

# Immunomodulatory potential of probiotic bacteria: implications for human and animal health

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## INTRODUCTION & AIM

- The quest for sustainable alternatives to antibiotics has led to intense research interest in probiotics.
- However, their widespread application remains limited owing to an incomplete understanding of their functional mechanisms.
- This preliminary phase focused on identifying promising candidates that will be further explored for experimental validation using animal models.

## METHOD

- Immunogenic peptides from *Ligilactobacillus saerimneri*, *Ligilactobacillus salivarius* and *Lactobacillus acidophilus* were used.
- The peptides were analysed for ability to induce interleukin-5 (IL-5), interleukin-6 (IL-6) and interferon gamma (IFN\_γ) (human)
- GLM procedures of SAS appropriate for CRD was used.
- Duncan Multiple Range Test was used to separate means.
- Level of significance was set at  $P < 0.05$ .
- Gene expression was performed using GENEVESTIGATOR.

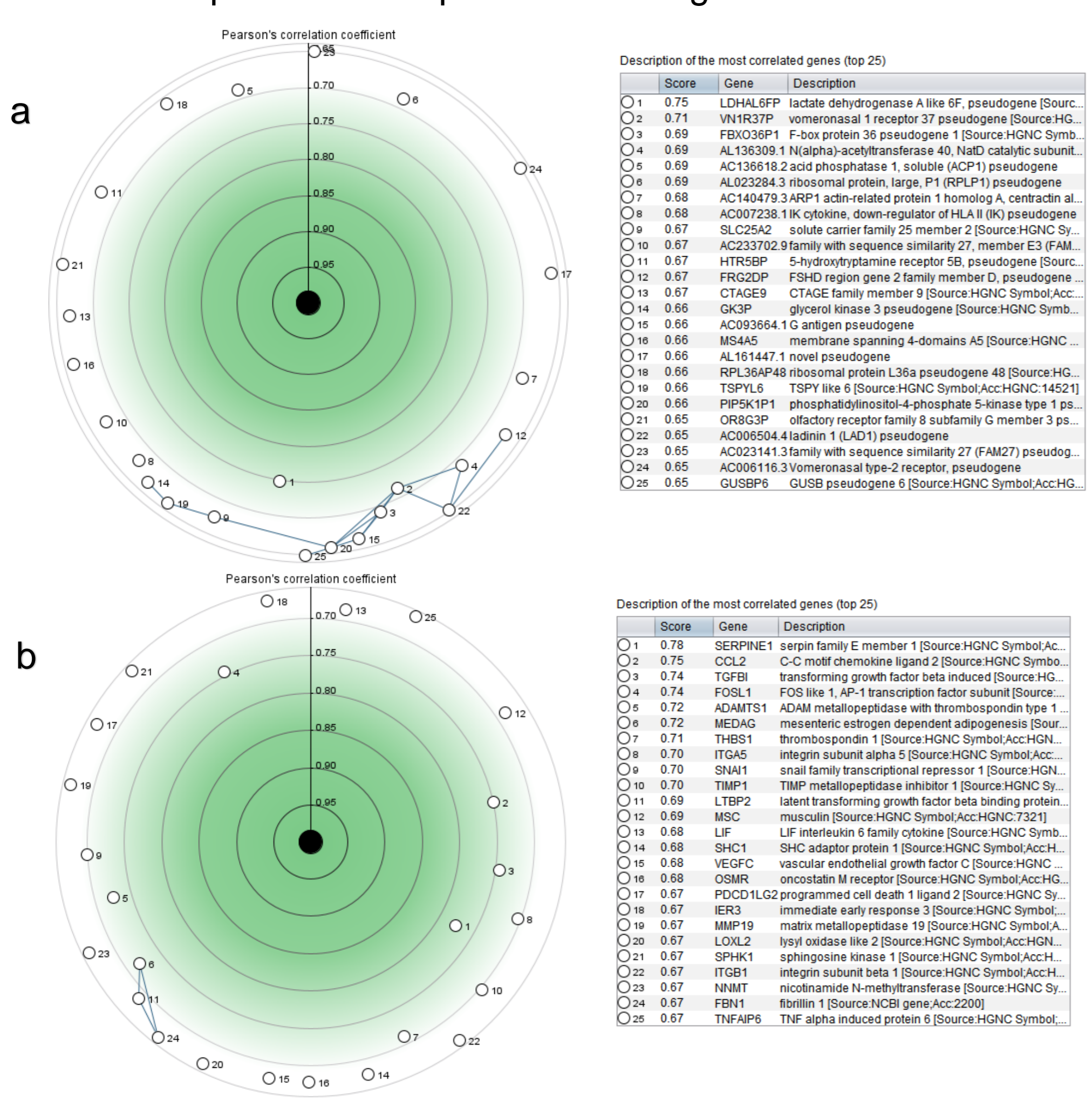
## RESULTS & DISCUSSION

- All the selected peptides induced IL-5, IL-6 and IFN\_γ.
- The values obtained were statistically similar across the organisms.
- The ability to induce IFN\_γ in human was highest in peptides from *Ligilactobacillus salivarius* which was statistically similar to those from *Ligilactobacillus saerimneri*.
- All the peptides were immunogens against tumor peptides, indicating potential therapeutic application.

