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## E. HIGHLIGHTS IN MEDICINE – THE PRACTICIONER’S PLATFORM DENTAL MEDICINE AND DENTAL TECHNOLOGY

### 1. THE EFFECT OF ACIDE CHALLANGES ON THE DENTAL TOUGH TISSUES AT AN ULTRASTRUCTURAL LEVEL

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#### **Abstract**

Because the tough dental tissues are formed of a fragile material – hydroxyapatite (natural ceramic) and a softer and more flexible material – mainly type I collagen matrix (natural polymer), can regarded as biological composite structures. Tough dental tissues can be demineralized under 3 clinical circumstances: the action of the acids stemming from bacterial metabolism – the dental carries, the action of the acids that do not come from the bacterian biofilm with an endo or exogenous origin – the erosive dental usage and the action of acids during the therapeutic acid grading – micro-retentive retentions. Tooth decay emphasised at a molecular level an initial external demineralisation, followed by a surface demineralization producing the appearance of white spots. As a result of the actions of acids, in the erosive usage, at a SEM evaluation, one noticed that the corroded surface of the enamel presented structural alterations at the top of the crystallites and in some areas even between crystallites. The action of the phosphoric acid for a period of 15 to 30 seconds led to a dissolution of the global-prismatic pattern, respectively an intraplasmatic demineralization. The evaluation of the surface morphology of the enamel and of the eroded dentine through different acid aggressions proved that the severity of the topographical changes was lower in the concomitant presence of saliva. Studies proved a net gain in terms of mineralsof the dental tough tissues after the use of some remineralizing products (SEM and EDX evaluation). Also, the investigation of the surface state (through AFM and profilometric analysis) and of the surface roughness suggested that the same products increase the dental tissues’ resistance to erosive attacks.

**Keywords:** *acid challenges, de-remineralization, tough dental tissues.*

### 2. CLINICAL RELEVANCE OF THE PULP REGENERATION PROCEDURES

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#### **Abstract**

Pulp regeneration procedures entered in the last decade in day to day practice of the endodontics practice, with the condition of upholding the therapeutic protocol accepted and recommended by the European Society of Endodontology. From this perspective the conservatory treatment possibilities and implicitly the survival hopes of the youth teeth with simple or complicated pulp gangrene or with an atypical chronical periodontitis. The success of the treatment appears due to root which starts to grow in lengths and thickness, the formation of the apical foramen and the on-time restoration of tooth sensitiveness to vitality tests, respectively

by associating the healing of the periapical bone injury. When it comes to present deficiencies, we speak about coronary dystromies given by antimicrobial endodontic dressings and the lack of control related to root regeneration through dentine and pulp conjunctive tissue.

**Keywords:** *Pulp regeneration, endodontics, atypical chronical periodontitis.*

### 3. THE REMOVAL OF THE BROKEN ENDODONTIC INSTRUMENTS WITH THE HELP OF THE ENDODONTIC MICROSCOPE

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#### **Abstract**

**Introduction.** During the manipulation of the endodontic instrument at the level of radicular channels, this can break and the endodontic treatment with therefore be compromised. **Materials and methods.** With the help of the endodontic microscope we identified, in various clinical situations, different broken instruments in the radicular channels. Using the ultrasonic vibration system, we managed to remove these fragments from the radicular channel. **Results.** By successfully removing the broken needle fragments at the level of the radicular channels the endodontic treatment was successfully carried out and the teeth concerned were able to be kept on arches. **Conclusions.** The endodontic microscope combined with the ultrasound system or other means of recovering the broken instrument fragments in the radicular channels represents a revolutionary rescue system in the clinical situations in which the endodontic treatment and the existence of teeth on arches would be completely compromised.

**Keywords:** *endodontic microscope, radicular channels, ultrasonic vibration system.*

### 4. CORRELATIONS OF THE FORMANTS IN SPEECH - IMPACT OF THE DENTITION STATE

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#### **Abstract**

The voiced phonemes in speech are characterized in the spectral domain by the 'formants', which represent spectral peaks. The first two formants (F1, F2) are essential in the recognition of the phonemes, while the pitch, also named zero-formant (F0), or fundamental sound contributes to the prosody. The upper formants, F3-F5, which have much smaller amplitude, contribute to the voice colouring and to prosody. The traits of the formants, amplitude, central frequency, and width, are partly due to the oral (buccal) cavity. Changes in the dentition state modify the formants. It is known that the formants are partly inter-correlated, especially the upper formants with the lower ones. We investigate the influence of the dentition on the correlations of the formants and make suggestions regarding a new test in speech pathology related to dentistry. The test may be useful especially in restorative dentistry.

