LIPOPOLYSACCHARIDES OF *PANTOEA AGGLOMERANS* P1a, P324 AND 8488: BIOLOGICAL PROPERTIES, THE O-SPECIFIC POLYSACCHARIDES AND LIPIDS A STRUCTURE

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The structural basis of *Pantoea agglomerans* lipopolysaccharide (LPS) was found to be similar to other Gram-negative bacteria, but some distinctive features were also described. Despite the fact that until now a fairly extensive literature on the biological activity of the *P. agglomerans* LPS exists there is only information on the isolation and characterization of its LPS. It is known that the peculiarities of the structure and functions of LPS are used as one of the recognized chemotaxonomic criteria in the identification of gram-negative bacteria including *P. agglomerans*, which systematics til now has many unresolved questions. Moreover, subtle variations of LPS structure are the molecular basis for the development of intraspecies serological classification schemes for gram-negative bacteria. Therefore, the aim of the current work was isolation, chemical characterization, and study of functional and biological activities of the *P. agglomerans* P1a, P324 and 8488 LPS, as well as elucidation of the O-specific polysaccharides (OPS) and lipid A structure of this strain.

P. agglomerans LPSs were isolated from the dry bacterial mass by a phenol-water method. The carbohydrates were analyzed by Dubois method, nucleic acids according to Spirin, protein content according to Lowry and 2-keto-3-deoxyoctonic acid according to Osborn. LPS mild acid degradation allowed to separate OPS and lipid A, which structures were identified by sugar analysis, 2D NMR spectroscopy and by ESI-MS spectrometry, respectively. Toxicity and pyrogenicity of LPS were tested with mice and rabbits upholding the rules of bioethics. Serological studies were performed by Ouchterlony method.

The *P. agglomerans* P1a, P324 and 8488 LPSs were isolated, purified and chemically characterized. It was found that lipids A of *P. agglomerans* P1a, P324 and 8488 were characterized by different levels of acylation and represented by hexa-, penta-, tetra- and tri-acylated species. A comparative study of the lipids A structure of the three studied *P. agglomerans* strains allowed us to suggest that the LPSs toxicity and pyrogenicity depended not only on the degree of lipid A acylation, but on the differences in the qualitative composition of fatty acids as well. Thus, lipids A of two strains P324 and 8488, contained C18:0 and C14:1 residues, respectively, which were not detected in lipid A of *P. agglomerans* P1a strain. The latter one showed lower toxicity. The structures of the P. agglomerans P1a (I), P324 (II) and 8488 (III) OPS were identified: (I) →3)-α-D-Manp-(1→4)-β-D-Fucp-(1→4)-α-D-Fucp-(1→; (II) →3)-α-L-Rhap-(1→4)-α-D-Glcp-(1→; (III) →3)- α -L-Rhap-(1→6)- α -D-Manp-(1→3)- α -L-Fucp-(1→3)-β-D-GlcNAcp-(1→. LPSs in the homologous system showed an antigenic activity.

In *P. agglomerans* P1a, P324 and 8488 LPSs were established the unique OPS structures and heterogeneity of lipids A structures.