

**Резюмета на научните публикации  
на доц. д-р Минко Господинов Минков, д.м. представени  
за участие в конкурс за заемане на АД „Професор“,  
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*А. Хабилитационен труд*

**А.1. Минков, М. М. Костова. Анатомия на човека: по следите на времето от древността до наши дни. Варна, Стено, 2019. 128 стр.**

Човешкото тяло е най-съвършеният инструмент, който като вместилище на най-висшата форма на съзнание в природата, позволява на човека да проникне във видимото и невидимото, оставяйки самото то загадка и тайна за хилядолетия.

Терминът „анатомия“ идва от гръцки: „ана“ – върху, „томи“ – режа и значението на тази дума, която на латински е „дисекция“, посочва неразривната ѝ връзка с нейния основен метод: дисекцията, разрязването на човешкото тяло, с цел да се изучи неговата вътрешна структура. Приложението на този метод се случва за първи път през около 300 г. пр. н. е. И този момент се счита за основополагащ в развитието на анатомията като наука.

Следва потъване в тъмнината на догмата и невежеството в продължение на столетия и отново скок с появата на великия Андреас Везалий, който отново поставя трупа на дисекционната маса, за да разкрие научната истина за съвършенството на човешкото тяло.

През 1537 г. Везалий полага успешно изпита за степен доктор по медицина и едва 22-годишен е назначен за лектор по хирургия и анатомия. Той извършва дисекция на човешкото тяло, като нарушава и окончателно скъсва с традицията текстът-описание да се чете от катедрата, а друг да дисецира: той заема мястото на дисектора и свързва преподаването с директното наблюдение.

През 1543 г., 28-годишен, Везалий публикува своя велик труд „De Humani Corporis Fabrica“ („За строежа на човешкото тяло“), откривайки нова ера в развитието на медицината, като полага непоклатимо основата на новата анатомия.

Въпреки грешките на Гален в анатомията, свързани с безкритичното пренасяне на особеностите на строежа на животинското към човешкото тяло, във „Fabrica“ Везалий поддържал практическия подход на Гален към дисекцията като нещо важно за преподавателите и студентите.

През 1628 г. във Франкфурт е публикувана книгата на Уилям Харви „Анатомично изследване на движението на сърцето и кръвта у животните“, в което авторът ѝ изложил своята теория за кръвообращението и представил експериментални доказателства за нейната вярност.

Днес модерните технологии позволяват да се влезе дори в клетката, да се докоснат и манипулират нейните структури, а един студент от първи-втори курс знае вероятно повече за анатомията на човешкото тяло, отколкото най-големите учени от древността.

Книгата е посветена на стотиците знайни и незнайни изследователи, очаровани от тайната на човешкото тяло и отдали живота си за нейното разкриване.

## *Б. Учебни помагала*

**Б.1. Костова, М., М. Минков. Общоезикова и общонаучна лексика в научния текст. Учебен речник за чуждестранни студенти по медицина, стоматология, фармация. Варна, Книгоиздателство ЗОГРАФ, 2013. 196 стр.**

Изследванията и приложените към тях практически разработки предлагат нови идеи в учебната лексикография, насочени към специфичния контингент на чуждестранните студенти в българските медицински университети.

Учебният речник „Общоезикова и общонаучна лексика в научния текст“ включва около 9000 думи от учебници по биология, анатомия, хистология, цитология, физиология, физика, биофизика и патофизиология. Той е помагало за работа с учебните текстове и е предназначен главно за чуждестранни студенти в българските медицински университети.

Учебните текстове съдържат четири вида лексика: 1. Общоезикова от ниво А1-В1 от европейската езикова рамка (ЕЕР); 2. Общоезикова от ниво В2-С2 (ЕЕР); 3. Общонаучна лексика и 4. Специална (предклинична и клинична терминология).

Общоезиковата лексика от ниво А1-В1 е позната на студентите от подготвителен курс. Медицинската терминология, която се въвежда за първи път, е нова и за българските студенти и се обяснява подробно от преподавателите в лекциите и упражненията по специалните дисциплини. Често тя се визуализира с илюстрации и това подпомага разбирането и усвояването ѝ.

Общоезиковата лексика от ниво В2-С2, както и общонаучната лексика, типична за академичните текстове и заемаща в количествено отношение по-голямата част от техния обем, е същинската трудност (наред със синтактичните особености на научния текст) в работата на чуждестранните студенти с тези текстове. Често тя съдържа дълги и трудни за четене и произнасяне думи, сложни думи, чужди думи, както и думи със специфични значения и синтактични функции. Необходимостта от преодоляването на тези трудности в текста забавя както скоростта на четене, така и степента на разбиране на научната информация.

Именно с идеята да бъдат подпомогнати чуждестранните студенти в първите етапи на тяхното обучение в медицинския университет в работата им с учебния текст е създаден настоящият речник. Той е представен като двуезичен речник – българско-английски, но съдържа и трета колона за самостоятелна работа, където студентът може да преведе думата на родния си език, да посочи синоним, да обясни тълкувателно значението ѝ, както и да отбележи пример за употреба. Тази трета колона дава възможност за по-задълбочена работа с думата.

**Б.2. Минков, М., М. Костова. Някои специфични аспекти на учебната лексикография с оглед обучението на чуждестранните студенти по специалните предмети в Медицински университет. Варна, СТЕНО, 2013. 32 стр.**

Въпреки непрекъснато усъвършенстващата се методика на обучението по общ и специализиран език в нефилологически вуз, преобладаващата част от студентите се сблъскват с труднопреодолими препятствия в първите години на обучението си по

специалността. Някои от тях са свързани с недостатъчната подготовка по специалните дисциплини от средното училище, други – с недостатъчно развитите навики за анализ и изучаване на научна информация, трети – с недостатъчната степен на владеене на новия език, на който се провежда обучението. Първите две от посочените трудности се проявяват индивидуално за различните обучаеми, но третата е валидна за всички. Студентите имат нужда от помощ в работата с текстовете на български език, но в програмата няма достатъчно време за увеличаване обема на обучението по български език и самите те не разполагат с достатъчно време да посещават допълнителни занятия.

При слушане (на лекции, обяснения по време на упражнения) трудностите се състоят в несъответствието между скоростта на речта на лекторите, голямото количество нови думи, логическата сложност на текстовете, от една страна, и темпа на възприятие на новата информация от чуждестранните студенти, от друга.

При четене основните трудности за тях са огромното количество нови и разнообразни думи, неспособността да определят степента на тяхната важност, а също и синтактичната сложност на изреченията и текста, в резултат на което извличането на основната информация не винаги е успешна. Нерядко стилът на учебниците – като индивидуална особеност на стила на авторите, е по-близък до стила на сложен научен труд, отколкото до стила на учебника като книга за обучение, което също усложнява способността за пълноценно и адекватно възприемане на информацията от текста.

При говорене основната трудност е синтаксисът, което, освен чисто езикова некомпетентност, е резултат и от неясно мислене, т. е. недостатъчна подготовка от предходните етапи на усвояването на информацията – слушане и четене. Когато съдържанието на думите не е ясно докрай, логическите връзки между тях е трудно да се осъществят. А тъй като думите изразяват мисълта, това показва липса или недостатъчно добра връзка между понятията: ако знанието е възприето правилно, тази правилност на съдържанието би могла да бъде изразена при говорене, дори и в неперфектна езикова форма. Същото е валидно и за писменото предаване на възприетата от студентите научна информация.

Важен инструмент в помощ на студента в работата му по специалността на този етап е речникът. Но ползването на съществуващите такива – общоезикови или терминологични, не е оптимистична алтернатива за него, тъй като, ако са терминологични – тълковни или преводни, не са съобразени с нивото му, те са твърде сложни. Тълковните, а също и общоезиковите, ако са обемни, изискват много време за търсене на думи, а ако са кратки – не съдържат всички търсени словни единици. Освен това не всички студенти могат да ги ползват, тъй като не всеки владее езика на превода (обикновено английски), а преводни речници на родния му език обикновено няма.

Ето защо учебната лексикография тук е особено актуална. Тя е гъвкава, тъй като може да се съобрази със специфичните особености на аудиторията, за която е предназначена, от една страна, а от друга – да отговори адекватно на техните нужди с конкретни цели и специфично съдържание.

Няма специално разработени речници за чуждестранни студенти в българските университети, насочени именно към този първи етап от тяхното обучение по специалността – I – III курс, който е най-критичен за тях и който е от особена важност, тъй като създава основата за същинското им професионално образование в клиничните направления по-нататък.

Именно това е предметът на нашето изследване и приложените към него практически разработки.

