

Supplemental Table 1. Expression of Auxin Response Genes Correlating with Hypocotyl Lengths in *SOB3* Mutants. List of genes in four-day-old seedlings having an *R* value of greater than 0.8 or less than -0.8 based on correlation with hypocotyl phenotypes in six-day-old Col-0, *SOB3-D*, and *sob3-6* seedlings, also falling in the GO annotation category "Response to Auxin," based on PLAZA 3.0. Genes misregulated less than 2-fold in *SOB3-D*, as compared to *sob3-6*, as well as those not expressed in the wild-type, were excluded from analysis. The group was over-represented among GO terms, *p* = 0.000478. Asterisks indicate genes which were misregulated in the same direction based on the RNA-seq screen from six-day-old seedlings (Supplemental Table 2).

AGI Number	Gene Name or Class	<i>R</i> Value	Fold Change (<i>sob3-6/SOB3-D</i>)
AT5G16530	<i>PIN5</i>	-1	0.317097077
AT2G36210	<i>SAUR45</i>	-0.99995	0.174403392
AT1G27740	<i>RSL4</i>	-0.99966	0.181986148
AT5G54490	<i>PBP1</i>	-0.99945	0.321975493
AT3G59610	F-box Protein	-0.99898	Not Expressed in <i>sob3-6</i>
AT3G20690	F-box Protein	-0.99898	Not Expressed in <i>sob3-6</i>
AT5G41490	F-box Protein	-0.99898	Not Expressed in <i>sob3-6</i>
AT3G22650	<i>CEG/SFL61</i>	-0.99898	Not Expressed in <i>sob3-6</i>
AT3G17620	F-box Protein*	-0.99898	Not Expressed in <i>sob3-6</i>
AT2G47260	<i>WRKY23</i>	-0.9988	0.328874968
AT3G44120	F-box Protein	-0.98569	0.369324831
AT4G05100	<i>MYB74</i>	-0.97934	0.416630326
AT3G53480	<i>ABCG37/PDR9</i>	-0.97743	0.485761596
AT1G23160	GH3 Protein	-0.97715	0.261605088
AT2G21220	<i>SAUR12</i>	-0.97675	0.116268928
AT1G57560	<i>MYB50</i>	-0.96516	0.465075713
AT3G11260	<i>WOX5</i>	-0.96328	0.160987747
AT4G16920	Disease Resistance Protein	-0.96182	0.116268928
AT2G46530	<i>ARF11</i>	-0.95815	0.481481758

AT4G37295	Unknown	-0.95579	0.184662415
AT4G22620	<i>SAUR34</i>	-0.94767	Not Expressed in <i>sob3-6</i>
AT1G19220	<i>ARF19/IAA22</i>	-0.93911	0.44472865
AT5G10990	<i>SAUR69*</i>	-0.92894	0.041036092
AT1G24881	F-box Protein	-0.91026	0.202249312
AT1G48690	GH3 Protein	-0.88994	0.244906891
AT3G22700	F-box Protein	-0.86996	Not Expressed in <i>sob3-6</i>
AT3G23420	F-box Protein*	-0.86996	Not Expressed in <i>sob3-6</i>
AT1G54970	<i>PRP1/RHS7</i>	-0.86403	0.372801882
AT5G64890	<i>PROPEP2</i>	-0.83687	Not Expressed in <i>sob3-6</i>
AT5G07990	<i>CYP75B1/TT7</i>	-0.83469	0.29727851
AT1G77850	<i>ARF17</i>	-0.82776	0.457173941
AT4G08040	<i>ACS11</i>	-0.82638	0.392407633
AT1G56150	<i>SAUR71</i>	-0.81941	0.348806785
AT3G13680	F-box Protein	-0.81941	0.348806785
AT3G28380	<i>ABCB17/PGP17</i>	-0.80095	Not Expressed in <i>sob3-6</i>
AT1G48670	GH3 Protein*	0.8047	Not Expressed in <i>SOB3-D</i>
AT5G18020	<i>SAUR20*</i>	0.805682	2.478363996
AT5G43700	<i>IAA4</i>	0.806903	2.34516902
AT4G12545	2S Albumin Protein	0.81242	2.031838624
AT3G54010	<i>DEI1/PAS1</i>	0.822833	2.779202445
AT3G18320	F-box Protein	0.82319	2.092840708
AT3G58190	<i>ASL16/LBD29*</i>	0.82989	3.139261061
AT5G18010	<i>SAUR19*</i>	0.836298	4.839694136
AT1G15520	<i>ABCG40/PDR12</i>	0.862375	3.139261061
AT1G77110	<i>PIN6</i>	0.874531	3.095660213
AT1G29420	<i>SAUR61</i>	0.883303	6.278522123
AT4G32810	<i>CCD8/MAX4</i>	0.888491	4.883294984
AT3G28210	<i>PMZ/SAP12</i>	0.891675	2.092840708

AT2G39550	<i>GGB</i>	0.9059	2.134697522
AT2G28085	<i>SAUR42*</i>	0.912291	Not Expressed in <i>SOB3-D</i>
AT4G32280	<i>IAA29*</i>	0.912676	11.2490188
AT1G56650	<i>MYB75/PAP1</i>	0.9157	8.371362831
AT1G29450	<i>SAUR64</i>	0.918421	18.83556637
AT2G21210	<i>SAUR6</i>	0.920418	2.187672552
AT5G51470	GH3 Protein	0.932347	3.40086615
AT1G24800	F-box Protein	0.932415	5.493706858
AT3G01140	<i>MYB106/NOK</i>	0.934234	4.924331077
AT4G16780	<i>ATHB2/HAT4</i>	0.935168	4.407649369
AT3G17265	F-box Protein	0.936635	Not Expressed in <i>SOB3-D</i>
AT2G47190	<i>MYB2</i>	0.948072	Not Expressed in <i>SOB3-D</i>
AT5G14960	<i>DEL2</i>	0.950345	2.616050885
AT5G18030	<i>SAUR21*</i>	0.953773	2.67642129
AT2G19690	<i>PLA2-BETA</i>	0.955374	13.25465782
AT3G15540	<i>IAA19/MSG2*</i>	0.95804	7.499345869
AT1G09540	<i>MYB61</i>	0.96136	2.850593378
AT5G13820	<i>TBP1</i>	0.961866	2.414816201
AT1G16510	<i>SAUR41</i>	0.961924	Not Expressed in <i>SOB3-D</i>
AT4G14550	<i>IAA14/SLR</i>	0.964986	2.790454277
AT1G22640	<i>MYB3</i>	0.965594	3.185426665
AT2G31180	<i>MYB14</i>	0.968868	5.580908554
AT1G29490	<i>SAUR68*</i>	0.969015	Not Expressed in <i>SOB3-D</i>
AT3G03830	<i>SAUR28</i>	0.971378	17.78914601
AT4G34770	<i>SAUR1*</i>	0.972195	8.371362831
AT2G21200	<i>SAUR7*</i>	0.972195	8.371362831
AT3G20710	F-box Protein*	0.973159	2.092840708
AT3G17480	F-box Protein	0.977269	Not Expressed in <i>SOB3-D</i>
AT2G44990	<i>CCD7/MAX3</i>	0.977269	Not Expressed in <i>SOB3-D</i>
AT3G13830	F-box Protein	0.977269	Not Expressed in <i>SOB3-D</i>

AT3G22730	F-box Protein	0.977269	Not Expressed in <i>SOB3-D</i>
AT4G33290	F-box Protein*	0.977269	Not Expressed in <i>SOB3-D</i>
AT3G28360	<i>ABCB16/PGP16</i>	0.977269	Not Expressed in <i>SOB3-D</i>
AT1G35540	<i>ARF14</i>	0.977269	Not Expressed in <i>SOB3-D</i>
AT1G15580	<i>IAA5</i>	0.977269	Not Expressed in <i>SOB3-D</i>
AT1G11810	F-box Protein	0.979512	Not Expressed in <i>SOB3-D</i>
AT4G11280	<i>ACS6</i>	0.980703	3.139261061
AT4G10100	<i>CNX7/SIR5</i>	0.981477	3.041159153
AT3G62100	<i>IAA30</i>	0.985414	3.139261061
AT2G22240	<i>MIPS2</i>	0.985833	2.017648826
AT4G02980	<i>ABP1</i>	0.986698	2.014359181
AT1G71230	<i>AJH2/CSN5B</i>	0.990394	6.600497616
AT2G26700	<i>PID2</i>	0.991002	3.461236555
AT5G18060	<i>SAUR23*</i>	0.993555	8.109757742
AT3G03820	<i>SAUR29</i>	0.99382	12.55704425
AT1G05180	<i>AXR1</i>	0.994364	2.012346834
AT1G59500	<i>GH3.4</i>	0.994558	Not Expressed in <i>SOB3-D</i>
AT1G15050	<i>IAA34</i>	0.994558	Not Expressed in <i>SOB3-D</i>
AT3G61510	<i>ACS1*</i>	0.994558	Not Expressed in <i>SOB3-D</i>
AT5G66700	<i>HB53</i>	0.995082	3.662471238
AT1G19640	<i>JMT</i>	0.995109	8.371362831
AT1G29460	<i>SAUR65</i>	0.995853	3.371798918
AT5G18050	<i>SAUR22*</i>	0.996315	28.77655973
AT5G18080	<i>SAUR24</i>	0.99707	Not Expressed in <i>sob3-6</i>
AT4G38825	<i>SAUR13*</i>	0.99707	Not Expressed in <i>SOB3-D</i>
AT5G50120	WD40 Repeat Protein	0.997117	2.72069292
AT1G18570	<i>MYB51</i>	0.998156	2.24232933
AT1G19180	<i>JAZ1</i>	0.998259	2.092840708
AT5G47370	<i>HAT2</i>	0.998562	2.181752241

