

# Latex Allergens

Latex allergens that have already been registered by [WHO-IUIS](#) can be tabulated with their predicted physiological roles as follows.

**Table. Registered Natural Rubber-Latex Allergens**

<i>Name</i>	<i>Trivial name</i>	<i>Predicted physiological roles</i>	<i>Accession number (Protein)</i>	<i>References</i>
Hev b 1	rubber elongation factor	rubber biosynthesis	<a href="#">P15252</a>	1
Hev b 2	beta-1,3-glucanases	defense-related protein	<a href="#">Q7XJ83</a> , <a href="#">P52407</a>	2
Hev b 3	small rubber-particle protein	rubber biosynthesis	<a href="#">O82803</a>	3
Hev b 4	microhelix component	defense-related protein	<a href="#">Q8WPJ2</a>	4
Hev b 5	acidic latex protein	-	<a href="#">Q39967</a>	5
Hev b 6.01 Hev b 6.02 Hev b 6.03	prohevein, hevein preprotein hevein prohevein C-terminal fragment	defense-related protein (latex coagulation)	<a href="#">O49860</a> , <a href="#">P02877</a> , <a href="#">P80359</a>	6
Hev b 7.01 = Hev b 13 (renamed) Hev b 7.02	patatin homologue from B-serum patatin homologue from C-serum	defense-related protein inhibitor of rubber biosynthesis	<a href="#">O04008</a> , <a href="#">O81984</a> , <a href="#">O65811</a> , <a href="#">Q9SEM0</a>	7
Hev b 8	latex profilin	structural protein	<a href="#">O65812</a> , <a href="#">Q9STB6</a> , <a href="#">Q9M7N0</a> , <a href="#">Q9M7M9</a> , <a href="#">Q9M7M8</a> , <a href="#">Q9LEI8</a>	8
Hev b 9	latex enolase	glycolytic enzyme	<a href="#">Q9LEJ0</a> , <a href="#">Q9LEI9</a>	9
Hev b 10	Mn-superoxide dismutase	destruction of radicals	<a href="#">P35017</a> , <a href="#">Q9STB5</a> , <a href="#">Q9FSJ2</a>	10
Hev b 11	class I endochitinase	defense-related protein	<a href="#">Q949H3</a> , <a href="#">Q8GUD7</a>	11
Hev b 12	lipid transfer protein	defense-related protein	<a href="#">Q8RYA8</a>	12

Hev b 13 (= Hev b 7.01)	latex esterase Early Nodule Specific Protein (ENSP)	defense-related protein	<a href="#">Q7Y1X1</a>	13
-------------------------	--	----------------------------	------------------------	----

## Web Sites Especially Related to Latex Allergens

[Guthrie Research Institute](#) (LEAP test, ASTM tests)

[FIT Biotech](#) (FITkit)

[BIOMAY Wien/Vienna](#) (Recombinant allergens for research use)

[PlasmaLab International](#) (Human plasma for research use)

[VBC-Genomics](#) (Immuno solid-phase allergen chip)

## References

[0] **Recent reviews**, Yeang, H.Y.: [Natural rubber latex allergens: new developments.](#), *Curr. Opin. Allergy Clin. Immunol.*, **4**, 99-104 (2004); Wagner, S. and Breiteneder, H.: [Hevea brasiliensis latex allergens: current panel and clinical relevance.](#), *Int. Arch. Allergy Immunol.*, **136**, 90-97 (2005).

[1] Czuppon, A.B., Chen, Z., Rennert, S., Engelke, T., Meyer, H.E., Heber, M. and Baur, X.: [The rubber elongation factor of rubber trees \(\*Hevea brasiliensis\*\) is the major allergen in latex.](#), *J. Allergy Clin. Immunol.*, **92**, 690-697 (1993); Yeang, H.Y., Cheong, K.F., Sunderasan, E., Hamszah, S., Chew, N.P., Hamid, S., Hamilton, R.G. and Cardosa, M.J.: [The 14.6 kd rubber elongation factor \(Hev b 1\) and 24 kd \(Hev b 3\) rubber particle proteins are recognized by IgE from patients with spina bifida and latex allergy.](#), *J. Allergy Clin. Immunol.*, **98**, 628-639 (1996).

[2] Sunderasan, E., Hamzah, S., Hamid, S., Ward, M.A., Yeang, H.Y. and Cardosa, M.J.: [Latex B-serum beta-1,3-glucanase \(\*Hev b II\*\) and a component of the microhelix \(\*Hev b IV\*\) are major latex allergens.](#), *J. Nat. Rubb. Res.*, **10**, 82-99 (1995); Alenius, H., Kalkkinen, N., Lukka, M., Reunala, T., Turjanmaa, K., Makinen-Kiljunen, S., Yip, E. and Palosuo, T., [Prohevein from the rubber tree \(\*Hevea brasiliensis\*\) is a major latex allergen.](#), *Clin. Exp. Allergy*, **24**, 659-665 (1995).