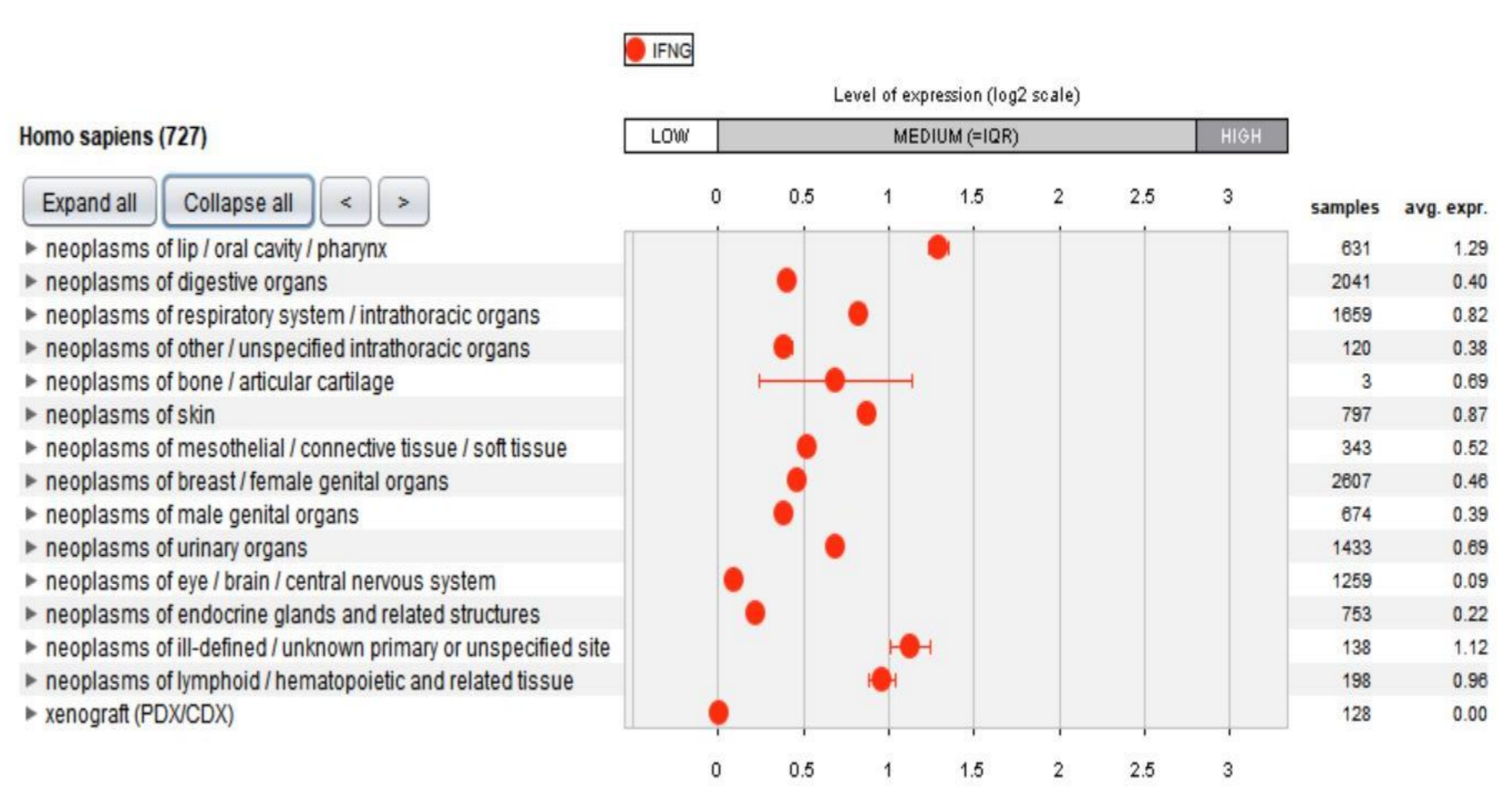
**Table 1. Cytokine-inducing-potential of immunogenic peptides from probiotic bacteria**

Peptide groups	IL-5	IL-6	IFN_human
A	0.5217	0.3175	0.8367 <sup>a</sup>
B	0.5017	0.2275	0.8000 <sup>ab</sup>
C	0.5433	0.2467	0.7533 <sup>b</sup>
P-value	0.2201	0.3896	0.0608
Pooled SD	0.039	0.094	0.055

A = *Ligilactobacillus salivarius*; B = *Ligilactobacillus saerimneri*; C = *Lactobacillus acidophilus*; SD = standard deviation  
<sup>ab</sup>Means with different superscripts ( $p < 0.05$ ) are significantly different



**Fig. 2.** Circular views showing gene expression: a) IL-5 expression and b) IL-6 expression across various anatomical parts in *Homo sapien*



**Fig. 1.** Scatter plot showing IFNG expression across various cancer categories in *Homo sapien*

## CONCLUSION

These results suggest potential sustainable applications for food supplements, feed additives and vaccine development.