

About Molecular and Structural Bases of Life Organization

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Abstract

There are many different publications about mechanics of vital functions of different organisms, about molecular and structural bases of life organization. Their data allow to confirm, that hard direct connection is absent between genotype and phenotype. Today available knowledge about genic organization of individuals are very limited, contradictory and not always objective. Therefore it should be to appraise a role of gens in development of organization very carefully. I think, that nucleic acids are passive material of development of being, let very important, but only instrument for proteins, organizing life of this individual. Just proteins form cells, their organelles and micro-environment, intercellular contacts. It is impossible organization of tissues and organs without the latter. And for this proteins make use different substances, including nucleic acids. I consider as important principle, that tissue integrate systems ensure formation of cells of basic types, then organism integrate system determines moulding of form, moreover changings of just organism integrate systems are fundamental driving force of morphological evolution. Results of my investigations make it possible, that individual spatial organization is realized in process of inter-organic interactions, uneven growth of organs, the rate of which usually are falling in accordance with maturing of tissues. Influence of environment on development of organisms and organs (epigenetic factor) plays key role in realization of genetic information.

Keywords: Organism; Organ; Cell; Growth; Development; Genotype; Phenotype; Interaction

Introduction

Now it is dominated point view about primary role of nucleic acids in vital functions. But analysis of widely known publications about mechanics of being performs distinctions and common outlooks of their authors on organization of the development. This analysis allows to confirm, that hard direct connection is absent between genotype and phenotype, structure and functional activity of genome and albuminous apparatus, including biosynthesis of proteins, and also between them and morphogenesis. Today available knowledge about genic organization of individuals are very limited, contradictory and not always objective. Therefore it should be to appraise a role of gens in development of organization very carefully [1-4]. I think, that nucleic acids are passive material of development of being, let very important, but only passive instrument for proteins, organizing life of this individual. Just proteins form cells, their organelles and micro-environment, intercellular contacts. It is impossible organization of tissues and organs without the latter. And for this proteins make use different substances, including nucleic acids. I consider as important principle, that tissue integrate systems ensure formation of cells of basic types, then organism integrate system determines moulding of form, moreover changings of just organism integrate systems are fundamental driving force of morphological evolution. Results of my own investigations make it possible, that individual spatial organization is realized in process of inter organic interactions, uneven growth of organs, the rate of which usually are falling in accordance with maturing of tissues. Influence of environment on development of organisms and organs (epigenetic factor) plays key role in realization of genetic information [4-6].

Molecular Bases of Vital Functions

I discussed this problem in the articles [7,8]. Cell, its parts and connections with other cells (micro surroundings of cell or intercellular substance) consist of large number of different molecules and their combinations. I regard protein as molecular pro-constituent of the life: this molecule is capable to autoregulation of its shape, beginning of its secondary structure that is accompanied by corresponding changings of micro surroundings of protein molecule. All other molecules, including nucleic acids, are using by proteins as instruments for organization itself and its micro surroundings, optimization its function by means of morphogenesis of super molecular complexes with different composition and structure – ultra structures of cells and their micro surroundings. I think always, that nucleic acids are passive material for development of living organisms, let very important, but only instrument for proteins, organizing individual life. Just proteins forms cells, their organelles and micro surroundings, intercellular contacts and without one's all it is impossible organization of tissues and organs. For this, proteins used are of different substances, including nucleic acids. Influence of environment on development of organisms and their organs (epigenetic factor) plays key role in realization of genetic information [9,10]. Degeneration of mesonephroses is famous example of relations genetic and epigenetic factors in embryonal organogenesis [11-13]. I demonstrated that cranio-caudal degeneration of embryonic mesonephroses is conditioned by violation of their blood supply by means of strain and constricting of their arteries under pressure intensive growing organs, surrounding mesonephroses [9]. About genetic programmed of degeneration of embryonic mesonephroses and another organs: the genome contains information about primary structure of proteins and perhaps about order of its realization. Proteins take part in formation of cells of all organs in quite another state (secondary, tertiary or quaternary structures) and in connection

with another substances. Changings of states of proteins and their compounds, and then cells and their connections, tissues and organs depend from state of surroundings and environment of individual at whole. In other words, destruction and proliferation of cells may be mechanics of development, but it is not their causes, and themselves have their causes [10]. Genomes do not programs each movement of proteins, and on this base – each movement of cells and organs, individual at whole, and only its possibility in definite environment of individual development. Another thing, if nucleic acids are damaged in such a way, that genetic information about primary structure of proteins or its transcription are disturbed.

Structural Bases of Vital Functions

Different authors paid attention on compartmentalization of cell by means of structural proteins for regulated distribution of different enzymes and accordingly regulated localization of different metabolic processes. It is lead to formation of different organelles in cell: structural complexity of living begins from macromolecules, continues at the level such structures as membranes and organelles, and then it is formed cells, tissues, organs and their systems, organisms at whole [14-17]. About middle of XIX century anatomists began to separate all human organs on two groups – somatic and vegetative organs. Thus human body is separated on two parts – soma and viscera, tracts, conducting fluids and irritation (cardiovascular and nervous systems), were selected in special department. In other words, human body is arranged as polychamber cavities, its walls are soma (supporting-motive apparatus and the integument). Body of annelids has polymer structure: partitions divide their body on the parts with similar structure and autonomous cavities. Something of similar is observed in arthropods, such segments of body in mollusks grow together in different degree – quasi-segmentary structure of their body, as in man, although to a far lesser complexity [18]. Human lymphatic system has polysegmentary construction too: in condition of deficit of own energy of lymph flow intervolved segments of lymphatic bud organize partial movement of lymph from organs to veins – the basic, passive and the active in addition [19]. Segmentation (separation of coats on segments) and compartmentalization (separation of cavities on compartment) are sides of single process of development of organisms in evolution and ontogenesis [20]; their bodies are separated on autonomous parts (cells and their organelles, organs). Forms and mechanics of atomization may be different, but main content and direction of this process are always the same – rise of effectiveness of function of biosystem, its stability and adaptation in conditions of changeable environment. Therefore experimenters study mechanics of morphogenesis of segments up to now [21]. On results of my own investigations I suppose, that formation of somite connects with twirl of soft body of embryo in process of its caudal lengthening. During this loose mesenchyme is deformed lightly with increasing of circulation of intercellular fluid, that must stimulate growth of capillaries. Blood vessels introduce into mesoderm with thread of somite. Vessels with blood are derivative of mesoderm; therefore it came out as autoregulation of its development. I agree with supposition, that patterns of segmentation are results multilayer process of development, hierarchic interactions of epigenetic mechanics and expression of genes [22-24]. In others words, genetic determination and epigenetic regulation of somitogenesis are interconnected [25,26], including autoregulation of development of mesoderm and embryo at whole.

Oclusion

So how living organism is built? May be as follows: it is the network of different proteins in connection between them and different another substance, in different aggregate state, with different solidity and different configuration. Accumulations of such joining of proteins become centres of life, determined as cells, their central figures are chromosomes, proteins too, but in connection with nucleic acids. Borders are conditionally in biosystem, established by man, no without grounds, of course, but biosystem doesn't suppose it knows. And what is it for biosystem? May be organism functions as Child's system of gradients or something like?

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