AT5G13320	<i>GH3.12/WIN3</i>	0.998632	Not Expressed in <i>SOB3-D</i>
AT2G01200	<i>IAA32</i>	0.998654	10.46420354
AT5G42460	F-box Protein	0.99869	2.588513507
AT1G29500	<i>SAUR66*</i>	0.998886	4.668644656
AT3G23260	F-box Protein	0.999087	Not Expressed in <i>SOB3-D</i>
AT3G15500	<i>NAC3</i>	0.999091	3.836874631
AT4G14560	<i>AXR5/IAA1</i>	0.999355	5.115832841
AT5G20820	<i>SAUR76</i>	0.999636	7.324942477
AT1G48660	GH3 Protein	0.999723	3.662471238
AT2G17830	F-box Protein	0.999762	2.232363421
AT2G27690	<i>CYP94C1</i>	0.999829	6.069238052
AT4G37770	<i>ACS8*</i>	1	Not Expressed in <i>SOB3-D</i>
AT2G44840	<i>ERF13</i>	1	Not Expressed in <i>SOB3-D</i>
AT1G29440	<i>SAUR63</i>	1	3.780615472

Supplemental Table 2. Auxin Response Genes Misregulated in *SOB3-D* at Six Days. List of genes, based on RNA-seq data from six-day-old seedlings, misregulated at least 5-fold in *SOB3-D*, as compared to Col-0, with GO annotation "Response to Auxin," based on PLAZA 3.0. The group was over-represented among GO terms, $p = 0.0038$. Asterisks indicate genes which were misregulated in the same direction based on the RNA-seq screen from four-day-old seedlings (Supplemental Table 1).

AGI Number	Gene Name or Class	Fold Change (<i>SOB3-D</i>/Col-0)
AT3G49700	<i>ACS9</i>	Not Expressed in <i>SOB3-D</i>
AT3G59900	<i>ARGOS</i>	Not Expressed in <i>SOB3-D</i>
AT1G12190	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G25141	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G31510	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G32430	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G47390	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G51290	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G54550	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G65990	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G66490	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT1G67450	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT2G24510	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G04250	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G16590	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G17560	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G17570	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G18330	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G21120	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G22770	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G24580	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G25090	F-box Protein	Not Expressed in <i>SOB3-D</i>

AT3G59590	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT3G59610	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT4G04690	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT5G41490	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT5G60560	F-box Protein	Not Expressed in <i>SOB3-D</i>
AT4G33290	F-box Protein*	Not Expressed in <i>SOB3-D</i>
AT1G48670	GH3 Protein*	Not Expressed in <i>SOB3-D</i>
AT5G57420	<i>IAA33</i>	Not Expressed in <i>SOB3-D</i>
AT2G21220	<i>SAUR12</i>	Not Expressed in <i>SOB3-D</i>
AT4G13790	<i>SAUR25</i>	Not Expressed in <i>SOB3-D</i>
AT2G28085	<i>SAUR42*</i>	Not Expressed in <i>SOB3-D</i>
AT2G37030	<i>SAUR46</i>	Not Expressed in <i>SOB3-D</i>
AT1G19840	<i>SAUR53</i>	Not Expressed in <i>SOB3-D</i>
AT1G29490	<i>SAUR68*</i>	Not Expressed in <i>SOB3-D</i>
AT1G56150	<i>SAUR71</i>	Not Expressed in <i>SOB3-D</i>
AT3G03847	<i>SAUR73</i>	Not Expressed in <i>SOB3-D</i>
AT4G36110	<i>SAUR9</i>	Not Expressed in <i>SOB3-D</i>
AT1G61120	<i>TPS4</i>	Not Expressed in <i>SOB3-D</i>
AT4G37295	Unknown	Not Expressed in <i>SOB3-D</i>
AT2G22810	<i>ACS4</i>	0.020080982
AT4G37770	<i>ACS8*</i>	0.021614946
AT4G38825	<i>SAUR13*</i>	0.045240584
AT4G32280	<i>IAA29*</i>	0.052735259
AT1G29510	<i>SAUR67</i>	0.058992415
AT5G18050	<i>SAUR22*</i>	0.061431951
AT5G18060	<i>SAUR23*</i>	0.06865924
AT1G52830	<i>IAA6/SHY1</i>	0.070739823
AT1G29430	<i>SAUR62</i>	0.073955269
AT5G13220	<i>JAS1/JAZ10</i>	0.084123032
AT5G18010	<i>SAUR19*</i>	0.1174548

AT4G34770	<i>SAUR1*</i>	0.122863902
AT5G18030	<i>SAUR21*</i>	0.137153829
AT3G15540	<i>IAA19/MSG2*</i>	0.143955539
AT5G18020	<i>SAUR20*</i>	0.148360951
AT3G53250	<i>SAUR57</i>	0.149641932
AT3G43120	<i>SAUR39</i>	0.15562761
AT1G34410	<i>ARF21</i>	0.15562761
AT2G18010	<i>SAUR10</i>	0.162112093
AT3G20710	F-box Protein*	0.163818537
AT2G21200	<i>SAUR7*</i>	0.166743868
AT3G58190	<i>ASL16/LBD29*</i>	0.172919566
AT4G38850	<i>SAUR15/SAUR-AC1</i>	0.184075667
AT3G17600	<i>IAA31</i>	0.194534512
AT3G61510	<i>ACS1*</i>	0.194534512
AT3G03840	<i>SAUR27</i>	0.198348914
AT1G29500	<i>SAUR66*</i>	0.198570498
AT5G59220	<i>HAI1/SAG113</i>	5.031248754
AT3G51171	F-box Protein	5.446966341
AT3G23250	<i>MYB15</i>	6.030569878
AT5G66700	<i>HB53</i>	6.22510439
AT3G28390	<i>ABCB18/PGP18</i>	6.22510439
AT2G24850	<i>TAT3</i>	7.003242439
AT2G35270	<i>AHL21/GIK</i>	8.429828861
AT1G53940	<i>GLIP2</i>	9.251196802
AT4G12410	<i>SAUR35</i>	14.78462293
AT1G51190	<i>PLT2</i>	34.23807414
AT1G35240	<i>ARF20</i>	Not Expressed in WT
AT1G12980	<i>DRN/ESR1</i>	Not Expressed in WT
AT1G12170	F-box Protein	Not Expressed in WT

AT1G77650	F-box Protein	Not Expressed in WT
AT2G14710	F-box Protein	Not Expressed in WT
AT2G27520	F-box Protein	Not Expressed in WT
AT3G13820	F-box Protein	Not Expressed in WT
AT3G13830	F-box Protein	Not Expressed in WT
AT3G14030	F-box Protein	Not Expressed in WT
AT3G17500	F-box Protein	Not Expressed in WT
AT3G17530	F-box Protein	Not Expressed in WT
AT3G18340	F-box Protein	Not Expressed in WT
AT3G20700	F-box Protein	Not Expressed in WT
AT3G22350	F-box Protein	Not Expressed in WT
AT3G22720	F-box Protein	Not Expressed in WT
AT3G22940	F-box Protein	Not Expressed in WT
AT3G44130	F-box Protein	Not Expressed in WT
AT3G49520	F-box Protein	Not Expressed in WT
AT4G05080	F-box Protein	Not Expressed in WT
AT5G37040	F-box Protein	Not Expressed in WT
AT5G41500	F-box Protein	Not Expressed in WT
AT3G17620	F-box Protein*	Not Expressed in WT
AT3G23420	F-box Protein*	Not Expressed in WT
AT5G13380	GH3 Protein	Not Expressed in WT
AT5G40990	<i>GLIP1</i>	Not Expressed in WT
AT1G80390	<i>IAA15</i>	Not Expressed in WT
AT2G46990	<i>IAA20</i>	Not Expressed in WT
AT1G15050	<i>IAA34</i>	Not Expressed in WT
AT2G47190	<i>MYB2</i>	Not Expressed in WT
AT5G15100	<i>PIN8</i>	Not Expressed in WT
AT4G09530	<i>SAUR17</i>	Not Expressed in WT
AT5G03310	<i>SAUR44</i>	Not Expressed in WT
AT5G10990	<i>SAUR69*</i>	Not Expressed in WT

AT2G17310

SON1

Not Expressed in WT

Supplemental Table 3: Misregulated SAUR Genes in SOB3-D Based on RNA-seq at Six Days. Ratios of RPKM expression values in seedlings grown under constant dim white light (Supplemental Data Set 2). *SAUR* genes showing at least a five-fold change in expression are listed.

