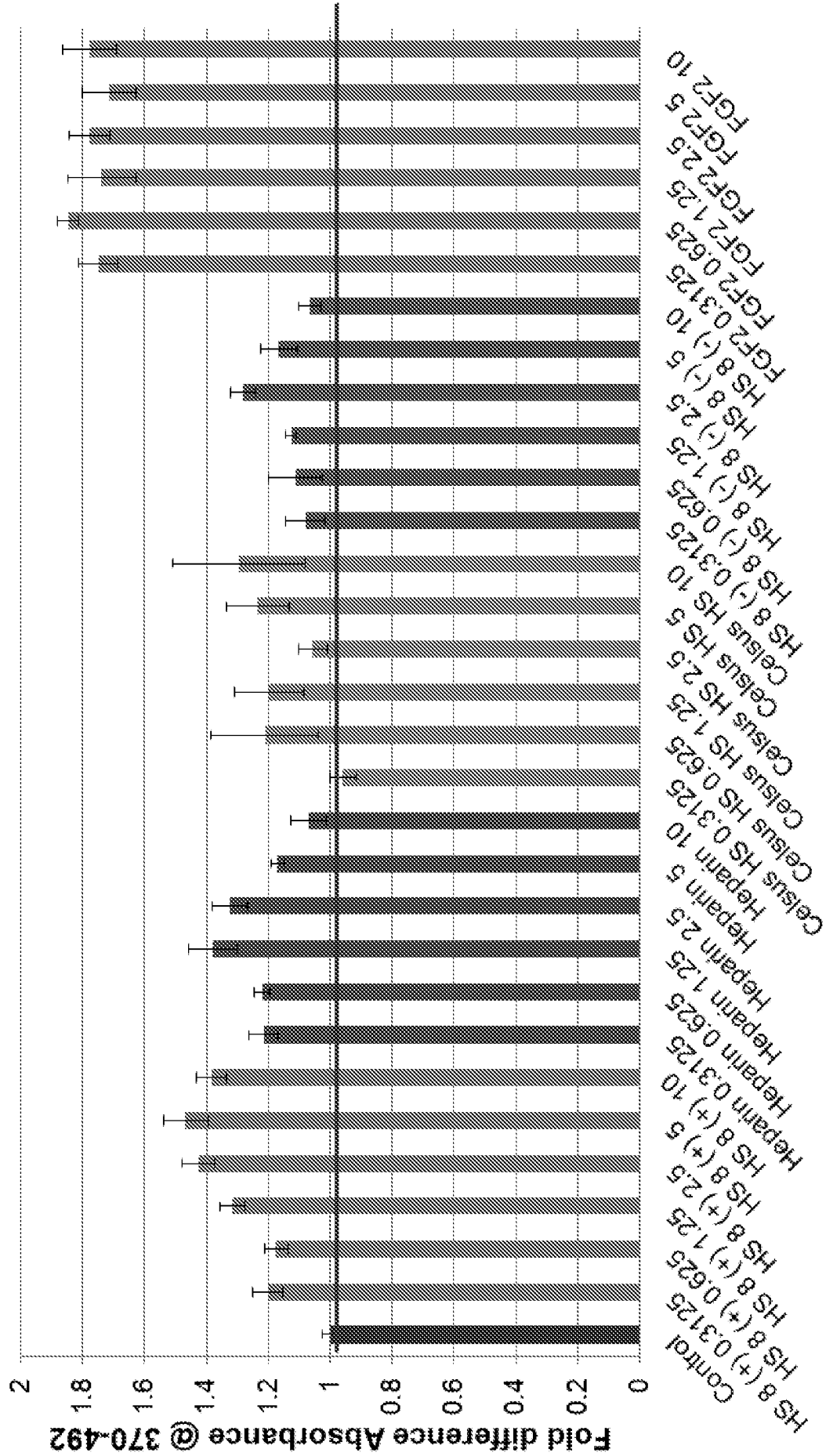


Figure 16D



Treatments (GAGs $\mu\text{g/ml}$ or FGF2 ng/ml)

