Table S4. Description of studies and the serpins involved in different biotic and abiotic stresses.

Serpins	Description	Author*
	Biotic	
CmPS-1	Increased CmPS-1 in phloem sap was correlated with reduced survival of the aphid *Myzus persicae* in *C. maxima.*	[51]
BSZ4 (*Serpin-Z4*)	Serpin-Z4 transcripts were upregulated in barley head tissue in response to treatment with the biocontrol bacterium *Pseudomonas fluorescens* and/or the pathogenic fungus *Fusarium culmorum*.	[88]
BSZ4 Z-Type-Serpin	Proteomic analyses identified three serpins that were upregulated in barley grains artificially and naturally infected with *Fusarium* spp.	[90]
AtSerpin1	Bioassays and artificial diet with transgenic plants overexpressing AtSerpin1 reduced the growth of *Spodoptera littoralis* larvae and caused mortality of *Acyrthosiphon pisum* nymphs.	[29]
	Arabidopsis thaliana leaves overexpressing AtSerpin1 compromised the development of the necrotrophic fungi *Botrytis cinerea* and *Sclerotina sclerotiorum*, and it was accelerated when serpin was absent.	[17]
	Overexpression of ASerpin1 resulted in decrease of cell death caused by the pathogen *Pseudomonas syringae* pv tomato expressing the type III effector *avrRpm1* (*Pto* DC3000 (*avrRpm1*)), compared to mutant and wild-type lines.	[18]
JK086945 JK086934	Serpin genes showed higher expression levels in the most resistant/tolerant cultivar of *Pyrus communis* after infection with the fungal pathogen *Stemphylium vesicarium* compared to the susceptible cultivar.	[105]
MtPiI4	Expression of *MtPiI4* was induced by the bacterial pathogen *Pseudomonas syringae* pv. tomato DC3000 strain (*Pst* DC3000) and treatment by methyl jasmonate (MeJA) in *Medicago truncatula*. In addition, transgenic *Arabidopsis thaliana* plants overexpressing *MtPiI4* were more resistant to *Pst* DC3000 and reduced bacterial populations.	[65]
Sbser1 Sbser2 Sbser3	Reductions between 29-53% of the average weight of *Helicoverpa zea* larvae was observed when the serpins Sbser1, Sbser2 and Sbser3 were added individually to the larval diet on sorghum leaves.	[32]
Z-type serpin BSZ7(Serpin Z7)	Z-type serpin and Serpin-Z7 were upregulated under the effect of an artificial infection by *Fusarium culmorum* and application of the mycotoxin Deoxynivalenol (DON) in cobs of two barley varieties.	[113]
WSZ1a (Serpin-Z1A) Serpin 1	Proteomic analysis revealed that spots from Serpin Z1A and serpin 1 were accumulated most in grains from wheat infected by powdery mildew.	[117]
TraesCS4A01G235700	Negative regulation against the pathogens *Blumeria graminis* and *Puccini striiformis*, and positive against *Zymoseptoria tritici.*	[120]
TraesCS2B01G530600	Negative and positive regulation against fungi *Blumeria graminis* and *Fusarium graminearum*, respectively.	
TraesCS4D01G231200	Negative regulation against *Puccini striiformis* and *Blumeria graminis*.	
TraesCS2B01G033100LC TraesCS2B01G033300LC TraesCS3B01G335800 TraesCS3D01G301100 TraesCS4A01G422200 TraesCS4A01G436000 TraesCS4D01G106100 TraesCS6B01G068900	Serpin genes were positive regulated in response to the fungal pathogen *Fusarium graminearum*.	
TraesCS4B01G079100	Negative regulation against *Fusarium pseudograminearum*.	
TraesCS4B01G079200	Negative regulation against *Puccini striiformis*	