Gene	Fold Change (<i>SOB3-D/Col-0</i>)
<i>SAUR17</i>	Not Expressed in WT
<i>SAUR44</i>	Not Expressed in WT
<i>SAUR69</i>	Not Expressed in WT
<i>SAUR35</i>	14.78462293
<i>SAUR66</i>	0.198570498
<i>SAUR27</i>	0.198348914
<i>SAUR15</i>	0.184075667
<i>SAUR7</i>	0.166743868
<i>SAUR10</i>	0.162112093
<i>SAUR39</i>	0.15562761
<i>SAUR57</i>	0.149641932
<i>SAUR20</i>	0.148360951
<i>SAUR21</i>	0.137153829
<i>SAUR1</i>	0.122863902
<i>SAUR19</i>	0.1174548

<i>SAUR62</i>	0.073955269
<i>SAUR23</i>	0.06865924
<i>SAUR22</i>	0.061431951
<i>SAUR67</i>	0.058992415
<i>SAUR13</i>	0.045240584
<i>SAUR9</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR12</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR25</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR42</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR46</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR53</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR68</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR71</i>	Not Expressed in <i>SOB3-D</i>
<i>SAUR73</i>	Not Expressed in <i>SOB3-D</i>

Supplemental Table 4: Primers Used for qRT-PCR and ChIP-qPCR.

<u>qRT-PCR</u>	Forward Primer	Reverse Primer
<i>SAUR19</i>	5'- GCTCTCATACTTGAG CCAACCG -3'	5'- AGGGATCGTTAAGCC ACCCATC -3'
<i>SAUR20</i>	5'- CGATCATCCAATGG GTGGCT -3'	5'-GCTCATCATCGTTGG AACCG -3'
<i>SAUR22</i>	5'- TGTGACTTCTCGGC TCCAAT -3'	5'- CAAAAATGGCATCCAT TCTCTAAAC -3'
<i>SAUR24</i>	5'- ACCAGCCTTCATTT CAAGCTCTTC -3'	5'- AGGGATCGTTAAGCC TCCCATC -3'
<i>SAUR28</i>	5'-AGCAAGAACGAGC AAAGCAC -3'	5'-CAAATTGTCAAGCCG CCCAT -3'
<i>SAUR57</i>	5'-CCGAGAGGACATT TGGTAGTG -3'	5'- TGCAACGAACAACAT CGAGA -3'
<i>SAUR62</i>	5'- GTGCTACTCAACAG TTGCTTGT -3'	5'- TGAGACAACCTTAAAT GAGAGACCA -3'
<i>SAUR63</i>	5'-ATTTCGGTCTCCCA ACGGAA -3'	5'- ACTACATTGTTGTTCT TGTGGTTG -3'
<i>SAUR66</i>	5'- GGAAATGGCAACA GAGAGCA -3'	5'- GCCGTGTAAACGAC AAAGCAT -3'
<i>YUC8</i>	5'- GAGGAAAGGGCTC TCAGGTG -3'	5'- GAAGAGAACCCCTT GAGCGT -3'
<i>UBQ10</i>	5'- GGCCTTGTATAATC CCTGATGAATAAG -3'	5'- AAAGAGATAACAGGA ACGGAAACATAGT -3'
<i>PP2AA3- lwase A, et al. (2011) Current biology: CB 21(6):508-514.</i>	5'- GACCAAGTGAACC AGGTTATTGG -3'	5'- TACTCTCCAGTGCCT GTCTTCA -3'

MDAR4-
Hruz T, *et al.* (2011)
BMC genomics 12:156.

5'- GCGGTGGCTATAT
CGGTATGG -3'

5'- AAAGAGACGTGCCA
TGCAGTG -3'

PMP-
Hruz T, *et al.* (2011)
BMC genomics 12:156

5'- ATATCAGACAGGCA
GTCAGCG -3'

5'- TGCTAAAGCATCGAT
ACCACC -3'

ChIP-qPCR

Forward Primer

Reverse Primer

SAUR19 Promoter
P1

5'-TGCAAGAACAAAG
ACAGCAGG -3'

5'- ACATTCAGGTCCCCA
CTTTAACT -3'

SAUR19 Promoter
P2

5'- TTTAGCACTCCCTG
AGCGAA -3'

5'-TCACGTTAGCATCTG
GACGAC -3'

SAUR20/21
Promoter P1

5'- TTGCTGGGCCTTCT
TATTGACA -3'

5'- TGAGTTTGGGCCAAT
AAACGA -3'

SAUR20/21
Promoter P2

5'-CCATATGCAATTCA
CAAGGGACTG -3'

5'- CATGGAGAAGAGAAA
CTTGCTGG -3'

SAUR22/23
Promoter

5'-AGCTATGCCAAGCT
CTTGCT -3'

5'- GAAGCGTGGGACAG
AGTTCA -3'

IAA29 Intragenic
Sequence

5'- GACGTTTGGGTTA
GGGAATGTGG -3'

5'- GACTCGGATTCCAG
AGGATCTTC -3'

YUC8 Promoter P1

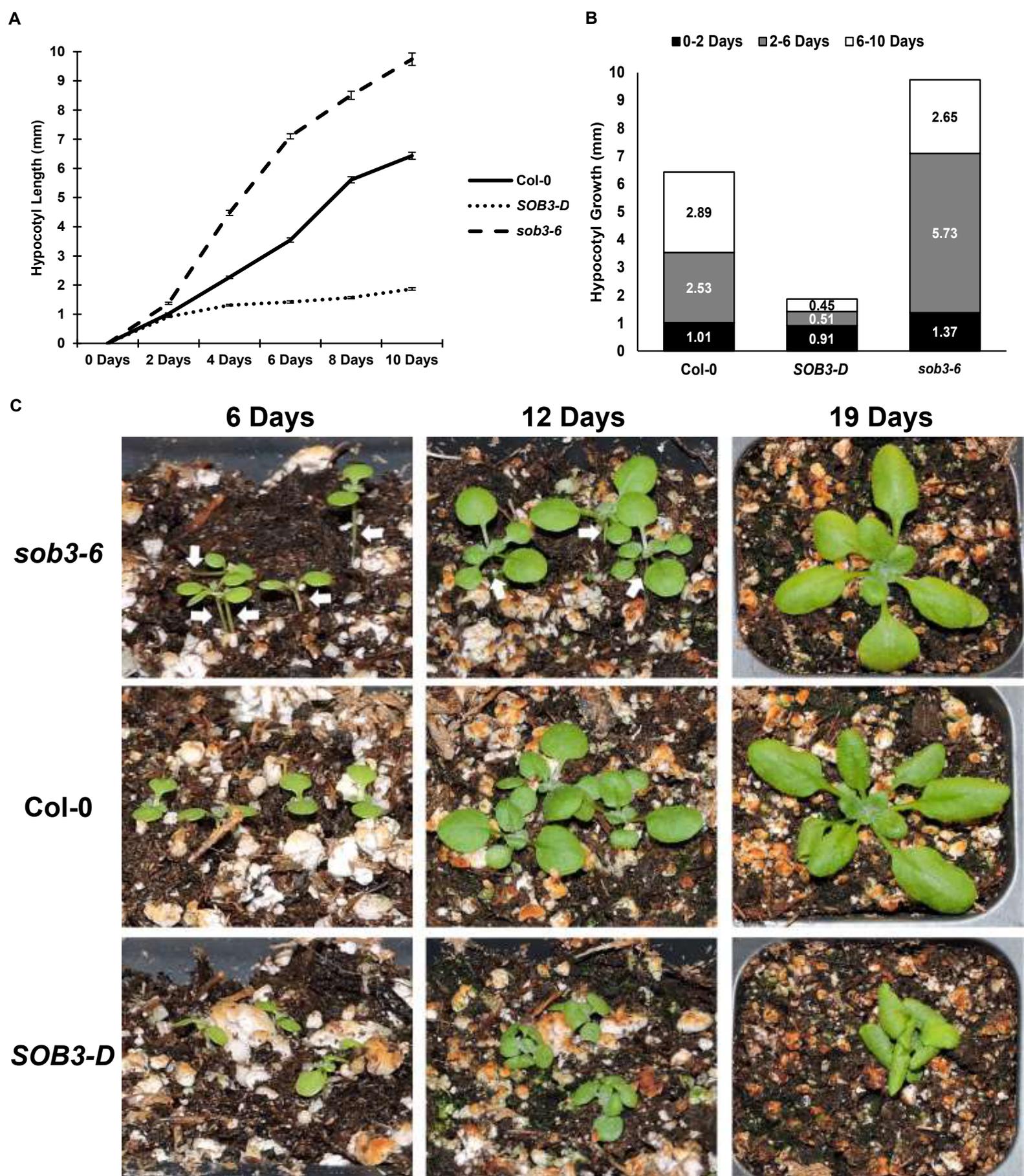
5'- ACAACTCTAAGCAA
TCATACTACA -3'