Считаме, че адекватно приложими са 5 вида учебни речници: 1) речник на общезиковата и общонаучна лексика; 2) учебен терминологичен речник; 3) смесен тип речник; 4) речник на чуждите думи; 5) медицински учебен речник-разговорник, като ще разгледаме всеки един поотделно.

Важно е да се отбележи, че всички те са: 1. Учебни речници; 2. Базираны са върху актуални за студентите учебни текстове; 3. Предназначени са конкретно за аудиторията на чуждестранните студенти в медицински университет.

#### ***В. Пълнотекстови научни публикации в периодични издания и сборници от конгреси и конференции***

**В.1. Kanellaki-Kyparissi, M., M. Minkov, K. Koliakou, V. Knyazhev, R. Guidoin, G. Marinov. Sem, Histological and Immunocytochemical Investigations in the Agger of Varicose Great Saphenous Vein Valves. – *ARS Medica Tomitana*, 16, 2010, 2, 59-67.**

It is well known that the valve agger is a part of the venous wall which plays an important role in the hydrodynamic function of the valve. However, the structure of the valve agger has not been completely clarified yet. The aim of the present study is to establish more detail on its structure, in both healthy and varicose human great saphenous veins. Segments of veins were examined by SEM, light microscopy, as well as by immunocytochemical methods. Some structural peculiarities were observed in this part of the valve complex. In the healthy veins, in comparison with the other parts of the venous wall, the valve agger was thicker and contained large number of vimentin-positive cells and small number of smooth muscle  $\alpha$ -actin positive cells. During the varicose process the number of the latter cells was increased and some of them were observed in the valvular cusp's stroma, in different distances from the agger. Whether this phenomenon may perform a reaction against the increasing hydrostatic pressure is discussed. According to our Opinion, the valve agger may be the place where migration of smooth muscle  $\alpha$ -actin positive cells takes place and, thus, it may be involved in the processes of development, survival, adaptation and pathology of the valve cusp.

**В.2. Костова, М. И., М. Д. Станчева, М. Г. Минков. Модель учебного словаря по специальности для иностранных студентов в болгарском вузе. – В: Современные проблемы гуманитарных и естественных наук. Пятая международная научно-практическая конференция. Москва, 29-30 декабря 2010 г. Москва, 2010. с. 115-118.**

Мы разработали модель учебного словаря по специальности, которая применима к разным специальностям, в разных вузах. Словарь состоит из нескольких разделов. Во-первых, узко специализированный толковый терминологический словарь. Здесь включены базовые термины, типичны для специальности. Вторая часть может включать термины сопутствующей дисциплины /если есть такой/: например, если это словарь по биохимии, сопутствующая специальность – химия. В словаре по анатомии такой сопутствующей дисциплины нет. Третья часть: общеспециальные термины. Четвертый раздел: общенаучная лексика. Пятый раздел: общелитературная /общезыковая/ лексика. В последнем разделе включаются более сложные слова общезыковой лексики, относящиеся к уровню C1-C2 по европейской языковой рамке.

**B.3. Marinov, G., M. Minkov. The Department of Anatomy, Histology and Embryology at Varna Medical University "Prof. Dr. Paraskev Stoyanov" on the Eve of its Half-Century Jubilee. - *Scripta Scientifica Medica*, 43, 2011, 2, 57-78.**

The Department of Anatomy, Histology and Embryology is the largest preclinical department of the Medical University – Varna, a well-respected centre for education and research. It originated as two separate Departments in 1962 – Department of Anatomy and Department of Histology and Embryology. The Department of Anatomy was founded and headed by Dr. Vanko Vankov, associate professor at that time. The Department of Histology and Embryology is founded in 1962 too. Two assistants were appointed – Dr. Svoboda Vankova and Dr. Milka Kiliovska. Dr. Emanuil Chakarov was appointed Head of the Department of Histology and Embryology in 1965 with the rank associate professor. After the unification of two departments in 1973 the Department of Anatomy, Histology and Embryology provides the training of the first- and second-year students into subjects from the curriculum of the specialties of medicine, dental medicine and pharmacy. As mentioned above the Departments is proud of its unique bone-joint collection, corrosion cast preparation, contrast stained preparations of the central nervous system, topographic-anatomical preparations, museum collections of X-rays, CAT-scans and angiograms, a large collection of histological and electron micrographs of cells, tissues and organs. The Department of Anatomy, Histology and Embryology – Varna hosted the First course of X-ray anatomy for the academic staff of all Departments in Bulgaria, September 1966, five national congresses of the Bulgarian Anatomical Society with international participation (1971, 1978, 1981, 1997 and 2011), First National Conference of Bulgarian Anatomical Society (1992), Workshop "Morphological Basis of Synthetic and Secretory Function" Varna (1987), and is co-organizer of the 76<sup>th</sup> Congress of Anatomische Gesellschaft (1981), of Third Symposium and School "Histochemical Methods and Their Application in the Science and Diagnosis" (1988).

**B.4. Hinova-Palova, D., L. Edelstein, V. Papantchev, B. Landzhov, L. Malinova, D. Todorova-Papantcheva, M. Minkov, A. Paloff, W. Ovtsharoff. Light and electron-microscopic study of leucine enkephalin immunoreactivity in the cat claustrum. – *J Mol Hist*, 43, 2012, 6, 641-649. (DOI 10.1007/s10735-012-9448-5).**

The claustrum is a complex telencephalic structure owing to its reciprocal connectivity with most – if not all – cortical areas. However, there is a paucity of data in the literature concerning its histochemical components, including opioid peptide neurotransmitters. The aim of the present

study was to examine the morphology, distribution and ultrastructure of leucine-enkephalin-immunoreactive (Leu-enk-ir) neurons and fibers in the dorsal claustrum (DC) of the cat. Seven healthy, adult male and female cats were used in our study. All animals received humane care. They were irreversibly anesthetized and transcardially perfused with fixative. Brains were removed, postfixed, blocked and sectioned. Sections were incubated with polyclonal anti-Leu-enk antibodies using the Avidin-Biotin-Peroxidase Complex method. Leu-enk-ir neurons and fibers were distributed throughout the DC. Some of neurons were lightly-stained, while others were darkly-stained. Light-microscopically, they varied in shape: oval, fusiform, multipolar and irregular. With regard to size, they were categorized as small (15  $\mu\text{m}$  or less in diameter), medium (16-20  $\mu\text{m}$  in diameter) and large (21  $\mu\text{m}$  or more in diameter). No specific pattern of regional distribution was found. On the electron microscope level, immunoproduсt was observed in neurons, dendrites and terminal boutons. Different types of Leu-enk-ir neurons differ in their ultrastructural features, including two types of synaptic boutons. No gender-specific features were observed. In conclusion, it is our hope that our study will serve to contribute to a better understanding of the functional neuroanatomy of the DC in the cat, and that it can be extrapolated and applied to other mammals, including humans.

**B.5. Minkov, M., M. Vankova, R. Minkov, S. Terzieva, T. Dimitrov, I. Velikov. Complications during a supraclavicular anesthesia of the brachial plexus with interscalene approach. – *Journal of IMAB*, 18, 2012, 3. DOI: 105272/jimab.2012183.339**

A hemidiaphragmatic paresis is one of the most frequently observed complications following the supraclavicular anesthesia of the brachial plexus with interscalene approach. In patients, crucially dependant on adequate diaphragmic function, hemidiaphragmatic paresis may provoke acute respiratory disturbances. The aim of this study was to analyze the anatomical features the brachial plexus with regard of the anesthesia of specific areas of the shoulder and the upper limb. A dissection of the cervical and brachial plexuses was done in human cadavers. We established that in some cases the phrenic nerve and the accessory phrenic nerve arise from the superior trunk of the brachial plexus. This type of anatomical arrangement significantly increases the risk of hemidiaphragmatic paresis during supraclavicular anesthesia with interscalene approach because the anesthetic tends to invade the supraclavicular space.

**B.6. Минков, М. Г. Общелитературная и общенаучная лексика в болгарских текстах по цитологии и гистологии и подготовка иностранных студентов по специальности.. – В: Психология и педагогика: методика и проблемы практического применения. Сборник материалов XXIV Международной научно-практической конференции. Ч. 2. Новосибирск, 6 марта 2012 г. Новосибирск, Изд. НГТУ, 2012. с. 170-175.**

Учебные тексты по цитологии и гистологии выдвигают специфические трудности для студентов первого курса с болгарским неродным языком. Они связаны прежде всего с лексикой и стилистикой. Мы обратили внимание на характеристики общенаучной и общелитературной лексики по цитологии и гистологии, отправляя выводы данной работы к преподавателям по специальности. Они могут иметь ввиду определенный набор слов общелитературной и общенаучной лексики, встречающихся с высокой частотностью в учебных текстах как языковую базу для иностранных студентов и при введении практических занятий со студентами следить за своей речью, пользоваться этими словами при объяснениях, не заменяя с чужими словами или специфическими синонимами и т.д.