Figure 17

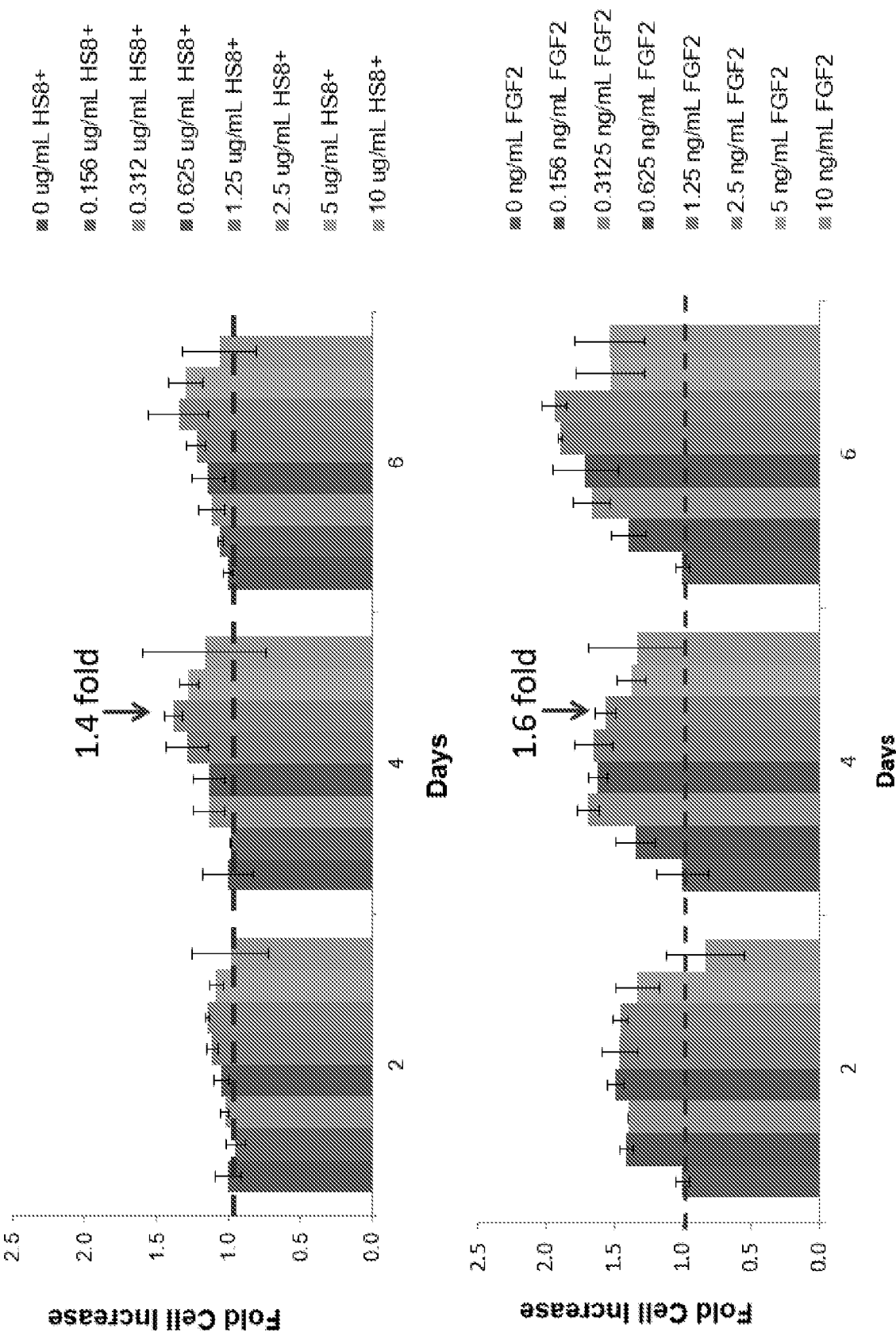


Figure 18

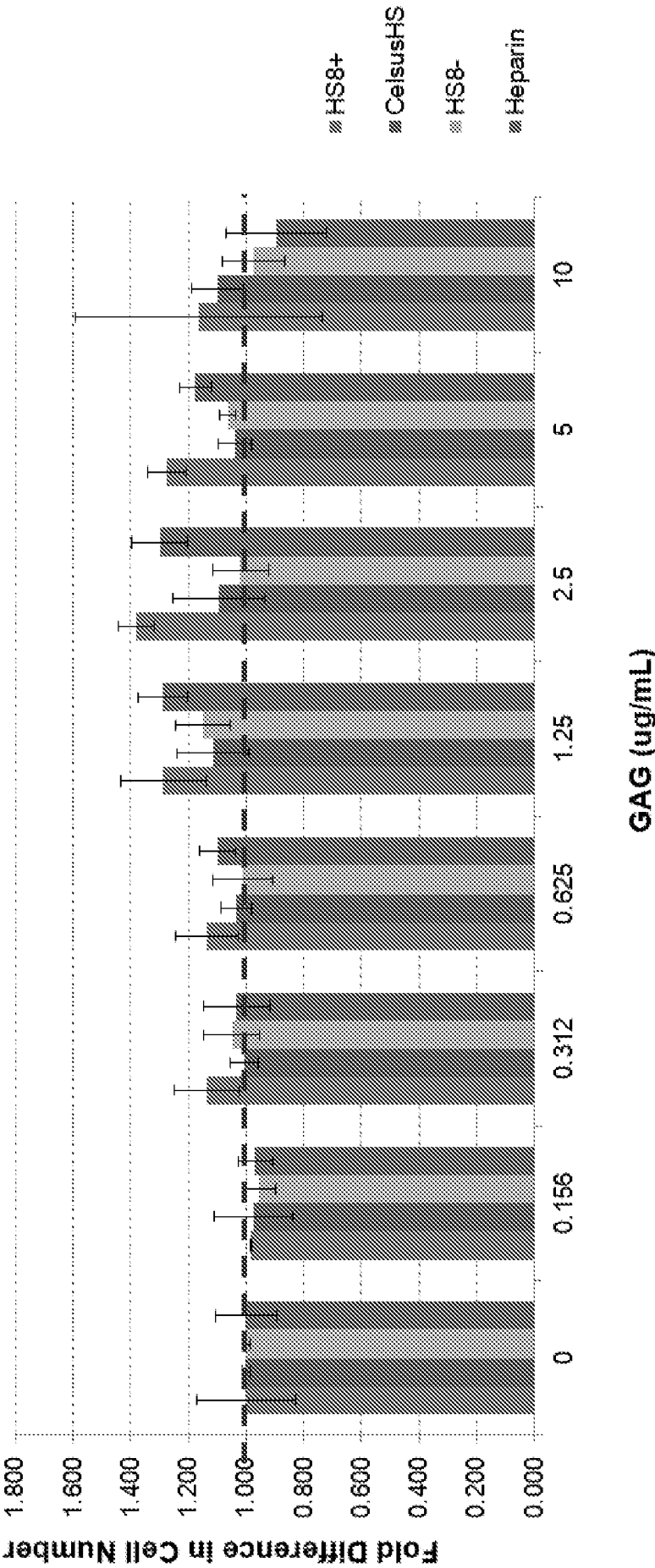


Figure 19

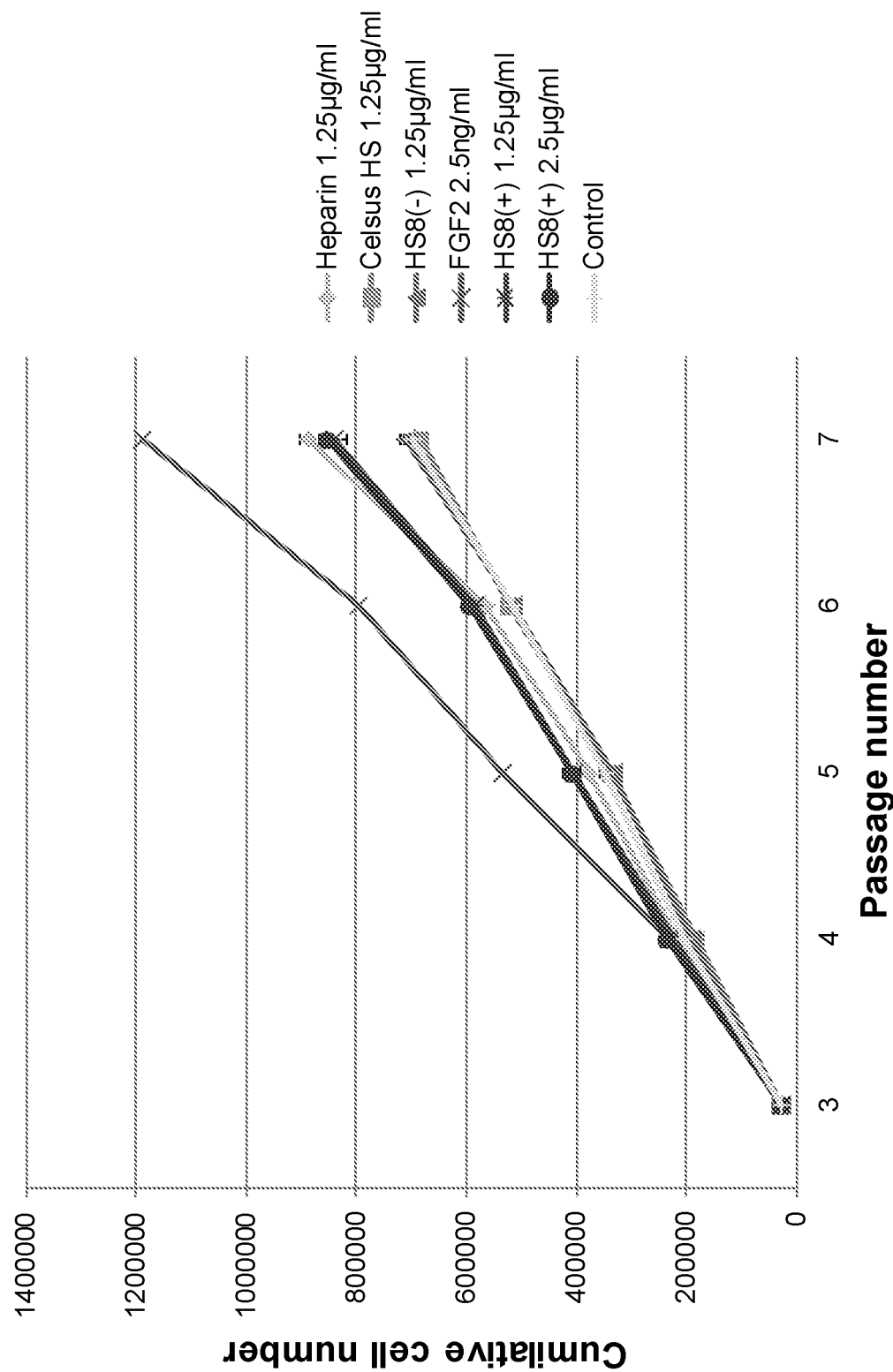


Figure 20

Negative Markers

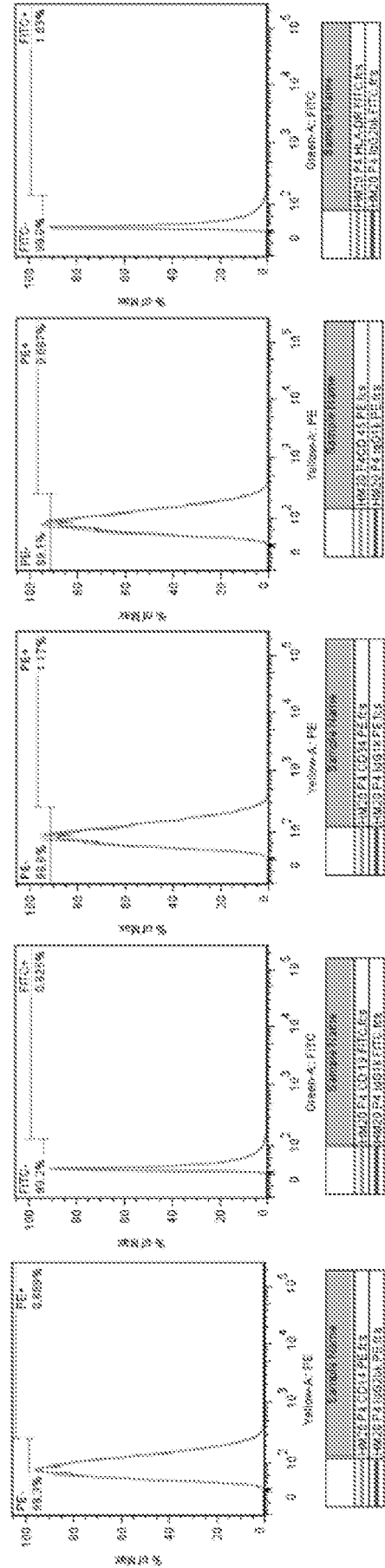


Figure 21A

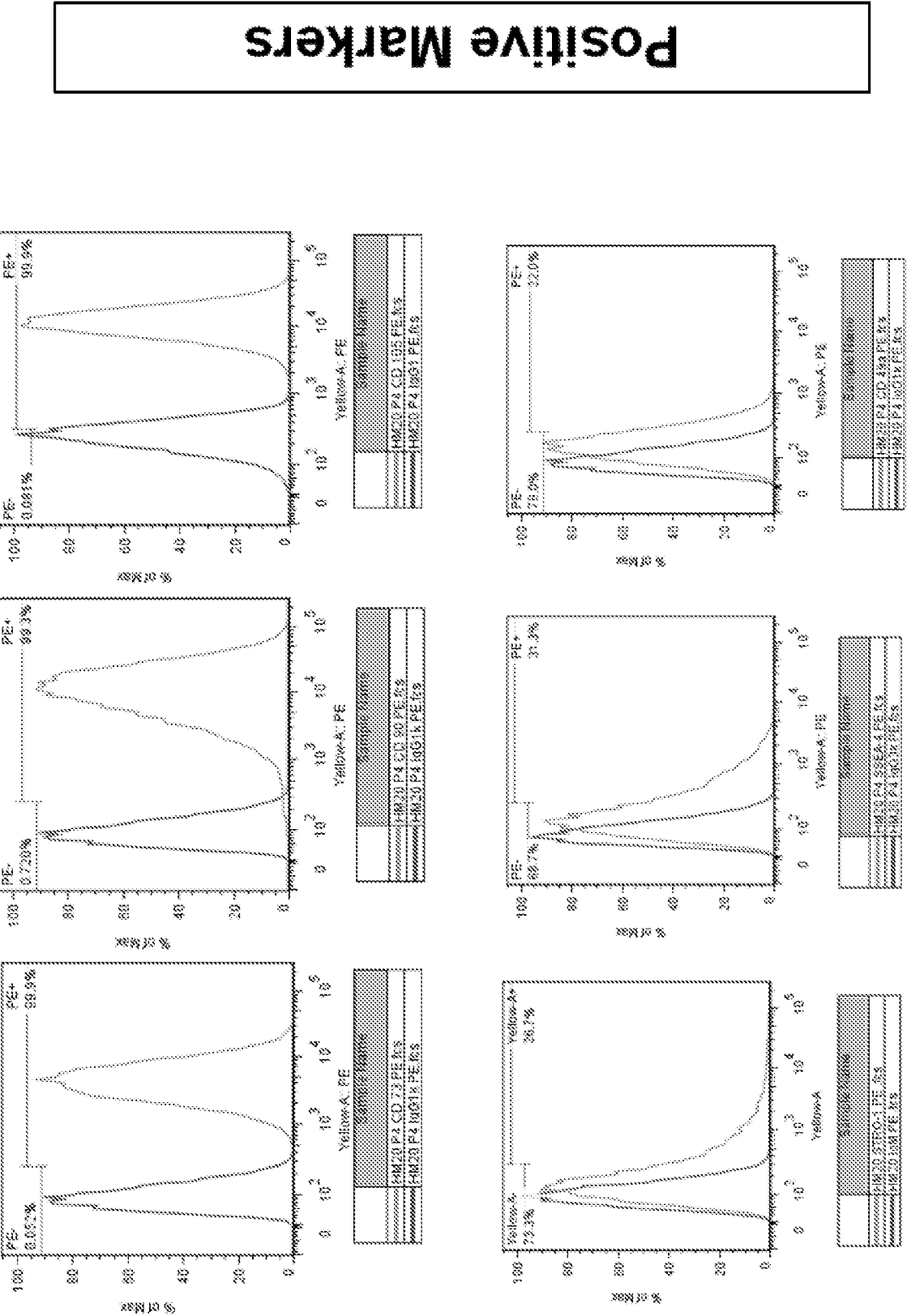


Figure 21B

Cell surface marker	P4 Control	P7 Control	P7 * HS8(+)	P7 ** HS8(+)	P7* HS8(-)	P7 * CHS	P7* Heparin	P7 # FGF-2
CD 14	0.784	0.74	0.502	0.82	4.19	0.813	0.503	0.961
CD 19	0.9725	0.718	1.05	0.825	1.36	1.43	0.937	0.815
CD 34	1.0225	0.625	0.899	0.554	1.04	0.859	0.867	1.05
CD 45	0.9235	0.745	0.797	0.817	1.15	0.914	0.728	1.1
HLA-DR	1.045	0.981	1.16	1.27	0.924	1.13	0.971	1.3
CD 73	99.95	99.9	99.9	99.9	100	100	99.8	99.8
CD 90	99.6	99.9	100	100	100	100	99.5	90.8
CD 105	99.95	99.9	99.9	99.9	100	99.9	99.4	99.9
CD49a	34	51.1	50.7	61.4	67.5	84.1	52.5	28
SSEA-4	33.65	57.5	66.1	71	12.9	63.2	73.4	83.7
STRO-1	24.1	33.7	25.3	34.9	28	26.2	34.5	3.58

P= Passage, * with a dose of 1.25µg/ml, ** with a dose of 2.5µg/ml and # with a dose of 2.5ng/ml

