

# Phytohaemagglutinin

**Phytohaemagglutinin** (PHA) is a lectin derived from the seeds of the garden bean (*Phaseolus vulgaris*). It occurs in the form of tetramers composed of two related polypeptides (PHA-L and PHA-E). The markings L and E correspond to leukoagglutination and erythroagglutination abilities of PHA subunits. <sup>[1]</sup> PHA is used, for example, as a mitogen to stimulate the division of lymphocytes in cytogenetic examinations or to activate latent HIV-1 in peripheral blood lymphocytes.

In high doses, PHA has toxic effects. It is found in the raw or uncooked seeds of a number of legumes. Measured in hemagglutination units (hau), the concentration in raw red beans can be as high as 70 000 hau, while in cooked beans it is only 200-400 hau. Heating the beans to less than 80 °C can increase the toxicity by up to five times, making them much more toxic than when raw. PHA poisoning manifests itself 1 to 3 hours after ingestion nausea and vomiting. <sup>[2]</sup>

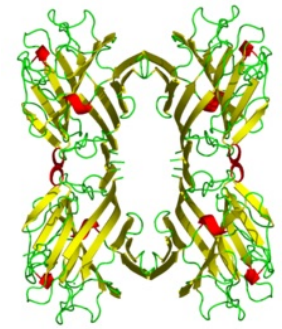
## Links

### Related Articles

- Material for the examination of chromosomes
- Chromosome Examination

### References

1. HAMELRYCK, Thomas W. , et al. The Crystallographic Structure of Phytohemagglutinin-L. *Journal of Biological Chemistry* [online]. 1996, vol. 271, no. 34, p. 20479-20485, Available from <<http://www.jbc.org/content/271/34/20479.full>>. ISSN 0021-9258 (Print), 1083-351X (On-line). PMID: 8702788 (<http://www.ncbi.nlm.nih.gov/pubmed/8702788>).
2. FDA. *Bad Bug Book : BBB - Phytohaemagglutinin* [online]. ©2009. [cit. 2010-06-29]. <<https://www.fda.gov/food/foodsafety/foodborneillness/foodborneillnessfoodbornepathogensnaturaltoxins/badbugbook/ucm071092.htm>>.



Phytohemagglutinin