STRESS RESISTANCE ON THE EXAMPLE OF SUPRAMOLECULAR-GENETIC LEVEL OF PLANT DEVELOPMENT

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(Ideological direction of the epigenetic phenotype (from Doctor of Biological Sciences R.N. Churaev)
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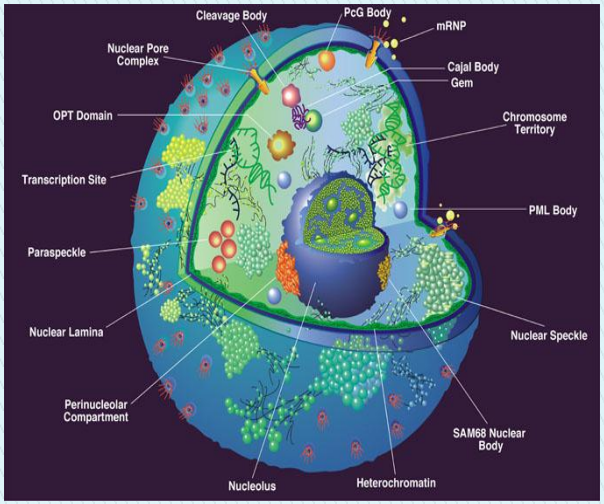
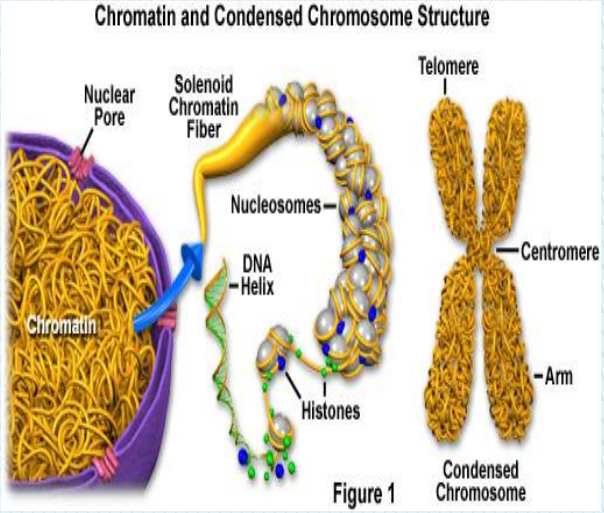
From the standpoint of the concept of **supra**molecular biochemistry (non-covalent interactions), on a model object of the epigenetic system of transitions of a spring wheat cultivar to a stress-resistant winter cultivar, an analysis of the barrier localization of proteomic ***super***molecular assemblies on the interface of the cell nucleus was carried out: on the s**upra**blocks - nucleoplasma (Np), eu- (Chr-I), heterochromatin Chr-II), nuclear matrix (NM) of the total chromatin matrix (TChrM).

Biochemical analysis of cell nuclei induced to organ-specific, coordinated-regular growth, hatching wheat germ

Cell nucleus

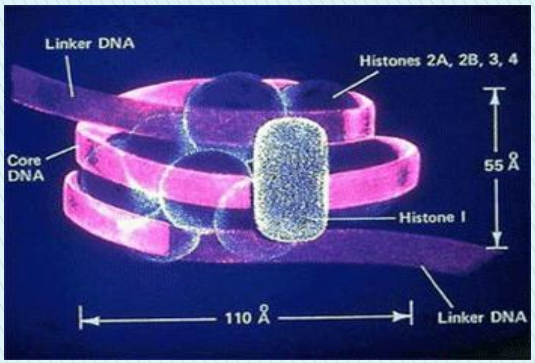


1.1. Age of hatching embryos, h (collection seeds from VIR)					
24	30	36	42	organs	48
Whole High-differential Embryo-germ			Coleoptile Mesocotyl Root		
1.2. Isolation of cell nuclei					
1.3 Isolation of **supra**-structure-blocks with an increase in the ionic strength of the salt gradient that helps to weaken the electrostatic interaction					
0,14 M NaCl	0,35 M NaCl	2M NaCl	6M GuHCl		
Nucleoplasm, Labile chromatin (Np)	"Eu" chromatin loosely bound to NM (Chr-I)	"Hetero" chromatin tightly bound to NM (Chr-II)	Nuclear matrix (NM)		
1.4. Gradient elution with GuHCl-guanidine hydrochloride, at the interface between non-histone and histone-supercomplex-ensembles of supra-structure-blocks, by ion exchange chromatography on IRC-50 (Heidelberg), prepared for work according to the description [Ivanova et al., 1975]					
Step concentrations					
6,0 - non-histone acidic proteins - (Ngb) 8,9 - lysine-rich, linker histone - (HI) 10,6- moderately lysine-rich histones - (H2A+H2B) 13,0 - arginine-fortified histones (H3+H4)' 40,0- arginine-rich histones - (H3+H4)"					

