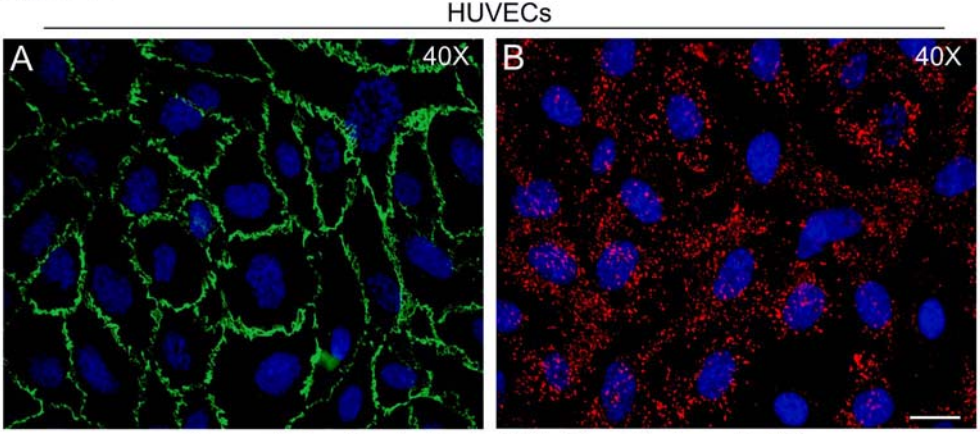
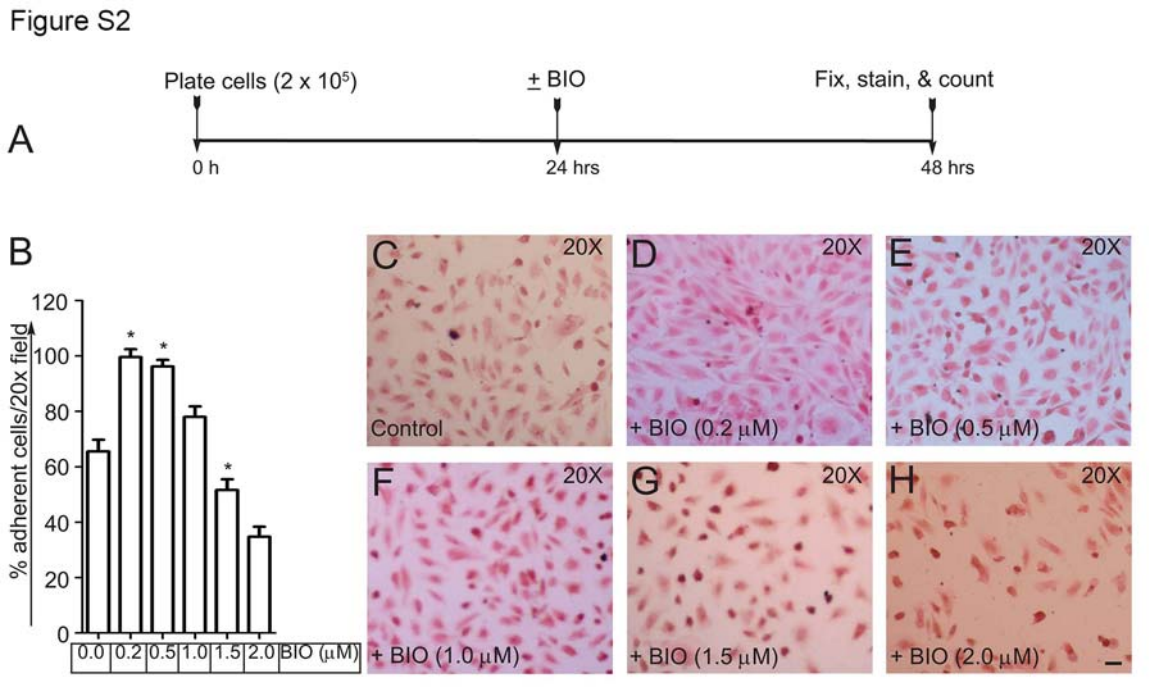
Figure S1



Green: VE-cadherin; Red: vWF; Blue: Nucleus (DAPI)

Figure S2


A
Plate cells (2 x 10^5)
± BIO
Fix, stain, & count
0 h
24 hrs
48 hrs
B
% adherent cells/20x field
120
100
80
60
40
20
0
*
*
*
0.0
0.2
0.5
1.0
1.5
2.0
BIO (μM)
C
20X
Control
D
20X
+ BIO (0.2 μM)
E
20X
+ BIO (0.5 μM)
F
20X
+ BIO (1.0 μM)
G
20X
+ BIO (1.5 μM)
H
20X
+ BIO (2.0 μM)

