Supplementary Table 3. Glandular trichome development transcription factors in *Nicotiana spp*.

Gene Name	TF Family	GT Type	Key Target Gene(s)	Evidence Type	Gene Function Identification	References
NtHD9 (+)	HD-Zip IV	LGT	NtHD12	Y2H/BiFC/Co-IP	OE/Mutant	[23]
NtMYB306c (-)	R2R3-MYB	LGT/SGT	NtMYB308	Y2H/Co-IP	OE	[24]
NtPRE4.1 (-)	bHLH	LGT/SGT	NtMYB330	Y2H/Co-IP	OE/VIGS	[25]
NbGIS (+)	C2H2	LGT/SGT	*NbMYB123-like*	RT-qPCR	OE/RNAi/VIGS	[26]
NbCycB2 (-)	Cyclins	LGT/SGT	NbWoolly	Y2H/BiFC	OE/RNAi	[27]
NbWoolly (+)	HD-Zip IV		*NbCycB2*	Y1H/DLR/ChIP-qPCR	OE/RNAi/Mutant	
			NbCycB2	Y2H/Pull-down/Co-IP		
NbJAZ3 (-)	JAZ	LGT	NbWoolly	Y2H/BiFC	OE/RNAi	[28]
NbGL3 (+)	HD-Zip IV	LGT	-	-	VIGS	[29]

*(+): Positive regulation of GT development, (−): Negative regulation of GT development.

LGT: long glandular trichomes, SGT: short glandular trichomes

Reference

[1] Xie L, Yan T, Li L, Chen M, Ma Y, et al. 2021. The WRKY transcription factor AaGSW2 promotes glandular trichome initiation in *Artemisia annua*. *Journal of Experimental Botany* 72(5): 1691-1701.

[2] Hu X, Liu H, Chen T, Ye Y, Shao J, et al. 2025. *AaPDF2* promotes glandular trichome formation in *Artemisia annua* through jasmonic acid signaling. *Industrial Crops and Products* 234: 121630.

[3] Yan T, Li L, Xie L, Chen M, Shen Q, et al. 2018. A novel HD-ZIP IV/MIXTA complex promotes glandular trichome initiation and cuticle development in *Artemisia annua*. *New Phytologist* 218(2): 567-578.

[4] Jiang R, Chen W, Li Q, Guo J, Lv Z, Chen W. 2025. Genome-wide identification of the WD40 protein family and functional characterization of *AaTTG1* in *Artemisia annua*. *International Journal of Biological Macromolecules* 289: 138834.

[5] Wang C, Chen T, Li Y, Liu H, Qin W, et al. 2023. AaWIN1, an AP2/ERF protein, positively regulates glandular secretory trichome initiation in *Artemisia annua*. *Plant Science* 329: 111602

[6] Shi P, Fu X, Shen Q, Liu M, Pan Q, et al. 2018. The roles of *AaMIXTA1* in regulating the initiation of glandular trichomes and cuticle biosynthesis in *Artemisia annua*. *New Phytologist* 217(1): 261-276.

[7] Xie L, Yan T, Li L, Chen M, Hassani D, et al. 2021. An HD-ZIP-MYB complex regulates glandular secretory trichome initiation in *Artemisia annua*. *New Phytologist* 231(5): 2050-2064.

[8] Chen TT, Liu H, Li YP, Yao XH, Qin W, et al. 2023. AaSEPALLATA1 integrates jasmonate and light-regulated glandular secretory trichome initiation in

