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β-*Glucan – promising candidate for vaccines and drug delivery*

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Abstract

β-Glucans have been studied extensively as an immune stimulant in anti-infective, anti-tumor immunity, immunoadjuvant in cancer therapy, wound healing, and for stress and the lowering of cholesterol. After a long long history of research, mechanisms of β-glucan actions are now established and the role of various receptors such as CR3 and Dectin-1 and subsequent signaling is clear. With recent studies showing stimulation of humoral immunity including antibody response, it is clear that glucan-mediated immunotherapy may link both innate and adaptive immune responses. In addition, β-glucan is similarly active in all animal species including humans.

One possibility is to use β-glucan in an immunocyte-targeting delivery system, which is particularly advantageous for therapeutic DNA or RNA. Similar approach uses β-glucan particles encapsulating various bacterial antigens. Another option is the development of vaccines, where β-glucan can substitute aluminium and offer higher immunostimulation. As glucan is similarly active when administered orally or parenteraly, β-glucans can improve immunogenicity of oral vaccines.

Glucans act as pathogen-associated molecular patterns and recognize specific receptors on immune cells, followed by triggering innate immunity and regulating adaptive immunity. What is more, glucans are safe and biodegradable without tissue deposits. Therefore, glucan-based compounds and formulations are significant vaccine adjuvant candidates, as it is clear that the glucans might offer an ideal solution – they are inexpensive, generally free from side effects and capable of significant biological effects.

Biography:

Vaclav Vetvicka completed his PhD at the Institute of Microbiology in Prague. After working at the same institute as Researcher, he spent a year at the Oklahoma Medical Research Foundation in Oklahoma City. Since 1991, he is working at the Department of Pathology, University of Louisville, KY, USA. He published more than 280 scientific publications, 7 books and 8 international patents.

Speaker Publications:

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2. "Prevalence of Asthma Bronchiale in the Czech Republic and its Economic Burden"; American Journal of Immunology / Volume 12 No. 3, 2016, 61-68
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7th European Biopharma Congress; Webinar- April 27-28, 2020.

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