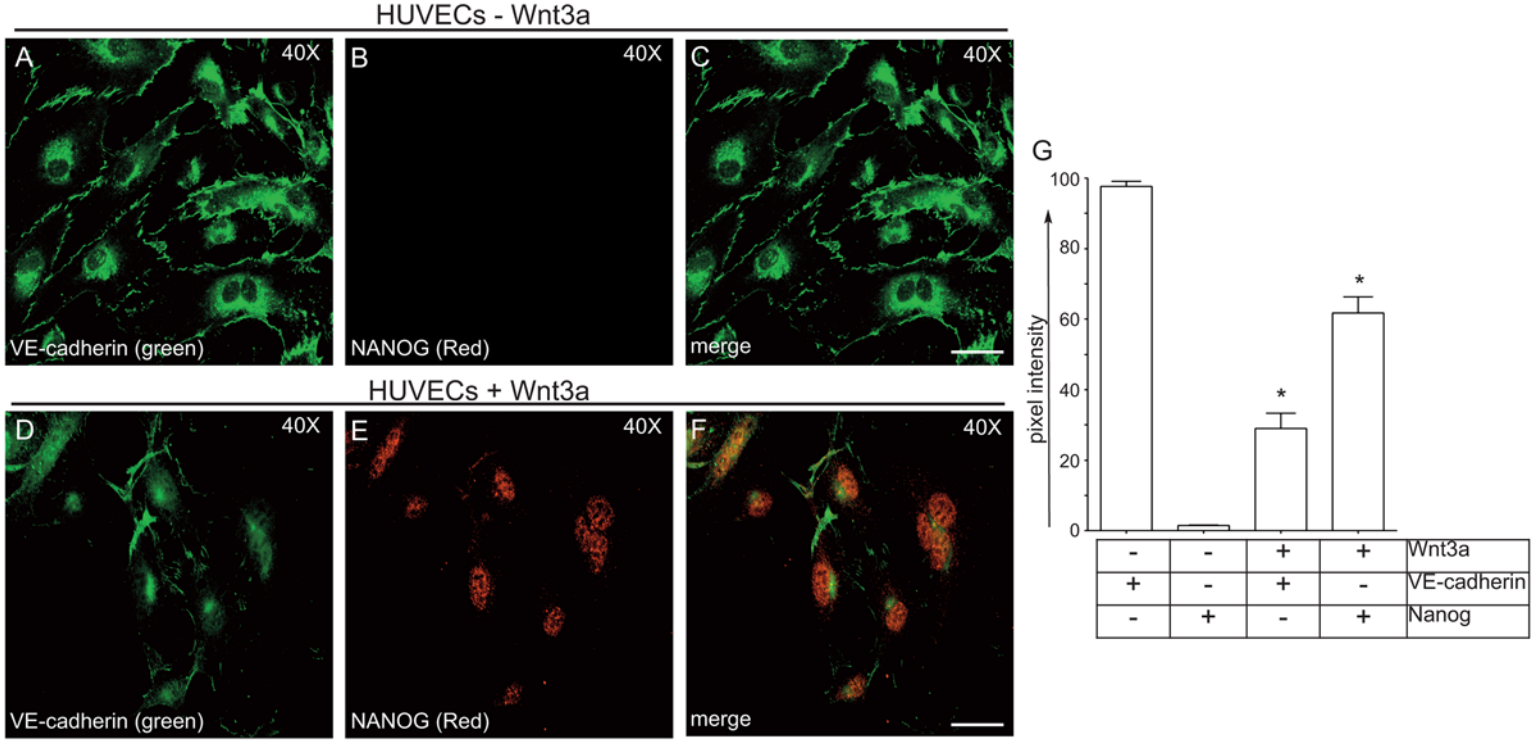

HUVECs - Wnt3a
A
40X
VE-cadherin (green)
B
40X
NANOG (Red)
C
40X
merge
HUVECs + Wnt3a
D
40X
VE-cadherin (green)
E
40X
NANOG (Red)
F
40X
merge
G
pixel intensity
100
80
60
40
20
0
*
*
- - + + Wnt3a
+ - + - VE-cadherin
- + - + Nanog

Figure S4: Nucleotide sequence of human *NANOG* promoter/enhancer (-2.2 kb)

```
   1 AACCTCCGCC TCTGGAGTTC AAGTGATTCT CCTGTCTCAG CCTCCCTAGT AGATGGGATT
  61 ACAGGCGTGC ACCACCACGC CCAGCCCAGT TAATTTTTGT ATTTTTAGTA CAGACAGGGT
 121 TTCACCATGT TGGTCAGGCT GGTCTTGAAC TCCTGATCTC AGATGATGCA CCTGGCTCGG
 181 CCTCGCAAAG TGCTGGGATT ACAGGTGTGA GCCACCGTGC CCAGCCGTTA GCTCATTTTA
 241 ACACATCCTT AGTCCAGCCT GTTCCAAAAA ATCTAAAGTC AGATAGCTTC CTAAACCTCA
 301 ACTTTATTCC AATTGCTTTC CTTGGCGAAG AATGTAGTAA GTCGGCCTTC CAGCCACCAG
 361 CCCCTTCCCT TTGGTCTTTC ACTCCGGAGG CTCTTACCCT AGACACAATG GGACAGGGAG
 421 CGGGGGATGG GGGAATTCAG CTCAGGCTTT TATGCAAAGA CCCCCTTCTG CAAAGAACAA
 481 AGCTTCTGGT ACCTGCCCTT TGGAGAGCTG CGGGCAAGCT CAGCCTCGGT GAGTCTTGGT
 541 GGCCTTGACA GCCCCCACTT AACAAACTGT GCTGATTAAG AGAGACAGGA GGGCAAGTTT
 601 TTCCCTTCTT TTAAAGAAAT CATCCTATTT CCTACGAGAC ATAGACTATC TGCCTGAAGC
 661 ATGATGTACT AGCCCCACTC ACCGGCTCCC TGATGCCCCT ATGCTTAATC TTCTCCGGAA
 721 TGGTAGTCTG AGAAGAAAAA AGATTACGCC CAATTTCATT TCCTTGTTTC ACATCAAGCA
 781 ATACTTTTCG AGTCTTTGCA TTGTGAACAA AAGTCAGCTT GTGTGGGAGC AAAGCCAGCT
 841 GCTCTGGGTG CAGACCCAGG AGCAGAGTGC AGAGGAGAAT GAGTCAAAGA GTTTTGTCTT
 901 CAAAAATTAC ATAATCGGGA TTTGCTAAGA GTTTACTTTT CGGTATGGAA GACTGGAAAA
 961 GAGAAAGAAA TCTTAGGTTT CTTGAATGTT GGGTTTGGGA ATAGGAAGGA AAATCGAAAA
1021 CTGTAGACTT TGTCCATAAA TGTTAGTGCT GGAACCCCAC TCTAAAAACT TTGTTCCTTT
1081 GGAAAACACC TCCCTTCCCC CAGAAACACA CACACCCACA CGAGATGGGC ACGGAGTAGT
1141 CTTGAAAGAC ATGACAAATC ACCAGACCTG GGAAGAAGCT AAAGAGCCAG AGGGAAAAAG
1201 CCAGAAGTCG ACTACCTGGG AGGAGGGATA GACAAGAAAC CAAACTAAAG GAAACTAAGG
1261 TAGGTGCTGA AAACAAGTAC CATTTTCAAC ATTAACTGAT GCCTTGGCTT CATGCTATAA
1321 TGCCATGTTG TGTTTCACTA TAACCTCAGA GTGAATGAAA GAGGAAAATG GAGCTAGTTG
1381 AAATTTCTGC CTAAACTAGC CAGATTTTGA GACACTAAGT TATCTCAAAT CAAGAAATCA
1441 CCCTAATGAG AATTTCAATA ACCTCAGGAA TTTAAGGTGC ATGCATCCCC CACCCCCCCC
```