TraesCS4D01G090600 TraesCS6B01G152500 TraesCS6D01G114700	Serpin genes were positive regulated in response to PAMP elicitors flg22 and chitin.	
TraesCS4A01G205200 TraesCS5B01G492700LC	Serpin genes were positive and negative regulated in response to the Flg22.	
TraesCS5B01G402400 TraesCS6D01G048700	Serpin genes were positive regulated in response to chitin.	
OsSRP-ZXA (Q75H81)	Among other proteins, OsSRP-ZXA was upregulated in a comparative proteomic study between two near-isogenic rice lines with a resistant phenotype and susceptible to infection by the fungus *Magnaporthe oryzae* 12 hours after inoculation with the pathogen.	[126]
Abiotic		
WSZ1a (Serpin-Z1A) WSZ2b (Serpin-Z2B)	Two-dimensional electrophoresis analyses of four wheat varieties grown in polytunnels under hot/dry or cold/humid regimes during the grain filling period identified Serpin-Z1A in three varieties, while Serpin-Z2B was absent or weakly detected regardless of variety.	[85]
AtSRP2 *AtSRP3*	Mouse ear cress seedlings exposed to methyl methanesulfonate (MMS), a model alkylating reagent that causes DNA damage, exhibited 5- and 100-fold increased expression of the *AtSRP2* and *AtSRP3* genes, respectively.	[86]
Serpin-1 *Serpin-2*	The transcriptional profile of protease inhibitors was evaluated in different winter wheat varieties with drought tolerance. Under drought, expression of the serpins in leaves of the most drought-tolerant variety tended to preserve levels close to controls, whereas in roots, *Serpin-1* exhibited variable expression in different plants, but with higher levels in the most drought-tolerant variety.	[106]
WSZ2b (Serpin-Z2B)	Serpin-Z2B protein was positively regulated under water stress in the substitution line *CS-1Sl*(*1B*) of wheat.	[108]
AtSerpin1	Mutant *Arabidopsis thaliana* lines overexpressing AtSerpin1 showed protective effect in leaves against photodynamic damage after treatment with acridine orange (AO) photosensitizer and had attenuated cell death by AO and water stress.	[45]
AtSerpin1	Osmotic stress induced the accumulation of *Atserpin1* transcripts and protein complexes of AtSerpin and cognate proteases. In addition, the lines with overexpression of AtSerpin1 showed a protective effect to osmotic stress, while AtSERPIN1 knockout lines exhibited decreased root elongation rate.	[116]
MtSer6	*MtSer6* gene expression increased in response to water stress (drought). In addition, knockdown of *MtSer6* and ferritins genes in response to drought caused increased papain-like cysteine protease activity and free iron levels, early nodule senescence, lower photosynthetic rate and shoot biomass.	[20]
BSZ7 (Serpin-Z7) BSZx (Serpin-Zx)	Serpin-Z7 and Zx were differentially expressed in two contrasting varieties with respect to salinity tolerance. Serpin-Z7 was most accumulated in the salt tolerant variety	[122]
WSZ2a WSZ2b	LC-MS/MS results revealed high abundance, in well-irrigated or stressed plants, of proteins such as Serpin-Z2A and Z2B in an ethyl methanesulfonate (EMS)-induced mutant wheat line (BIG8-1) with greater tolerance to water deficit.	[125]
ApSerpin-ZX	At the transcriptional level Apserpin-ZX was upregulated under abiotic stress caused by saline, oxidative, cold, osmotic stress and cryopreservation in embryogenic callus of *A. praecox*. When serpin was added to the plant vitrification solution, it had a positive effect on the survival rate of cryopreserved callus.	[53]
Biotic and Abiotic		
OsSRP-LRS	*OsSRP-LRS* expression was induced by inoculation of the necrotrophic fungal pathogen *Rhizoctonia solani*, UV and salt. Furthermore, transgenic RNAi lines with reduced expression of *OsSRP-LRS* showed exaggerated cell death under these conditions.	[19]

AtSRP4; *AtSRP5*	The expression of *AtSRP4* and *AtSRP5* genes was induced after ultraviolet (UV) treatment and inoculation with virulent strains of *Pseudomonas syringae* pv DC3000 carrying the *AvrRpt2* (*Pst-AvrRpt2)* and *AvrB* (*Pst-AvrB*) genes. Furthermore, mutant lines of both serpin genes were more susceptible to cell death by UV and *Pst-AvrRpt2*, and the AtSRP4 overexpression line had lower cell death. *AtSRP4* was induced in leaves by NaCl treatment.	[37]

* The references cited are available in Table S2.