Artemisia annua. *Plant Physiology* 192(2): 1483-1497.
[9] He Y, Fu X, Li L, Sun X, Tang K, Zhao J. 2022. AaSPL9 affects glandular trichomes initiation by positively regulating expression of *AaHD1* in *Artemisia annua* L. *Plant Science* 317: 111172.
[10] Ahmad Khan R, Mohammad, Kumar A, Abbas N. 2024. AaGL3-like is jasmonate-induced bHLH transcription factor that positively regulates trichome density in *Artemisia annua*. *Gene* 904: 148213.
[11] Zhang S, Chen H, Guo S, Wang C, Jiang K, et al. 2024. *Artemisia annua ZFP8L* regulates glandular trichome development. *Physiologia Plantarum* 176(4): e14461.
[12] Gao Y, Ruan J, Wang G, Zhang Y, Wang Y, et al. 2025. SlHDZIV8-SlnsLTP33 module controls trichome density and lipid metabolism in tomato. *The Plant Journal* 123(3): e70398.
[13] Li M, Fu Y, Liang X, Liu X, Huang L, et al. 2025. SlHDZIV3 and SlHDZIV9 Are Two Positive Regulators in the Formation of Tomato Trichomes. *Plant, Cell & Environment* 48(8): 5789-5801.
[14] Chang J, Yu T, Yang Q, Li C, Xiong C, et al. 2018. *Hair*, encoding a single C2H2 zinc-finger protein, regulates multicellular trichome formation in tomato. *The Plant Journal* 96(1): 90-102.
[15] Chen Y, Su D, Li J, Ying S, Deng H, et al. 2020. Overexpression of bHLH95, a basic helix-loop-helix transcription factor family member, impacts trichome formation via regulating gibberellin biosynthesis in tomato. *Journal of Experimental Botany* 71(12): 3450-3462.
[16] Zheng X, Jian Y, Long Q, Luo Y, Xu X, et al. 2025. SlASR3 mediates crosstalk between auxin and jasmonic acid signaling to regulate trichome formation in tomato. *The Plant Journal* 121(4): e70053.
[17] Chang J, Wu S, You T, Wang J, Sun B, et al. 2024. Spatiotemporal formation of glands in plants is modulated by MYB-like transcription factors. *Nature Communications* 15(1): 2303.
[18] Shi Y, Wang Y, Pan Y, Deng C, Zeng T, et al. 2025. The SlGRAS9-SlMYC1 regulatory module controls glandular trichome formation and modulates resilience to pest in tomato. *The Plant Journal* 122(3): e70183.
[19] Zocca P, van Doore E, Roovers AJM, Glas JJ, Uittenbogaard M, et al. 2025. *Glandless*, a tomato HD-ZIP transcription factor, is important for the gland formation of type VI trichomes. *The Plant Journal* 123(1): e70308.
[20] Gao S, Gao Y, Xiong C, Yu G, Chang J, et al. 2017. The tomato B-type cyclin gene, *SlCycB2*, plays key roles in reproductive organ development, trichome initiation, terpenoids biosynthesis and *Prodenia litura* defense. *Plant Science* 262: 103-114.
[21] Zhang X, Yan F, Tang Y, Yuan Y, Deng W, Li Z. 2015. Auxin Response Gene *SlARF3* Plays Multiple Roles in Tomato Development and is Involved in the Formation of Epidermal Cells and Trichomes. *Plant Cell Physiol* 56(11): 2110-2124.
[22] Yang C, Marillonnet S, Tissier A. 2021. The scarecrow-like transcription factor SlSCL3 regulates volatile terpene biosynthesis and glandular trichome size in tomato (*Solanum lycopersicum*). *The Plant Journal* 107(4): 1102-1118.
[23] Zhang H, Xu H, Xu M, Yan X, Wang Z, et al. 2023. Transcription factors *NtHD9* and *NtHD12* control long glandular trichome formation via jasmonate signaling. *Plant physiology* 191(4): 2385-2399.
[24] Zheng J, Wu Y, Zhang L, Yang L, Jin J, et al. 2025. Overexpression of NtMYB306c reduces the glandular trichomes density in tobacco. *Biochemical and Biophysical Research Communications* 772: 152061.
[25] Yang L, Wu Y, Jin J, Zheng J, Yu J, et al. 2025. An atypical bHLH transcription factor *NtPRE4.1* negatively regulates tobacco glandular trichome density.

Gene 962: 149575.

[26] Liu Y, Liu D, Khan AR, Liu B, Wu M, et al. 2018. *NbGIS* regulates glandular trichome initiation through GA signaling in tobacco. *Plant molecular biology* 98(1): 153-167.

[27] Wu ML, Cui YC, Ge L, Cui LP, Xu ZC, et al. 2020. NbCycB2 represses Nbwo activity via a negative feedback loop in tobacco trichome development. *Journal of experimental botany* 71(6): 1815-1827.

[28] Yan X, Cui L, Liu X, Cui Y, Wang Z, et al. 2022. *NbJAZ3* is required for jasmonate-meditated glandular trichome development in *Nicotiana benthamiana*. *Physiologia plantarum* 174(2): e13666.

[29] Tian Y, Dai Tw, Fan Cx, Zhou J, Ren Xl, Xu Y. 2020. An HD-Zip IV transcription factor protein NbGL3 regulates glandular trichome initiation in tobacco. *Biologia Plantarum* 64: 378-384.