1501 TTTTTTTTTT GAGACGTAGT CCCGCTCTGT TGCCCAGGCT GGAGTACAGT GGCGCGATAT

1561 CGGCTCACCA CAACCTCTGC CTCCCAGGTT CAAGGGATTC TCCCGCCTCA GCTTCCAGAG

1621 TAGCTGGGAC TACAGACACC CACCACCATG CGTGGC**TAAT** TTTTGTATTT TTAGTAGAGA

1681 GGGGGTTTCG CCATGTTGGC CAGGCTGGTT TCAAACTCCT GACTTCAGGT GATCCGCCTG

1741 CCACGGCCTC CCAATTTACT GGG**ATTA**CAG GGGTGGGCCA CCGCGCCCGG CCTTTTTCT**T**

1801 **AAT**TTTTAAA AAT**ATTA**AAG TTTTATCCCA TTCCTGTTGA ACCATATTCC TGATTTAAAA

1861 GTTGGAAACG TGGTGAACCT AGAAGTATTT GTTGCTGGGT TTGTCTTCAG GTTCTGTTGC

1921 TCGGTTTTCT AGTTCCCCAC CTAGTCTGGG TTACTCTGCA GCTACTTTTG C**ATTA**CAATG

1981 GCCTTGGTGA GACTGGTAGA CGGG**ATTA**AC TGAGAATTCA CAAGGGTGGG TCAGTAGGGG

2041 GTGTGCCCGC CAGGAGGGGT GGGTCTAAGG TGATAGAGCC TTC**ATTA**TAA ATCTAGAGAC

2101 TCCAGGATTT TAACGTTCTG CTGGACTGAG CTGGTTGCCT CATGTT**ATTA** TGCAGGCAAC

2161 TCACTTTATC CCAATTTCTT GATACTTTTC CTTCTGGAGG TCCTATTTCT CTAACATCTT

2221 CCAGAAAAGT CTTAAAGCTG CCTTAACCTT TTTTCCAGTC CACCTCTTAA ATTTTTTCCT

2281 CCTCTTCCTC TATACTAAC**A TG**

Figure S5: Nucleotide sequence of human *BRACHYURY* promoter/enhancer (-3.8 kb)

```
   1 GAGTCTAAAG A**ATTA**CGTTA CACACCTTTT AAAGCAATAA CAAAAGCCAT TGGGTTTCTT
  61 T**TAAT**GGGAG AGACAAATAA ACCAATTGGT GGCAGA**ATTA** TTGGCCATGA AACATGGCTG
 121 TCATCTCTAA TGTAGAACTT GTGACTGTTT GCGATCAGTC CGCTTAGTCA GTGTGGGAGA
 181 AGGAGCTCAT GAGAAGAACA AAATGAAAAA AAGACGAGGA ACACCCCAAA ATATGAACAT
 241 TGCTTAGTGC TTGAGGTTAG CATTTATATA CATAGAGAGA GATAAACATA CAGCCAGCCC
 301 TCCATAGCCA CAGGTTCCAT ATCCGTGGTT GGTTGAATTG ATAGAAAACA TTCCAAACTC
 361 CCTCTCCCCA A**TAAT**GAAAG AATAAAA**ATT A**TACAAATAA AAAGCAATAC AGTATAACTA
 421 CTATTTGCAT AGTGTTACAT TGT**ATTA**GGT **ATTA**TAAGTA ATCCAGAAGT GATTTATAGT
 481 TCATGGAGGA AGTCCATAGG TTATATGCAA ATACCATGCC AAGGGACTAG GGCATCCCTG
 541 GATTCTGCCA TCTTTGTAGG TCCTGGAACC AATCCCCCAC AGATACTGTG GGTGACTGTT
 601 TTACATATAT ATGAAGACAG ATACATATA**T AAT**ATTTCTA CAAGGAGTAC ATATA**TAAT**C
 661 AGAAAAGAAA TTCATTTGTT TTTCTTGCAG AAAGAGAGGG ACTAGAGTGT GGGGTAAGAG
 721 TCACGCGAGG CTGTCCTCCA CCCCTCCTTG AGCCTGTTAC AGCTTCATTG TTGCCTGCTT
 781 CTAAAGATAA ATGGCTTTGC TTTTTCAGAA GGGATTGGGC CCAGGAAAAC TGCCTCTCTG
 841 GGAGTCGAGT GGGGTGTGTG TGTGTGTTTT CTTATAAAAT GTTTCAAGCA TGTTTTCGGT
 901 GGGACAGTTG CATCCTGAGG CCCAGCCATA AGGCTTTGTC TTGTTTTTCT CTGAATGGCT
 961 GGGCTTGCCA AGGAGAGATA GACCCTGGGA GCGAAACAGC TGGCGGTGCC TCAGCCCCTC
1021 TTTCCTCCCA AGGAAGCGCA TTGTT**ATTA**A CTGGGAATTC TTTATAGCCG GGCTGGAGGA
1081 AGTTTTGGCT GTAAACTGTC ATGCACTGCA GCCTTCGCTG AAAAGGCGGA GGGAGTGGGC
1141 CTGGTCCTGG GAACCGAGGA ACAAAGATCA GAAAATCAGC CACAGAAAGG GGAGGAAAAA
1201 TAAACGTTAG AAAGTGAAGA CAGGTGACAC TACACAAGTG CTGGCCAAAG TCGGTGACTT
1261 CCAACCTCTA CCTCCTCCGA CTTGGGTGGT TCAATTCCTG GGTCGTACTC TTCAATGCTT
1321 CAGACATTCT CTCTGGAGAG TAGAAATTTT **ATTA**CGCGTG TTAGAAACGG AATATTCTTT
1381 CCTGCTGAAG TTGTATTCTT ATTTGGCCGT GCCCCTCCTG TTCGGAACAG TTTTAGAGCG
1441 ATCTGTTAAA CCCTCCAGTC TTCTTTGGCG CTTCCCGACT GTGGGAAAAG CGGCCGCGAC
```

