

Table S1**List of HI genes identified that scored ≥ 2 standard deviations from the mean**

ORF	^a Average Score	Gene	Essential
YBR085W	1.50	<i>AAC3</i>	Essential
YNL331C	2.00	<i>AAD14</i>	Non-essential
YFL039C	1.83	<i>ACT1</i>	Essential
YDR448W	1.50	<i>ADA2</i>	Non-essential
YDR524C	1.83	<i>AGE1</i>	Non-essential
YHR093W	1.50	<i>AHT1</i>	Non-essential
YBR108W	1.83	<i>AIM3</i>	Non-essential
YDR063W	1.67	<i>AIM7</i>	Non-essential
YOR067C	1.50	<i>ALG8</i>	Non-essential
YDL008W	2.00	<i>APC11</i>	Essential
YBR151W	2.00	<i>APD1</i>	Non-essential
YNR035C	1.83	<i>ARC35</i>	Essential
YNL020C	1.67	<i>ARK1</i>	Non-essential
YER101C	1.50	<i>AST2</i>	Non-essential
YBR128C	1.83	<i>ATG14</i>	Non-essential
YPL271W	1.50	<i>ATP15</i>	Non-essential
YDL004W	2.33	<i>ATP16</i>	Essential
YBR039W	1.50	<i>ATP3</i>	Essential
YBL089W	1.50	<i>AVT5</i>	Non-essential
YIL140W	1.50	<i>AXL2</i>	Non-essential
YIL033C	2.67	<i>BCY1</i>	Essential
YPL161C	1.50	<i>BEM4</i>	Non-essential
YJR053W	1.50	<i>BFA1</i>	Non-essential
YFR047C	1.50	<i>BNA6</i>	Non-essential
YMR055C	1.67	<i>BUB2</i>	Non-essential
YDR241W	1.67	<i>BUD26</i>	Non-essential
YCL014W	1.50	<i>BUD3</i>	Non-essential
YMR275C	1.50	<i>BUL1</i>	Non-essential
YFL029C	2.00	<i>CAK1</i>	Essential
YBR120C	1.50	<i>CBP6</i>	Non-essential
YAL021C	1.50	<i>CCR4</i>	Non-essential
YIL142W	2.83	<i>CCT2</i>	Essential
YDL143W	1.50	<i>CCT4</i>	Essential
YJR064W	1.50	<i>CCT5</i>	Essential
YDR188W	1.50	<i>CCT6</i>	Essential
YJL111W	2.00	<i>CCT7</i>	Essential
YFR028C	1.67	<i>CDC14</i>	Essential
YOR074C	2.00	<i>CDC21</i>	Essential
YBR160W	1.50	<i>CDC28</i>	Essential
YGL130W	1.83	<i>CEG1</i>	Essential
YER061C	1.50	<i>CEM1</i>	Non-essential
YBR274W	1.67	<i>CHK1</i>	Non-essential

YMR138W	1.50	<i>CIN4</i>	Non-essential
YGL215W	1.50	<i>CLG1</i>	Non-essential
YOR250C	1.67	<i>CLP1</i>	Essential
YBR155W	1.50	<i>CNS1</i>	Essential
YER157W	1.83	<i>COG3</i>	Essential
YHR051W	1.83	<i>COX6</i>	Non-essential
YOR303W	2.67	<i>CPA1</i>	Non-essential
YPL181W	1.50	<i>CTI6</i>	Non-essential
YPR124W	1.67	<i>CTR1</i>	Non-essential
YNL111C	2.17	<i>CYB5</i>	Non-essential
YBR233W-A	1.67	<i>DAD3</i>	Essential
YHR028C	1.50	<i>DAP2</i>	Non-essential
YPL194W	2.17	<i>DDC1</i>	Non-essential
YKL002W	1.67	<i>DID4</i>	Non-essential
YPL265W	1.50	<i>DIP5</i>	Non-essential
YIL010W	1.50	<i>DOT5</i>	Non-essential
YJR082C	1.67	<i>EAF6</i>	Non-essential
YKR004C	1.50	<i>ECM9</i>	Essential
YER035W	1.50	<i>EDC2</i>	Non-essential
YGR060W	1.50	<i>ERG25</i>	Essential
YJR017C	1.67	<i>ESS1</i>	Essential
YNL023C	1.50	<i>FAP1</i>	Non-essential
YMR277W	1.83	<i>FCP1</i>	Essential
YCR028C	1.50	<i>FEN2</i>	Non-essential
YCR089W	1.67	<i>FIG2</i>	Non-essential
YIL131C	1.67	<i>FKH1</i>	Non-essential
YGL080W	1.67	<i>FMP37</i>	Non-essential
YDL222C	1.83	<i>FMP45</i>	Non-essential
YCL026C-A	1.50	<i>FRM2</i>	Non-essential
YMR232W	1.50	<i>FUS2</i>	Non-essential
YPL248C	1.67	<i>GAL4</i>	Non-essential
YER027C	1.50	<i>GAL83</i>	Non-essential
YER136W	1.67	<i>GDI1</i>	Essential
YJR031C	1.50	<i>GEA1</i>	Non-essential
YER133W	1.67	<i>GLC7</i>	Essential
YEL017W	1.50	<i>GTT3</i>	Non-essential
YDL238C	1.83	<i>GUD1</i>	Non-essential
YGL084C	1.50	<i>GUP1</i>	Non-essential
YDL223C	1.67	<i>HBT1</i>	Non-essential
YNL021W	1.67	<i>HDA1</i>	Non-essential
YER014W	2.00	<i>HEM14</i>	Essential
YOR278W	2.00	<i>HEM4</i>	Essential
YBL008W	1.50	<i>HIR1</i>	Non-essential
YNL004W	2.00	<i>HRB1</i>	Non-essential
YGL073W	1.50	<i>HSF1</i>	Essential
YBR133C	1.50	<i>HSL7</i>	Non-essential
YBR272C	1.50	<i>HSM3</i>	Non-essential