5'- AGAGATCCCATGTG
GCGTTG -3'

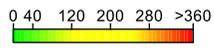
YUC8 Promoter P2

5'- TTCCTCTCGTTGGT
CCCACA -3'

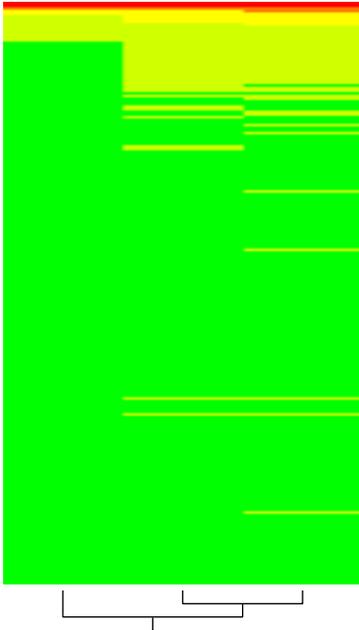
5'-TGGTTAGAGAAGGG
AAGTGATGG -3'



Supplemental Figure 1: *Sob3-6* does Not Affect Development After Day Six. **A** - Hypocotyl elongation assays at various time points. Seedlings were grown on LS media and harvested for hypocotyl measurements at the indicated time points. Error bars represent standard error of the mean. 2 days- Col-0, $n = 73$; SOB3-D, $n = 76$; sob3-6, $n = 63$. 4 days- Col-0, $n = 78$; SOB3-D, $n = 69$; sob3-6, $n = 75$. 6 days- Col-0, $n = 74$; SOB3-D, $n = 73$; sob3-6, $n = 78$. 8 days- Col-0, $n = 63$; SOB3-D, $n = 83$; sob3-6, $n = 72$. 10 days- Col-0, $n = 65$; SOB3-D, $n = 69$; sob3-6, $n = 60$. **B** - Hypocotyl growth by time period. Values represent hypocotyl growth in mm during the indicated intervals for the seedlings measured in A. **C** - Phenotypes in soil-grown mutants. Plants were grown in long-day conditions with a moderate intensity of white light supplied during the day. White arrows point to tall, exposed hypocotyls observed in sob3-6.

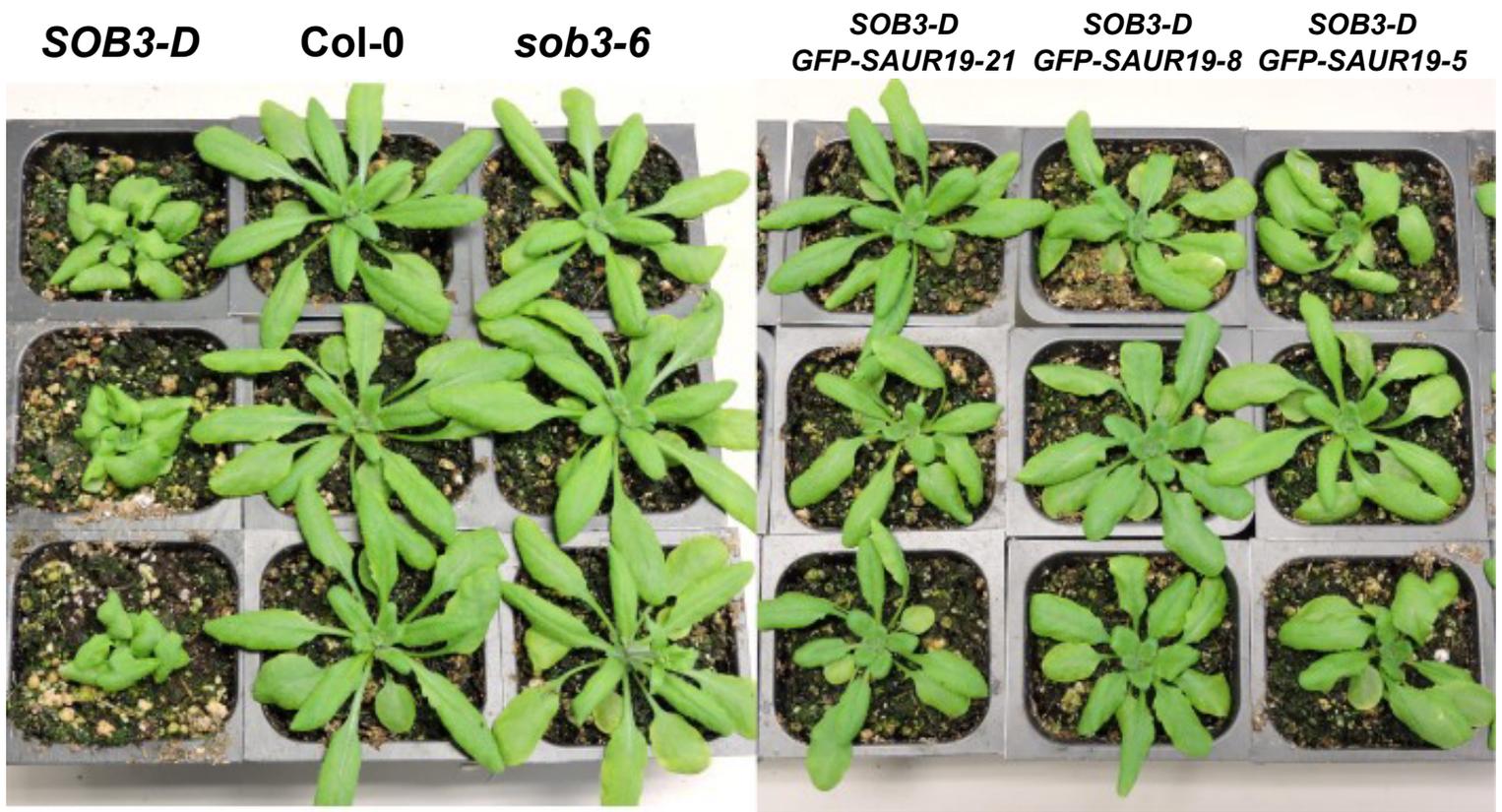


SOB3-D **Col-0** ***sob3-6***

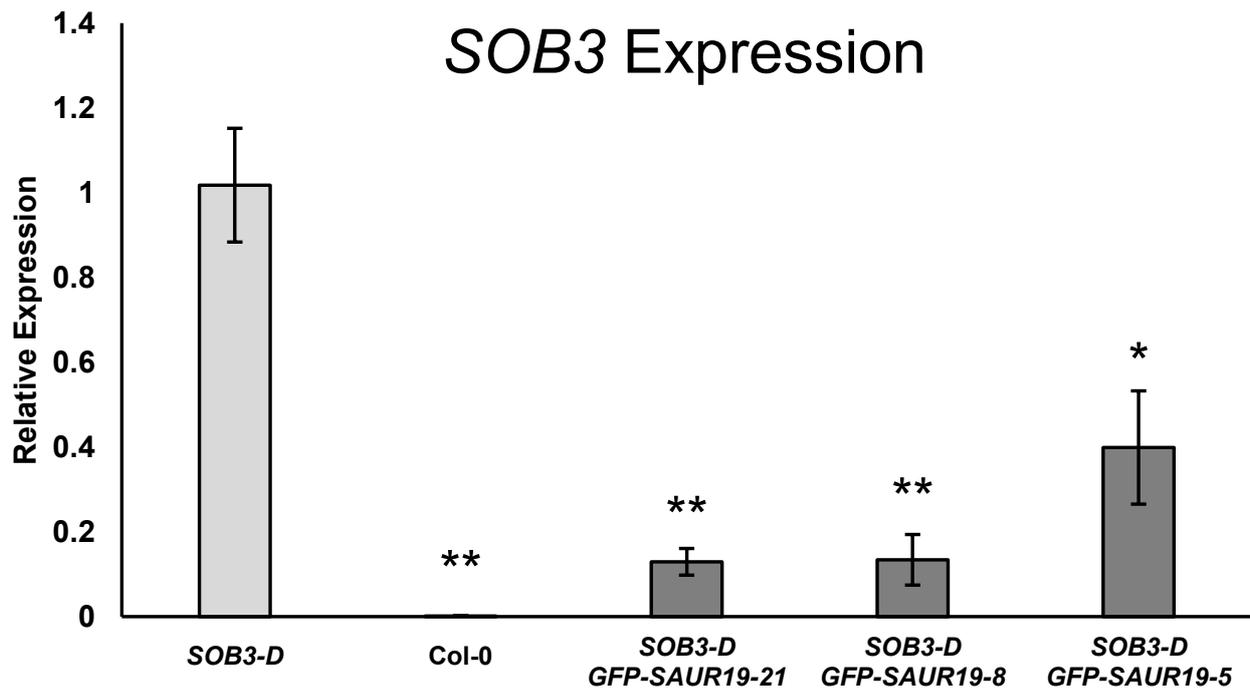


Supplemental Figure 2: Hierarchical Clustering of RNA-seq Data. Analysis is based on RPKM values for the data from four-day-old seedlings, presented in Supplemental Data Set 1.