**В.7. Минков, М. Г., М. С. Иванова, П. П. Николова, И. И. Пашалиева, М. И. Костова.** Здоровье как ценность в современном болгарском обществе. – В: Современная медицина: тенденции развития. Материалы международной заочной научно-практической конференции. Новосибирск, Изд. ЭКОР-книга, 2012. с. 129-134.

Сущность принципа Всемирной организации здравоохранения состоит в том, что здоровье - центр человеческого развития, являясь в то же время базовым ресурсом, от которого зависит успешное общественное развитие. Ставя здоровье и защищенность жизни как основополагающую ценность в триаде „человек-общество-государство“, мы считаем, что деньги должны служить человеку, а не человек – деньгам. Взгляд, который раскроет огромный потенциал, так как предоставит общий базовый интерес – как отдельному человеку, так обществу и государству. Он – прямой путь к гуманизации и гармонизации функционирования триады и единственная возможность, обеспечивающая не только защиту физического здоровья, но и личностное и общественное благополучения.

**В.8. Hinova-Palova, D. V., L. Edelstein, B. V. Landzhov, E. Braak, L. G. Malinova, M. Minkov, A. Paloff, W. Ovtcharoff.** Parvalbumin-immunoreactive neurons in the human claustrum. – *Brain Struct Funct*, 2013, DOI 10.1007/s00429-013-0603-x.

The morphology and the distribution of the parvalbumin-immunoreactive neurons (PV-ir) were studied in the human claustrum. PV-ir neurons were observed throughout the claustrum, with the highest numbers noted in the central (broadest) portion as compared with the dorsal and ventral aspects. Reaction product was evident in the neuronal perikaryal, dendritic processes, and spine. In the majority of these labeled neurons, the cytoplasm was devoid of lipofuscin pigment. Cell bodies varied widely in both shape and size, ranging from oval and small, to multipolar and large. PV-ir neurons were classified into two groups, primarily based on dendritic morphology: spiny neurons with long and straight dendrites, and aspiny neurons with thin and curving dendritic processes. PV-ir fibers were seen throughout the neuropil, with many immune-positive puncta noted.

**В.9. Ovtcharoff, W., M. Gratzl, B. Landzhov, L. Malinova, D. Hinova-Palova, M. Minkov, A. Paloff, L. Jelev.** Immunohistochemistry of synaptic proteins for synaptic exocytosis. – *Scripta Scientifica Medica*, 45, 2013, 1, 29-34.

The synaptic proteins synaptobrevin/VAMP, SNAP-25 Syntaxin1, NSF and  $\alpha$ -SNAP were revealed by means of immunocytochemistry. Materials from cerebral cortex of adult, newborn and postnatal rats (P6 and P11) were used. Immunostaining for synaptobrevin/VAMP was mainly around the synaptic vesicles, where - as the immunolabeling for SNAP-25 and syntaxin1 was revealed in most cases of the cytoplasmic surface of the presynaptic membrane and to a lesser extend – on synaptic vesicles. Immunostaining for NSF and  $\alpha$ -SNAP was found out not only on the axoplasm of axonal endings and varicosities, but also in perikarya and dendrites. In cerebral cortex of newborn rats, a small number of immunopositive presynaptic parts could be observed. The number of these immunolabeled structures increases evidently with increasing age of rats.

**B.10. Hinova-Palova, D., L. Edelstein, B. Landzhov, M. Minkov, L. Malinova, A. Paloff, W. Ovtcharoff. Light microscopic immunocytochemical identification of leucine enkephalin in human claustrum. - *Scripta Scientifica Medica*, 45, 2013, Suppl.1, 23-28.**

Leucine-enkephalin is a potent and naturally-occurring opioid peptide which serve to inhibit other neurotransmitters involved with pain perception, thereby reducing its emotional and physical impact. Nevertheless, there is little data in the literature concerning leucine-enkephalin-immunoreactivity (Leu-enk-ir) in the human claustrum. The objectives of this study were to confirm the existence of leucine-enkephalin immunoreactive neurons and fibers in the human claustrum. Light microscopy was used to describe their morphology and distribution. Samples of claustrum were obtained from the brains of two females (39 and 48 years of age) and two males (27 and 42 years of age). The brains did not signs of pathology or trauma. Immunoreactivity to Leu-enk was assessed via Avidin-Biotin Complex Method. Light-microscopic analysis confirmed the presence of Leu-enk-ir neurons and fibres in all areas of the human claustrum. The cell bodies varied in shape and size, and were divided unto three groups: small, medium and large. The density of immunostaining varied both within and between the cell types, with some neurons, staining more darkly or lightly than others. The large and medium sized cells most likely correspond to claustrrocortical projection neurons while the small-sized cells appear to be inhibitory interneurons. It is our hope that these results will be contributed to a better understanding the functions of claustrum, in both health and disease, given its relationships with the development of autism, schizophrenia, Alzheimer disease, Parkinson disease and Huntington disease.

**B.11. Landzhov, B., E. Dzhambazova, L. Malinova, L. Edelstein, A. Bozhilova-Pastirova, D. Hinova-Palova, M. Minkov, A. Paloff, W. Ovtcharoff. Immunohistochemical Study on Distribution of Cannabinoid CB1 Receptors in the Rat's Prefrontal Cortex After Cold Stress Procedure. - *Scripta Scientifica Medica*, 45, 2013, Suppl. 1, 29-33.**

The prefrontal (PFC), which mediates the emotional coping response to different stress-ful paradigms, is composed of distinct parts depends on stimulus involved physical or psychological stress. It also plays a role in a number of neurological conditions. It's known that neuro-endocrine control of homeostatic and reproductive functions including stress response and energy metabolism in fulfils by important signaling molecules as endogenous cannabinoids. The aim of the present study was to examine the effects of cold stress on distribution of CB1-receptors in PFC of rats. Immunohistochemical procedure for CB1-receptors was performed in adult male Wistar rats. The data were entered in the computer program, recorded automatically, calculated and compared by Student's t-test. We found CB1-immunoreaction in axons and dendrites as well as in cell bodies where they presented as puncta on somata. The cells bodies were comprised of several distinct shapes: pyramidal, oval, fusiform and multipolar. Numerous fine-beaded fibers and puncta were seen on a handful of pyramidal large-sized neurons and many puncta were observed around the oval-shaped small- and medium-sized neurons. The PFC in cold stress rats demonstrated around 18% higher density of CB1-receptors compared with controls. In conclusion our results showed that cold stress exposure increased distribution of CB1-receptors in PFC of rats. These experimental data suggest that endocannabinoid system in this brain area may play an important role in the continuity of homeostasis in cold stress.



**B.12. Malinova, L., B. Landzhov, A. Bozhilova-Pastirova, D. Hinova-Palova, M. Minkov, L. Edelstein, A. Paloff, W. Ovtcharoff. CB1 receptors in the thalamic reticular nucleus during acute immobilization stress of the rat: an immunohistochemical study. - *Scripta Scientifica Medica*, 45, 2013, Suppl.1, 43-46.**

Cannabinoids and opioids interact in a number of ways that could be therapeutically beneficial. The CB1 receptors are implicated with the endocannabinoid-mediated modulation of stress, pain, visceral sensation, synaptic plasticity in the thalamus via GABAergic signaling. Thalamic reticular nucleus (TRN) is a thin sheet of GABAergic neurons surrounding anterolateral surface of the thalamus. In our immunohistochemical study we demonstrated expression of CB1 immunoreactive neurons in a light microscope during a normal condition and after the acute stress in rats. We found higher expression of CB1 immunoreactivity in stressed animals compared with control group. Opioids and cannabinoids have been shown to have analgesic properties and they are considered as drug targets for the treatment of numerous neurological disorders, pain and stress.