YFR053C	1.67	<i>HXK1</i>	Non-essential
YGL253W	2.00	<i>HXK2</i>	Non-essential
YBR157C	2.17	<i>ICS2</i>	Non-essential
YPL250C	1.50	<i>ICY2</i>	Non-essential
YBR159W	1.67	<i>IFA38</i>	Non-essential
YMR044W	1.50	<i>IOC4</i>	Non-essential
YPL209C	1.50	<i>IPL1</i>	Essential
YBR140C	2.00	<i>IRA1</i>	Essential
YJL037W	1.67	<i>IRC18</i>	Non-essential
YOR044W	1.50	<i>IRC23</i>	Non-essential
YGL133W	2.00	<i>ITC1</i>	Non-essential
YDR492W	1.67	<i>IZH1</i>	Non-essential
YJL162C	1.50	<i>JJJ2</i>	Non-essential
YLL057C	1.50	<i>JLP1</i>	Non-essential
YPR141C	2.50	<i>KAR3</i>	Non-essential
YGR238C	1.50	<i>KEL2</i>	Non-essential
YAR018C	2.00	<i>KIN3</i>	Non-essential
YDL049C	1.50	<i>KNH1</i>	Non-essential
YGR040W	1.67	<i>KSS1</i>	Non-essential
YKL103C	1.67	<i>LAP4</i>	Non-essential
YOR171C	1.50	<i>LCB4</i>	Non-essential
YGR244C	1.67	<i>LSC2</i>	Non-essential
YLR438C-A	1.83	<i>LSM3</i>	Essential
YER112W	1.50	<i>LSM4</i>	Essential
YDL182W	1.67	<i>LYS20</i>	Non-essential
YBL091C	2.67	<i>MAP2</i>	Non-essential
YOR298C-A	1.50	<i>MBF1</i>	Non-essential
YDL056W	1.50	<i>MBP1</i>	Non-essential
YBL023C	2.17	<i>MCM2</i>	Essential
YBR202W	1.50	<i>MCM7</i>	Essential
YBR136W	1.50	<i>MEC1</i>	Essential
YJR010W	1.83	<i>MET3</i>	Non-essential
YPL187W	2.17	<i>MF(ALPHA)1</i>	Non-essential
YGR249W	1.83	<i>MGA1</i>	Non-essential
YNL218W	1.67	<i>MGS1</i>	Essential
YOR330C	1.67	<i>MIP1</i>	Non-essential
YPL224C	1.50	<i>MMT2</i>	Non-essential
YKL201C	1.67	<i>MNN4</i>	Non-essential
YFL035C-A	1.67	<i>MOB2</i>	Essential
YMR070W	1.83	<i>MOT3</i>	Non-essential
YOL088C	1.50	<i>MPD2</i>	Non-essential
YDR033W	2.17	<i>MRH1</i>	Non-essential
YBL090W	1.50	<i>MRP21</i>	Non-essential
YDR116C	1.50	<i>MRPL1</i>	Non-essential
YDR462W	1.67	<i>MRPL28</i>	Non-essential
YKL009W	2.00	<i>MRT4</i>	Non-essential
YNL053W	1.50	<i>MSG5</i>	Non-essential