A



B



Supplemental Figure 3: Rosette Phenotypes in *SOB3* Mutants and *SOB3-D/GFP-SAUR19* Double Transgenic Lines. **A** - 26-day-old rosettes. *SOB3-D* and *sob3-6* lines are homozygous, and all *SOB3-D/GFP-SAUR19* lines are homozygous for the *SOB3-D* locus. In regards to the *GFP-SAUR19* transgene, these lines are segregating T2 generation plants. All plants were grown in long-day conditions under a moderate light intensity. **B** - *SOB3* expression in rosette leaves. Expression levels were analyzed via qRT-PCR using the plants for the indicated lines pictured in **A** at 28 days. Transcript levels are normalized based on the expression of the *MDAR4* housekeeping gene. All values are shown as fold change compared to *SOB3-D*. Error bars represent standard error of the mean for three biological replicates. In a Welch's *t*-test (unpaired one-tailed *t*-test with unequal variance) compared to *SOB3-D* * $P < 0.05$. ** $P < 0.01$.



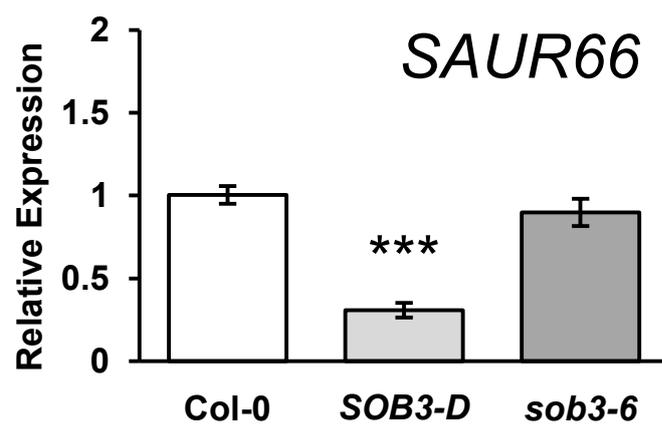
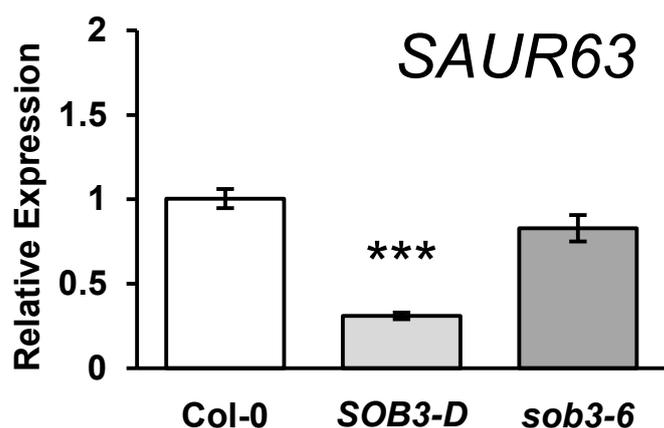
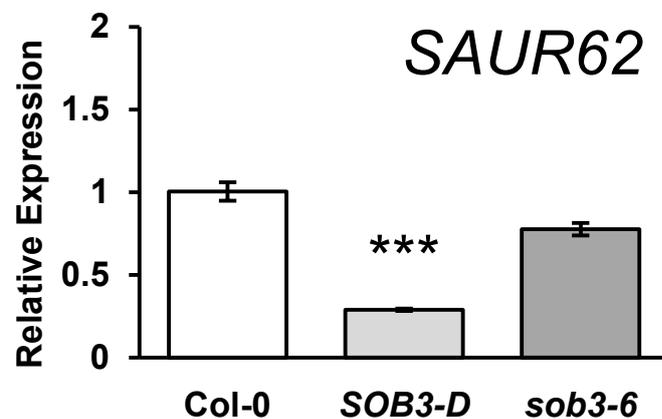
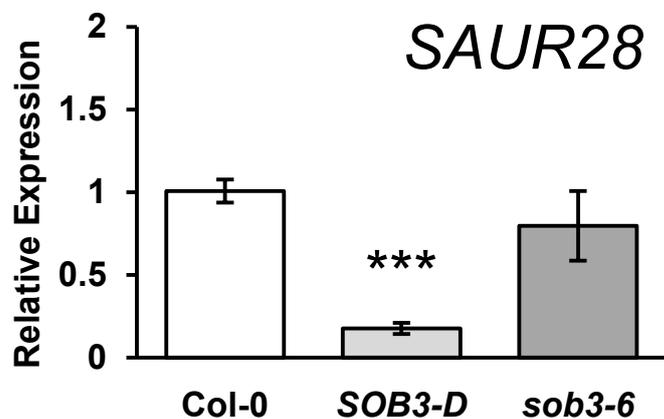
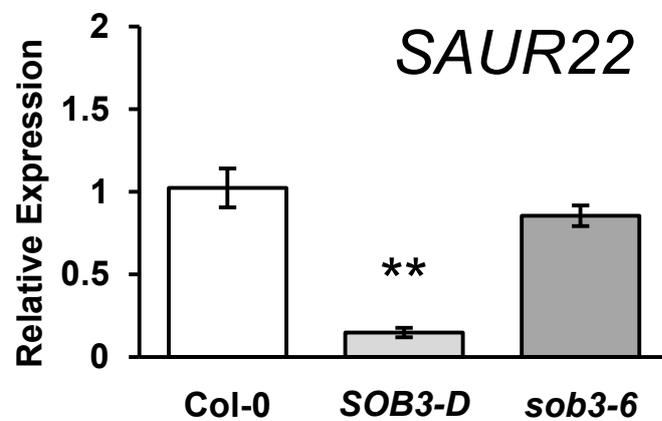
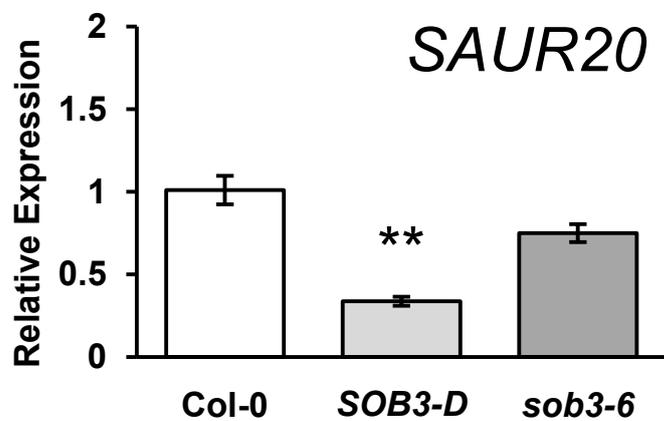
sob3-6