[3] Yeang, H.Y., Cheong, K.F., Sunderasan, E., Hamszah, S., Chew, N.P., Hamid, S., Hamilton, R.G. and Cardosa, M.J.: [The 14.6 kd rubber elongation factor \(Hev b 1\) and 24 kd \(Hev b 3\) rubber particle proteins are recognized by IgE from patients with spina bifida and latex allergy.](#), *J. Allergy Clin. Immunol.*, **98**, 628-639 (1996); Yeang, H.Y., Ward, M.A., Zamri, A.S.M. Dennis, M.S. and Light, D.R.: [Amino acid sequence similarity of Hev b 3 to two previously reported 27- and 23-kDa latex proteins allergenic to spina bifida patients.](#), *Allergy*, **53**, 513-519 (1998); Oh, S.K., Kang, H., Shin, D.H., Yang, J., Chow, K.S., Yeang, H.Y., Wagner, B., Breiteneder, H. and Han, K.H.: [Isolation, characterization, and functional analysis of a novel cDNA clone encoding a small rubber particle protein from \*Hevea brasiliensis\*.](#), *J. Biol. Chem.*, **274**, 17132-17138

(1999); Wagner, B., Krebitz, M., Buck, D., Niggemann, B., Yeang, H.Y., Han, K.-H., Scheiner, O. and Breiteneder, H.: [Cloning, expression, and characterization of recombinant Hev b 3, a \*Hevea brasiliensis\* protein associated with latex allergy in patients with spina bifida.](#), *J. Allergy Clin. Immunol.*, **104**, 1084-1092 (1999).

[4] Sunderasan, E., Hamzah, S., Hamid, S., Ward, M.A., Yeang, H.Y. and Cardoso, M.J.: [Latex B-serum beta-1,3-glucanase \(\*Hev b II\*\) and a component of the microhelix \(\*Hev b IV\*\) are major latex allergens.](#), *J. Nat. Rubb. Res.*, **10**, 82-99 (1995); Sunderasan, E., Chow, K.-S., Ward, M.A., Yeang, H.-Y.: [Hev b 4 heavy peptide identified as latex cyanogenic glucosidase.](#), *J. Allergy Clin. Immunol.*, **109**, No.1, S333 (2002); Sunderasan, E., Ward, M.A. and Yeang, H.Y.: [Isolation and characterization of latex cyanogenic glucosidase in \*Hevea brasiliensis\*.](#), *J. Rubber Res.*, **5**, 244-252 (2002)!

[5] Akasawa, A., Hsieh, L.-S., Martin, B.M., Liu, T. and Lin, Y.: [A novel acidic allergen, Hev b 5, in latex.](#), *J. Biol. Chem.*, **271**, 25389-25393 (1996); Slater, J.E., Vedvick, T., Arthur-Smith, A., Trybul, D.E. and Kekwick, R.G.O.: [Identification, cloning, and sequence of a major allergen \(Hev b 5\) from natural rubber latex \(\*Hevea brasiliensis\*\).](#), *J. Biol. Chem.*, **271**, 25394-25399 (1996).

[6] Alenius, H., Kalkkinen, N., Lukka, M., Reunala, T., Turjanmaa, K., Makinen-Kiljunen, S., Yip, E. and Palosuo, T., [Prohevein from the rubber tree \(\*Hevea brasiliensis\*\) is a major latex allergen.](#), *Clin. Exp. Allergy*, **24**, 659-665 (1995); Chen, Z., Posch, A., Lohaus, C., Raulf-Heimsoth, M., Meyer, H.E. and Baur, X.: [Isolation and identification of hevein as a major IgE-binding polypeptide in \*Hevea latex\*.](#), *J. Allergy Clin. Immunol.*, **99**, 402-409 (1997); Beezhold, D.H., Kostyal, D.A. and Sussman, G.L.: [IgE epitope analysis of the hevein preprotein; a major latex allergen.](#), *Clin. Exp. Immunol.*, **108**, 114-121 (1997).