Figure 22

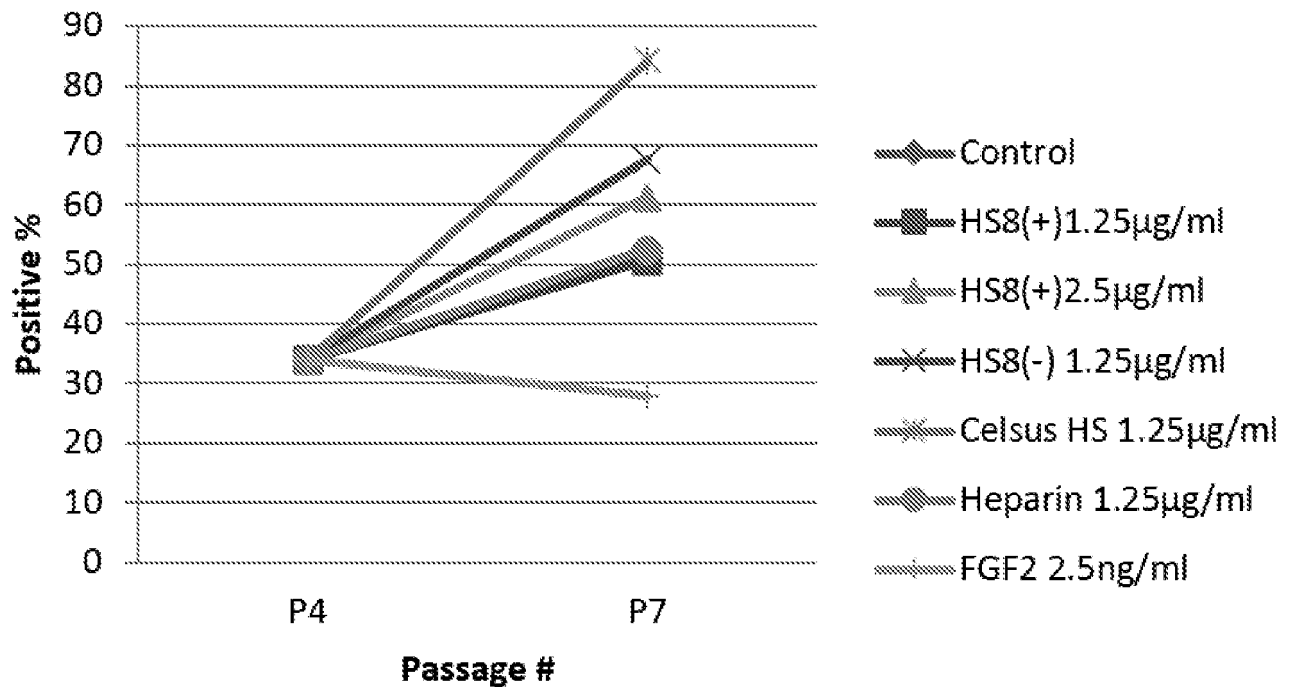
CD49a

Figure 23A

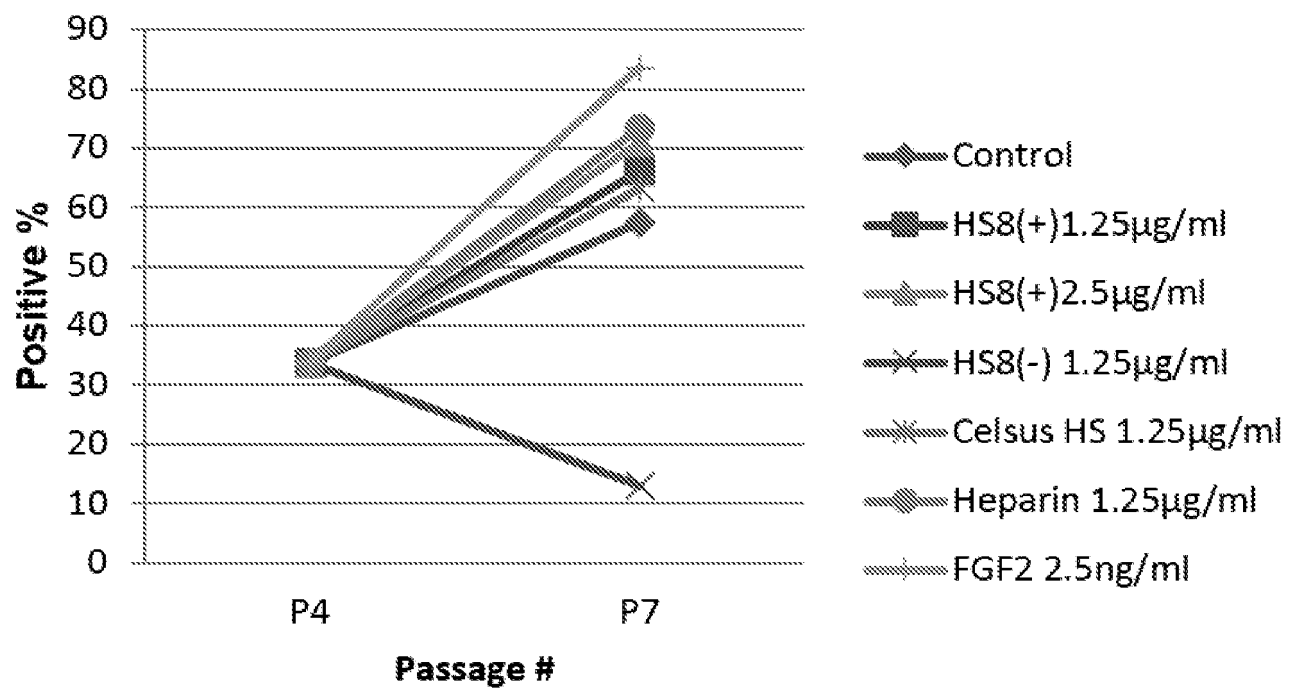
SSEA-4

Figure 23B

STRO-1

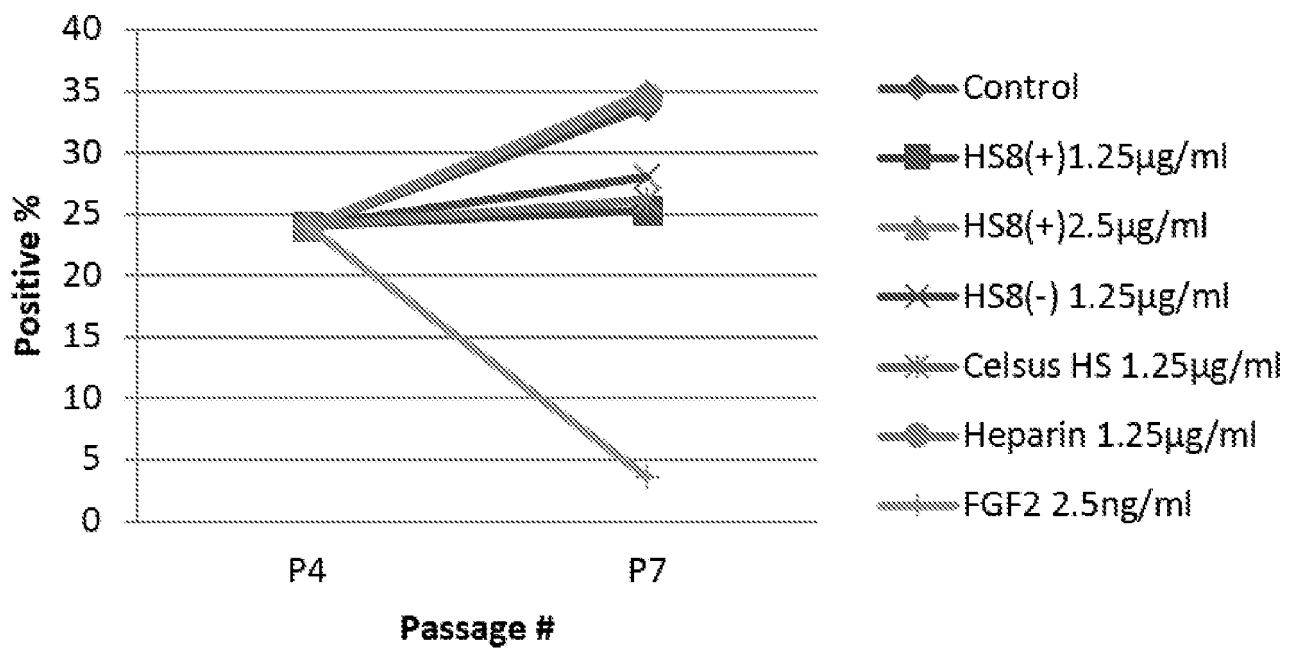


Figure 23C

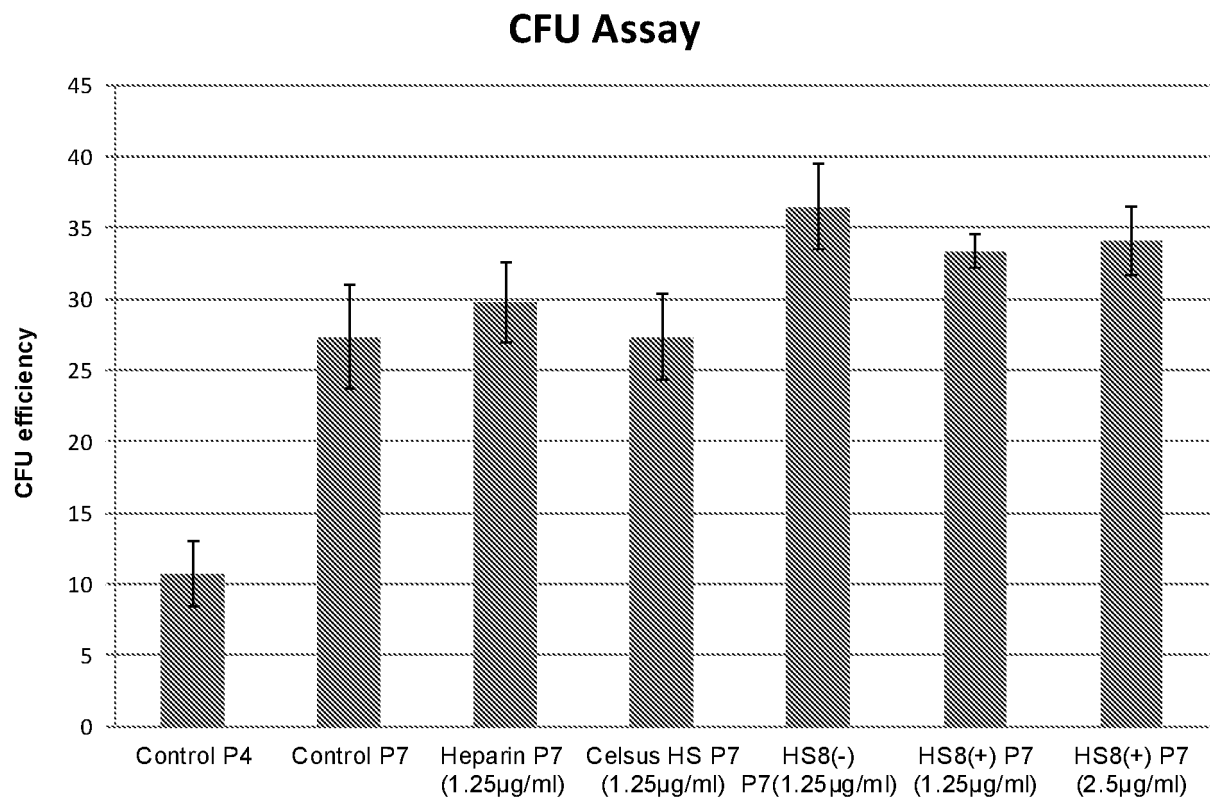


Figure 24A

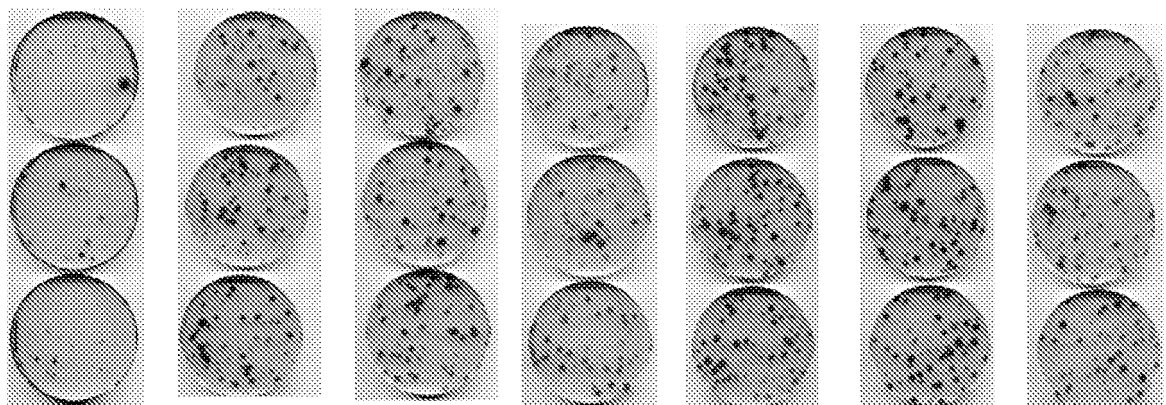
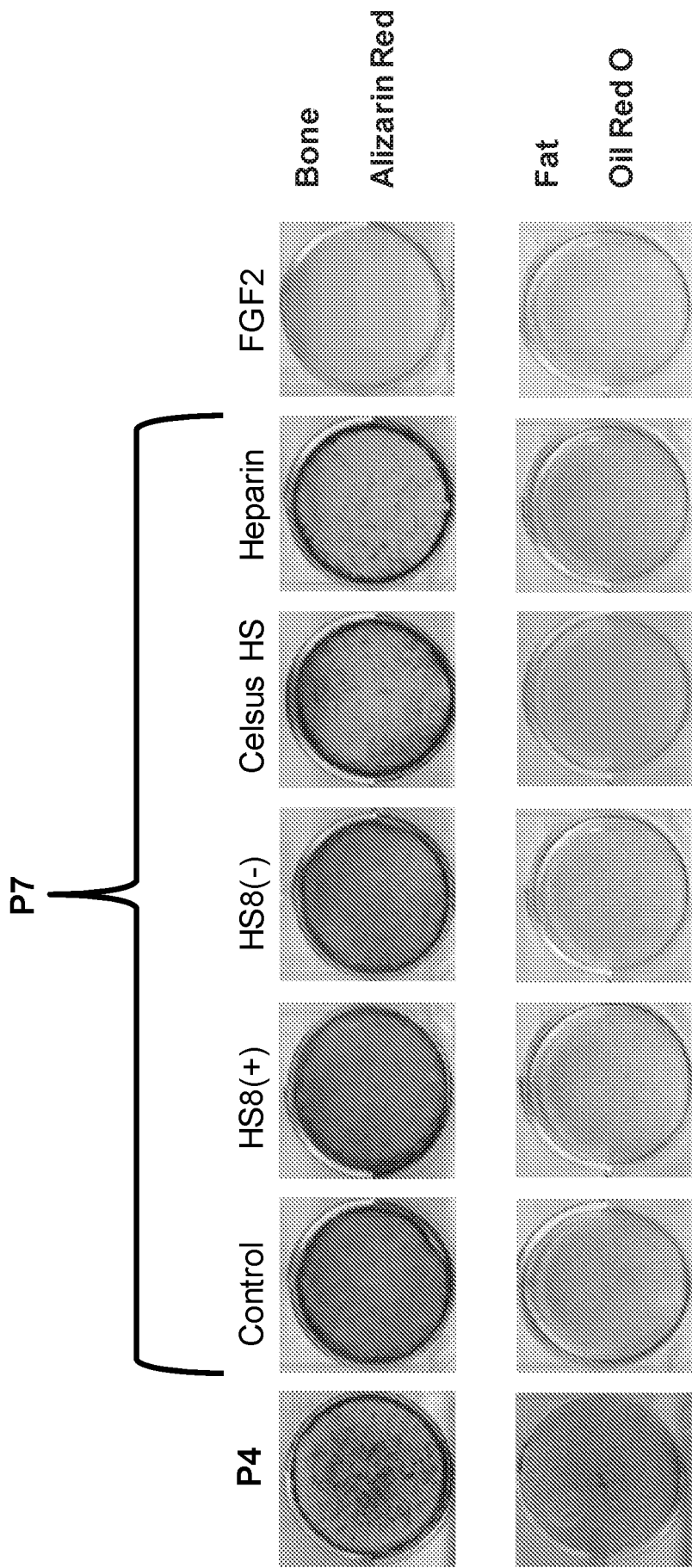


Figure 24B



Human Mesenchymal Stem Cells

Figure 25

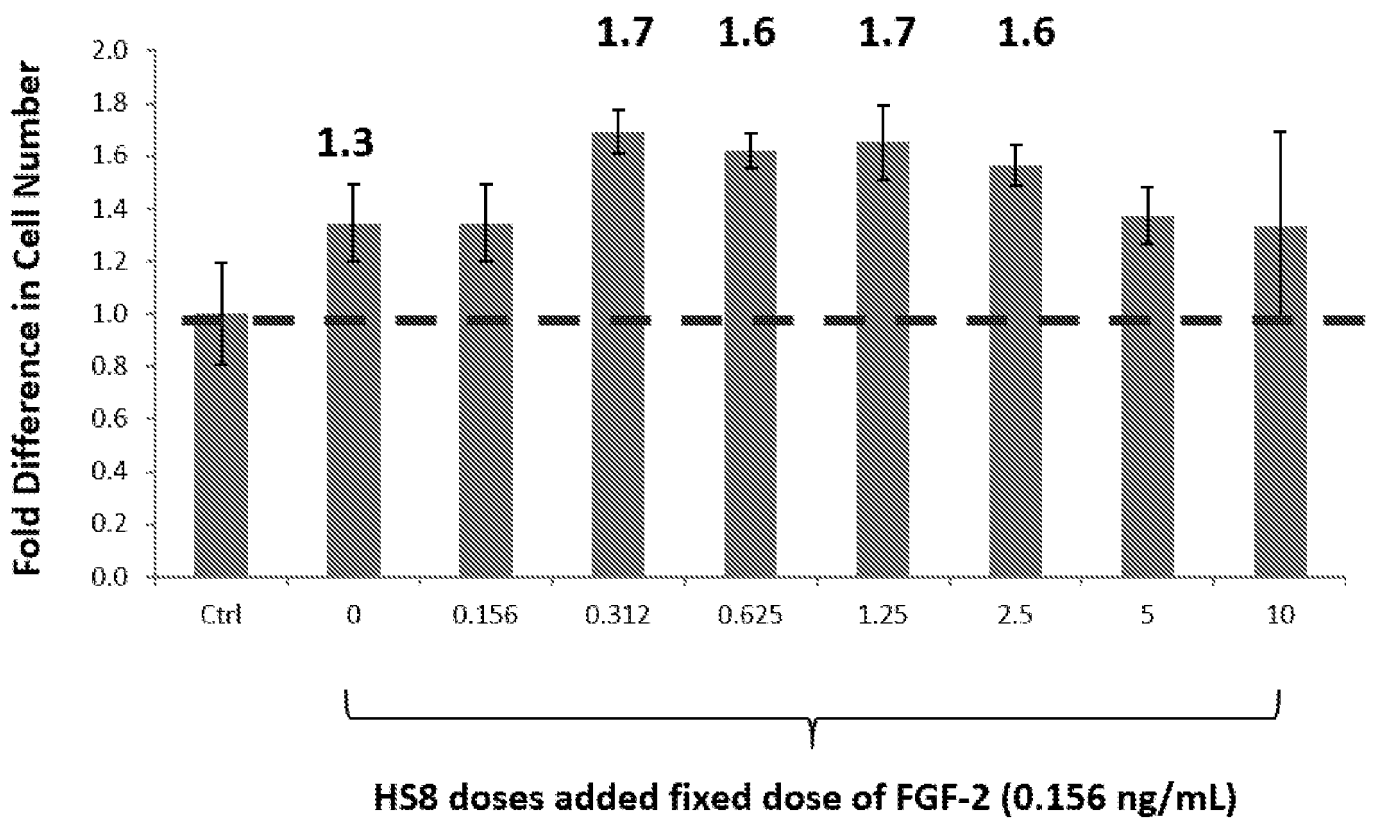


Figure 26

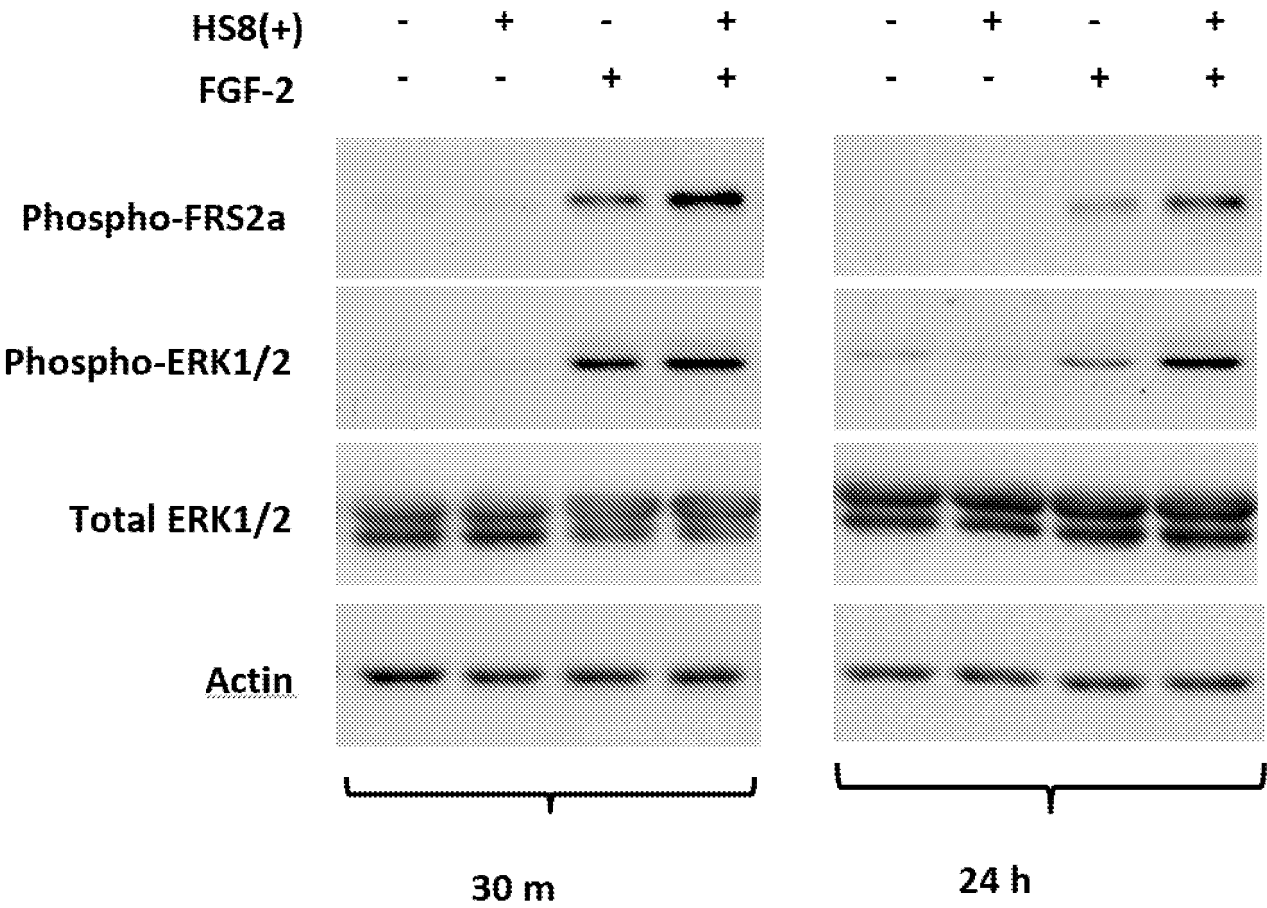


Figure 27

MVGVGGGDVE DVTPRPGGCQ ISGRGARGCN GIPGAAWEA ALPRRRPRRH PSVNPRSRAA
 GSPRTRGRRT EERPSGSRLG DRGRGRALPG GRLGGRGRGR APERVGGRGR GRGTAAPRAA
 PAARGSRPGP AGTMAAGSIT TLPALPEDGG SGAFPPGHFK DPKRLYCKNG GFFLRIHPDG
 RVDGVREKSD PHIKLQLQAE ERGVVSIKV CANRYLAMKE DGRLLASKCV TDECFFFERL
 ESNNYNTYRS RKYTSWYVAL KRTGQYKLGS KTGPGQKAIL FLPMSAKS

