

BACTERIAL NANOCELLULOSE OBTAINED USING *MEDUSOMYCES GISEVII* SA-12: IN VIVO EVALUATION OF ALLERGENIC AND SENSITIZING PROPERTIES UPON ORAL ADMINISTRATION

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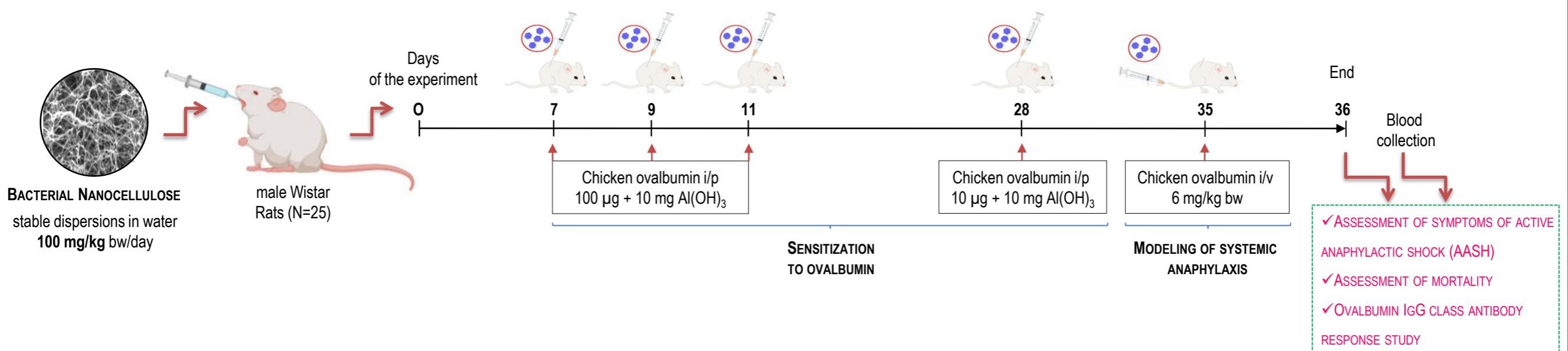
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An industrially scalable technology for the production of bacterial nanocellulose has been developed using a symbiotic culture of *Medusomyces gisevii* strain Sa-12 on a semi-synthetic glucose medium and hydrolysates of pretreated oat husks (Fig. 1). The unique properties of the material consist in extraordinary values of the content of cellulose allomorph Ia (CIa) in the range of 94-100% and the degree of crystallinity (CI) in the range of 88-93%, which is due to the specifics of the use of this producing community. High-resolution TEM imaging confirmed the nanofiber structure of bacterial nanocellulose (Fig. 2). Possible applications of the material include food ingredients, packaging materials with improved functional characteristics, medical devices, diagnostic tools, and drug delivery agents. The aim of the study was to evaluate the allergenic reactivity of the obtained bacterial nanocellulose in a model of systemic anaphylaxis in rats.



Fig. 1. Technology for the production of bacterial nanocellulose

STUDY DESIGN



RESULTS

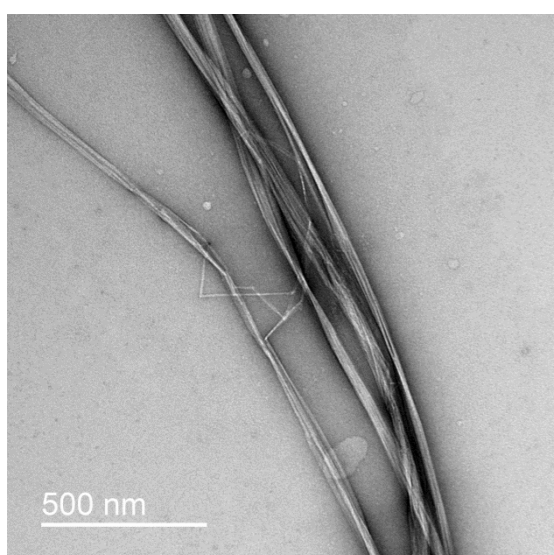


Fig. 2. High-resolution TEM image of the bacterial nanocellulose nanofiber structure

