

# NSABS 2020

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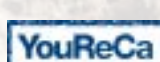
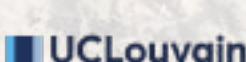
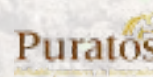
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## Seed $\beta$ -conglutin proteins from narrow-leaved lupin (*Lupinus angustifolius* L.) as functional foods and their role in cancer prevention

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*Lupinus angustifolius* (narrow-leaved lupin, NLL) seeds are a valuable source of proteins for human consumption with multiple nutritional and nutraceutical properties [1]. Among these proteins, particular research attention has been focused to those from the vicilin or beta-conglutin family, which are the most abundant proteins in lupin seeds [2].

Recently, it has been demonstrated the potential anti-diabetic [3], insulin sensitivity improvement [4], antioxidant and anti-inflammatory activities of particular beta-conglutin proteins ( $\beta$ 1,  $\beta$ 3 and  $\beta$ 6) [3,4,5]. These properties could be attributed to the ability of these conglutins to interact with insulin [3] and their particular structural characteristics [6,7].

Up until now, there is no information concerning how NLL seed proteins affect cancer cell at molecular level. The aim of this study was to evaluate the effects of NLL  $\beta$ -conglutin proteins on human breast cancer cells by clonogenic and viability assays.

These studies allowed determining the optimal  $\beta$ -conglutin proteins concentration ranges of each isoform to know the percentage of breast cancer cells surviving in comparison to control healthy cells, and whether there was sensitization of these cancer cells after treatment with x-ray radiation at different doses (1 Gy to 8 Gy) alone and in combination with  $\beta$ -conglutin proteins treatment.

NLL  $\beta$ -conglutin proteins may be an agent with potential uses in combinatorial therapies helping to fight human breast cancer.

### References

- [1] Delgado-Andrade et al. 2016. *Arbor* 192: a313- ; doi: 10.3989/arbor.2016.779n3003
- [2] Foley et al. 2015. *BMC Plant Biology* 15: 106; doi: 10.1186/s12870-015-0485-6
- [3] Lima-Cabello et al. 2017. *Molecular Nutrition & Food Research* 61(5). doi: 10.1002/mnfr.201600819
- [4] Lima-Cabello et al. 2018. *Food & Function* 9(10): 5176-5188; doi: 10.1039/c8fo01164h
- [5] Lima-Cabello et al. 2018. *Journal of Functional Foods* 40: 510 – 519; doi: 10.1016/j.jff.2017.11.040
- [6] Lima-Cabello et al. 2016. *Genomics & Computational Biology* 2(1): e29; doi: 10.18547/gcb.2016.vol2.iss1.e29
- [7] Jimenez-Lopez et al. 2015. *Bioinformatics and Biomedical Engineering* 9043: 96-107, doi: 10.1007/978-3-319-16483-0\_10

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