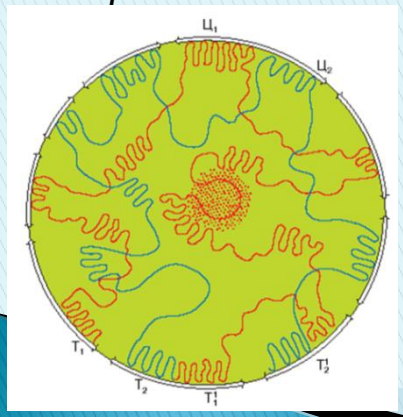


Features of the reorganization of the *super*molecular proteome at the interface of topologically associated supra-blocks of TChrM in the process of initiation of growth morphogenesis of the genetic subsystems of the whole organism of spring and winter wheat derived from it

Nucleosome Mathematical Model

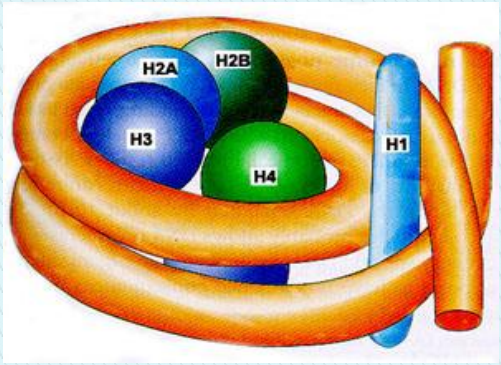


Arrangement of chromosomes in the interphase nucleus

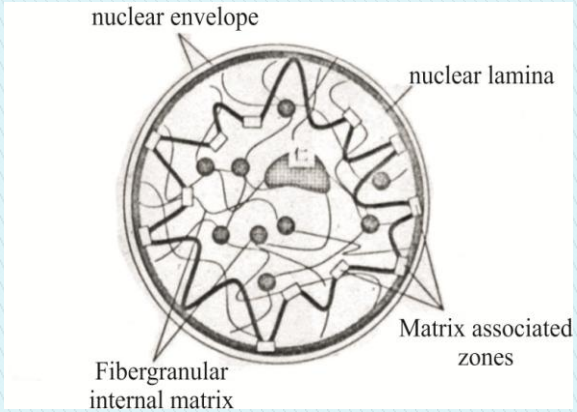


Total chromatin blocks	Organogenesis	Proteomic *super*molecular assemblies-structures	
		Spring	**Winter**
		42 ч.	
Np	**Coleoptile**	HI	(H2A+H2B)≥ HI≥ Hгб
	Mesocotyl	**(H3+H4)"**	HI≥ Hгб
	Root	HI	**(H3+H4)"**≥(H3+H4)'
Chr-I	**Coleoptile**	(H2A+H2B)	(H3+H4)'
	Mesocotyl	**(H3+H4)"**	(H2A+H2B)
	Root	(H2A+H2B)	(H2A+H2B)≥ HI
Chr-II	**Coleoptile**	(H3+H4)'	HI≥ Hгб
	Mesocotyl	HI	(H3+H4)'
	Root	HI	(H3+H4)'**+(H3+H4)"**
NM	**Coleoptile**	(H2A+H2B)	(H3+H4)'
	Mesocotyl	Hгб	Hгб
	Root	Hгб≥ HI	Hгб≥ HI≥ **(H3+H4)"**
		48 ч.	
Np	**Coleoptile**	(H3+H4)'	Hгб
	Mesocotyl	(H2A+H2B)	HI
	Root	HI	(H2A+H2B)≥ Hгб
Chr-I	**Coleoptile**	Hгб	HI≥(H3+H4)'≥ Hгб
	Mesocotyl	Hгб≥(H3+H4)'	(H3+H4)'
	Root	(H2A+H2B)≥ HI≥ H3+H4)'	(H3+H4)'
Chr-II	**Coleoptile**	(H2A+H2B)	HI≥(H3+H4)'
	Mesocotyl	(H3+H4)'	(H2A+H2B)≥ (H3+H4)'
	Root	(H3+H4)'	HI≥ Hгб
NM	**Coleoptile**	HI≥ Hгб	Hгб
	Mesocotyl	(H3+H4)'	Hгб≥ HI≥(H2A+H2B)
	Root	(H2A+H2B)	HI