YOL090W	1.50	<i>MSH2</i>	Non-essential
YDL154W	1.67	<i>MSH5</i>	Non-essential
YGL051W	1.67	<i>MST27</i>	Non-essential
YNL240C	1.50	<i>NAR1</i>	Essential
YMR069W	1.50	<i>NAT4</i>	Non-essential
YHR170W	1.83	<i>NMD3</i>	Essential
YOR310C	1.50	<i>NOP58</i>	Essential
YDR288W	1.50	<i>NSE3</i>	Essential
YKR022C	1.67	<i>NTR2</i>	Essential
YLR335W	1.67	<i>NUP2</i>	Non-essential
YAR002W	2.00	<i>NUP60</i>	Non-essential
YER165W	2.17	<i>PAB1</i>	Essential
YJL128C	1.50	<i>PBS2</i>	Non-essential
YMR257C	1.50	<i>PET111</i>	Non-essential
YJL023C	1.67	<i>PET130</i>	Non-essential
YNR045W	1.50	<i>PET494</i>	Non-essential
YLR191W	1.67	<i>PEX13</i>	Non-essential
YKL127W	1.50	<i>PGM1</i>	Non-essential
YGR231C	1.67	<i>PHB2</i>	Non-essential
YGR233C	1.83	<i>PHO81</i>	Non-essential
YPL031C	1.67	<i>PHO85</i>	Non-essential
YBR296C	1.50	<i>PHO89</i>	Non-essential
YOR386W	1.50	<i>PHR1</i>	Non-essential
YDR501W	2.00	<i>PLM2</i>	Non-essential
YPL036W	1.50	<i>PMA2</i>	Non-essential
YKL128C	1.67	<i>PMU1</i>	Non-essential
YOR161C	1.50	<i>PNS1</i>	Non-essential
YBR257W	1.50	<i>POP4</i>	Essential
YHR026W	1.83	<i>PPA1</i>	Non-essential
YMR268C	1.50	<i>PRP24</i>	Essential
YDR473C	1.67	<i>PRP3</i>	Essential
YGR091W	1.50	<i>PRP31</i>	Essential
YHR165C	2.17	<i>PRP8</i>	Essential
YNL169C	2.00	<i>PSD1</i>	Non-essential
YOL146W	1.67	<i>PSF3</i>	Essential
YOL045W	1.50	<i>PSK2</i>	Non-essential
YDR055W	1.50	<i>PST1</i>	Non-essential
YHR189W	1.67	<i>PTH1</i>	Non-essential
YGR156W	1.50	<i>PTI1</i>	Essential
YNL016W	1.67	<i>PUB1</i>	Non-essential
YGL014W	1.50	<i>PUF4</i>	Non-essential
YER185W	1.83	<i>PUG1</i>	Non-essential
YJL166W	2.00	<i>QCR8</i>	Non-essential
YOR048C	1.67	<i>RAT1</i>	Essential
YDR527W	1.67	<i>RBA50</i>	Essential
YGL158W	1.50	<i>RCK1</i>	Non-essential