1501 GCCGTCCGAG CGCAGGGGAG GGATCCAGCC TTCGGGACTC CTTTGCCCTG AAGCCGCAGG

1561 AGAGGTTTCG CTCCCGTGCC TAGGGTTCCG AGGCCCTCAA TTGCCTGGGA CCCACCCTCG

1621 TTCCTCCTTC ACCTCCCCTC CACTTTTCCC TTTTATCTTA TCCTCGGGAG GCCTTGGGCC

1681 AAAGCGATGA CCTCTTAGAC ATTT**TAAT**AC CCGGAGTAAG GAGAGTAACA CGCACCACGC

1741 TCTCCCCCAA AGCCCAGGAC CCGATGAGCC AGTGAAGGCG TGTCAGGAGG GTCCGGCGTC

1801 AGGAGCAAAT GAGGTCCTTT TGGTGCCTCT TTCTAGAAGG AAACTTCCCC ACCTCGGGTC

1861 AGCCCCCTGG GAATATCCAT GCATCCCAGA CATCAAAAGA CACTGAGAAA TGCGGACAGG

1921 GACTAGACGC TCCGGCTTCC TGACTCGTCG GTGTAAGTTG GAGAAGGGAG AGAAGGAGCC

1981 CTGTCCCCCA CGGGCGGCAG GCACCCTTCC CCGGGACTGG CTCCTGGCAG CCCTCCGCAT

2041 ACCGCGAGGC GGGTCGATCC CTCGAGTCCC GGGCGGGGAT CCCTCCTTCG GCTTCCCCAG

2101 CAATTCCCGA CCCCGGAGCG AGCCCGGCTG GGCGAGGGGC GAGGGGCAGG GGGCAGGGGG

2161 CAGGGGAGAC TTAGCGCGGG GCGCAGATAC CATGTCCGCG GGAAAGCCCC CTTGCTAGGG

2221 CGCAAGACTC CTCTGAACTC GCTGCCCCAC CCGATGCGCA GGCTTTCTCT AGAGGGGTTG

2281 GGGCTGGGGT GCCCGCTCAG GAGACCGGGA AACAGAGGCT GCTACCCGAG GCAGGCCCTC

2341 GTCCAGCGAA TGGGCGAGGT GTGCAGAAGC GCAAAGCCAG GCCTTGGAAG GGGGAGCTTC

2401 TGCCTCCTTC CCCCTTCCTG GGCTCCCGTT TTAGGAGGAA TGTTACTGTT TAAAGAGACC

2461 CCACTGAACT ATTTCCTGCT CATTGTCACC TCTCCTTCGC TCTCCTCGCG TAAGTTCTCA

2521 CCGAAAGG**TA** **AT**AAAACAAC CGCTGCCGAC ACCGCTTGGC GCTGGGCCGG GCGGGGAAAG

2581 CGCCCCGAGT CCCACTAGTC CGGACCACCC CGCCAGCCCC GACCTTCTCC CACCTTCCGT

2641 GAAAGCAATG ACACAGCAGA AACCACGCAC ACGCCTGGCA CACTCGATGC GCGCGCTGAC

