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Current Research Interests:

1. Plant cell elongation (symplastic and intrusive growth), with special emphasis on the role of cell wall polysaccharides.
2. Highly cellulosic (gelatinous) type of secondary cell wall (present in many fiber crops, tension wood, etc.): development, supramolecular structure and functional role realization.
3. Oligosaccharins - physiologically active fragments of plant cell wall.
4. Spatial organization of complex polysaccharides (rhamnogalacturonan I, glucuronoarabinoxylan).

The main achievements:

1. The concepts about the ways of plant fiber growth have been revised. Marker features of the various stages of fiber formation - initiation, coordinated and intrusive growth, maturation - were identified.
2. Peculiarities of distribution and structure of the major matrix glycans of primary cell walls (type II) - mixed-linkage glucan and glucuronoarabinoxylan - were characterized. These peculiarities corresponded to the different stages of elongation growth and correlated with the rate of cell expansion in various organs.
3. The approaches to the study the mechanisms and regulation of intrusive growth were developed. It was established that fiber intrusive elongation occurred by diffuse growth and led to formation of symplastically isolated domain.
4. New physiologically active fragments of plant cell wall polysaccharides (oligosaccharins) were found and their involvement in the pant adaptive response as endogenous regulators was demonstrated.
5. The specific (gelatinous) type of the secondary cell wall, formed by many fiber crops and tension wood, was characterized. The processes forming the basis for the cell wall biogenesis of this type were identified.
6. A set of approaches for studying the structure and metabolism (in the intact plant) of individual cell wall polymer (stage-and tissue-specific galactan, which plays a key role in cell wall supramolecular structure formation), was developed.
7. It was shown that the galactan got strongly retained by cellulose microfibrils after deposition into the cell wall, and its extraction by even strong alkaline solutions was not

effective. A method for the complete destruction of the fiber cell wall and the release of matrix polysaccharides, strongly retained by cellulose, was developed.

Two well-grounded monographs were published, International Symposium "Plant Fibers: View of Fundamental Biology" (2009) and All-Russia conference “Fundamental Glycobiology” (2012) were held in by our lab team.

List of publications:

1. Mikshina P.V., Chernova T.E., Chemikosova S.B., Ibragimova N.N., Mokshina N.Y., Gorshkova T.A. Cellulosic Fibers: Role of Matrix Polysaccharides in Structure and Function // Cellulose. 2013. Chapter 4. P.91-113. http://dx.doi.org/10.5772/51941 .
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9. Biogenesis of Plant Fibers / Ed. T.A.Gorshkova. M.: Nauka, 2009. 260c.
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11. A.I. Zabotin, T.S. Barisheva, O.I. Trofimova, T.E. Toroschina, I.A. Larskaya, O.A. Zabotina Oligosaccharin and ABA synergistically affect the acquisition of freezing tolerance in winter wheat. // Plant Physiology and Biochemistry. V.47. 2009. P.854-858
12. Gurjanov O.P., Ibragimova N.N., Gnezdilov O.I., Gorshkova T.A. Polysaccharides, tightly bound to cellulose in cell wall of flax bast fibre: Isolation and identification // Carbohydrate

Polymers. 2008. V. 72. P.719–729.

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