Col-0

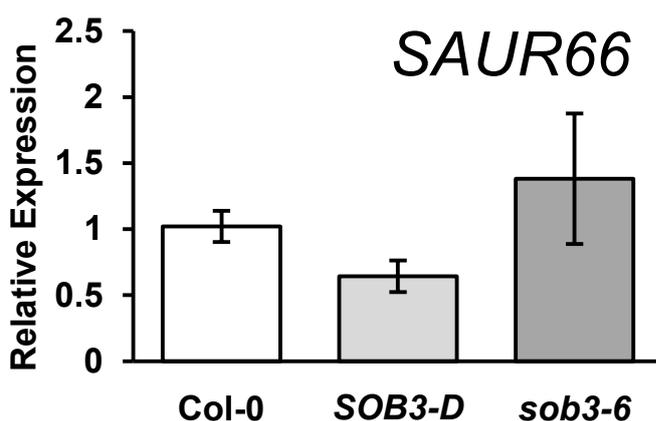
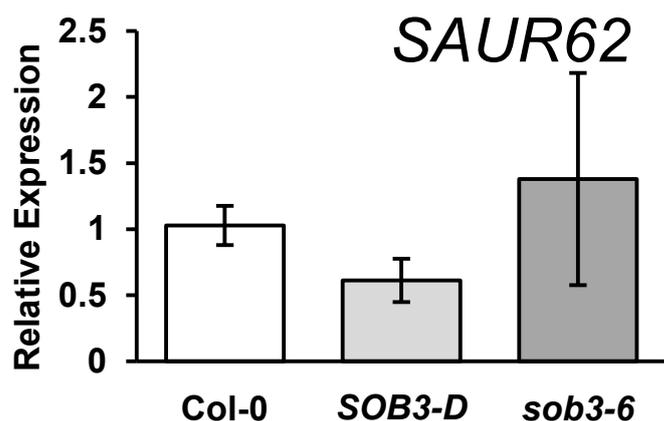
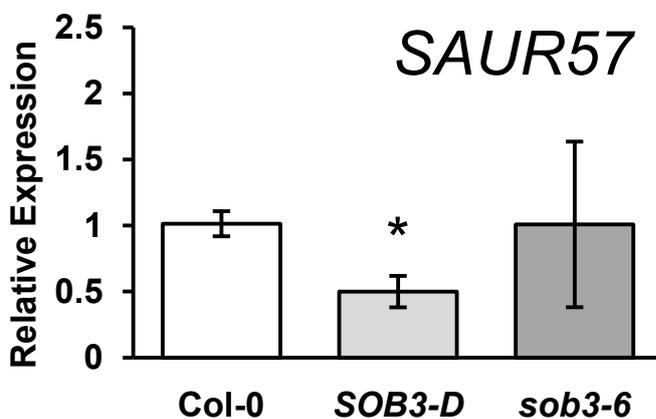
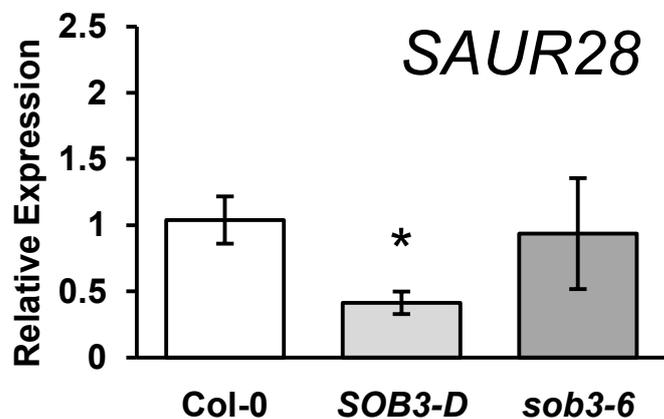
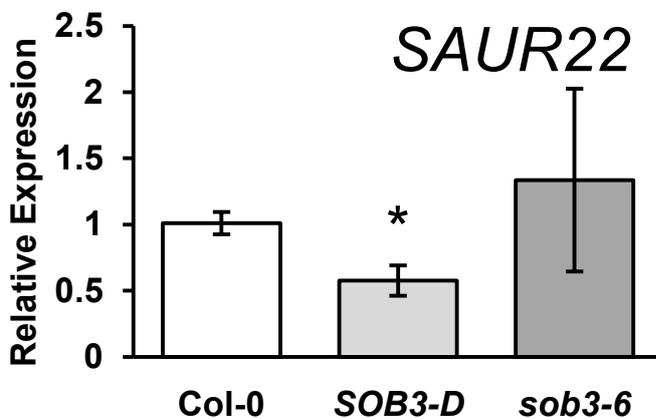
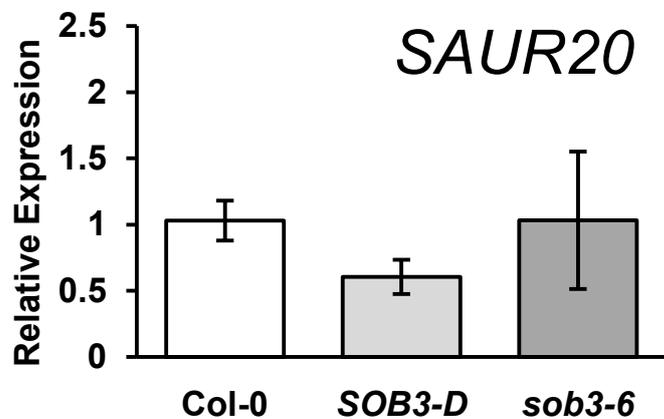
**ProSOB3:
SOB3-GFP**

SOB3-D

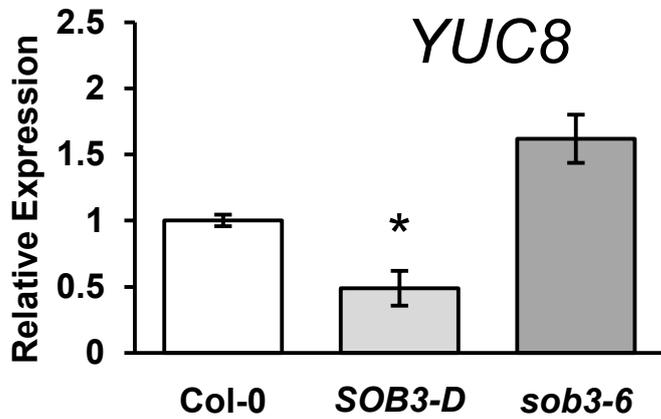
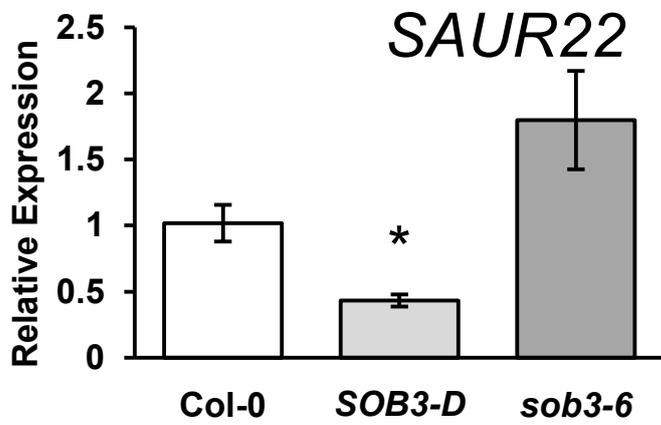
Supplemental Figure 4: Phenotypes in 55-day-old SOB3 Mutants. All plants were grown in long-day conditions under a moderate light intensity. Mutants are homozygous.



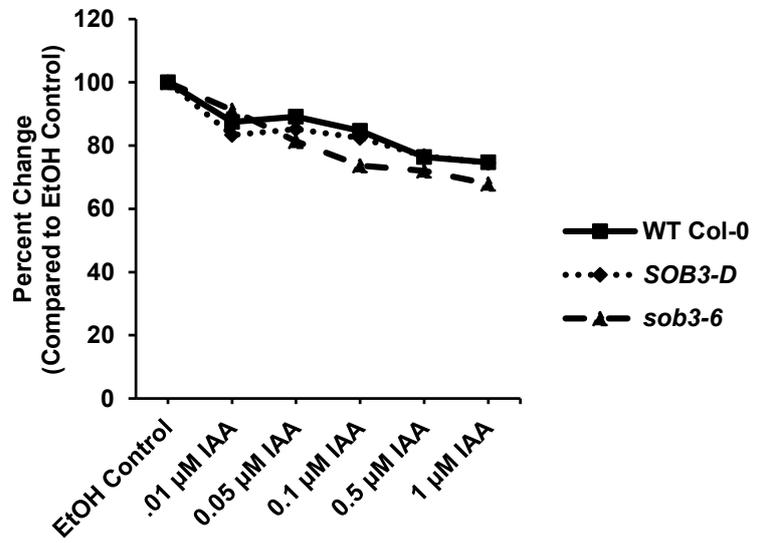
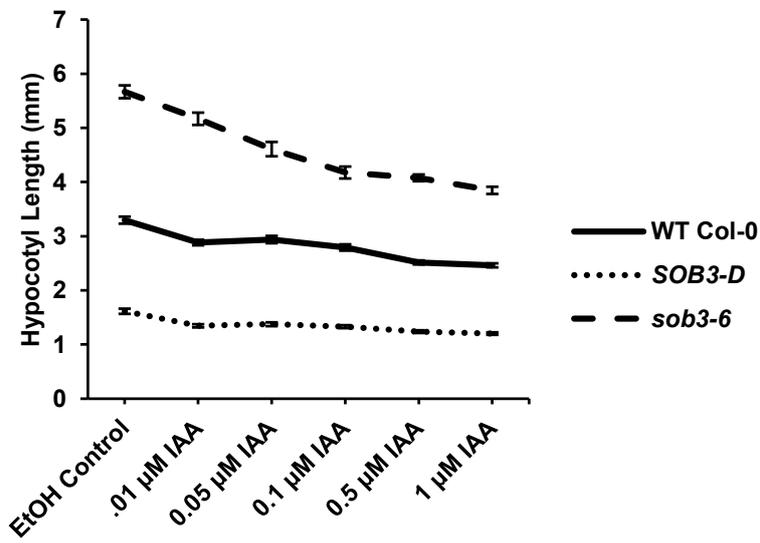
Supplemental Figure 5: SAUR Genes are Repressed in SOB3-D at Six Days. Relative expression of SAUR genes in wild-type and homozygous mutant seedlings grown in dim white light, as determined by qRT-PCR. Transcript levels are normalized based on the expression of the *UBQ10* housekeeping gene. All values are shown as fold change compared to the wildtype. Error bars represent standard error of the mean for four biological replicates. In a Welch's *t*-test (unpaired two-tailed *t*-test with unequal variance) compared to the WT ** $P < 0.01$. *** $P < 0.001$.



Supplemental Figure 6: SAUR Genes are Down-regulated in SOB3-D Seedlings Grown in Far-red Light. Relative expression of SAUR genes in wild-type and homozygous mutant seven-day-old seedlings grown in 6 $\mu\text{mol}/\text{m}^2/\text{sec}$ far-red light, as determined by qRT-PCR. Transcript levels are normalized based on the expression of the *PP2AA3* housekeeping gene. All values are shown as fold change compared to the wildtype. Error bars represent standard error of the mean for three or four biological replicates. In a Welch's *t*-test (unpaired two-tailed *t*-test with unequal variance compared to the WT) $*P < 0.05$.

