Phenotype transformations during epigenesis of human placenta
Synopsis and atlas

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The monography contains scientific papers of morphology, in which the authors proposed to identify and evaluate the phenotypic transformations of structural elements, both at endometrium level, considered as biological fertile terrain for the zygote implantation, as well at the placenta chorionic plate level, location of biological barriers within fetal-placental system. Phenotypic transformations of endometrium were evaluated in the dynamic stages of anatomical conditions preparation for zygote hemyalogrefa. Phenotypic transformations determined by genesis, evolution, modeling and remodeling of choriale villosities were assessed at the level of chorionic plate. Phenotypic transformations determined by interrelations and reciprocal inductions between trophoblast, mesenchyme and blood capillaries were evaluated at choriale villosities stroma level. Phenotypic transformations of the structures involved in the organization of uteroplacental circulatory biosystem were assessed at the level of endometrial stroma junction with decidua basalis.

The current paper highlights the perenity of phenotypic transformation in placental epigenesis, both through the existence of mesenchymal and trophoblast stem cells, as well as through the involvement of fibrinoid substance. In this matter, the authors consider that the basis of phenotypic transformations evaluation within placental system is represented by the concept of “trophoblast cells turn-over” which opened new perspectives in understanding these phenomena. Equally, authors have developed a new structural concept in mesenchyme-vascular relations organization, following the assessment of structural interrelationships and reciprocal induction process between umbilical blood vessels and mesenchyme. The authors nominate two effects of these reports: "Parangium alanto-chorionic" and "Mesangium choriovillous". In all the chapters of the monography, forensic implications of endometrium structures pathology, hemo-chorial barriers, fetal and trophoblastic membranes, chorial villosities and fibrinoid substance structures, relations between umbilical blood vessels and mesenchyme, fetal-placental and uteroplacental circulatory systems structures, as well as social and forensic implications of antepartum fetus intrauterine death and newborn viability after performing antepartum surgical operations on fetus are analyzed.

The monography contains 15 chapters, 97 color boards and 484 bibliographic references and imposes both through writing clarity, as well as through macro- and micro-anatomical iconography, personally performed by authors with high-performance digital photography equipment. In conclusion, I am convinced that this monography will partially fill a void felt in the acknowledgement of procreation biosystem structures.

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Morphological study of human procreation biosystem represented the reference point for the monography authors, through theoretical and practical issues raised on one side by functional structures involved in genesis and implantation of the zygote and on the other side, by embryo and fetus evolution. The main objectives for the authors of the 15 monography chapters were macro- and micro-anatomical analysis of phenotypic transformation within endometrium and placental structures which participate either in zygote hemi allograft or in the evolution of embryo and fetus.

Particular attention is drawn to phenotypic transformations of structures at the level of chorionic plate, determined by interrelations and reciprocal inductions between trophoblast, mesenchyme and blood capillaries within chorial villosities stroma. Equally, authors conducted a rigorous analysis regarding assessment and significance of phenotypic transformation within structures of procreation biosystem, in examination or forensic of pregnancy and abortion. The monography contains a total of 97 color boards, representing important iconographic and informational value and 484 bibliographic references implemented in the 15 chapters of the paper.

The monography imposes by the fact that harmoniously combines macro- and micro-anatomical researches, which represent an important contribution to the functional morphology acknowledgement of trophoblastic, mesenchymal and vascular structures within procreation biosystem in its epigenesis dynamics. Through content and perspectives that it opens for future research, the monography represents a useful tool both for researchers, as well as for medical specialists in normal and pathological morphology, in obstetrics and gynecology, forensic and not least, for medicine students and residents.

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The study of placenta was highly debated in the history of knowledge through analysis and evaluation of its relations and interactions with maternal-fetal structures. However, the structures of human procreation biosystem are incompletely known.

The monography entitled "Phenotype transformations during epigenesis of human placenta. Synopsis and atlas" contains a total of 15 chapters, exposing results of researches performed by university stuff, under the scientific leadership of Professor Gheorghe S. Dragoi, MD, PhD, Titular member of the Academy of Medical Sciences of Romania, Anatomy Department of the University of Medicine and Pharmacy from Craiova, during a program of interdisciplinary studies and research focused on phenotypic transformation in the human procreation biosystem.

Authors selected and analyzed from macro- and micro-anatomic point of view, the following functional structure, in their epigenesis dynamic: funiculus omblilicalis, amnion, choroid lamina, choriall villosities, intervillous spaces, hemochorial barriers decidua, fibrinoid substance, prenidational endometrium, fetal-placental and utero-placental circulatory systems. Many issues raised by the authors represented the motivation for functional research: - What are the anatomical-functional criteria for macroscopic assessment of placenta right after deliverance or after cesarean extraction? - What are the determinant factors of synchronism and phenotypic transformation of endometrium isogenic structures in ensuring endometrial structures perennially during procreation period in women? - What are the tissue interrelations underlying structural heterogeneity of chorial villosities? - What mechanisms ensure chorionic villosities homeostasis by the trophoblast? - What is the significance of anatomic and forensic phenotypic transformation of amnion and lamina chorial? - What are the variability limits of chorial villosities phenotype in placental orthology and pathology? - What is the role of angiogenesis and vasculogenesis during formation and remodeling of blood vessels inside chorial villosities? - Who assures chorial villosities perennially during gestation? - Are there biodynamic structure that may control blood flow inside villous capillaries network? - What are the relations and reciprocal inductions between trophoblast, mesenchyme and blood capillaries of chorial villosities structure in the epigenesis of placenta? - What are the anatomical-functional particularities of capillary networks located at the border of umbilical circulatory systems: arterial and venous? - What is the role played by fibrinoid substance in remodeling and regimen of placental structures in their epigenesis? - What are the microanatomic characteristics of antepartum gaseous exchange structures for survival in amniotic fluid environment and also for survival in postpartum atmosphere? - What are the phenotypic transformations of placental structures which may cause antepartum fetal death? At what age can the fetus be considered a human being in terms of forensic and from legally point of view?

By macroanatomic and microanatomic performed studies, the authors elaborated outstanding contributions to the phenotypic transformation of fetal and maternal-placental structures, that ensure, through remodeling, regimen, angiogenesis and vasculogenesis processes, the perennially of structural elements within procreation biosystem in temporal-spatial gestation period. Researches performed by authors of studies found in the monography are
original and elaborated on human biological material, respecting the principles of medical and scientific research ethics codes. Anatomical imaging, performed with high-performance photo-digital devices is representative in understanding placental functional morphology. Through contributions brought to the acknowledgement of human placenta structures in their epigenesis dynamics, the monography represents an important work in anatomical literature, clinical obstetrics and forensic and it also contributes in understanding physiologic and pathophysiologic processes that occur in human procreation biosystem.

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