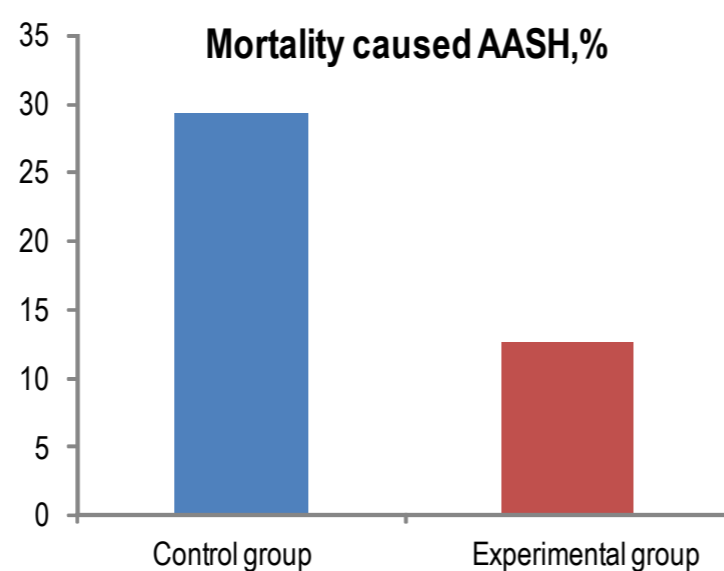


Fig. 3. Mortality of animals caused by the developed reaction of systemic anaphylaxis

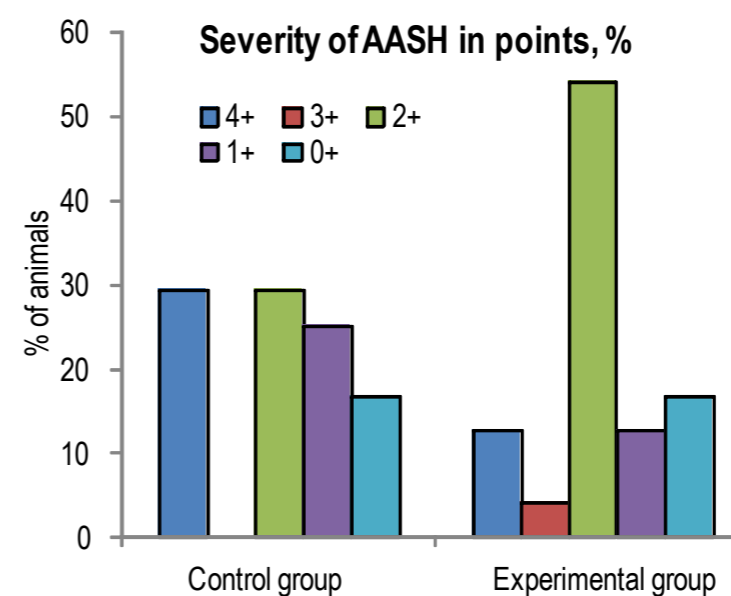


Fig. 4. Severity of symptoms of active anaphylactic shock

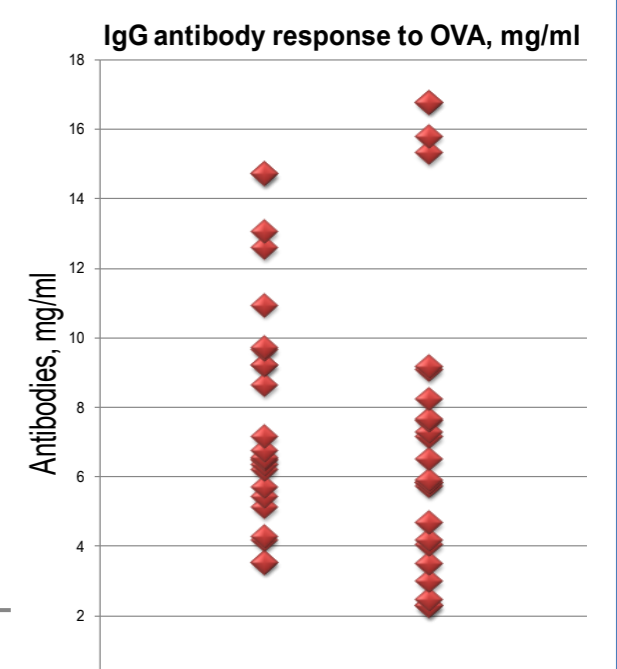


Fig. 5. Levels of specific circulating IgG

CONCLUSION. The potential allergenicity and sensitizing properties of bacterial nanocellulose with a daily oral route of admission for 36 days were studied using a model antigen - the protein of chicken egg ovalbumin in an in vivo experiment on a model of systemic anaphylaxis in Wistar rats. The results obtained demonstrated in the experimental group a tendency to decrease the mortality of animals caused by the developed reaction of systemic anaphylaxis as a result of the introduction of a resolving dose of the model antigen (Fig. 3). Based on the study of the levels of specific circulating IgG (Fig. 4) and the results of assessing the severity of systemic anaphylaxis reactions (Fig. 5), bacterial nanocellulose has no allergenic and sensitizing properties when consumed by the Wistar rats with a diet for 35 days.