2701 CTCGGCAACA AGTCCTGTTT TTATAAGAGA GCGAGGAGGA CACTTCTCAG AAGGGGTTGT

2761 TTTGCTTTTG CTTATTTCCG TCCATTTCCC TCTCTGCGCG CGGACCTTCC TTTTCCAGAT

2821 GGTGAGAGCC GCGGGGACAC CCGACGCCGG GGCAGGCTGA TCCACGATCC TGGGTGTGCG

2881 TAACGCCGCC TGGGGCTCCG TGGGCGAGGG ACGTGTGGGG ACAGGTGCAC CGGAAACTGC

2941 CAGACTGGAG AGTTGAGGCA TCGGAGGCGC GAGAACAGCA CTACTACTGC GGCGAGACGA

3001 GCGCGGCGCA TCCCAAAGCC CGGCCAAATG CGCTCGTCCC TGGGAGGGGA GGGAGGCGCG

3061 CCTGGAGCGG GGACAGGTGA GGCCGCGCGA ACGTTCCAGC CTGGCGCGGC TGCGGGATCC

3121 GGGCGCGCTG GGAAAGCGAG GAGGACCCCG CGCGGGAATC AGGGAGCATC GCAGGCTGCC

3181 GGGCAGCCCC TCGCGGAAGT GCGGGCTGGG GCGGGCTGGG GCGGGCTGGG GCAGGCCGGG

3241 GCGTCCAGCT TACCTTCCTC CGGGGCTTGC CCCGCCGCTT TGATGGAGGT GCAAACATTT

3301 GGAGAAGGGC GGGGGTGTAG GGGCTGGGCC GGGGCTCGCA GGGCTGGGGC CCCGGATTTA

3361 CATGAAACAG GCGTGCGGGA GCCCATTGTT GGCCCCCGGC CTCCCAGACC CGCCCGGCTG

3421 GGTCTGATAT GGCCGCTCTC GGCCAATGGG AGGCTGCCCG GCACTTCAAA GCGTGCGCGG

3481 CCCAATCCGC CGAGCACCCC AGCGCTGCCG CCGCGGCTCT ATTTATGGGG AGGGCACTGA

3541 ATTTCGGTCC CCAGAGACCT ACACTAGTAG AGCCTTGGGG AGTTCAAGTG GAATAACTTC

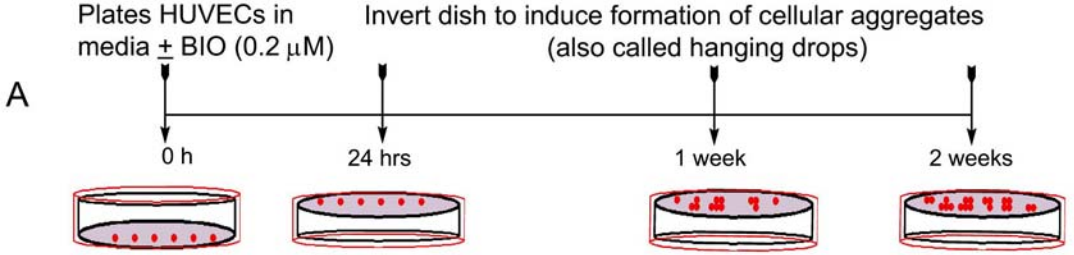
3601 TCCCCACCCC TCTGCCCCCG TCCCCTCCCC CCAAGTCTTG GTCCGCGCCC TCCTCCCGGG

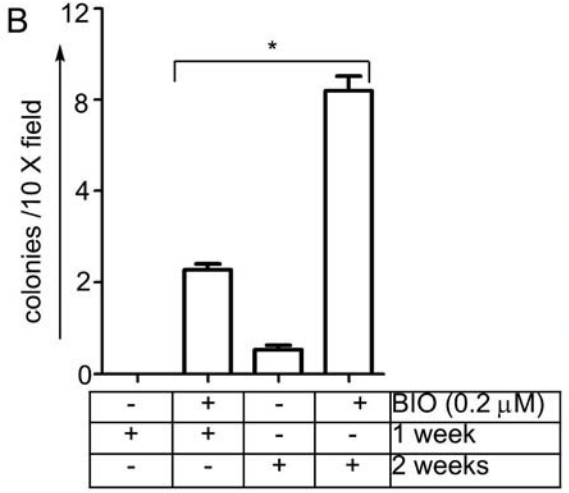
3661 TCTGTGCCGG GACCCGGGAC CCGGGAGCCG TCGCAGGTCT CGGTCCAAGG GGCCCCTTTT

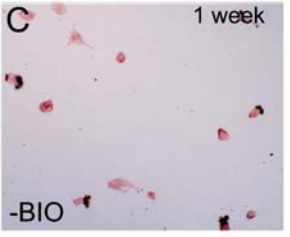
3721 CTCGGAAGGG CGGCGGCCAA GAGCAGGGAA GGTGGATCTC AGGTAGCGAG TCTGGGCTTC

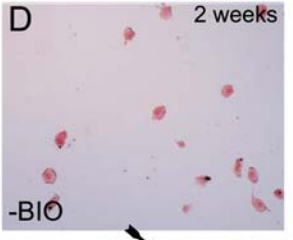
3781 GGGGACGGCG GGGAGGGGAG CCGGACGGGA GGATG

