T_H cytokine pattern induced by synthetic manno- and glucooligosaccharide conjugates

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Introduction

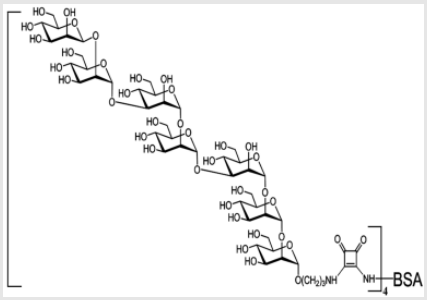
Candidiasis are infections caused by a dimorphic fungus *Candida albicans*. It can infect e.g. the bucal and vaginal mucosa, skin, gastrointestinal, respiratory, and urinary tract.
T lymphocytes are crucial mediators of the cellular antifungal immune response.
T_H differentiation give arise to cells with a significant potential for cytokine expression. Depending upon the balance of local cytokines, co-stimulatory molecules, antigen levels, and genetic factors T_H1, T_H2, T_H17 and Treg lymphocytes are generated by immune responses.
Functionally-polarized $CD4^+$ T cell subsets have been identified based on their exclusive patterns of various cytokine secretion. The aim of this study was to evaluate the immunobiological efficacy of synthetically prepared mannan- and glucan-derived oligosaccharide BSA-conjugates.

Materials and Methods

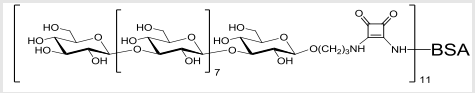
Balb / c mice were immunized (10 mice per group, prime, 1st, 2nd intraperitoneal (i.p) and / or subcutaneous (s.c) boost, 7 weeks (wks) after 2nd boost, 3- weeks boost´s intervals) by **immunization formulas:**

mannan- and glucan-derived synthetic oligosaccharidic i.e heptamannoside (M7) and nonaglucoside (G9) BSA conjugates and *Candida albicans* CCY 29-3-32 whole cell formula (WC).

M7



G9



Cytokines detection: mouse IL-4, mouse IL-10, mouse IL-17, mouse IFN-γ were detected by the ELISpot method (e-Bioscience, Inc.). Cytokine specific spots were visualised and quantified by Axio Imager.A1, KS ELISPOT 4.10 (C. Zeiss).

References

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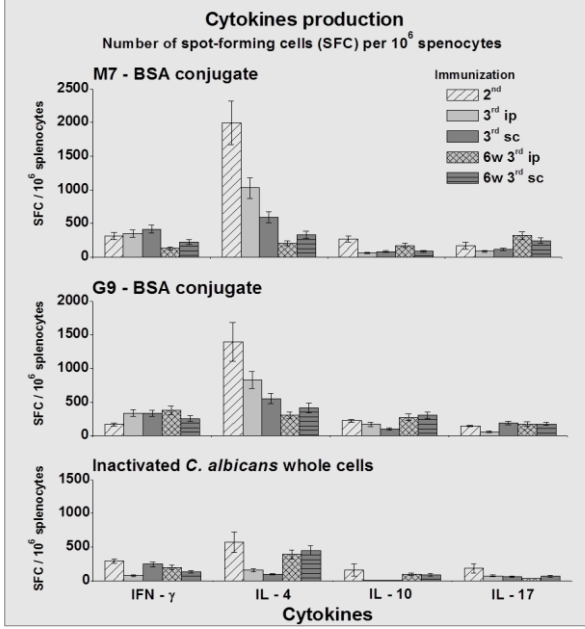
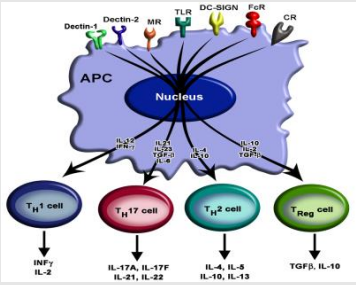
Results



- prime-boost vaccination of Balb/c mice with synthetic-BSA conjugated (M7, G9) revealed pro-T_H1 over T_H2 immune responces (increasing frequency of IFNγ and decreasing frequency of IL-4)
- acceleration of T_H17 and depression of Tr responces were generated predominantly by immunisation with G9 conjugate



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Conclusions

The novel synthetized glycooligosacccharidic conjugates, mimicking the structure of native *Candida* mannooligosaccharide and glucooligosaccharide epitopes demonstrate the immunobiological efficacy *in vivo*. These model structures offer oppportunity to follow up the relationships between structure and immunobiological effectivity.
Prime-boost vaccination of Balb/c mice with synthetic-BSA conjugated heptamannoside (M7) and nonaglucoside (G9) revealed pro-T_H1 over T_H2 immune responces based on the increasing frequency of IFN-γ and decreasing frequency of IL-4 producing splenocytes throughout the i.p and/or s.c immunisation routes. Acceleration of T_H17 and depression of Tr responces were generated predominantly by immunisation with G9 conjugate. Immunomodulation of specific T_H1, T_H2, T_H17 and Tr cytokine release by both conjugated oligosaccharides throughout the vaccination demonstrated on activated mice splenocytes, allows to detect the immunobiological diversity of such oligosaccharidic constructs suitable for *Candida* vaccine.

This contribution is the result of project implementation: Centre of Excellence for Glycomics, ITMS 26240120031, supported by the Research & Development Operational Programme funded by ERDF.
This work was supported by the Grant Agency of Slovak Academy of Sciences VEGA No. 2/0026/13.