**B.13. Jeleu, L., R. Romansky, K. Guirov, M. Minkov, W. Ovtcharoff. Morphological changes in the rat aorta endothelium at the clamping sites after surgical anastomosis. - *Scripta Scientifica Medica*, 45, 2013, Suppl.1, 57-59.**

This study aimed to investigate on en face preparations the morphological changes in the rat aorta endothelium at the clamping sites while performing surgical anastomosis. Adult male Wistar rats (14-18-month-old, 390-420g) were used for the experiments. Under surgical anesthesia, the postrenal part of the abdominal aorta was dissected, clamped proximally and distally, cut and restored microsurgically using 10-0 suture. The clamping time was 30-40 min. At different days after surgery the animals were sacrificed, their aorta fixed and removed from the body and preparations for en face observation were made. *En face* preparations, obtained at the first postoperative day, showed complete denudation of the clamping sites. The most interesting endothelial cell population was noted at the borders of the clamping sites on the 3<sup>rd</sup> day after surgery – a large number of small endothelial cells and also few endothelial cells having very large size. At the later stages, the endothelial cell layer advanced rapidly to the denuded areas, as the complete restoration was observed after day 14.

**B.14. Jeleu, L., K. Guirov, M. Minkov, W. Ovtcharoff. Morphological changes in the wall of great saphenous vein after radiofrequency ablation. - *Scripta Scientifica Medica*, 45, 2013, Suppl.1, 60-62.**

Radiofrequency ablation (RFA) is a relatively new method for endoluminal thermal occlusion of the incompetent saphenous veins. The aim of the present study was to investigate microscopically the changes in the venous wall after routine RFA procedures. Short pieces (n=7) from the knee segment of the great saphenous vein were taken during RFA procedures. The removed segments were immersion fixed in 10% formalin and proceed to routine histology examination. Microscopically, the venous wall after RFA showed circular disintegration of the intimal layer. In addition, cylindrical medial lesions with disintegration and intercellular splits and gaps were observed. No transmural thermal lesions were seen. The present results highlight the mechanism of predetermined tissue damage after RFA procedures of the great saphenous vein.

**B.15. Kostova, M., M. Minkov, P. Tsvetkov. A dictionary of general language and general lexis as a handbook for foreign medical students. – JAHR – European Journal of Bioethics, 4, 2013, 7, p.183-194. (Proceedings from the International conference “The Language of Medicine – from Its genesis to the Culture and Ethics of Communication”).**

There is represented a new lexicographic edition, which is intended for foreign students in medicine, pharmacy and stomatology in the Bulgarian medical universities: Bulgarian-English training dictionary, reflecting some basic difficulties, which the foreign students encounter at work with training texts in the subject in the first years of their training in Bulgarian language.

**B.16. Hinova-Palova, D., L. Edelstein, B. Landzhov, M. Minkov, L. Malinova, S. Hristov, F. Denaro, A. Alexandrov, T. Kiriakova, I. Brainova, A. Paloff, W. Ovtsharoff. Topographical distribution and morphology of NADPH-diaphorase-stained neurons in the human claustrum. - *Front. Syst. Neurosci.*, 27 May 2014 | <https://doi.org/10.3389/fnsys.2014.00096>**

We studied the topographical distribution and morphological characteristics of NADPH-diaphorase-positive neurons and fibers in the human claustrum. These neurons were seen to be heterogeneously distributed throughout the claustrum. Taking into account the size and shape of stained perikaryal as well as dendritic and axonal characteristics, Nicotinamide adenine dinucleotide phosphate-diaphorase (NADPHd)-positive neurons were categorized by diameter into three type: large, medium and small. Large neurons ranged from 25 to 35  $\mu\text{m}$  in diameter and typically displayed elliptical or multipolar cell bodies. Medium neurons ranged from 20 to 25  $\mu\text{m}$  in diameter and displayed multipolar, bipolar and irregular cell bodies. Small neurons ranged from 14 to 20  $\mu\text{m}$  in diameter and most often displayed oval or elliptical cell bodies. Based on dendritic characteristics, these neurons were divided into spiny and aspiny subtypes. Our findings reveal two populations of NADPHd-positive neurons in the human claustrum – one comprised of large and medium cells consistent with a projection neuron phenotype, the other represented by small cells resembling the interneuron phenotype as defined by previous Golgi impregnation studies.

**B.17. Hinova-Palova, D., B. Landzhov, E. Dzhambazova, M. Minkov, L. Edelstein, L. Malinova, A. Paloff, W. Ovtsharoff. Neuropeptide Y immunoreactivity in the cat claustrum: A light- and electron-microscopic investigation. – *J. Chem. Neuroanatomy*, 61-62, 2014, 107-119. DOI: 10.1016/j.jchemneu.2014.08.007.**

The claustrum is a telencephalic nucleus located ventrolateral to the basal ganglia in the mammalian brain. It has an extensive reciprocal connectivity with most if not all of the cerebral cortex, in particular, primary sensory areas. However, despite renewed and growing interest amongst investigators, there remains a paucity of data concerning its peptidergic profile. The aim of the present study was to examine the presence, morphology, distribution and ultrastructure of neuropeptide Y-immunoreactive (NPY-ir) neurons and fibers in the claustrum of the cat. Ten adult healthy cats from both sexes were used. All animals received human and ethical treatment in accordance with the Principles of Laboratory Animals Care. Subjects were irreversibly anesthetized and transcardially perfused with fixative solution containing glutaraldehyde and paraformaldehyde. Brains were promptly removed, postfixed and sectioned. Slices were incubated with polyclonal anti-NPY antibodies according to the standard avidin-biotin-peroxidase complex

method adopted by our Department of Anatomy, Histology and Embryology. NPY-ir neurons and fibers were found to be diffusely distributed throughout the claustrum, with no obvious topographic or functional patterning other than larger numbers in its central/broadest part (stereotaxic planes A12-A16). Neurons were generally classified by diameter into three sizes: small (under 17  $\mu\text{m}$ ) medium (17-25  $\mu\text{m}$ ) and large (over 25  $\mu\text{m}$ ). Staining density is varied with some neurons appearing darker than others. At the electron-microscopic level NPY immunoprodukt was observed within neurons, dendrites and terminal boutons, each differing relative to their ultrastructural attributes. Two types of NPY-ir synaptic boutons were found. Lastly, it is of interest to note that gender-specific differences were not observed.

**B.18. Hinova-Palova, D., L. Edelstein, E. Braak, B. Landzhov, L. Malinova, M. Minkov, A. Paloff, W. Ovtsharoff. Parvalbumin-immunoreactive neurons in the human claustrum. - *Brain Structure and Function*, 219(5):1813-30, 2014. DOI: 10.1007/s00429-013-0603-x.**

The morphology and the distribution of the (PV) parvalbumin-immunoreactive neurons were studied in the human claustrum. The investigation was carried out on 60-80  $\mu\text{m}$  sections of brains with a short post-mortem period. The PV immunoreactive cells were observed throughout the whole claustrum and their number was higher in the dilated parts of the nucleus. The PV immunoreactive product was present in the neuronal perikarya, the dendritic processes and dendritic spines. The cell bodies were different in shape and size varying ovoid and small to multipolar and large. Based mainly on the morphology of the dendritic tree, the PV immunoreactive neurons were classified into two groups: spiny neurons with long dendrites and aspiny neurons with thin and curving dendritic processes. The PV immunoreactive fibers were found to form a background staining throughout the entire extent of the claustrum. Many PV immunoreactive puncta were also present. The characteristics of the parvalbumin-immunoreactive neurons was studied in the combined pigment – Nissl preparations after decoloring of the chromogen and restaining with Aldehyde fuchsin for lipofuscin and Darrow red for the Nissl substance. The majority of the PV immunoreactive neurons were displaying a cytoplasm devoided of lipofuscin pigment.

**B.19. JeleV, J., S. Marangozov, M. Minkov, D. Hinova-Palova, A. Paloff. Phlebectasia of the internal jugular vein – an accidental finding during contrast CT angiography. - *Scripta Scientifica Medica*, 46, 2014, 2, 48-50.**

The internal jugular phlebectasia is a rare vascular disorder. It is well known in children but infrequently reported in adult. This condition is characterized by an abnormally dilated internal jugular vein that is usually asymptomatic or may cause moderate symptoms of compression. Herewith, we report a case of an asymptomatic right-sided internal jugular phlebectasia in a 37-year-old male patient. During contrast CT angiography of the neck and upper thorax, we accidentally came across an enlarged fusiform segment (maximal diameter 22 mm) of the internal jugular vein. The clinical presentation of this interesting condition and the possible treatment options are discussed.