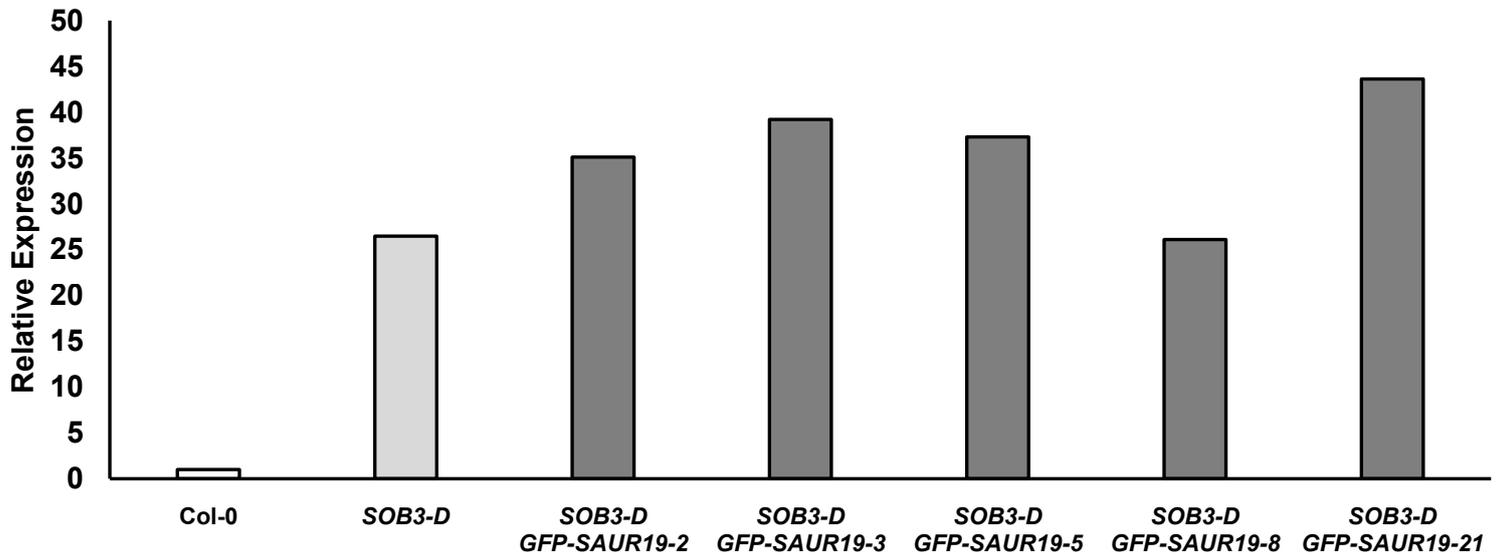


Supplemental Figure 7: SAUR22 and YUC8 Expression Patterns in SOB3 Mutants at Five Days. Relative expression of genes associated with auxin signaling in Col-0 and homozygous SOB3-D and sob3-6 seedlings, as determined by qRT-PCR analysis. All seedlings were grown in dim white light. Transcript levels are normalized based on the expression of either the MDAR4 (YUC8) or PMP (SAUR22) housekeeping gene. All values are shown as fold change compared to the wildtype. Error bars represent standard error of the mean from three biological replicates. In a Welch's *t*-test (unpaired two-tailed *t*-test with unequal variance) compared to the WT **P* < 0.05.

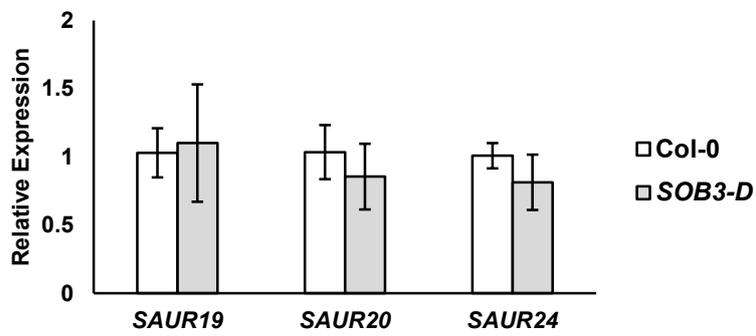


Supplemental Figure 8: Responses of SOB3 Mutants to Exogenous IAA. Hypocotyl growth of seedlings grown in dim white light for six days on LS media containing the specified concentrations of IAA. Values represent the mean of either the actual measured hypocotyl length (left) or the sensitivity to treatment (right) calculated as percent change compared to the same genotype on the EtOH control plates. Error bars represent standard error of the mean. EtOH- Col-0, $n = 58$, SOB3-D, $n = 48$; sob3-6, $n = 65$. 0.01 μM IAA- Col-0, $n = 72$; SOB3-D, $n = 54$; sob3-6, $n = 61$. 0.05 μM IAA- Col-0, $n = 69$; SOB3-D, $n = 65$; sob3-6, $n = 54$. 0.1 μM IAA- Col-0, $n = 65$; SOB3-D, $n = 54$; sob3-6, $n = 62$. 0.5 μM IAA- Col-0, $n = 62$; SOB3-D, $n = 56$; sob3-6, $n = 69$. 1 μM IAA- Col-0, $n = 58$; SOB3-D, $n = 47$; sob3-6, $n = 59$.

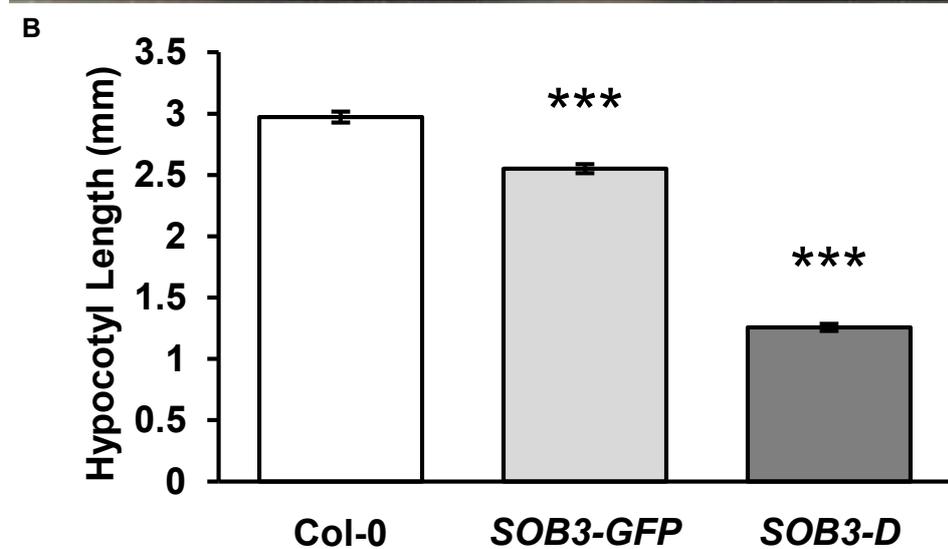
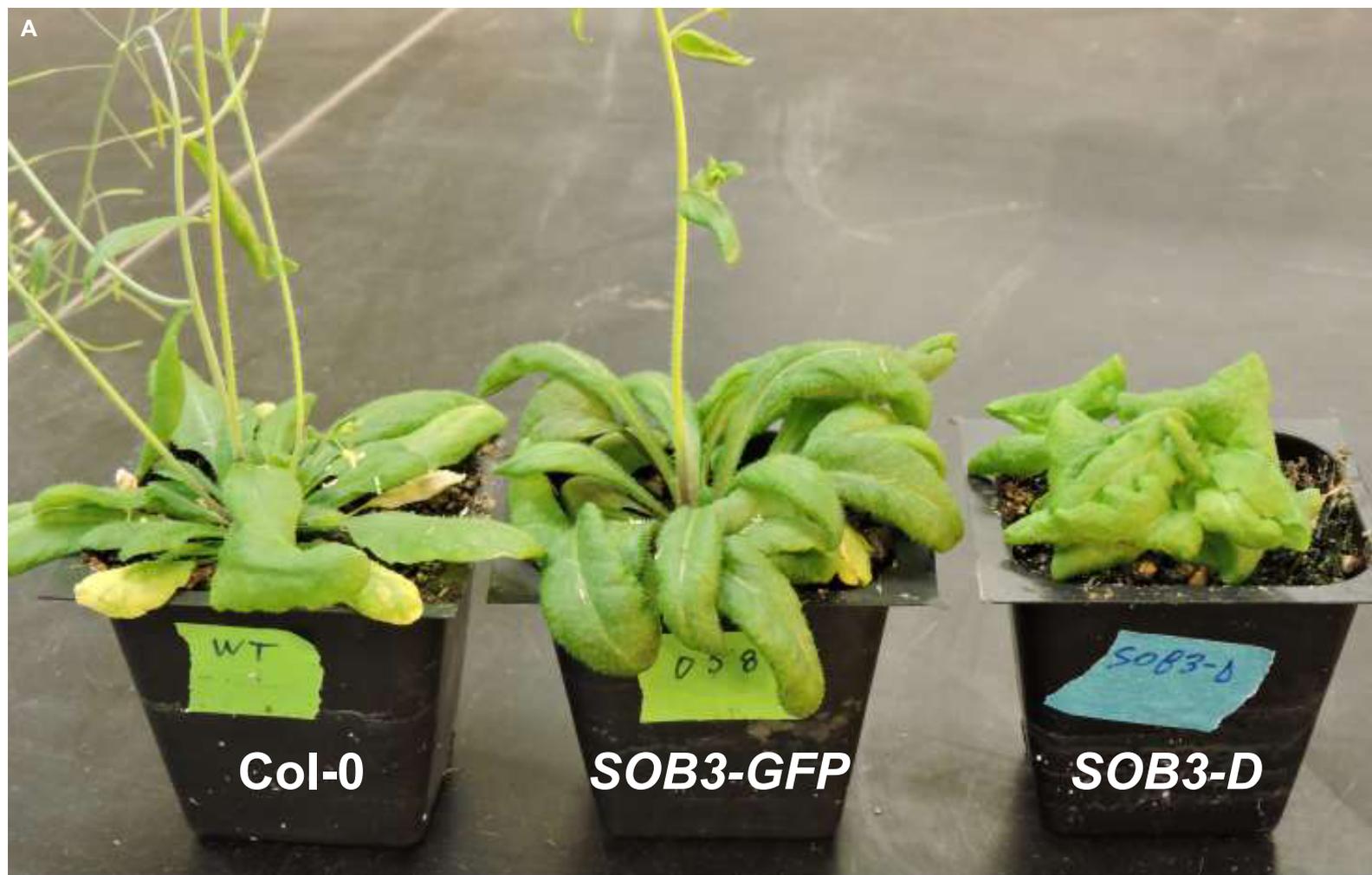
SOB3 Expression