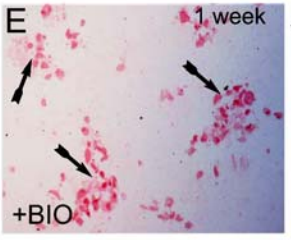
Figure S6

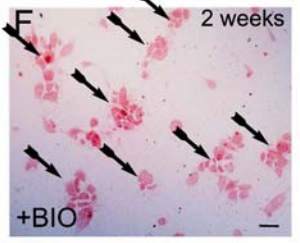

Plates HUVECs in media ± BIO (0.2 μM)
Invert dish to induce formation of cellular aggregates (also called hanging drops)
A
0 h
24 hrs
1 week
2 weeks

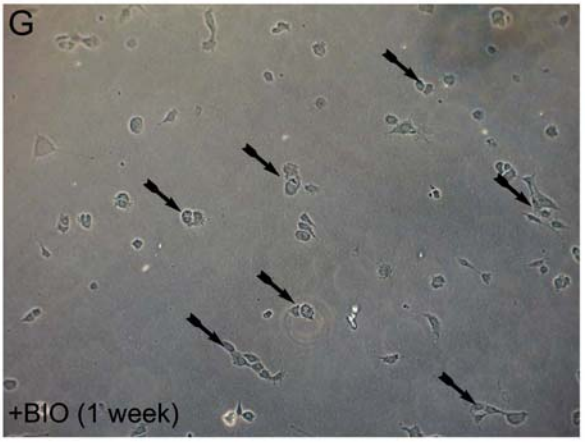

B
colonies /10 X field
12
8
4
2
0
*
- + - + BIO (0.2 μM)
+ + - - 1 week
- - + + 2 weeks


C
1 week
-BIO


D
2 weeks
-BIO


E
1 week
+BIO


F
2 weeks
+BIO


G
+BIO (1 week)

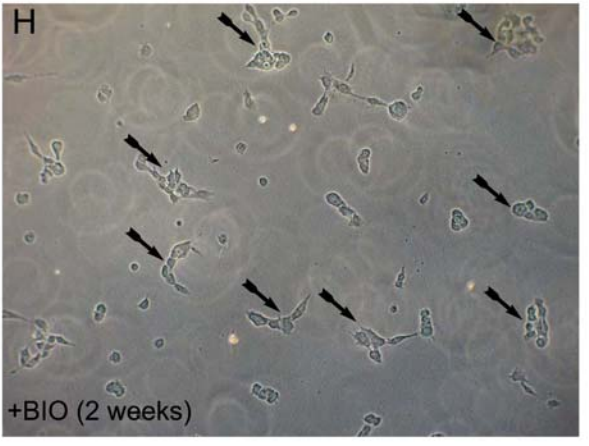
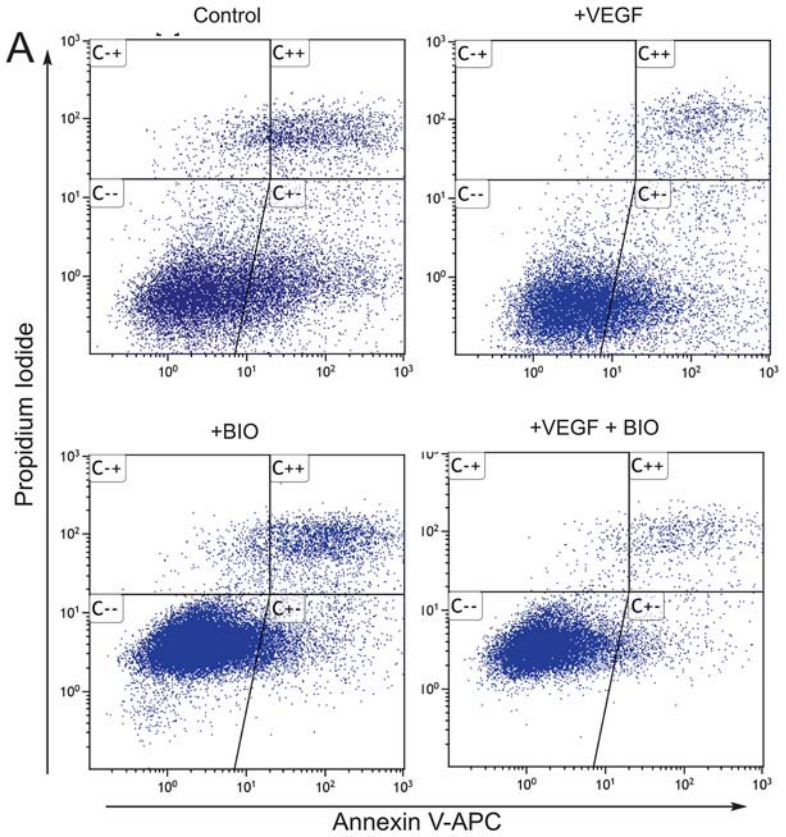

H
+BIO (2 weeks)