**B.20. Kiryakova, T., A. Alexandrov, L. JeleV, M. Minkov, P. Timonov, D. Nikolov, G. Gergov, S. Hristov. Cases of Death due to Electrocution of Fishermen Using Carbon Fishing Rods - Morphological Aspects. - *Science & TechnologicS. Union of Scientists - Stara Zagora. Medicine*, 4, 2014, 1, 146-149.**

With the development of technologies for fishing and the affordability of the fishing rods made of light enough and durable materials (carbon fibers, which are conductive) in recent years there are more frequent cases of death among fishermen using such accessories too close to high-voltage power lines. Given to their length such fishing rods may easily come into contact with parts of the electricity network, located close to different ponds, while not excluding the possibility of fulmination during thunderstorms. The morphological changes found in cases of deceased fishermen using carbon fishing rods without considering the danger of the nearby overhead power lines are presented. The established morphological findings are based on data of the Department of Forensic Medicine and Deontology, Medical University – Sofia. Materials and methods: complete forensic medical examination – anamnestic and criminology data, examination of the accident scene, forensic autopsy of the body of the deceased. Results: Fatal accidents associated with fishing rod contact with overhead power lines involve carbon-fiber rods. If a carbon fiber fishing rod is used in proximity of a power line there is a significant risk of a fatal electric shock, due to the fact that these fishing rods are excellent conductors of electricity. It is not necessary for the rod to touch the cables because the electricity may arc (“jump”) over considerable distances. Predisposing factors are the wet feet and shoes of the fishermen, which reduces the resistance of the skin and makes easier the passage of the electric current through the human body. The morphological changes due to the effect of the electric current represented in the present research are mainly in the skin – from small electrical burns on the palms of the hands and tips of the fingers (entry sites) and soles of the feet (exit sites) to carbonization of the body, depending on the duration of contact with the source of electricity as well as its voltage.

**V.21. Минков, М. Г., М. И. Костова. Учебный словарь-минимум болгарской медицинской терминологии в помощь студентам-медикам англоязычного обучения. – В: Обучение и воспитание: методики и практика 2013/2014 учебного года. Сборник материалов XIII Международной научно-практической конференции. Новосибирск, 16 мая 2014 г. Новосибирск, Изд. ЦРНС, 2014. с.151-153.**

Учебный словарь – гибкая форма для решения разного типа методических задач преподавания общих и специальных дисциплин. В статье рассматривается инновативный учебный словарь со специфическими целями для определенного типа обучаемых.

**B.22. Hinova-Palova, D., B. Landzhov, E. Dzhambazova, L. Edelstein, M. Minkov, R. Fakih, K. Minkov, A. Paloff., W. Ovtcharoff. NADPH-Diaphorase-Positive Neurons in the Human Inferior Colliculus: Morphology, Distribution and Clinical Implications. - *Brain Structure and Function*, 222(4)1829-1846, 2017. DOI: 10.1007/s00429-016-1310-1.**

Using the nicotinamide adenine dinucleotide phosphatase-diaphorase (NADPH-d) reaction with nitroblue tetrazolium, we provided a detailed investigation of the distribution, dimensional characteristics and morphology of NADPH-d-positive neurons in the three main subdivisions of the human inferior colliculus (IC): central nucleus, pericentral nucleus, and external nucleus. In accordance with their perikaryal diameter, dendritic and axonal morphology, these neurons were categorized as large (aver-aging up to 45  $\mu\text{m}$  in diameter), medium (20 -30  $\mu\text{m}$ ), small (13 – 16  $\mu\text{m}$ ) and very small (7 – 10  $\mu\text{m}$ ). Their morphological differences could contribute to varying functionality and processing capacity. Our results support the hypothesis that large and medium

NADPH-d-positive cells represent projection neurons, while the small cells correspond to interneurons. Heretofore, the very small NADPH-d-positive neurons have not been described in any species. Their functions – and if they are, indeed, the smallest neurons in the IC of humans – remain to be clarified. Owing to their location, we posit that they are interneurons that connect the large NADPH-d-positive neurons and thereby serve as an anatomical substrate for information exchange and processing before feeding forward to higher brain centers. Our results also suggest that the broad distribution of nitric oxide (NO) synthesis in the human IC is closely tied to the neuromodulatory action of NO on col-licular neurotransmitters such as GABA and glutamate, and to calcium-binding proteins such as parvalbumin. A deeper understanding of the relationship between NADPH-d-positive fibers in all IC connections and their co-localization with other neurotransmitters and calcium-binding proteins will assist in better defining the function of NO in the context of its interplay with the cerebral cortex, the sequelae of the aging process and neurodegenerative disorders.

**В.23. Бозов, Х., Д. Щерев, Г. Бозова, М. Минков. Смърт на море. - *Авиационна, морска и космическа медицина*, 2018, 1, 22-25.**

На борда на кораба се наблюдава, макар и рядко, летален изход вследствие на заболявания или инциденти. В тази статия се представят ранните и късни признаци на смъртта, поведението на капитана и медицинското лице на борда на кораба, съхранението на тялото и някои медицински и административни процедури. Насочена е към лица, които са оторизирани да оказват медицинска помощ на борда.

**В.24. Бозова, Г., Д. Щерев, Х. Бозов, М. Минков, П. Компански. Здравна профилактика на море. - *Авиационна, морска и космическа медицина*, 2018, 1, 35-42.**

Предотвратяването на заболяванията е важна част от медицината и никъде това не е толкова важно, колкото на борда на кораба. Факторите, въздействащи върху човешкия организъм при плаване по море нямат благоприятен ефект, затова за поддържането на добро здраве на членовете на екипажа, трябва да се спазват някои основни принципи на профилактика, като добра лична хигиена, редовна ваксинация, адекватна дезинфекция, дезинсекция, дератизация, повишаване здравната култура на екипажа и други. В тази статия се разглеждат основните принципи на здравната профилактика на море.

**В.25. Бозов, Х., В. Обретенов, В. Василев, И. Попов, М. Минков, В. Васева, Д. Щерев. Корабна аптека. - *Авиационна, морска и космическа медицина*, 2018, 2, 6 - 9.**

На борда на кораба най-често се развиват различни заболявания от почти всички медицински специалности. В тази статия се представят средствата, чрез които може да се окаже медицинска помощ. Количеството и видовете на лекарствата – лекарствените продукти и медицинските изделия, както и оборудването, трябва да бъдат съобразени с продължителността и района на плаване, видовете предвидени корабни работи по време на плаването, вида на товара и броя на лицата на борда.

**В.26. Бозов, Х., М. Минков, В. Обретенов, Л. Мануелян. Стоматологични грижи на борда на кораба. - *Авиационна, морска и космическа медицина*, 2018, 3, 32-34.**

На борда на кораба се наблюдават някои дентални проблеми. В тази статия се представя поведението при зъбобол, счупени зъби, кървене. Насочена е към лица, които са оторизирани да оказват медицинска помощ на борда.

*Г. Публикувани резюмета на доклади, изнесени на конгреси и конференции*

**Г.1. Kanellaki-Kyparissi, M., M. Minkov, K. Koliakou, V. Knyazhev, R. Guidoin, G. Marinov. Investigations in the Agger of Varicose Great Saphenous Vein Valves. – In: XI-lea Congres al Societatii Anatomistilor din Romania cu participare international. Rezumate. Constanta, 12-15 mai 2010. Constanta, Ovidius University Press, 2010. P.111.**

It is well known that the valve agger is a part of the venous wall which plays an important role in the hydrodynamic function of the valve. However, the structure of the valve agger has not been completely clarified yet. The aim of the present study is to establish more detail on its structure, in both healthy and varicose human great saphenous veins. Segments of veins were examined by SEM, light microscopy, as well as by immunocytochemical methods. Some structural peculiarities were observed in this part of the valve complex. In the healthy veins, in comparison with the other parts of the venous wall, the valve agger was thicker and contained large number of vimentin-positive cells and small number of smooth muscle  $\alpha$ -actin positive cells. During the varicose process the number of the latter cells was increased and some of them were observed in the valvular cusp's stroma, in different distances from the agger. Whether this phenomenon may perform a reaction against the increasing hydrostatic pressure is discussed. According to our Opinion, the valve agger may be the place where migration of smooth muscle  $\alpha$ -actin positive cells takes place and, thus, it may be involved in the processes of development, survival, adaptation and pathology of the valve cusp.