**Keywords:** *formants, phonemes, dentition.*

## 5. OCCLUSAL FEATURES IN DEPRESSIVE PATIENTS WITH CRANIOMANDIBULAR DYSFUNCTION

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### Abstract

**Introduction.** The relationship between craniomandibular disorders (CMD) and the occlusal and psychological features is a most actual issue. This paper evaluates whether the occlusion (OT) and disclusion (DT) times in depressive subjects are longer than the average values. **Material and method.** Using the T-Scan III-Bio EMG II system, 11 depressive patients with confirmed CMD were evaluated as to the OT and DT durations. **Results.** A significantly prolonged OT was registered in depressive subjects ( $p=0.0008$ ), with no differences compared to the average values of DT ( $p=0.426$ ) and no correlation between the OT and DT durations ( $R_s=0.0364$ ;  $p=0.9029$ ). **Conclusions.** According to the present study, the prolonged OT may be due not only to occlusal but also to some behavioural features; in depressive patients, the extended OT is probably a result of antidepressants' side effects.

**Keywords:** depression, craniomandibular disorder, occlusion time, disclusion time.

## 6. A CENTENARY OF ROMANIAN DENTAL EDUCATION

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### Abstract

The 1<sup>st</sup> of December 1918, the day of the proclamation of the Great Union of Alba-Iulia, represented not only the beginning of the major socio-political transformations but also of some ample renewals in the medical and educational sector in Transylvania. On October 1, 1919, the University of the Superior Dacia appeared in Cluj, including the Faculty of Medicine. Therefore, the foundation of the medical teaching in the Romanian language was laid, which also included dentistry among the other fields of study. Some of the best doctors in the country headed towards this new university as well as some doctors who were working abroad in order to make their contribution, as teachers, to the development of the different fields of study of the medical teaching. In this historical context the first page of the Romanian dentistry was written as well as its study in an organised and enacted background, aligned with the highest standards of the era

**Keywords:** Great Union, dental education, centenary.

## 7. INVISALIGN - THE WORK FLOW OF THE ORTODONTIC AESTHETIC BRACKETS FREETREATMENT

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### Abstract

Invisalign is produced by Align Technology, a multinational company of medical devices based in San Jose, California. Treatment implies an experienced orthodontist and who benefited from training in the field. The average treatment duration is of 13,5 months. It is the only precision technique with CAD-CAM assisted design and manufacture available in the USA, a therapeutic alternative to the fix orthodontic treatment based on the transparent sets of aligners which guide the teeth in correct positions using a gradual force in order to control dental movements and repositioning them in their ideal position. This technique is recommended to adults and teenagers with permanently erupted teeth and a medium compliance level to the orthodontic treatment. Invisalign is at same time a brand and an achievement technique with the help of the aligner computer, offering numerous advantages: Aligners that allow the discreet movement of the teeth and are useful in the treatment of bruxism preventing selective scavengers; Aligners are removable and facilitate a correct brushing and flossing, preserving oral health; Aligners are made of plastic, comfortable, easy to wash, apply and remove, rarely determining gingival irritation or mucosal irritations; Less frequent visits at the ward than those required by the fixed and traditional techniques.

**Keywords:** *Invisalign, ortodontic, CAD-CAM.*

## 8. THE BIOLOGY OF THE INTEGRARII OF DENTAL IMPLANTS

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### Abstract

In the oral implantology field and tissue regeneration industry, we can discover a diverse palette of advanced findings, that highlight the interconnections between the supra and intra systemic factors that are involved in the integration of dental implants in the early osseointegration stage. This is a step that occurs as a result of the cicatrization process that unfolds immediately after the surgery and represents a subsequent post-cicatrization process that is assimilated in the maturation and bone remodelling stage. The immediate integration of the dental implant is dependent on the process of cicatrization and on the immediate biocompatibility. This stage is influenced by the biochemical, bioelectrical, immune and biomechanical interactions between the oral tissues and the dental implant itself. The subsequent stage of the osseointegration process is determined by the dynamic between the advanced biocompatibility and the maturation and bone remodelling process. This phase is conditioned by the molecular, cellular, epithelial growth and by the morpho-functional and biomechanical integration. Both stages of osseointegration are determined by the balance of all the systems that exist in the human body. In this context, we give acknowledgment to professor Vasile Burlui who proved that the osseointegration stage, is actually a relative biologically integration process between the dental implant and the human body. We can now say that this process is in fact a compromise between the practitioner and the patient in the prosthetic implant treatment phase when we find ourselves in the absence of an equally effective solution.