Figure S7


A
Control
+VEGF
+BIO
+VEGF + BIO
C-+
C++
C--
C+-
Propidium Iodide
Annexin V-APC

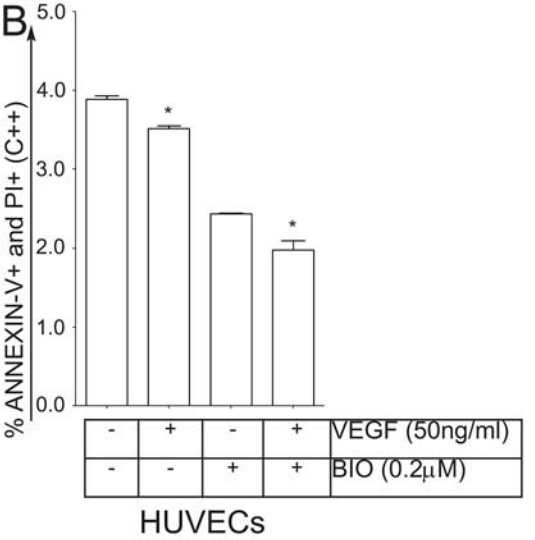
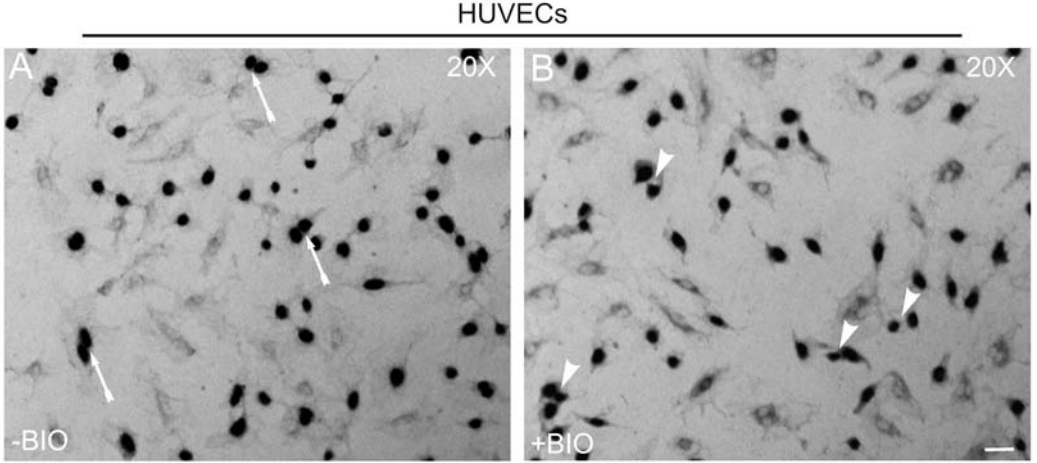
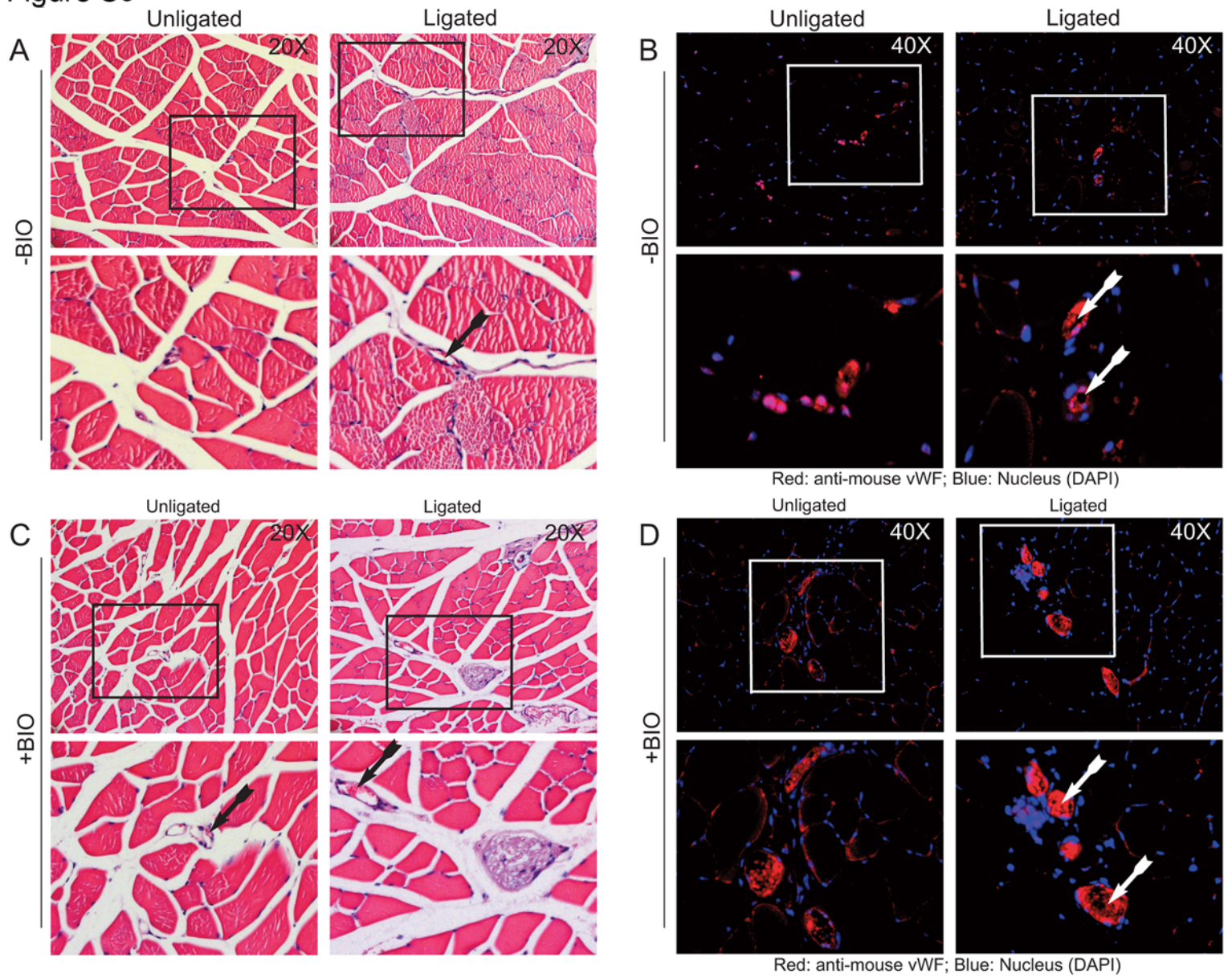