[7] Beezhold, D.H., Sussman, G.L., Kostyal, D.A. and Chang, N.-S.: [Identification of a 46-kd latex protein allergen in health care workers.](#), *Clin. Exp. Immunol.*, **98**, 408-413 (1994); Kostyal, D.A., Hickey, V.L., Noti, J.D., Sussman, G.L. and Beezhold, D.H.: [Cloning and characterization of a latex allergen \(\*Hev b 7\*\): homology to patatin, a plant PLA2.](#), *Clin. Exp. Immunol.*, **112**, 355-362 (1998); Sowka, S., Wagner, S., Krebitz, M., Arija-Mad-Arif, S., Yusof, F., Kinaciyani, T., Brehler, R., Scheiner, O. and Breiteneder, H.: [cDNA cloning of the 43-kD latex allergen Hev b 7 with sequence similarity to patatins and its expression in the yeast \*Pichia pastoris\*.](#), *Eur. J. Biochem.*, **255**, 213-219 (1998); Yeang, H.Y., Chow, K.S., Yusof, F., Arif, S.A., Chew, N.P. and Loke, Y.H.: [Appraisal of latex glove proteins in the induction of sensitivity to multiple latex allergens.](#), *J. Investig. Allergol. Clin. Immunol.*, **10**, 215-222 (2000).

[8] Vallier, P., Bolland, S., Harf, R., Valenta, R. and Deviller, P.: [Identification of profilin as an IgE-binding component in latex from \*Hevea brasiliensis\*: clinical implications.](#), *Clin. Exp. Allergy*, **25**, 332-339 (1995); Nieto, A., Mazon, A., Estornell, F., Boquete, M., Carballada, F., Martinez, A., Asturias, J.A., Aguirre, M., Martinez, J. and Palacios, R.: [Profilin, a relevant allergen in latex allergy.](#), *J. Allergy Clin. Immunol.*, **101**, S207 (1998); Rihs, H.P., Chen, Z., Rozynek, P., Baur, X., Lundberg, M. and Cremer, R.: [PCR-based cloning, isolation, and IgE-binding properties of recombinant latex profilin \(rHev b 8\).](#), *Allergy*, **55**, 712-717 (2000).

[9] Wagner, S., Breiteneder, H., Simon-Nobbe, B., Susani, M., Krebitz, M., Niggemann, B., Brehler, R., Scheiner, O. and Hoffmann-Sommergruber, K.: [Hev b 9, an enolase and a](#)

- [new cross-reactive allergen from hevea latex and molds. Purification, characterization, cloning and expression.](#), *Eur. J. Biochem.*, **267**, 7006-7014 (2000).
- [10] Wagner, S., Sowka, S., Mayer, C., Cramer, R., Focke, M., Kurup, V.P., Scheiner, O. and Breiteneder, H.: [Identification of a \*Hevea brasiliensis\* latex manganese superoxide dismutase \(Hev b 10\) as a cross-reactive allergen.](#), *Int. Arch. Allergy Immunol.*, **125**, 120-127 (2001).
- [11] O'Riordain, G., Radauer, C., Hoffmann-Sommergruber, K., Adhami, F., Peterbauer, C.K., Blanco, C., Godnic-Cvar, J., Scheiner, O., Ebner, C. and Breiteneder, H.: [Cloning and molecular characterization of the \*Hevea brasiliensis\* allergen Hev b 11, a class I chitinase.](#), *Clin. Exp. Allergy*, **32**, 455-462 (2002); Rihs, H.P., Dumont, B., Rozynek, P., Lundberg, M., Cremer, R., Bruning, T. and Raulf-Heimsoth, M.: [Molecular cloning, purification, and IgE-binding of a recombinant class I chitinase from \*Hevea brasiliensis\* leaves \(rHev b 11.0102\).](#), *Clin. Exp. Allergy*, **58**, 246-251 (2003).
- [12] Beezhold, D.H., Hickey, V.L., Kostyal, D.A., Puhl, H., Zuidmeer, L., van Ree, R. and Sussman, G.L.: [Lipid transfer protein from \*Hevea brasiliensis\* \(Hev b 12\), a cross-reactive latex protein.](#), *Ann Allergy Asthma Immunol*, **90**, 439-445 (2003).
- [13] Bernstein, D.I., Biagini, R.E., Karnani, R., Hamilton, R., Murphy, K., Bernstein, C., Arif, S.A., Berendts, B. and Yeang, H.Y.: [In vivo sensitization to purified \*Hevea brasiliensis\* proteins in health care workers sensitized to natural rubber latex.](#), *J. Allergy Clin. Immunol.*, **111**, 610-616 (2003); Arif, S.A., Hamilton, R.G., Yusof, F., Chew, N.P., Loke, Y.H., Nimkar, S., Beintema, J.J. and Yeang, H.Y.: [Isolation and characterization of the early nodule specific protein homologue \(Hev b 13\), an allergenic lipolytic esterase from \*Hevea brasiliensis\* latex.](#), *J. Biol. Chem.*, **279**, 23933-23941 (2004).