YBR267W	1.83	<i>REI1</i>	Non-essential
YOR279C	1.50	<i>RFM1</i>	Non-essential
YDR379W	2.00	<i>RGA2</i>	Non-essential
YPR165W	1.83	<i>RHO1</i>	Essential
YIL118W	1.50	<i>RHO3</i>	Essential
YNL002C	2.67	<i>RLP7</i>	Essential
YEL072W	1.50	<i>RMD6</i>	Non-essential
YFR048W	1.67	<i>RMD8</i>	Non-essential
YDR465C	1.67	<i>RMT2</i>	Non-essential
YDR045C	1.50	<i>RPC11</i>	Essential
YNL151C	1.67	<i>RPC31</i>	Essential
YBL027W	1.50	<i>RPL19B</i>	Non-essential
YBR191W	2.67	<i>RPL21A</i>	Non-essential
YBL087C	1.50	<i>RPL23A</i>	Non-essential
YGL103W	2.00	<i>RPL28</i>	Essential
YGL030W	2.50	<i>RPL30</i>	Essential
YDL075W	2.33	<i>RPL31A</i>	Non-essential
YER056C-A	1.67	<i>RPL34A</i>	Non-essential
YIL052C	1.83	<i>RPL34B</i>	Non-essential
YPL249C-A	2.50	<i>RPL36B</i>	Non-essential
YDR500C	1.50	<i>RPL37B</i>	Non-essential
YDR500C_1	1.83	<i>RPL37B</i>	Non-essential
YJL189W	2.00	<i>RPL39</i>	Non-essential
YDL134C-A	1.50	<i>RPL41B</i>	Non-essential
YNL162W	1.67	<i>RPL42A</i>	Essential
YNL067W	1.67	<i>RPL9B</i>	Non-essential
YDR427W	1.67	<i>RPN9</i>	Essential
YDR450W	1.50	<i>RPS18A</i>	Non-essential
YHL015W	1.67	<i>RPS20</i>	Essential
YDL216C	1.50	<i>RR1</i>	Non-essential
YMR266W	2.00	<i>RSN1</i>	Non-essential
YER104W	1.50	<i>RTT105</i>	Essential
YGL083W	1.50	<i>SCY1</i>	Non-essential
YKL141W	1.50	<i>SDH3</i>	Essential
YGL224C	1.50	<i>SDT1</i>	Non-essential
YPR181C	1.83	<i>SEC23</i>	Essential
YIL109C	1.50	<i>SEC24</i>	Essential
YDR077W	2.00	<i>SED1</i>	Non-essential
YIL099W	2.33	<i>SGA1</i>	Non-essential
YBR263W	1.50	<i>SHM1</i>	Non-essential
YLR442C	1.83	<i>SIR3</i>	Non-essential
YGL213C	1.50	<i>SKI8</i>	Non-essential
YDR328C	1.67	<i>SKP1</i>	Essential
YKL108W	1.67	<i>SLD2</i>	Essential
YBR266C	1.50	<i>SLM6</i>	Non-essential
YFL008W	1.67	<i>SMC1</i>	Essential
YGL131C	1.67	<i>SNT2</i>	Non-essential

YHR163W	1.50	<i>SOL3</i>	Non-essential
YMR066W	1.67	<i>SOV1</i>	Non-essential
YGL093W	2.17	<i>SPC105</i>	Essential
YML055W	1.50	<i>SPC2</i>	Non-essential
YER018C	1.67	<i>SPC25</i>	Essential
YKL042W	1.50	<i>SPC42</i>	Essential
YNL126W	1.50	<i>SPC98</i>	Essential
YNL202W	1.67	<i>SPS19</i>	Non-essential
YDR522C	1.50	<i>SPS2</i>	Non-essential
YGR063C	1.83	<i>SPT4</i>	Non-essential
YDL092W	2.00	<i>SRP14</i>	Essential
YAL005C	2.00	<i>SSA1</i>	Non-essential
YBL075C	1.83	<i>SSA3</i>	Non-essential
YBR169C	2.33	<i>SSE2</i>	Non-essential
YDR312W	1.50	<i>SSF2</i>	Non-essential
YDR443C	1.50	<i>SSN2</i>	Non-essential
YHR184W	2.00	<i>SSP1</i>	Non-essential
YNL222W	1.50	<i>SSU72</i>	Essential
YDR160W	1.50	<i>SSY1</i>	Essential
YGL184C	2.00	<i>STR3</i>	Non-essential
YLR305C	1.50	<i>STT4</i>	Essential
YDL084W	1.50	<i>SUB2</i>	Essential
YPR151C	1.50	<i>SUE1</i>	Non-essential
YJR007W	1.67	<i>SUI2</i>	Essential
YCR030C	2.00	<i>SYP1</i>	Non-essential
YIL129C	1.67	<i>TAO3</i>	Essential
YPR140W	1.83	<i>TAZ1</i>	Non-essential
YPL128C	1.50	<i>TBF1</i>	Essential
YDR212W	2.17	<i>TCP1</i>	Essential
YGR192C	1.50	<i>TDH3</i>	Non-essential
YBR118W	1.83	<i>TEF2</i>	Essential
YPR041W	1.67	<i>TIF5</i>	Essential
YJL143W	1.50	<i>TIM17</i>	Essential
YDL217C	1.67	<i>TIM22</i>	Essential
YER113C	1.50	<i>TMN3</i>	Non-essential
YKL058W	1.50	<i>TOA2</i>	Essential
YGR082W	1.50	<i>TOM20</i>	Essential
YPR133W-A	1.50	<i>TOM5</i>	Non-essential
YDL060W	1.67	<i>TSR1</i>	Essential
YFL037W	1.83	<i>TUB2</i>	Essential
YLR212C	2.00	<i>TUB4</i>	Essential
YHR111W	1.50	<i>UBA4</i>	Non-essential
YDR177W	1.83	<i>UBC1</i>	Essential
YBL067C	1.83	<i>UBP13</i>	Non-essential
YDL190C	1.50	<i>UFD2</i>	Non-essential
YML088W	1.50	<i>UFO1</i>	Non-essential
YGR019W	1.67	<i>UGA1</i>	Non-essential