**Г.2. Kanellaki-Kyparissi, M., G. Marinov, M. Minkov, K. Koliakou, V. Knyazhev, D. Kovatchev, R. Guidoin. The Agger of Varicose Great Saphenous Vein Valves – the Structure and Function. SEM, Histological and Immunocytochemical Investigations. - *Scripta Scientifica Medica*, 43, 2011, 2, 131-132.**

It is well known that the valve agger is a part of the venous wall which plays an important role in the hydrodynamic function of the valve. However, the structure of the valve agger has not been completely clarified yet. The aim of the present study is to establish more detail on its structure, in both healthy and varicose human great saphenous veins. Segments of veins were examined by SEM, light microscopy, as well as by immunocytochemical methods. Some structural peculiarities were observed in this part of the valve complex. In the healthy veins, in comparison with the other parts of the venous wall, the valve agger was thicker and contained large number of vimentin-positive cells and small number of smooth muscle  $\alpha$ -actin positive cells. During the varicose process the number of the latter cells was increased and some of them were observed in the valvular cusp's stroma, in different distances from the agger. Whether this phenomenon may perform a reaction against the increasing hydrostatic pressure is discussed. According to our opinion, the valve agger may be the place where migration of vimentin positive cells takes place too and, thus,

it may be involved in the processes of development of the valvular cusp and, particularly, in the seeding and renovating the cellular elements of this stroma during valve development as well as in survival, adaptation and pathology of the valve cusp. Based on the data reported here we allow us to accept that valvular agger presents a part of the venous wall which is differentiated in morphological and functional aspect. Along with its mechanical importance for the hemodynamic function of the venous valve it performs some other significant functions, too. It realizes the connection between the valvular cusp stroma and tissue components of the venous wall. It is the immediate source of various cells migrating into this stroma. It seems possible that some cells migrating into valvular cusp stroma have originated from cells around deeply penetrating intramural vasa vasorum, at particularly from their pericytes at the same place.

**Г.3. Kostova, M., M. Minkov, G. Bekyarova. A dictionary of the General Scientific lexics as a Handbook for Foreign Medical Students. –In: 14<sup>th</sup> Days of Bioethics. International Scientific Conference The Language of Medicine – from its Genesis to the Culture and Ethics of Communication at Faculty of Medicine University of Rijeka. Rijeka, Croatia, May 10-11, 2012. Book of Abstracts. p.70.**

The foreign students in the Bulgarian medical school work with three groups of lexics: 1. conversational lexics; 2. general scientific lexics; 3. medical terminology – general and special. They master their colloquial vocabulary on a certain satisfactory level in a preparatory course. The medical terminology, which is new also for the Bulgarian students, is introduced and explained by the teachers of the special subjects during their lectures and seminars. The actual problem for the students is a general scientific lexics. It constructs the main body of the texts in the student's textbooks and lectures. These words are often long and difficult to read and pronounce; they often are compound or foreign words. From the syntax point of view they are difficult too, because they often belong to the various types of participles with a specific role and meaning in the sentences. The dictionary we prepared is based on the main special subjects (Cytology, Histology, etc.) from the first years of study, when the problem is particularly topical for the foreign students for both understanding and reproducing of oral and written scientific speech.

**Г.4. Edelstein, L., D. Hinova-Palova, F. Denaro, B. Landzhov, L. Malinova, M. Minkov, A. Paloff, W. Ovtcharoff. NADPH-diaphorase-positive neurons in the human claustrum. – In: 42nd Annual Meeting of the Society-for-Neuroscience, New Orleans, October 13-17, 2012.**

Introduction: NADPH-diaphorase (NADPHd) is a marker for neurons producing nitric oxide, somatostatin and neuropeptide Y, whose absence has been implicated as a causative agent in the excitotoxic damage prevalent in both Alzheimer's disease and Huntington's disease. Objective: The objective of this study was to assess the distribution and morphological characteristics of NADPHd-positive cells in the human claustrum.

Sample/Methods: Samples of claustrum were obtained from the brains of two females (39 and 48 years of age) and one male (63 years of age) at autopsy. The brains did not show any overt signs of pathology or trauma. The delay from death until fixation was 6-12 hours. NADPHd histochemistry was employed, along with light and electron-microscopic analysis.

**Results:** NADPHd-positive neurons were irregularly distributed, often in clusters of 10 to 15. Very few positive neurons were observed adjacent to or in close proximity of the extreme and external capsules, or in the claustrum's most dorsal or caudal aspect. Reaction product diffusely filled the cytoplasm of positive neurons, while their nuclei remained stain-free. In many instances, cell staining was so intense that they resembled Golgi-impregnated neurons. These neurons were present throughout the claustrum, primarily in three sizes.

[1] **Large** neurons were 25-35  $\mu\text{m}$  in diameter, displaying multipolar, pyramidal, fusiform, elliptical, irregular, and oval soma. Each had 2-6 primary dendrites which branched into secondary and tertiary dendrites. The tertiary dendrites had an undulating course, radiating 700-900  $\mu\text{m}$  from the soma. Their dendrites spread in all directions, some running parallel to the fibres of the extreme and external capsules. As a rule, they were aspiny, with the axon emanating from the perikaryon with a distinct hillock.

[2] **Medium** neurons were 19-25  $\mu\text{m}$  in diameter, less common than the large type, and displayed round, multipolar or irregular soma, each with 3-4 dendrites with primary dendrites bifurcated or trifurcated into diverging secondary dendrites.

[3] **Small** neurons were 14-18  $\mu\text{m}$  in diameter, with oval or elliptical soma, each with 3-4 dendrites. Primary dendrites were noted as being thin and varicose.

**Conclusions:** Our results provide additional insight into the distribution of NADPHd within the human claustrum. Given the critical importance of NADPHd in the context of neural transmission and its relationship to the etiology and sequelae of both Alzheimer's and Huntington's disease, it behooves us to investigate its presence in the claustrum, which has also been implicated in the development of these life-threatening disorders.

**G.5. Edelstein, L., D. Hinova-Palova, B. Landzhov, L. Malinova, M. Minkov, A. Paloff, W. Ovtcharoff. Neuronal nitric oxide synthase immunoreactivity in the human claustrum: A light- and electron-microscopic investigation. – In: 42nd Annual Meeting of the Society-for-Neuroscience, New Orleans, October 13-17, 2012.**

**Introduction:** Neuronal nitric oxide synthase (nNOS) is a relatively unique neurotransmitter which participates in many physiological and pathological processes, including the development of the nervous system and cell communication. Nevertheless, little is known about the nNOS-immunoreactive (nNOS-ir) neurons and fibers in the human claustrum, which has been the subject of growing interest from the standpoint of multisensory integration/binding, cross-modal processing and spike coincidence detection.

**Objectives:** The objectives of this study were to confirm the existence of nNOS-ir neurons and fibers in the human claustrum, employ light microscopy to describe their morphology and distribution, employ electron microscopy to describe and analyze their ultrastructure and synaptic architecture, verify whether they comprise a specific subpopulation of neurons, and establish whether they present with a specific pattern of organization.

**Sample/Methods:** Samples of claustrum were obtained from the brains of two females (39 and 48 years of age) and one male (63 years of age) at autopsy. The brains did not show any overt signs of pathology or trauma. The delay from death until fixation was 6-12 hours. Immunoreactivity to nNOS was assessed via the Avidin-Biotin Complex method.



F.7. Himova-Palova, D., L. Edelstein, B. Landzhov, M. Minkov, L. Malinova, A. Alexandrov, A. Paloff, W. Ovtsharov. Light microscopic immunocytochemical identification of NPY in human claustrum. - In: XXI National Congress of the Bulgarian Anatomical Society with international participation. Abstracts. Sofia, May 31-June 2, 2013, pp. 76-77.

Neural tube defects are common birth defects occurring in approximately 0.5-2 per 1000 pregnancies worldwide. Among these, the spina bifida is one of the most frequent conditions. An autopsy case of 42-days old male child is presented with multiple neural tube defects. By the external examination of the cadaver the following findings were established: hydrocephalus and spina bifida aperta in the thoracolumbar area with leakage of liquor. The internal examination revealed that sutures between the skull bones were separated, the fontanelles were wide open. The occipital bone and the cranial base had specific relief and porous structure with depressed areas in the inner surface and coinciding prominent areas on the outer surface – a condition known as cranioleakunia. There was also cranioschisis in the inferior part of the occipital bone. The spine was opened at the level of 8<sup>th</sup>-9<sup>th</sup> thoracic vertebra and the spinal cord along with the meninges were located subcutaneously ending with modified subcutaneous cauda equina in the thoracolumbar area. Histological examination of the bone areas with cranioleakunia was performed. Neural tube defects, depending on their severity, might be life-threatening conditions with high mortality rate in infants. The fatal outcome in this case was most probably due to increased intracranial pressure resulting in depression of the cardiovascular and respiratory centers.

F.6. Alexandrov, A., I. Brainova, L. Jelev, V. Ivanova, M. Minkov, S. Hristov. A case of cranioleakunia associated with hydrocephaly and spina bifida aperta. - In: XXI National Congress of the Bulgarian Anatomical Society with international participation. Abstracts. Sofia, May 31-June 2, 2013, pp. 48-49.