Figure 28

	%E10 GAG
DISACCHARIDE	
IdoA/GlcA-AMann_R	12.9
IdoA(2S)-AMann_R	53.4
GlcA-AMann_R(6S)	10.25
IdoA-AMann_R(6S)	3.4
IdoA(2S)-AMann_R(6S)	18.7
GlcA(2S)-AMann_R	1.0
GlcA-AMann_R(3S)	0.30
GlcA-AMann_R(3,6S)	0.15
UNKNOWN	0.0

Figure 29

PEAK NUMBER	DISACCHARIDE	% in E10 GAG
1	Δ HexUA- GlcNAc	44.8
3	Δ HexUA- GlcNSO ₃	21.5
2	Δ HexUA- GlcNAc(6S)	8.0
7	Δ HexUA(2S)- GlcNAc	2.4
4	Δ HexUA- GlcNSO ₃ (6S)	4.0
5	Δ HexUA(2S)- GlcNSO ₃	12.4
8	Δ HexUA(2S)- GlcNAc(6S)	0.2
6	Δ HexUA(2S)- GlcNSO ₃ (6S)	4.1
9	unknown	2.4

Figure 30

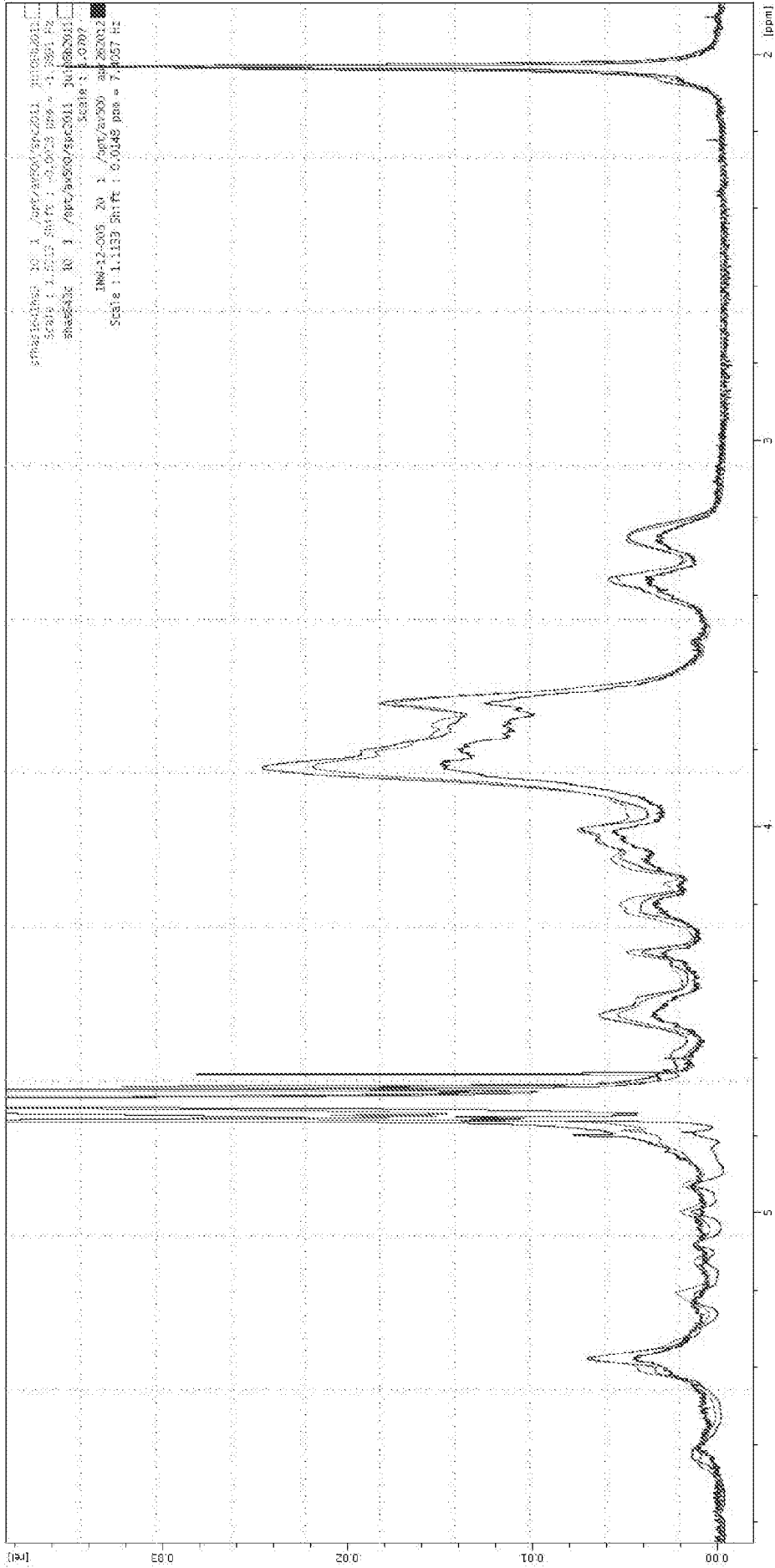


Figure 31

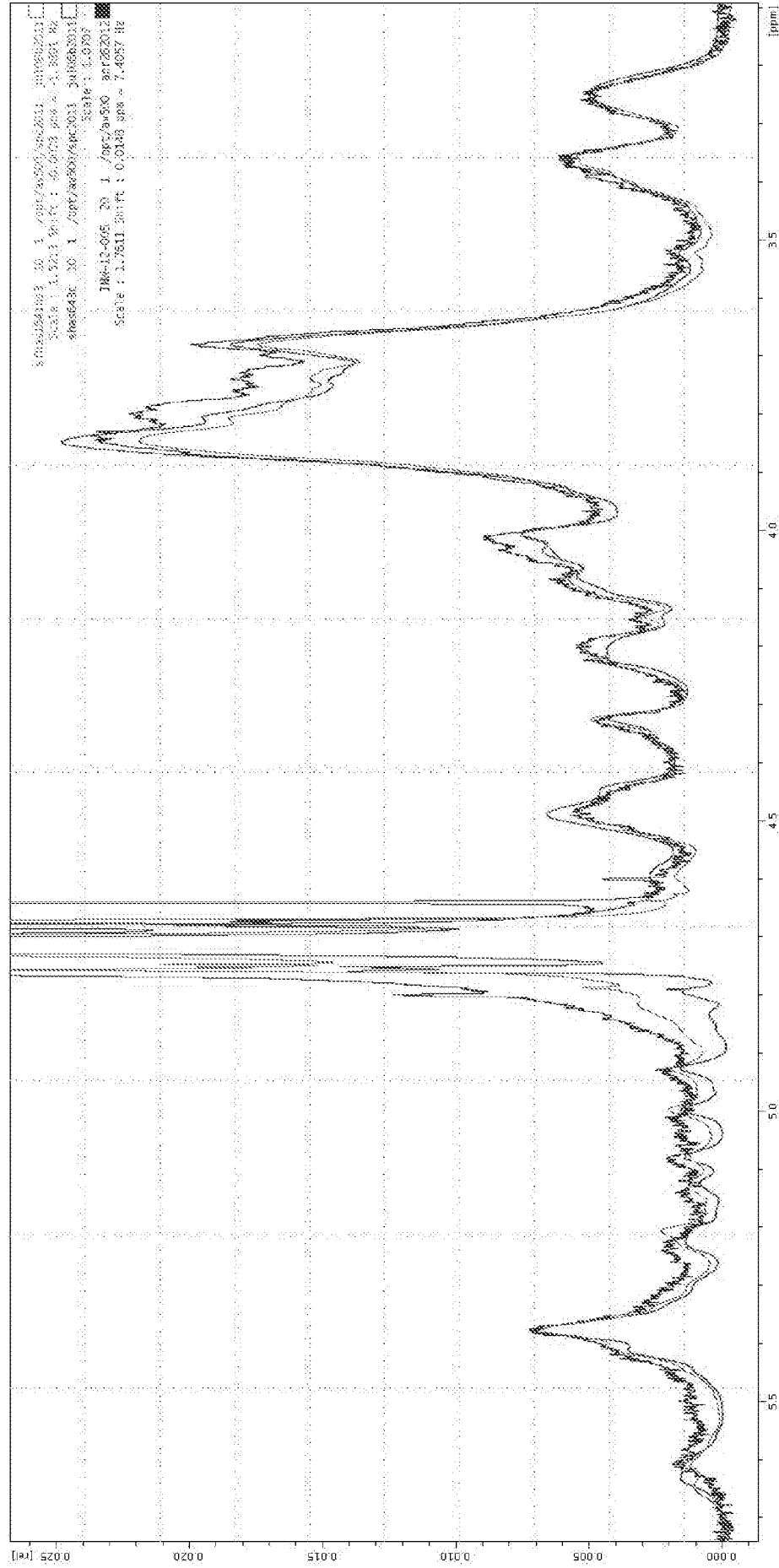


Figure 32

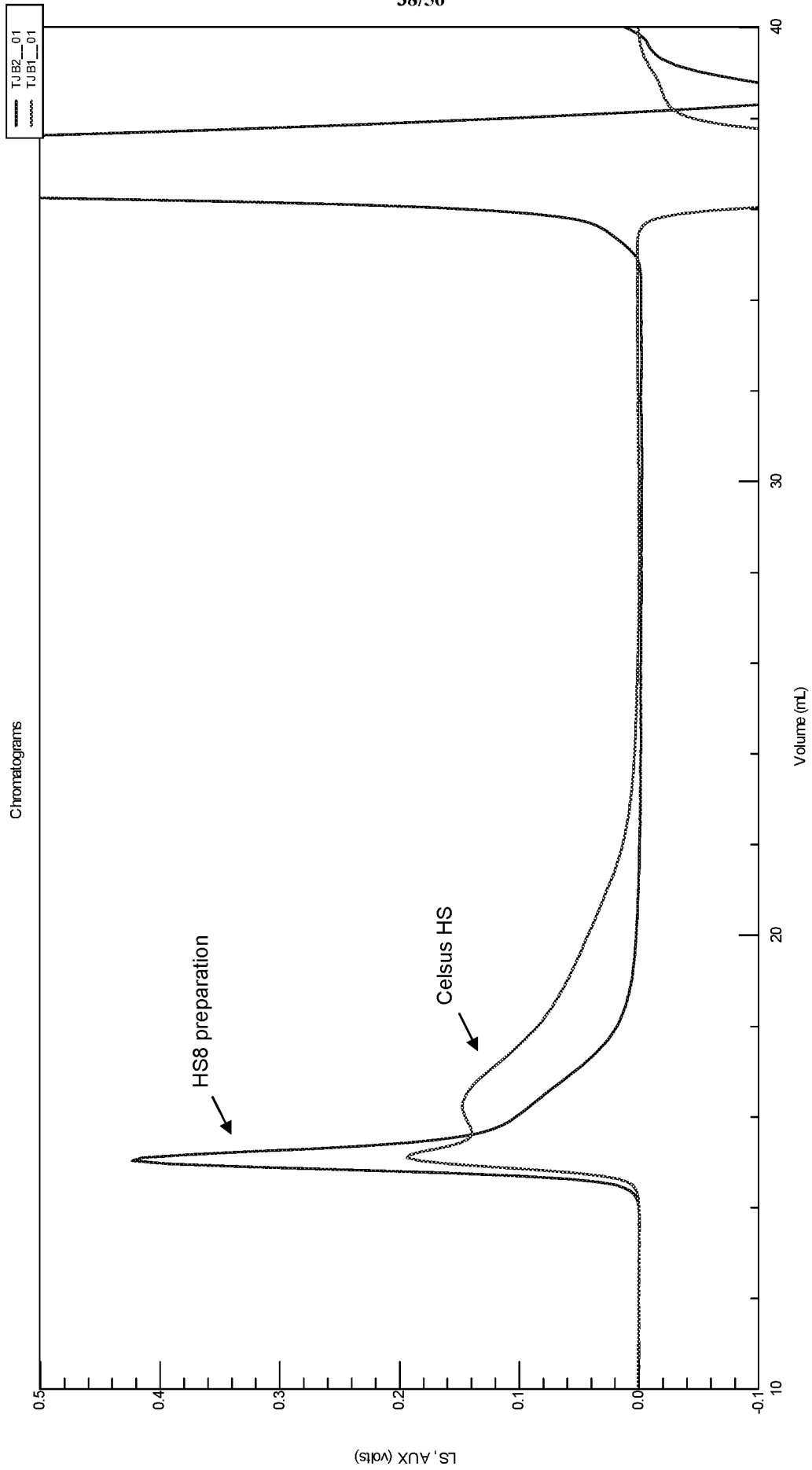


Figure 33

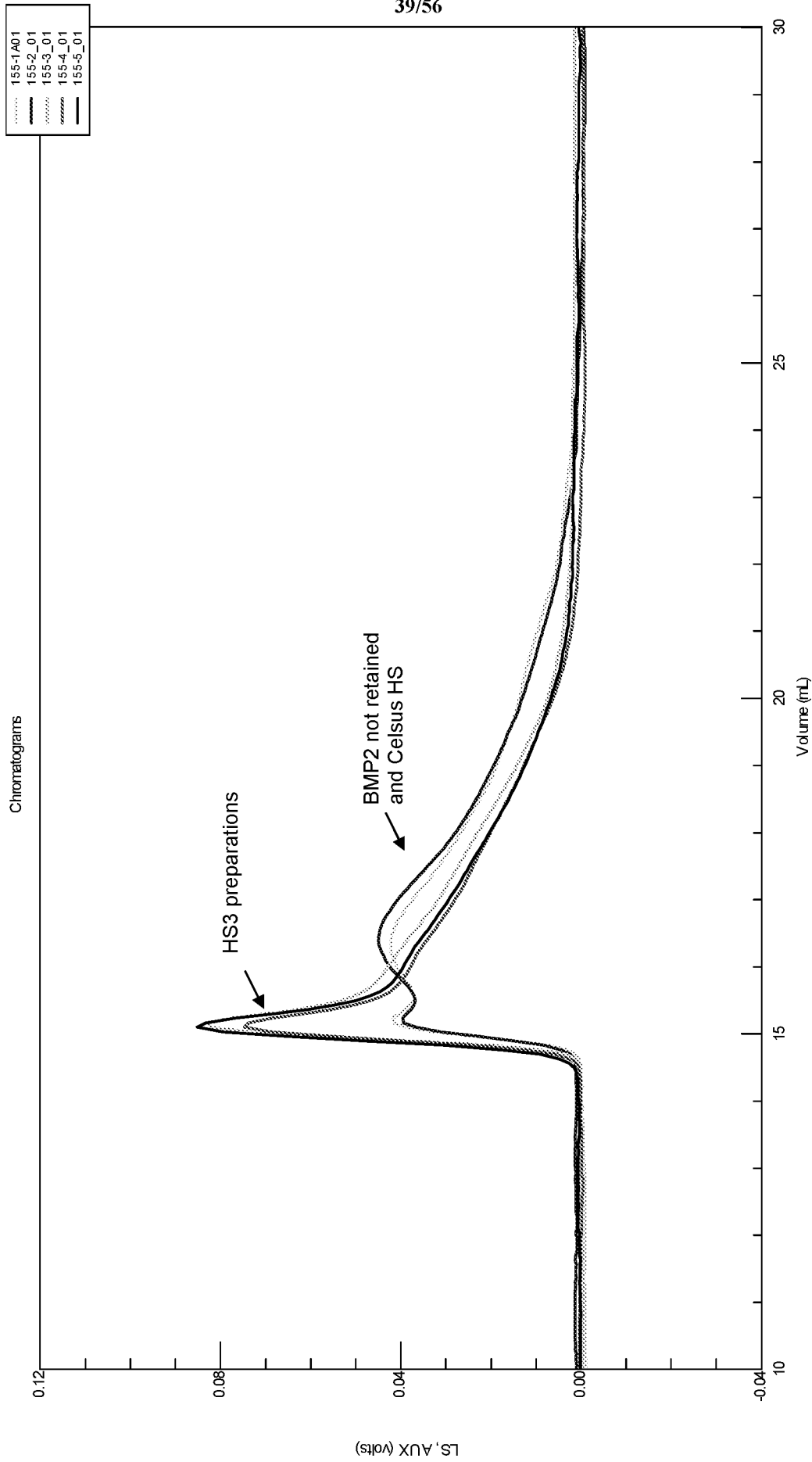


Figure 34

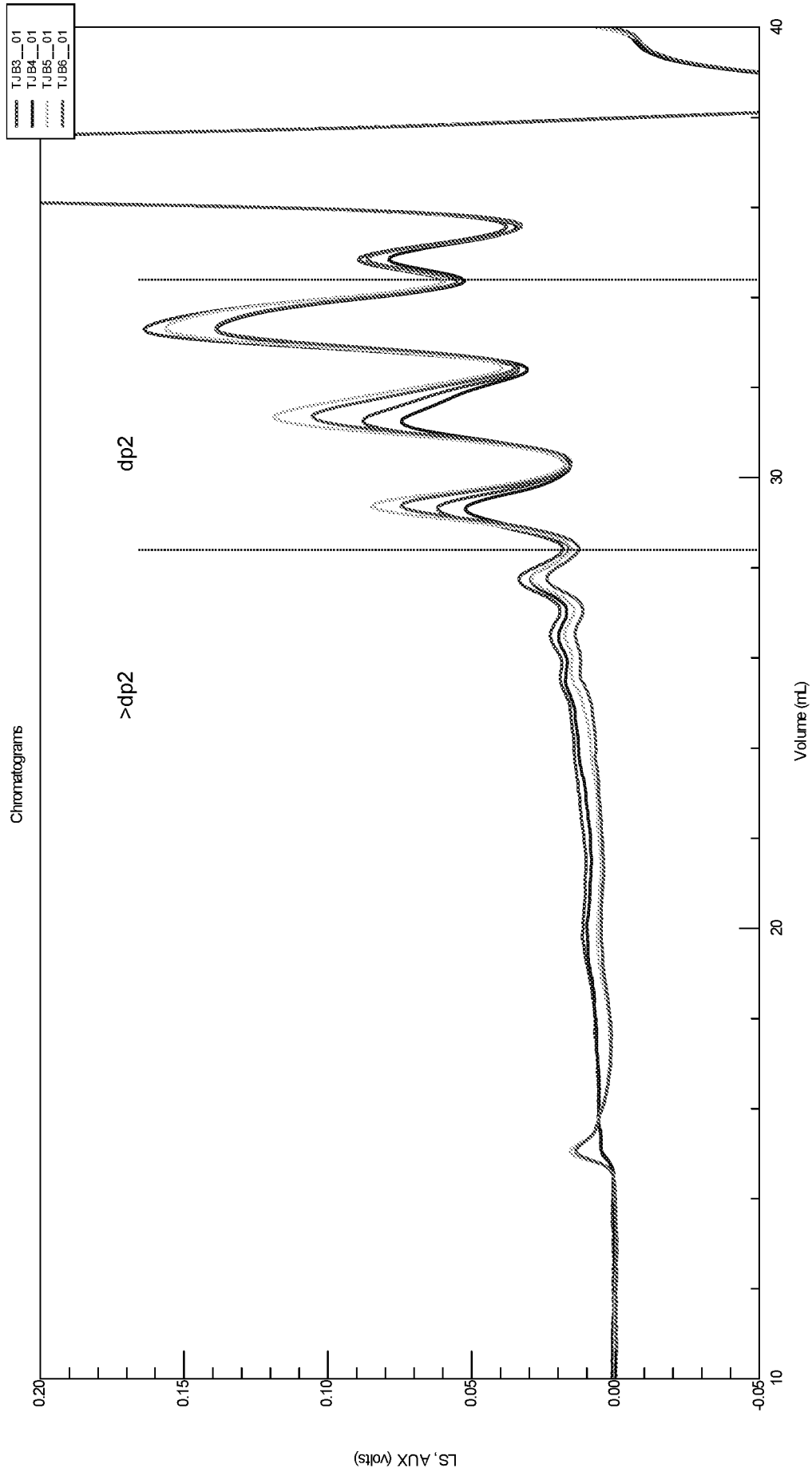


Figure 35