YPL186C	1.67	<i>UIP4</i>	Non-essential
YIL031W	1.50	<i>ULP2</i>	Essential
YOR060C	1.67	<i>YOR060C</i>	Essential
YBL095W	2.17	<i>YBL095W</i>	Non-essential
YDL121C	1.50	<i>YDL121C</i>	Non-essential
YDL156W	1.50	<i>YDL156W</i>	Non-essential
YDR042C	1.50	<i>YDR042C</i>	Non-essential
YDR520C	2.00	<i>YDR520C</i>	Non-essential
YER128W	2.00	<i>YER128W</i>	Non-essential
YFR045W	2.17	<i>YFR045W</i>	Non-essential
YGR106C	1.50	<i>YGR106C</i>	Non-essential
YGR110W	2.00	<i>YGR110W</i>	Non-essential
YHL012W	1.67	<i>YHL012W</i>	Non-essential
YHR033W	1.67	<i>YHR033W</i>	Non-essential
YIL102C	1.83	<i>YIL102C</i>	Non-essential
YJL028W	1.50	<i>YJL028W</i>	Non-essential
YJR011C	1.83	<i>YJR011C</i>	Non-essential
YJR054W	1.50	<i>YJR054W</i>	Non-essential
YJR098C	1.50	<i>YJR098C</i>	Non-essential
YKL069W	2.17	<i>YKL069W</i>	Non-essential
YKR078W	1.50	<i>YKR078W</i>	Non-essential
YLR278C	1.83	<i>YLR278C</i>	Non-essential
YMR074C	1.67	<i>YMR074C</i>	Non-essential
YMR118C	1.83	<i>YMR118C</i>	Non-essential
YMR317W	2.00	<i>YMR317W</i>	Non-essential
YNL022C	1.67	<i>YNL022C</i>	Non-essential
YNL144C	1.50	<i>YNL144C</i>	Non-essential
YNR047W	1.83	<i>YNR047W</i>	Non-essential
YOR114W	1.67	<i>YOR114W</i>	Non-essential
YPL225W	1.50	<i>YPL225W</i>	Non-essential
YOR223W	1.83	<i>YOR223W</i>	Non-essential
YFL012W	1.67	<i>YFL012W</i>	Non-essential
YPR098C	1.67	<i>YPR098C</i>	Non-essential
YOR097C	1.50	<i>YOR097C</i>	Non-essential
YAL037C-A	2.17	<i>YAL037C-A</i>	Non-essential
YCL021W-A	2.50	<i>YCL021W-A</i>	Non-essential
YMR242W-A	2.17	<i>YMR242W-A</i>	Non-essential
YGL007C-A	1.83	<i>YGL007C-A</i>	Non-essential
YPL183W-A_1	1.67	<i>YPL183W-A_1</i>	Non-essential
YAL044W-A	1.50	<i>YAL044W-A</i>	Non-essential
YBL039W-A	1.50	<i>YBL039W-A</i>	Non-essential
YKL024C	1.50	<i>URA6</i>	Essential
YBL004W	1.50	<i>UTP20</i>	Essential
YOR004W	1.50	<i>UTP23</i>	Essential
YOR054C	1.50	<i>VHS3</i>	Non-essential
YPL253C	1.50	<i>VIK1</i>	Non-essential

YBR097W	1.50	<i>VPS15</i>	Essential
YOR089C	1.83	<i>VPS21</i>	Non-essential
YHR012W	1.67	<i>VPS29</i>	Non-essential
YJR044C	2.00	<i>VPS55</i>	Non-essential
YPL201C	1.50	<i>YIG1</i>	Non-essential
YML038C	1.50	<i>YMD8</i>	Non-essential
YGR198W	1.50	<i>YPP1</i>	Essential
YKR014C	1.50	<i>YPT52</i>	Non-essential
YKL214C	1.50	<i>YRA2</i>	Non-essential
YIR026C	1.50	<i>YVH1</i>	Non-essential
YOL109W	2.17	<i>ZEO1</i>	Non-essential

^aAverage scores were derived from three independent replicates as described in Experimental Procedures.