Results: Light-microscopic analysis confirmed the presence of nNOS-ir neurons and fibers in all areas of the human claustrum, with neurons commonly found within a network of immunostained fibers. Cell bodies varied in shape and size, and were divided into three groups we've categorized as: small (35% of the sampled population, < 19 µm, but typically 13-17 µm in diameter), medium (45%, 19-25 µm in diameter), and large (20%, > 25 µm in diameter). The density of immunostaining varied both within and between cell types, with some neurons staining more darkly or lightly than others. Electron-microscopic analysis confirmed the presence of nNOS immunoprodukt within neurons, dendrites and terminal boutons, with neurons further defined by their ultrastructural features. Three types of nNOS-ir synaptic boutons were noted. Additional information will be presented.

Conclusions: There are different types of nNOS-ir neurons within the human claustrum. The large- and medium-sized cell most likely correspond with claustrrocortical projection neurons, while the small-sized cell appear to be inhibitory interneurons. It is our hope that these results contribute to a better understanding of the claustrum's function in both health and disease, given its relationship with the development and sequelae of autism, schizophrenia, Alzheimer's disease, Parkinson's disease and Huntington's disease.

**Introduction:** NPY is one of the most abundant peptides in mammalian brain. As such, it is associated with a wide variety of physiologic and behavioral concomitants, including affective disorders, appetite regulation, as well as the facilitation of learning and memory. Nevertheless, there is little data in the literature concerning NPY-immunoreactivity in the human claustrum. **Objectives:** The objectives of this study were to confirm the existence of NPY immunoreactive neurons and fibers in the human claustrum, employ light microscopy to describe their morphology and distribution. **Methods:** Samples of human claustrum were obtained from the brains of 3 female (39, 42 and 48 years of age) and 4 males (27, 39, 41 and 42 years of age). The brains did not show any overt signs of pathology or trauma. Immunoreactivity to NPY was assessed via the Avidin-Biotin Complex Method. **Results:** Light-microscopic analysis confirmed the presence of NPY neurons and fibres in all areas of the human claustrum. Cell bodies varied in shape and size, and were divided into three groups: small 15-18  $\mu\text{m}$  in diameter, medium 20-25  $\mu\text{m}$  in diameter and large 25-45  $\mu\text{m}$  in diameter. Some bore a resemblance to cortical pyramidal cells, with apical and basal dendrites. NPY immunoprodukt was dispersed throughout the cytoplasm, while nuclei remained label-free. The density of immunostaining varied both within and between the cell types, with some neurons, staining more darkly or lightly than others. Many puncta were visible throughout the entire extend from rostral to caudal and from dorsal to ventral of human claustrum. **Conclusions:** These data support the contention that there are different types of NPY containing neurons within human claustrum. The large and medium-size cells most likely correspond to claustralcortical projection neurons while the small-sized cells appear to be inhibitory interneurons. It is our hope that these results will be contributed to a better understanding the functions of claustrum, in both health and disease, given its relationship with the development of autism, schizophrenia, Alzheimer disease, Parkinson disease and Huntington disease.

**Г.8. Landzhov, B., E. Dzhambazova, L. Malinova, A. Bozhilova-Pastirova, A. Bocheva, D. Hinova-Palova, M. Minkov, A. Paloff, W. Ovtsharoff. Immunohistochemical Examination of the Distribution of CB1 Receptors in the Rat's Amygdala After Cold Stress. - In: XXI National Congress of the Bulgarian Anatomical Society with international participation. Abstracts. Sofia, May 31-June 2, 2013, pp. 79-80.**

Stress is one of the environment factors to induce physiological and behavioral changes. Stressful stimuli can disrupt the homeostasis and inability to cope with such aversive inputs has widespread deleterious effects on the biological system. An integrated response to stressful stimuli is an essential component of adaptive process which is critical for the survival of an organism. The central nervous system (CNS) is a crucial mediator during such stress related responses and some limbic structures, particularly amygdaloid complex and its interactions with lower brain stem areas, have be implicated. The concept of stress has evolved into one of a "stress system" wherein complex interactions between central nervous system, limbic system, hypothalamus-pituitary-adrenal (HPA) axis and several components of visceral system occur in response to a variety of stressful inputs. Such interactions play a significant role in the outcome of the stress response and are crucial determinants of health and disease. Complex neurochemical mechanisms are also

known to regulate the activity of stress systems. Literature data revealed that stress alters the levels of many biologically active substances – hormones and mediators, which affect through auto regulation different signaling molecules – like opioids, endocannabinoids and others. The aim of our study was to investigate the distribution of cannabinoid 1 (CB1) receptors in rat's amygdala after cold stress. After the completion of 1 hour cold stress procedure male Wistar rats (180-200g) were anaesthetized and perfused through the heart with fixative (4%paraformaldehyde in 0.1M phosphate buffer). Brains were removed and sectioned by a freezing microtome. After an immunohistochemical procedure the distribution of CB1 receptors was estimated. Twelve sections were utilized for calculation of the neuronal packing density in the amygdala. Our results showed that distribution of CB1 receptors in the rat's amygdala was affected by cold stress.

**Г.9. Malinova, L., B. Landzhov, A. Bozhilova-Pastirova, D. Hinova-Palova, A. Paloff, M. Minkov, W. Ovtsharoff. Morphology of NADPH – diaphorase reactive neurons in the human thalamic reticular nucleus. - In: XXI National Congress of the Bulgarian Anatomical Society with international participation. Abstracts. Sofia, May 31-June 2, 2013, pp. 80-81.**

The thalamic reticular nucleus (TRN) is a thin layer of GABAergic cells around the external medullar lamina of the thalamus. This nucleus is considered as pacemaker, indirectly regulating the activity of the cerebral cortex by thalamocortical and corticothalamic collaterals. On the other hand it has direct connection with different subcortical regions and the other thalamic nuclei. The dendrites of its neurons form a local inhibitory network. The aim of the present study was to determine the morphology and distribution of NADPH-diaphorase positive neurons in the TRN of human brain. Samples of the TRN were obtained from the brains of two females (40 and 45 years of age) and two male (43 and 52 years of age) at autopsy. The brains did not show any overt signs of pathology or trauma. The delay from death until fixation was up to 12 hours. NADPH-diaphorase histochemistry was employed, along with light-microscopic analysis. The light-microscopic analysis of the TRN showed that the nucleus contains the islets of neurons or scattered single NADPH-d-positive cells in different shape. The NADPH-diaphorase positive neurons varied from fusiform, oval, triangular to multipolar in shape. The clusters we found on the anterior portion of sagittal section of the TRN. In the intermediate part a large number of neurons were typical fusiform in shape on the lateral and medial subdivisions, and oval and triangular on the central subdivision of the TRN. The posterior portion consists of predominantly fusiform cell. Our results enlarge the existing data concerning the morphology and distribution of NADPH-diaphorase positive neurons in human TRN.

**Г.10. Paloff, A., D. Hinova-Palova, B. Landzhov, L. Malinova, M. Minkov, A. Alexandrov, I. Brainova, T. Kiriakova, W. Ovtsharoff. NADPH – Diaphorase Positive Neurons in the Human Colliculus Inferior. - In: XXI National Congress of the Bulgarian Anatomical Society with international participation. Abstracts. Sofia, May 31-June 2, 2013, pp. 83-84.**

Introduction: The NADPH-diaphorase is a marker for neurons producing nitric oxide, somatostatin and neuropeptide Y, whose absence has been implicated as a causative agent in the excitotoxic

damage prevalent in both Alzheimer disease and Huntington disease. **Objective:** The objective of this study was to assess the distribution and morphological characteristics of NADPH-d positive cells in the human inferior colliculus. **Materials and Method:** Samples of inferior colliculus were obtained from the brains of two females (39 and 48 years of age) and two males (40 and 63 years of age) at autopsy. The brains did not show any overt signs of pathology or trauma. The delay from death until fixation was 6-12 hours. NADPH-d histochemistry was employed along with light microscopic analysis. **Results:** NADPH-d positive neurons were irregularly distributed, often in cluster of 30 to 45. The NADPH-diaphorase positive neurons were found in all sections from rostral to caudal extension of human inferior colliculus. The shape of NADPH-diaphorase stained neurons ranged from oval, triangular, multipolar to typical fusiform. The large number of NADPH-diaphorase positive neurons were observed in the ventromedial subdivision of central nucleus. Very few positive neurons were observed in external nucleus and pericentral nucleus. Reaction product diffusely filled the cytoplasm of positive neurons, while their nuclei remained stain-free. In many instances, cell staining was so intense that they resembled Goldji-impregnated neurons. Large neurons were 25-35  $\mu\text{m}$  in diameter, displaying multipolar, pyramidal, fusiform, elliptical, irregular, and oval soma. 2-6 primary dendrites were branched into secondary and tertiary dendrites. Medium neurons were 19-25  $\mu\text{m}$  in diameter, less common than the large type, and displayed round, multipolar or irregular soma, each with 3-4 dendrites. Small neurons were 14-18  $\mu\text{m}$  in diameter, with oval or elliptical soma, each with 3-4 dendrites. Primary dendrites were noted as being thin and varicose. **Conclusions:** Our results provide additional insight into the distribution of NADPH-d within the human inferior colliculus.