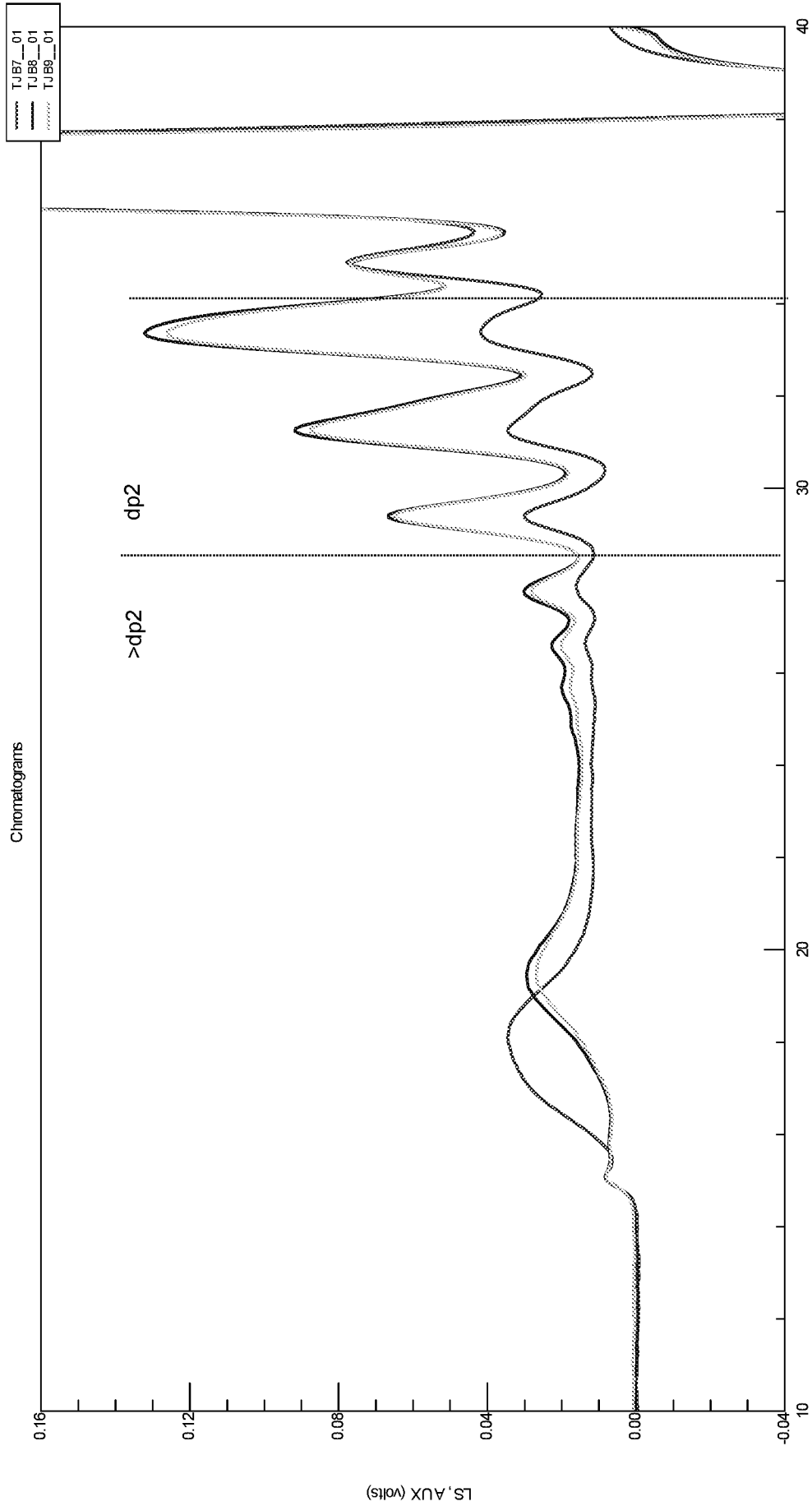


Figure 36

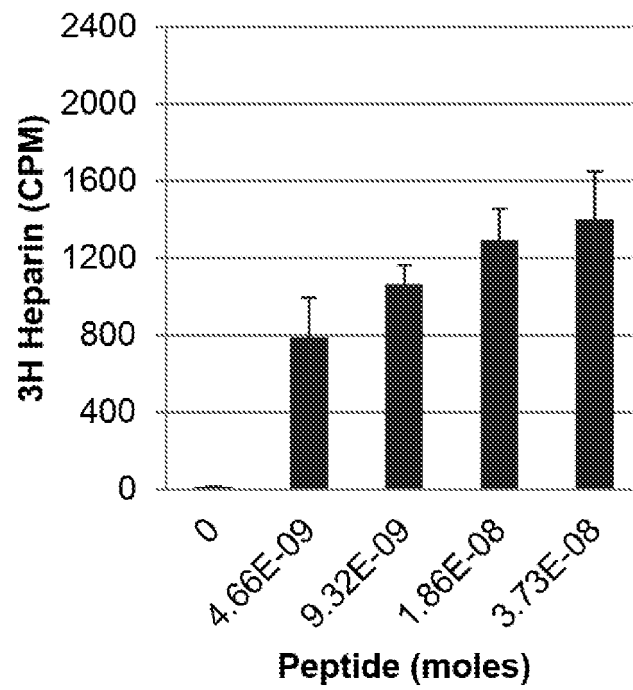


Figure 37

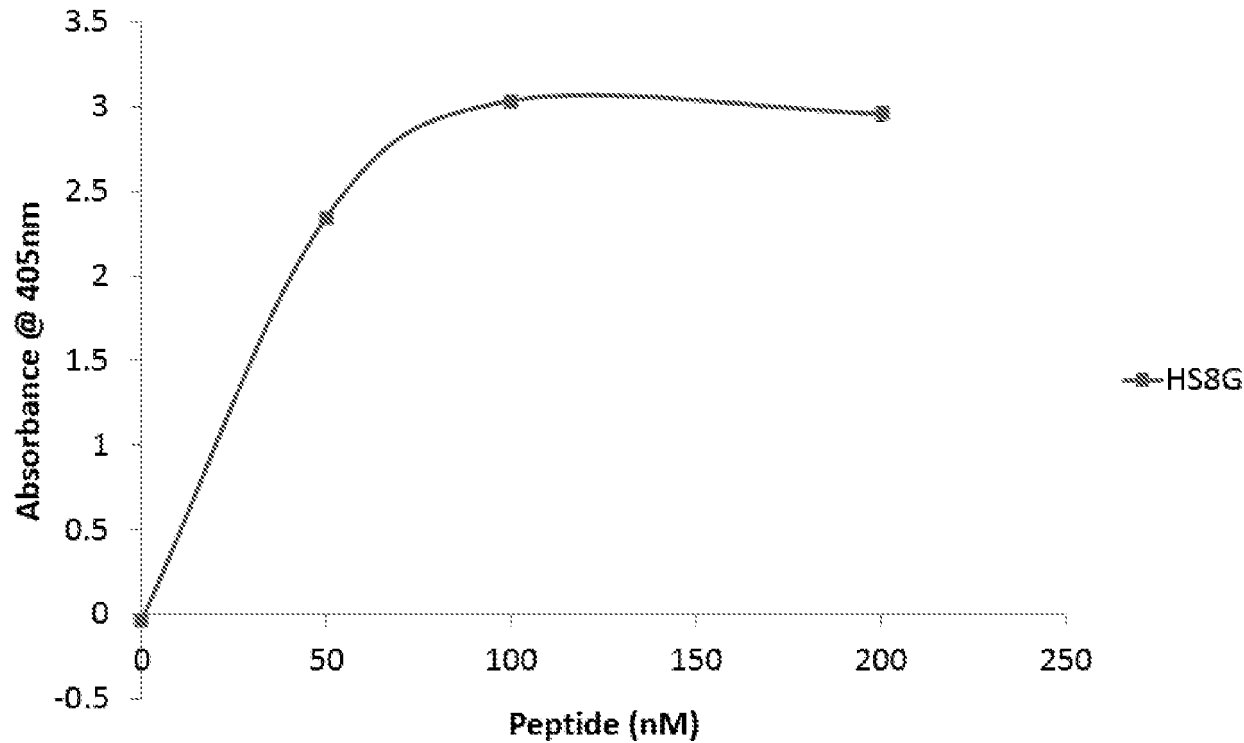


Figure 38

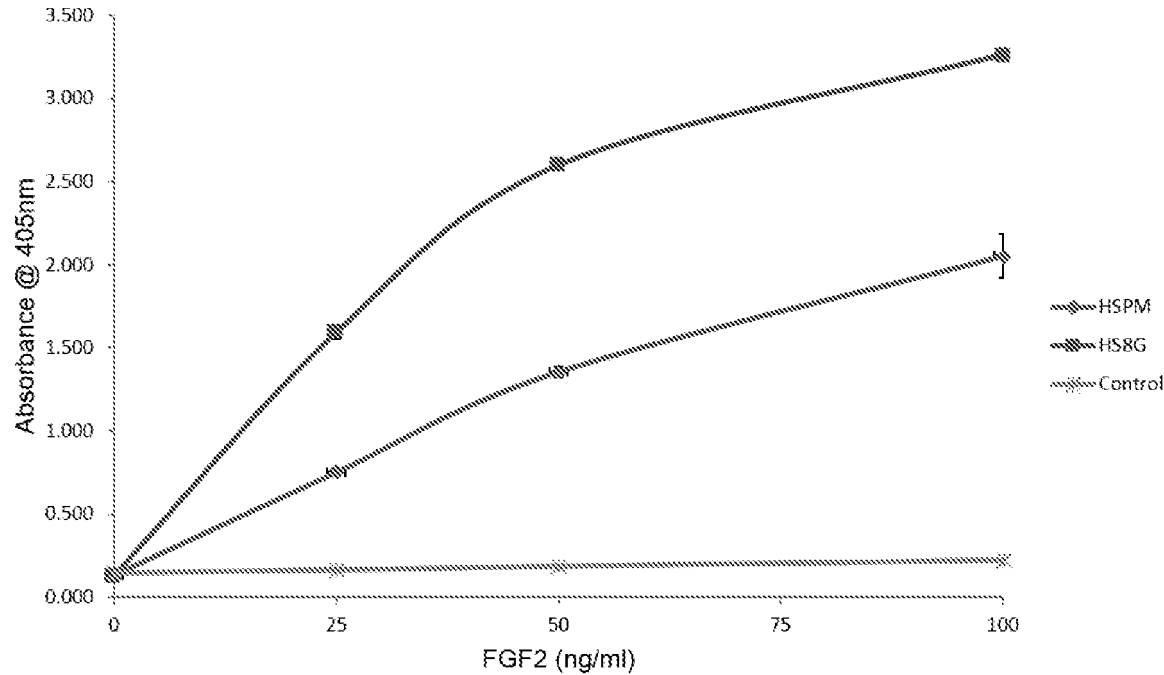


Figure 39

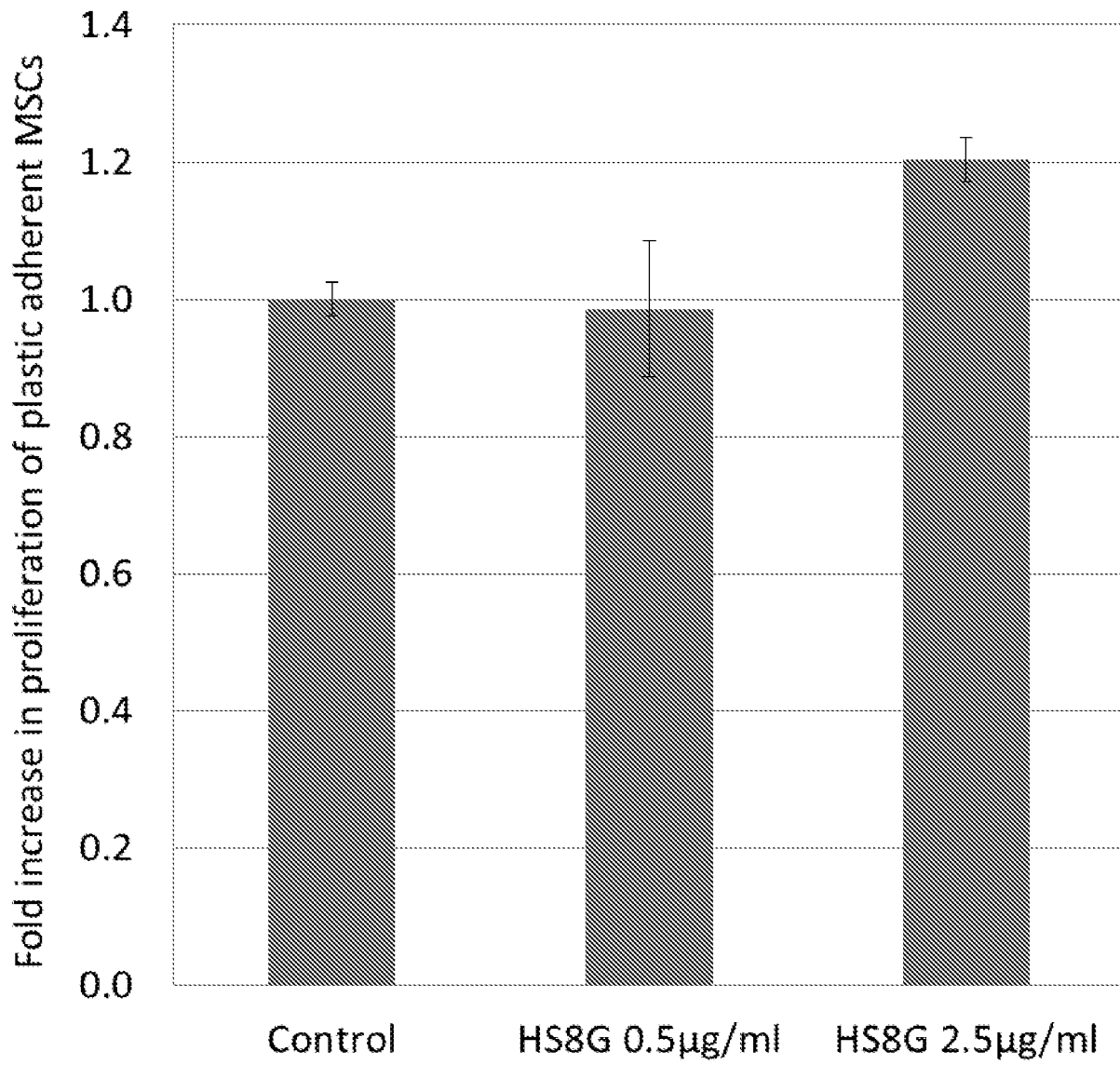


Figure 40

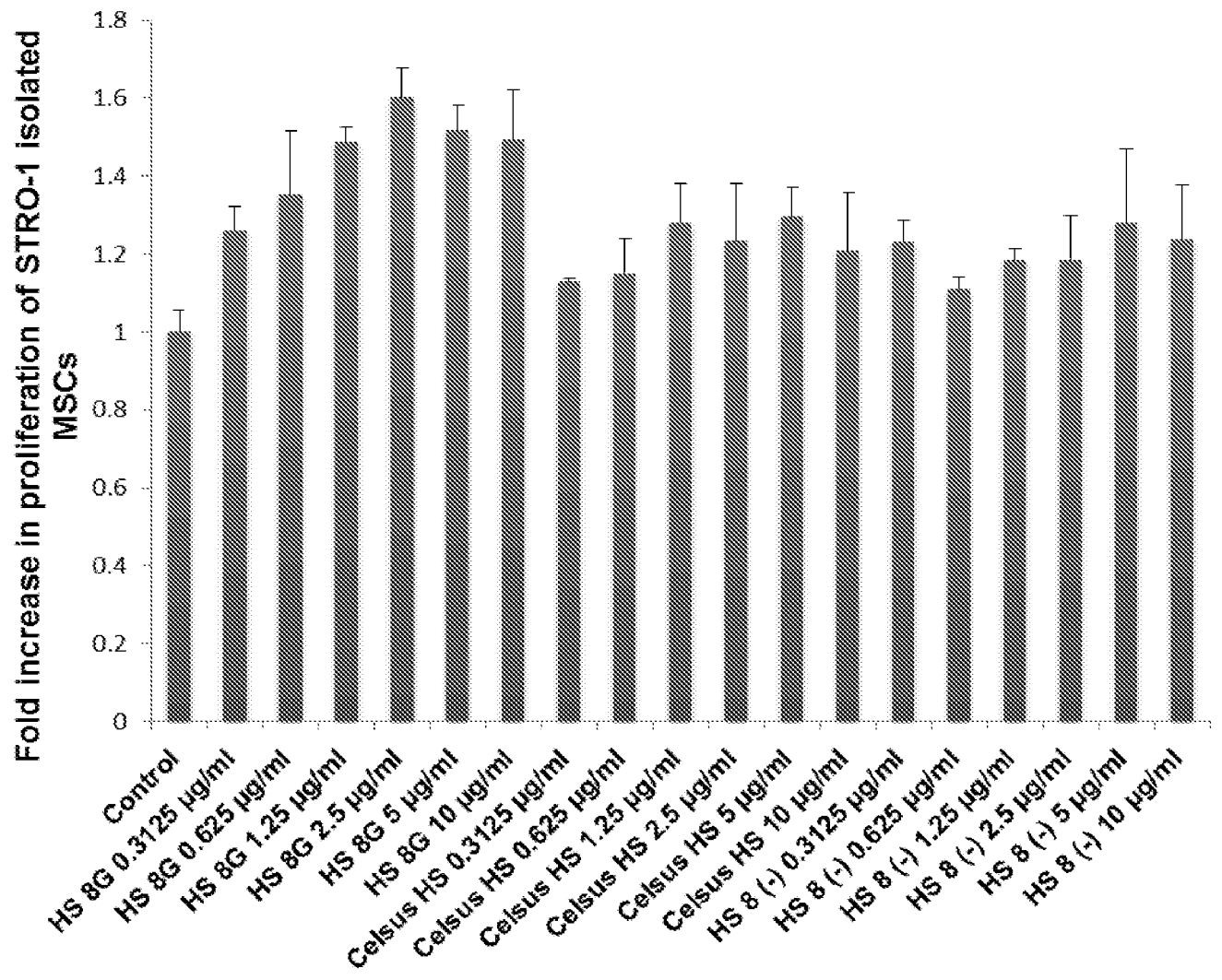


Figure 41

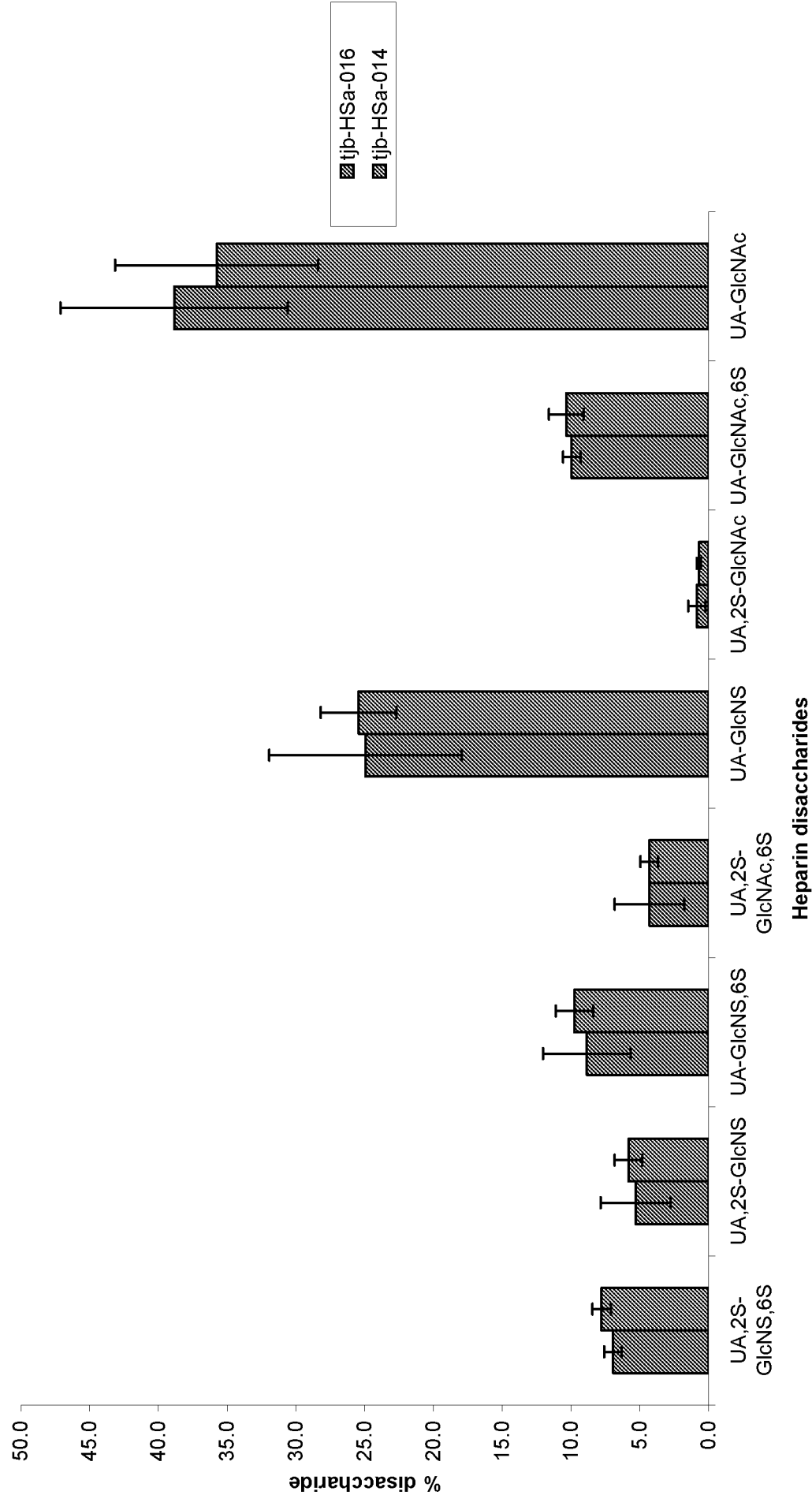
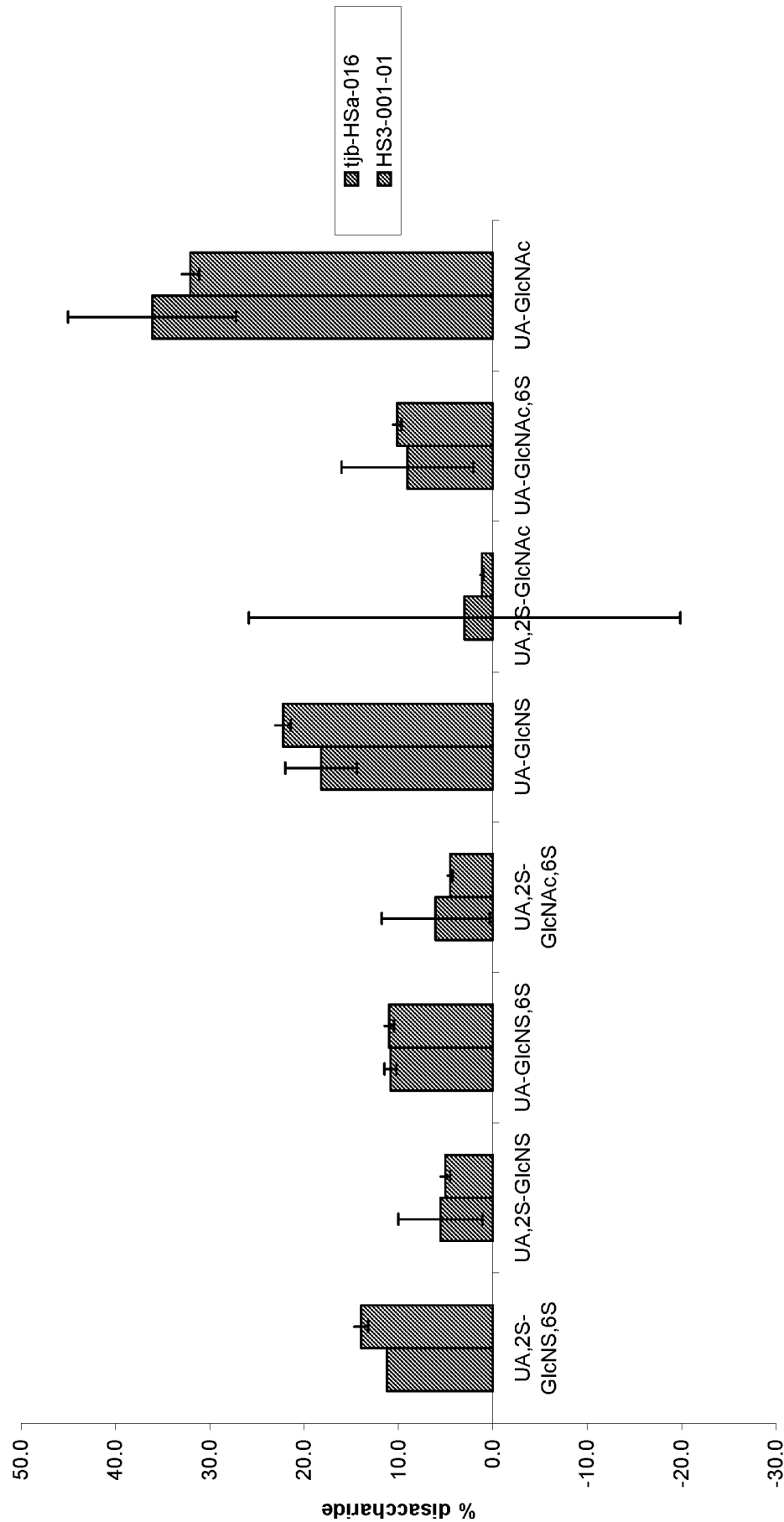