B
% ANNEXIN-V+ and PI+ (C++)
5.0
4.0
3.0
2.0
1.0
0.0
*
*
VEGF (50ng/ml)
BIO (0.2μM)
HUVECs

Figure S8



Arrows: Symmetric cell division (SCD)
Arrowheads: Asymmetric cell division (ACD)

Figure S9


A
Unligated
Ligated
20X
20X
-BIO
B
Unligated
Ligated
40X
40X
-BIO
Red: anti-mouse vWF; Blue: Nucleus (DAPI)
C
Unligated
Ligated
20X
20X
+BIO
D
Unligated
Ligated
40X
40X
+BIO
Red: anti-mouse vWF; Blue: Nucleus (DAPI)

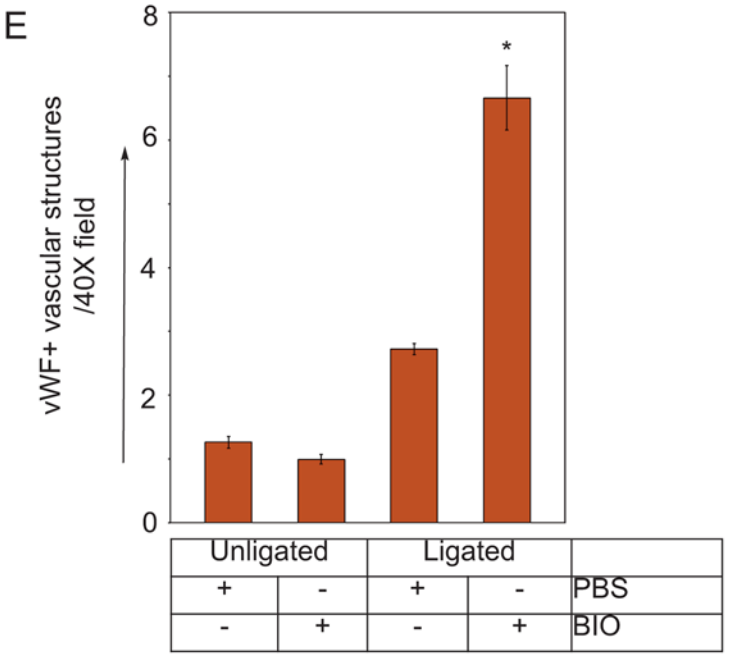
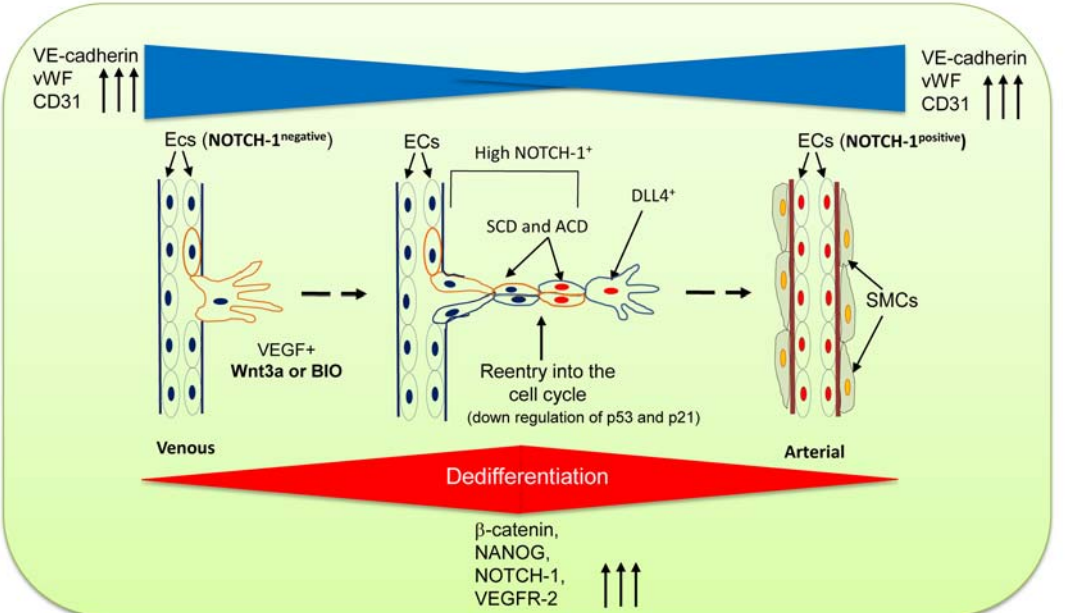

E
vWF+ vascular structures /40X field
0
2
4
6
8
*
Unligated
Ligated
+
-
+
-
PBS
-
+
-
+
BIO

Figure S10


VE-cadherin
vWF
CD31
VE-cadherin
vWF
CD31
Ecs (NOTCH-1negative)
ECs
High NOTCH-1+
DLL4+
SCD and ACD
ECs (NOTCH-1positive)
SMCs
VEGF+
Wnt3a or BIO
Reentry into the
cell cycle
(down regulation of p53 and p21)
Venous
Arterial
Dedifferentiation
β-catenin,
NANOG,
NOTCH-1,
VEGFR-2