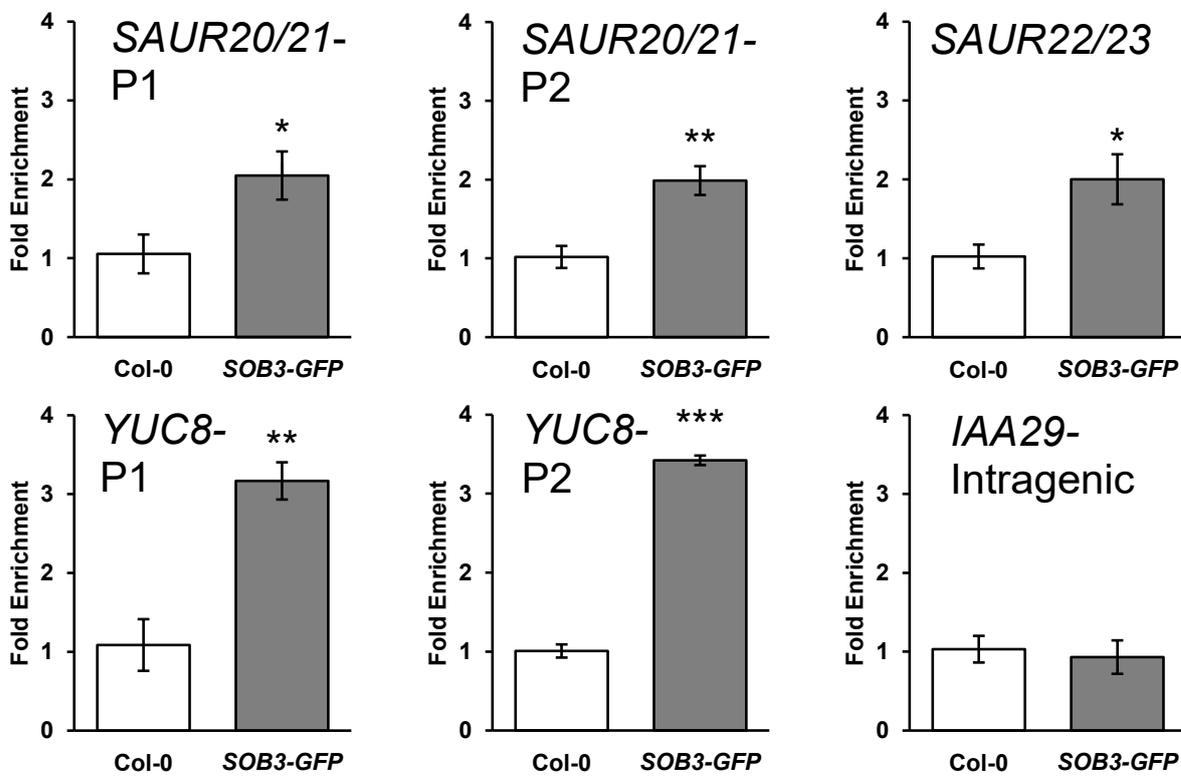
Supplemental Figure 9: SOB3 Expression in SOB3-D/GFP-SAUR19 Seedlings. Expression levels were analyzed via qRT-PCR using six-day-old seedlings grown in dim white light. All lines, excluding Col-0, are homozygous at the *SOB3-D* locus. In regards to the *GFP-SAUR19* transgene, these lines are T2 generation plants. Transcript levels are normalized based on the *MDAR4* housekeeping gene. All values are shown as fold change compared to the WT. For each genotype, approximately 20 seedlings were harvested and pooled together into a single sample for RNA extraction and subsequent cDNA synthesis.



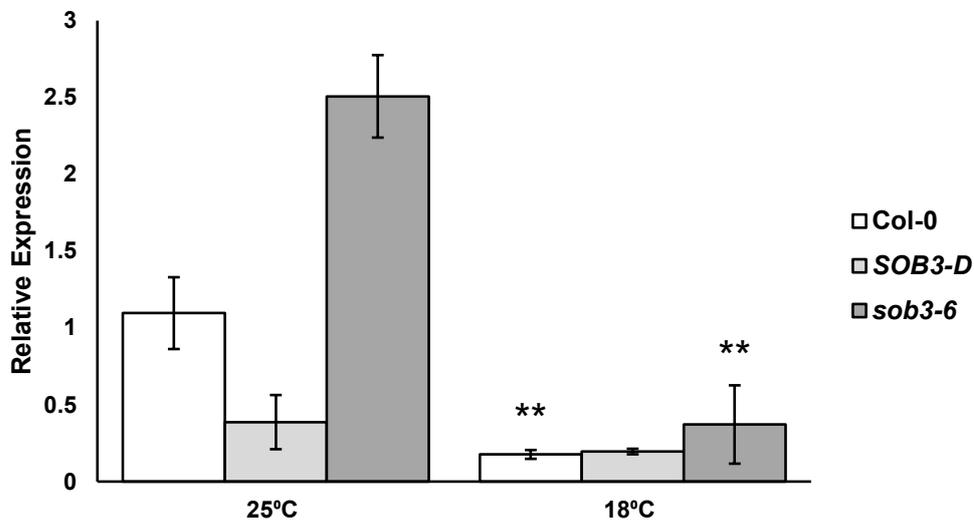
Supplemental Figure 10: SAUR Expression in Rosettes Leaves. Expression levels were analyzed via qRT-PCR using the plants pictured in Supplemental Figure 3A, for the indicated genotypes, at 28 days. Transcript levels are normalized based on the expression of the *MDAR4* housekeeping gene. *SOB3-D* values are depicted as fold-change compared to Col-0 for the same gene. Error bars represent standard error of the mean for three biological replicates.



Supplemental Figure 11: SOB3-GFP Phenotypes are Reminiscent of SOB3-D. **A** - 44-day-old plants grown in long-day conditions under a moderate light intensity. **B** - Hypocotyl measurements performed with six-day-old seedlings grown on LS plates in dim white light. Mutants are homozygous. Error bars represent standard error of the mean. Col-0, $n = 79$; SOB3-GFP, $n = 101$; SOB3-D, $n = 56$. In a Welch's t -test (unpaired one-tailed t -test with unequal variance) compared to the WT *** $P < 0.001$.



Supplemental Figure 12: SOB3 Binding to SAUR and YUC8 Promoters. Relative enrichment of various loci in WT or transgenic *SOB3-GFP* lines, using a ChIP-qPCR procedure employing an antibody against the GFP epitope. A separately-prepared set of ChIP samples was used as compared to Figures 5 and 6. All values are shown as fold change compared to the Col-0 control sample. Error bars represent standard error of the mean from three different ChIP preparations. In a Welch's *t*-test (unpaired one-tailed *t*-test with unequal variance) **P* < 0.05. ***P* < 0.01. ****P* < 0.001.



Supplemental Figure 13: Comparison of SAUR22 Expression at 25°C and 18°C. SAUR22 expression in six-day-old dim white-light grown seedlings, as determined by qRT-PCR. Transcript levels are normalized based on the expression of the *MDAR4* housekeeping gene. All values are shown as fold change compared to the wildtype at 25°C. Error bars represent standard error of the mean from four or five biological replicates. In a Welch's *t*-test (unpaired two-tailed *t*-test with unequal variance) compared to the same genotype at 25°C *****P* < 0.01**.