Figure 42



Heparin disaccharides

Figure 43

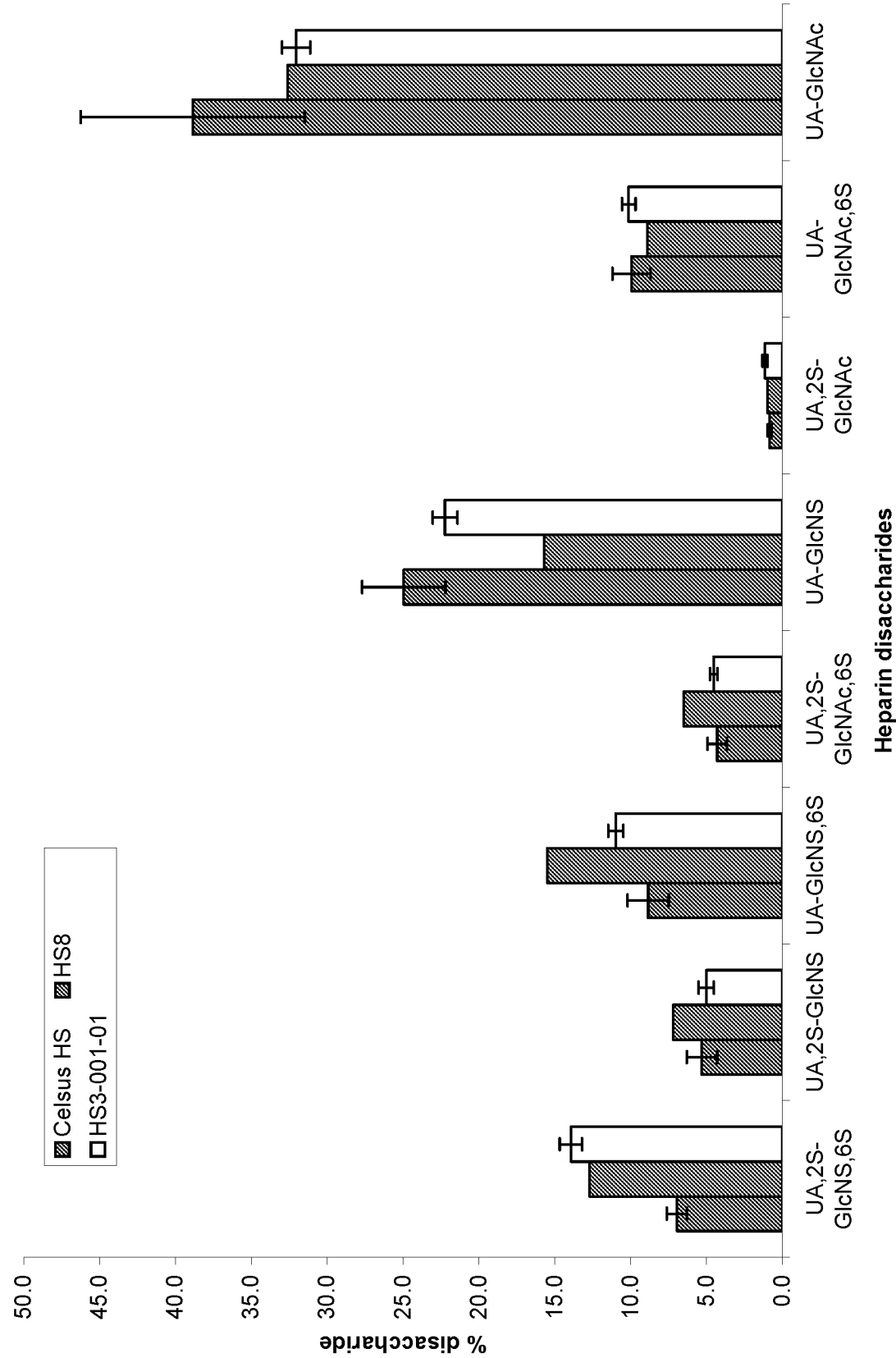


Figure 44

Disaccharide	Celsus HS	HS3 (848/HS3/001)	HS8
Δ HexUA,2S-GlcNS,6S	8.3	14.8	12.7
Δ HexUA,2S-GlcNS	5.1	4.9	7.2
Δ HexUA-GlcNS,6S	9.1	11.1	15.5
Δ HexUA,2S-GlcNAc,6S	3.3	4.8	6.5
Δ HexUA-GlcNS	26.9	22.2	15.7
Δ HexUA,2S-GlcNAc	1.6	1.1	1.0
Δ HexUA-GlcNAc,6S	10.8	10.1	8.9
Δ HexUA-GlcNAc	34.9	31.0	32.5
Total	100.0	100.0	100.0

Mean average of duplicate analyses of duplicate hydrolysates
Normalised weight percentage disaccharide