Core histone model

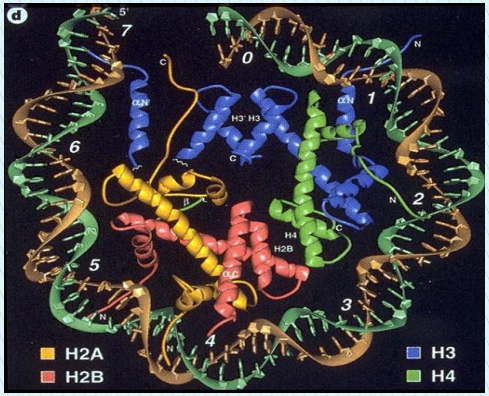


Arrangement of fibrogranular and fibrillar structures in the cell nucleus

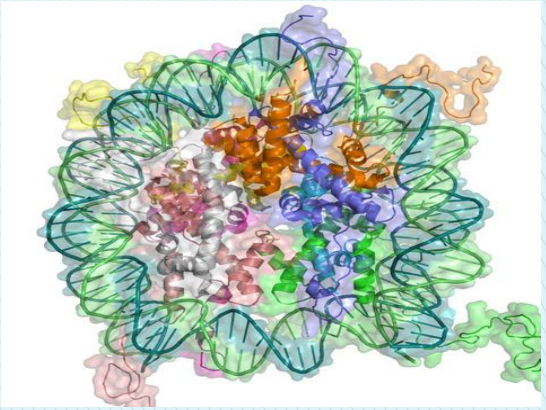


Supramolecular-genetic derivation

Nucleosome molecular model



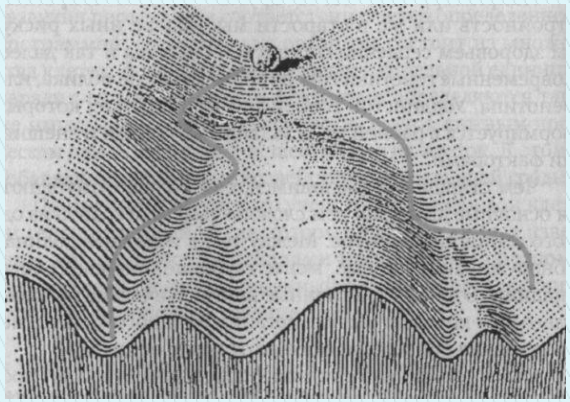
An algorithm for the dynamics of proteomic ***super***molecular ensembles on the interface of **supr**amolecular blocks of TChrM is shown, on which (**Np, Chr-II, NM**) the positioning role of core **(H3 + H4)"** histones in the winter phenotype in the zone of geomorphism of the root system during 42 hours of integration stabilization of physiological genetic stress resistance of the organism. Thus, the proteomic genomics algorithm of integrative physiology leads to the concept of the perspective of the epigenetic landscape of the polyhedron.



The motives of the epigenetic landscape in the depiction of artists

British scientist, born in India Waddington, Conrad Hal 08.11.1905–26.09.1975

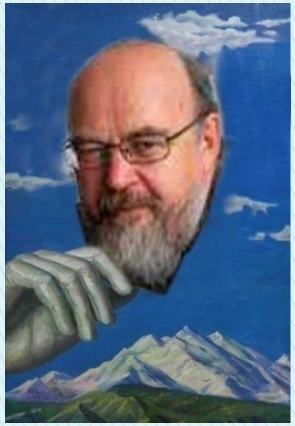
Knight at the crossroads. Victor Mikhailovich Vasnetsov



The epigenetic landscape of Waddington

Memories of Baikal

Overcoming



Reflections from above

Nikas Stepanovich Safronov