#### *Д. Участие в конгреси и конференции*

Д.1. **Минков, М.**, Р. Гидоен, В. Княжев. Хронична венозна недостатъчност – индуцирано ремоделиране на клапния комплекс. – III Копривщенски морфологични дни. VII Национална конференция по антропология. 30 май-1 юни 2008 г. Програма.

Д.2. **Minkov, M.**, G. Marinov, R. Guidoin, V. Knyazhev, M. Angelova, S. Kirilova. Pathophysiological mechanisms of occurrence of chronic venous insufficiency of the lower extremities. – Eight International Symposium of Clinical Anatomy. October 10-12, 2008, Varna. Program.

Д.3. Pavlov, S., M. Grosheva, H. Bendella, **M. Minkov**, D. Angelov. Effect of altered trigeminal input and manual stimulation of denervated muscles on the recovery of whisking after facial nerve transection and anastomosis in adult rats. – XIX National Congress of the Bulgarian Anatomical Society with International Participation. Programme. Pleven, 29-31 May 2009.

Д.4. **Минков, М.**, Г. Маринов, С. Павлов, С. Кирилова, С. Терзиева, И. Великов. Влияние на хроничната венозна недостатъчност върху ремоделирането на клапния комплекс на VSM –

светлинномикроскопско изследване. – IV Копривщенски морфологични дни. VIII Национална конференция по антропология. 04-06 юни 2010. Програма.

Д.5. Павлов, С., Х. Бенделла, М. Groшева, А. Иринчев, Е. Скурас, С. Ангелова, Д. Меркрл, Н. Синис, К. Каидоглу, С. Дънлоп, **М. Минков**, Д. Ангелов. Морфологични корелати на възстановената мустачкова подвижност след едновременна лезия на лицевия и троичния нерв при плъхове – ефекти на неинвазивната стимулация на вибрисната възглавничка. - IV Копривщенски морфологични дни. VIII Национална конференция по антропология. 04-06 юни 2010. Програма.

Д.6. Kanellaki-Kyparissi, M., **M. Minkov**, K. Koliakou, V. Knyazhev, R. Guidoin G. Marinov. Investigations in the agger of varicose great saphenous vein valves – XI-lea Congres di Societatiei Anatomistilor din Romania cu participare internationala. 12-15 mai 2010. Program.

Д.7. Kanellaki-Kyparissi, M., G. Marinov, **M. Minkov**, K. Koliakou, V. Knyazhev, D. Kovatchev, R. Guidoin. The agger of varicose great saphenous vein valves – the structure and function. SEM, histological and Immunocytochemical Investigations. – XX National Congress of the Bulgarian Anatomical Society. IX International Symposium of Clinical Anatomy. Programme. September 30-October 2, 2011. Varna, Bulgaria. Program

Д.8. **Minkov, M.**, M. Vankova, R. Minkov, S. Terzieva, T. Dimitrov. Complications during a supraclavicular anesthesia of the brachial plexus with interscalene approach. – XXII Annual Assembly of International Medical Association Bulgaria (IMAB) "Infection and Cancer". 3-6 May 2012, Hotel Admiral, Resort Golden Sands, Varna, Bulgaria. Programme

Д.9. Dyankova, S., N. Stoinov, **M. Minkov**, M. Gabrovska. The students' scientific circle at the Department of anatomy: An Academy for future morphologist. - Jubilee symposium "50 years of the Department of anatomy, histology and embryology". Medical University - Varna. November 1-2, 2012, Varna.

Д.10. Ovtsharoff, W., B. Landzhov, L. Malinova, D. Hinova-Palova, **M. Minkov**, A. Paloff, L. Jeleu. Immunocytochemistry of synaptic proteins for synaptic exocytosis. - Jubilee symposium "50 years of the Department of anatomy, histology and embryology". Medical University - Varna. November 1-2, 2012, Varna.

Д.11. Landzhov, B., E. Dzhambazova, L. Malinova, L. Edelstein, A. Bozhilova-Pastirova, D. Hinova-Palova, **M. Minkov**, A. Paloff, W. Ovtsharoff. Immunohistochemical Study on Distribution of Cannabinoid CB1 Receptors in the Rat's Somatosensory Cortex After Cold Stress Procedure. – Jubilee symposium "50 years of the Department of anatomy, histology and embryology" Medical University - Varna. November 1-2, 2012, Varna.

Д.12. Malinova, L., B. Landzhov, A. Bozhilova-Pastirova, D. Hinova-Palova, **M. Minkov**, L. Edelstein, A. Paloff, W. Ovtsharoff. CB1 receptors in the thalamic reticular nucleus during acute immobilization stress of the rat: an immunohistochemical study. – Jubilee symposium "50 years of

the Department of anatomy, histology and embryology" Medical University - Varna. November 1-2, 2012, Varna.

Д.13. Hinova-Palova, D., L. Edelstein, B. Landzhov, M. Minkov, L. Malinova, A. Paloff, W. Ovtsharoff. Light microscopic immunocytochemical identification of lucine enkephalin in human claustrum. – Jubilee symposium "50 years of the Department of anatomy, histology and embryology" Medical University - Varna. November 1-2, 2012, Varna

Д.14. Jeleв, L., R. Romansky, K. Guirov, M. Minkov, W. Ovtsharoff. Morphological changes in the rat aorta endothelium at the clamping sites after surgical anastomosis. – Jubilee symposium "50 years of the Department of anatomy, histology and embryology". Medical University - Varna. November 1-2, 2012, Varna

Д.15. Jeleв, L., K. Guirov, M. Minkov, W. Ovtsharoff. Morphological changes in the wall of great saphenous vein after radiofrequency ablation. – Jubilee symposium "50 years of the Department of anatomy, histology and embryology" Medical University - Varna. November 1-2, 2012, Varna.

Д.16. Kostova, M., M. Minkov, G. Bekyarova. A dictionary of the General Scientific lexics as a Handbook for Foreign Medical Students. –International Scientific Conference The Language of Medicine – from its Genesis to the Culture and Ethics of Communication. Faculty of Medicine University of Rijeka. May 10-11, 2012.

Д.17. Alexandrov, A., I. Brainova, I. Jeleв, V. Ivanova, M. Minkov, S. Hristov. A case of craniolacunias associated with hydrocephaly and spina bifida aperta. – XXI National Congress of the Bulgarian Anatomical Society with international participation. Sofia, May 31-June 2, 2013. Programme.

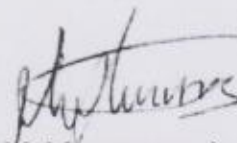
Д.18. Hinova-Palova, D., L. Edelstein, B. Landzhov, M. Minkov, L. Malinova, A. Alexandrov, A. Paloff, W. Ovtsharoff. Light microscopic immunocytochemical identification of NPY in human claustrum. - XXI National Congress of the Bulgarian Anatomical Society with international participation. Sofia, May 31-June 2, 2013. Programme.

Д.19. Landzhov, B., E. Dzhambazova, L. Malinova, A. Bozhilova-Pastirova, A. Bocheva, D. Hinova-Palova, M. Minkov, A. Paloff, W. Ovtsharoff. Immunohistochemical Examination of the Distribution of CB1 Receptors in the Rat's Amygdala After Cold Stress. - XXI National Congress of the Bulgarian Anatomical Society with international participation. Sofia, May 31-June 2, 2013. Programme.

Д.20. Malinova, L., B. Landzhov, A. Bozhilova-Pastirova, D. Hinova-Palova, A. Paloff, M. Minkov, W. Ovtsharoff. Morphology of NADPH – diaphorase reactive neurons in the human thalamic reticular nucleus. - XXI National Congress of the Bulgarian Anatomical Society with international participation. Sofia, May 31-June 2, 2013. Programme.

Д.21. Paloff, A., D. Hinova-Palova, B. Landzhov, L. Malinova, **M. Minkov**, A. Alexandrov, I. Brainova, T. Kiriakova, W. Ovtcharoff. NADPH – Diaphorase Positive Neurons in the 4.7.2019 г. Human Colliculus Inferior. - XXI National Congress of the Bulgarian Anatomical Society with international participation. Sofia, May 31-June 2, 2013. Programme.



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