Figure 45

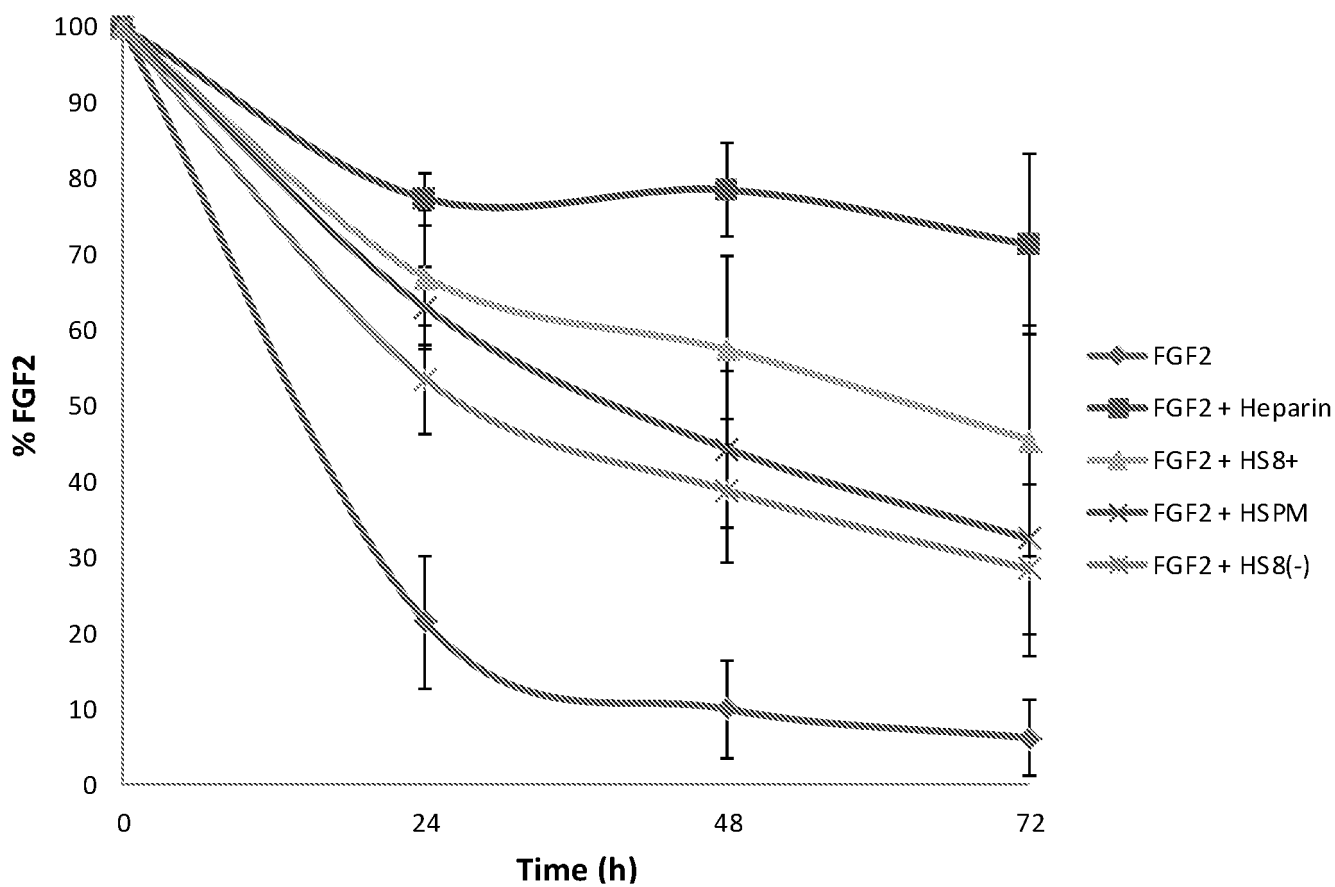


Figure 46

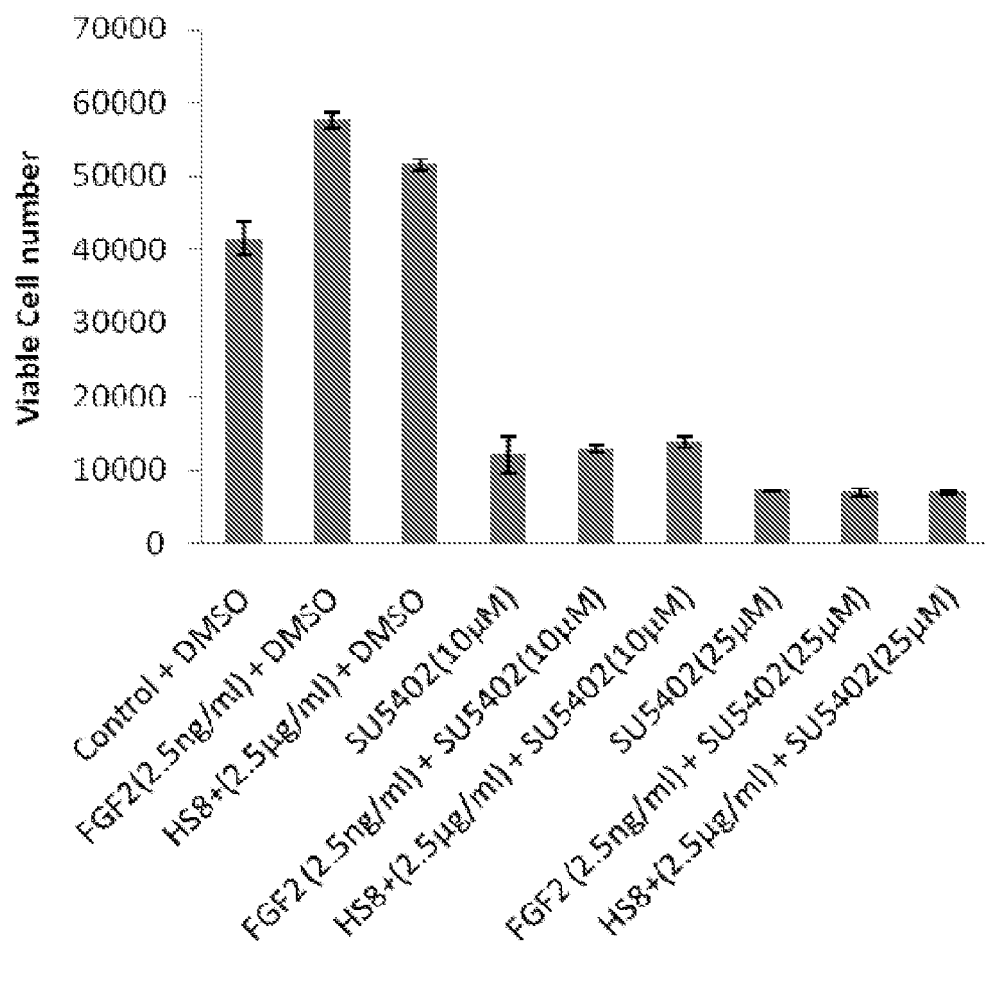


Figure 47

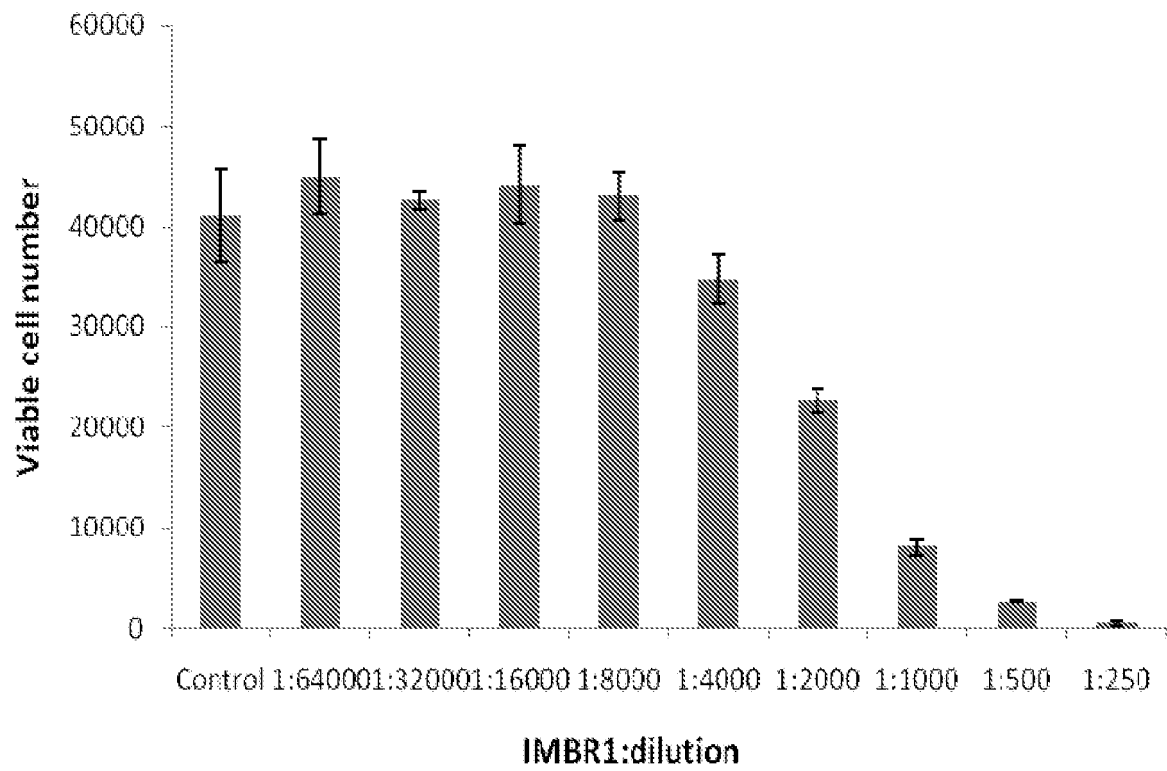


Figure 48

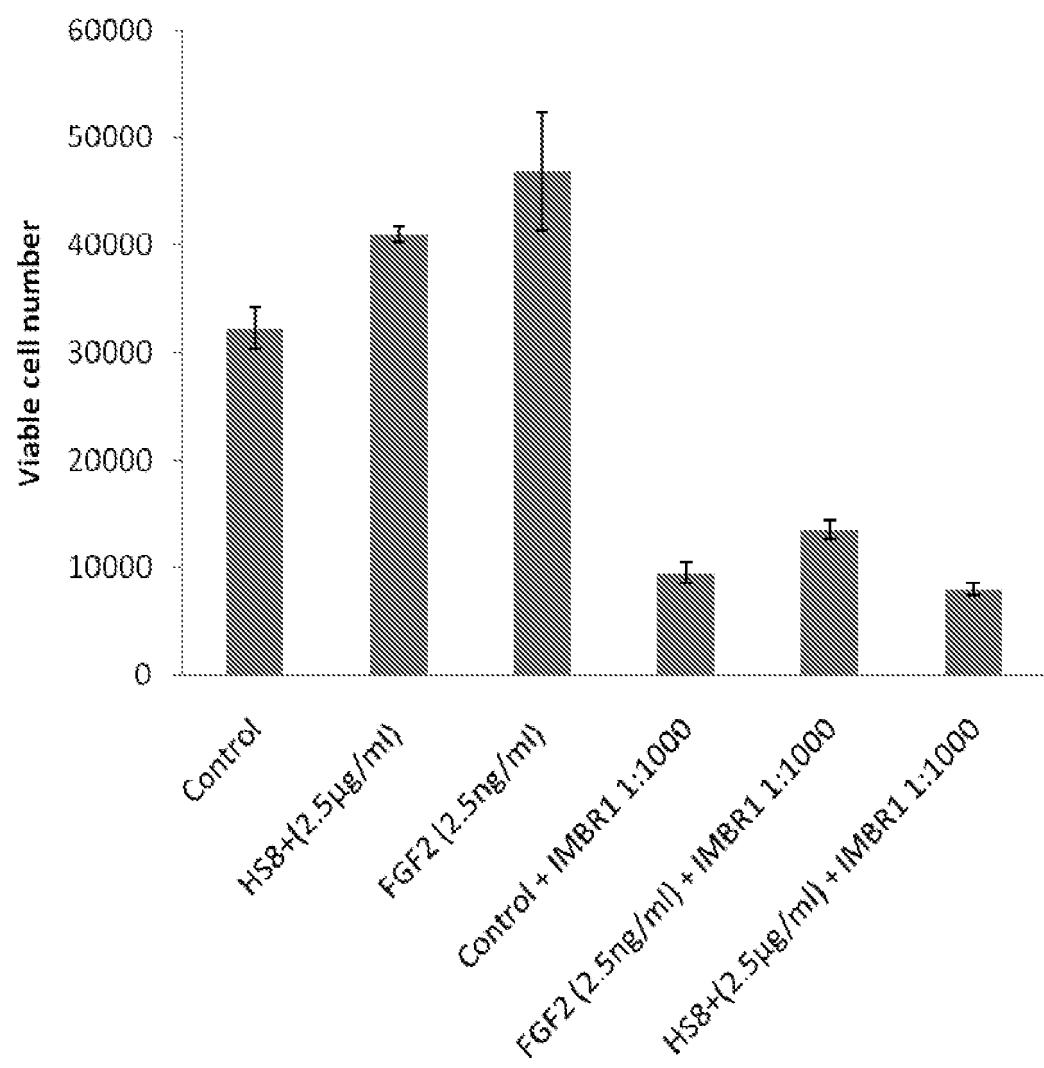


Figure 49

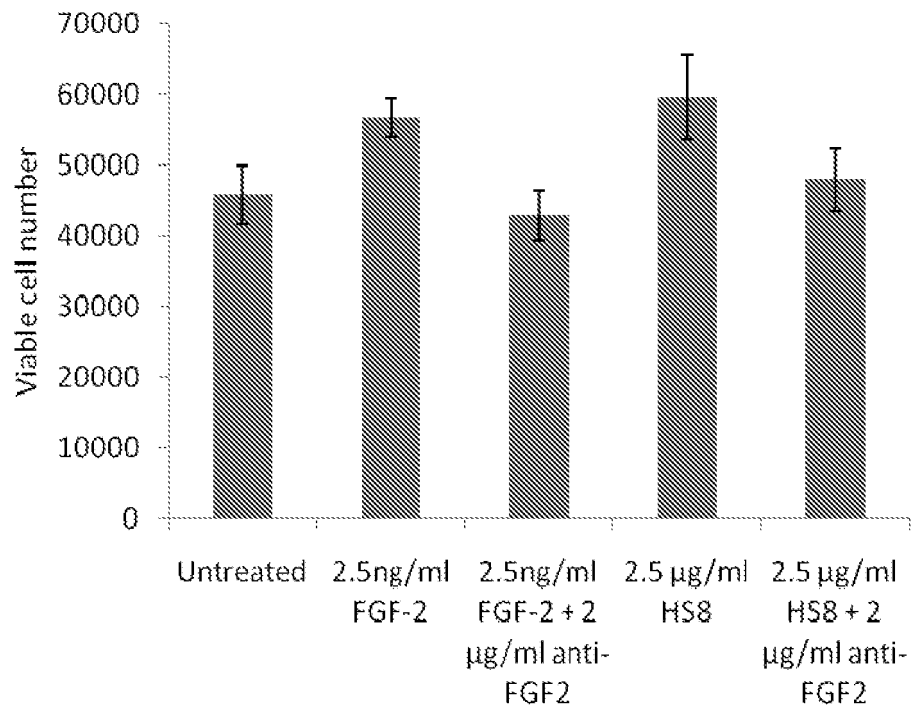


Figure 50

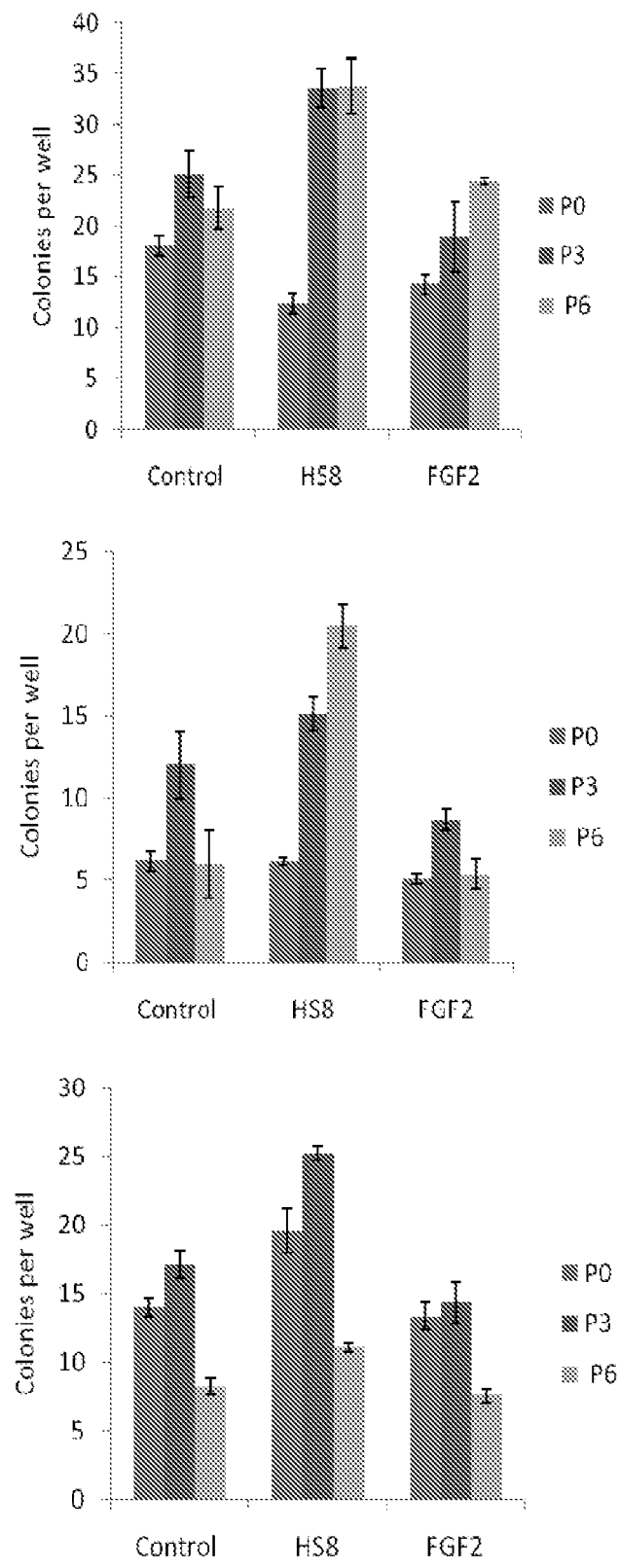


Figure 51

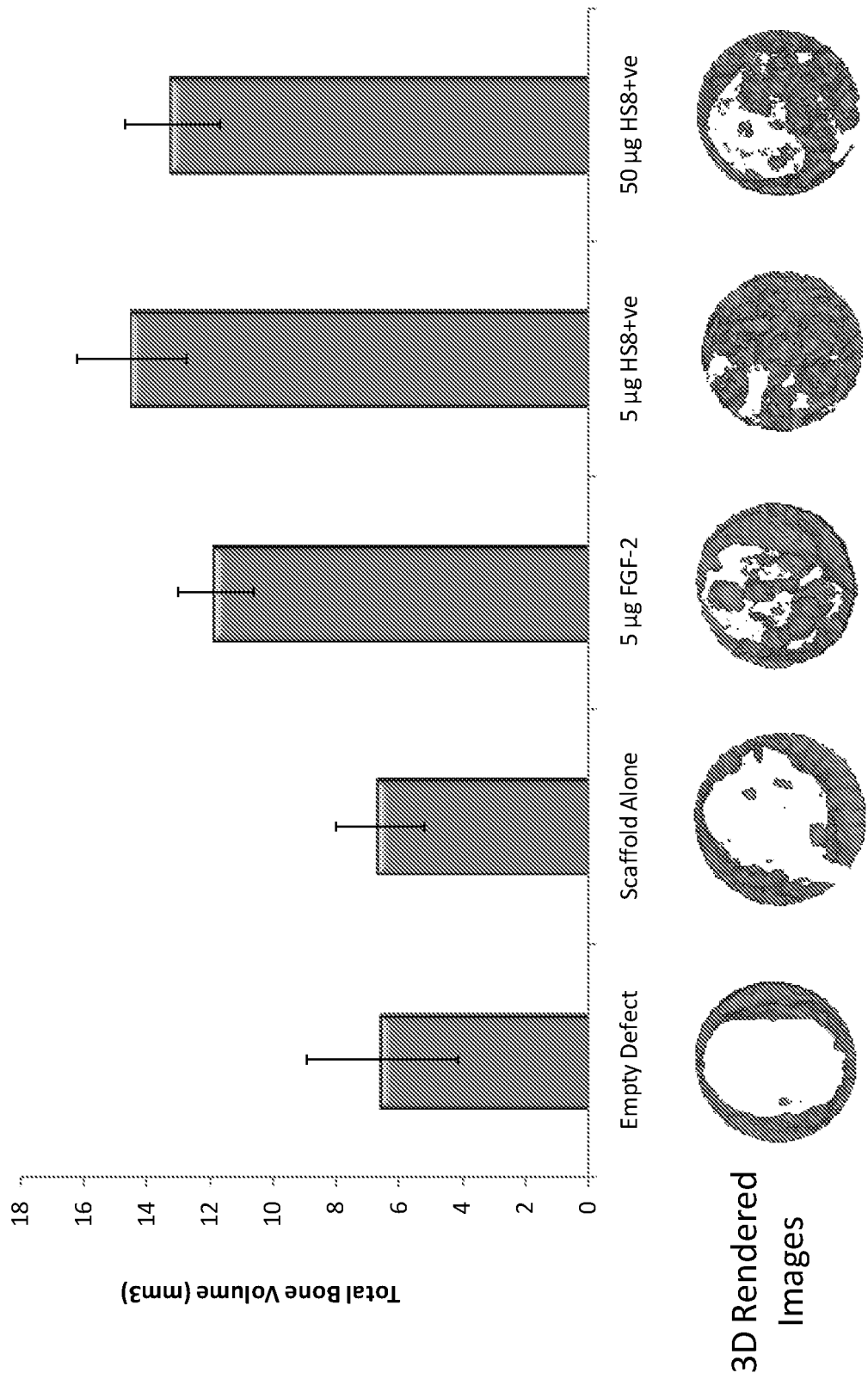


Figure 52

Day 0

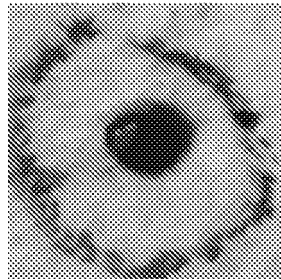


Figure 53A

Wound at Day 7

CMC

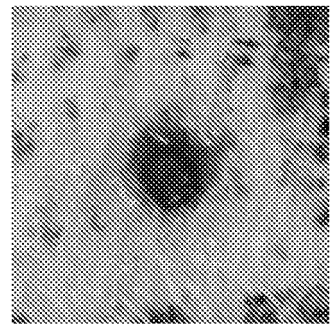
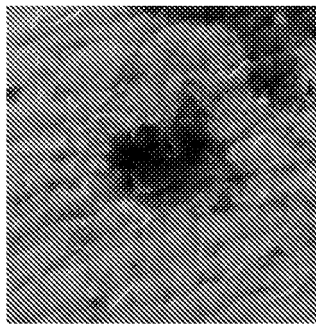
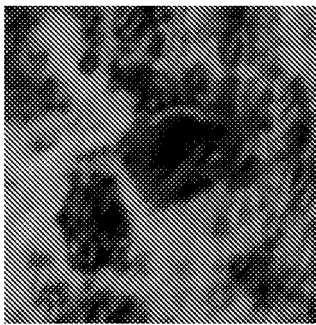


Figure 53B

Wound at Day 7

HS8

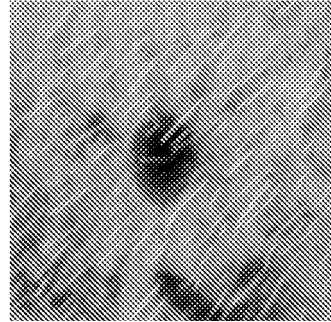
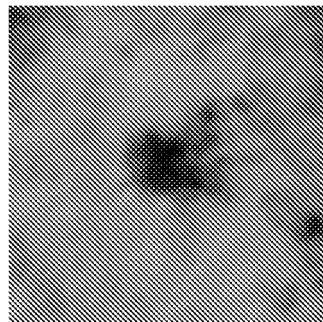
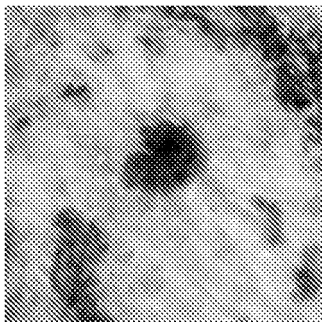


Figure 53C