**Keywords:** *biological integration, dental implants, osseointegration process.*

## 9. AN INTERDISCIPLINARY APPROACH REGARDING THE MORPHO-FUNCTIONAL REHABILITATION OF TOTAL OR PARTIAL EDENTULOUS PATIENTS USING ORAL IMPLANT THERAPY

Prof. PhD Carmen Stadoleanu<sup>1</sup>, Univ. Assist. PhD Toni Andor Cigu<sup>1</sup>, Univ. Assist. PhD Oana Adina Popescu<sup>1</sup>, Assist. Prof. PhD Aurel Apintiliese<sup>1</sup>, Univ. Assist. PhD Student Oana Cucoveică<sup>1</sup>

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### Abstract

The complex therapeutic process of patients with total or partial edentulism requires an interdisciplinary approach in order to get an appropriate treatment. In this respect, it is necessary to apply therapeutic strategies that involve the morphological reconfiguration of the occlusion, the rebalancing of the TMJ, the muscular system, and with that, rebalancing the functions of the stomatognathicsystem. The morpho-functional rehabilitation therapy consists in electing the prosthetic substitution solution, the reconfiguration of the main parameters of the stomatognathic system, the reconfiguration of the occlusion, the cranio-mandibular repositioning, the final prosthetic therapy and the functional recovery treatment (extended since the cranio-mandibular repositioning stage, where the dishomeostasia was manifested or decompensated). The morphological and functional rehabilitation of edentulous patients should be achieved gradually, depending on the target set and on the positive feedback; the recovery depending on the establishment of the homeostasis. The therapeutic input that each specialist is giving toward the patient therapyencompasses the good practice andthe optimal result of the therapeutical act.

**Keywords:** *morpho-functional rehabilitation, dental implants, interdisciplinary approach.*

## 10. COMPARATIVE ANALYSIS OF MARGINAL ADAPTATION EVALUATION METHODS - THREE-DIMENSIONAL DIGITAL SCANNING VERSUS SCANNING ELECTRON MICROSCOPY

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### Abstract

**Aim:** The purpose of this in vitro study is to perform a comparative analysis of a novel 3D digital method of evaluating marginal adaptation of single crowns by comparison with a well proven 2D method, in the form of Scanning Electron Microscopy (SEM). **Material and methods:** Five cobalt-chrome copings were manufactured through Selective Laser Melting and were tested using both the three dimensional and the two-dimensional methods of marginal adaptation testing. The data were analysed with the nonparametric version of a two-way analysis of variance using rank-transformed values and the Tukey's post-hoc test ( $\alpha = .05$ ). **Results:** No significant differences were found in the marginal gap ( $P > .350$ ) between the two testing methods when the side by side comparison of the results was performed. As the three-dimensional method is digital, it allows for the measurement of arbitrary points and also a mean value of the deviation can be obtained. **Conclusions:** Both methods of evaluating marginal adaptation of single crowns obtained similar results, but the three-dimensional method of evaluation is better fitted for use in the clinical setting because it allows an instant visualisation of the marginal fit, in a more friendly matter through colour coded maps.

**Keywords:** *scanning electron microscopy, dental technology, digital scanning.*

### 11. TECHNOLOGICAL REQUIREMENTS IN THE ACHIEVEMENT OF MOBILIZABLE PROSTHESES WITH MINI-CONNECTOR

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#### Abstract

Removable dental prostheses are exceptional executions for situations where dental bridges cannot be applied or a dental implant treatment. The difficulty of building is to achieve the maintenance and balancing of the prosthesis on a single hemiarcada practically a unilateral saddle. To achieve maximum yield, clinical tissue conditioning work is required and a perfect achievement of prosthetic teeth construction, and in particular support and stabilization support elements. Essential are inter-cardial contacts and how to achieve support on neighbouring teeth through rigid arms occlusal rest, dental clasps and sliding variants.

**Keywords:** mobilizable prostheses, dental technology, mini-connector.

### 12. THE DENTAL TECHNICIAN'S CONTRIBUTION TO CAD-CAM TECHNOLOGIES

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#### Abstract

CAD-CAM technologies are continuously evolving, reaching the stage where the prosthetic piece can be applied medically without the intervention of the dental technician. Currently there are techniques in which a triple physician collaboration - CAD-CAM - technician is achieved. We can highlight three possibilities of doctor-technician collaboration, intermediate of CAD-CAM technique. The most used technique is physician (data transfer) - CAD-CAM (Infrastructure Execution) - technician (plumbing). There are situations where the technician realizes the model, scans it and schedules the computer. The CAD-beck route in which the CAD-CAM performs the prosthetic piece, the technician removes certain portions and restores the prosthesis. The third route is the one in which the CAD-CAM performs the finite shape of the prosthetic piece, the technician intervening with glazing, the only way to achieve perfect surfaces.

**Keywords:** CAD-CAM technologies, dental technology, prosthodontics.

### 13. THE EFFICIENCY OF AESTHETIC RESTORATIONS PLATED WITH RDC

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#### Abstract

In conceiving the conjunctive treatment plan a special attention is paid to the aesthetic appearance under the conditions of a corresponding biomechanical concept. It refers to the capability of the occlusal reliefs to correctly transmit the forces of stress remaining in the same morphological structure for a long time. It does not tolerate abrasion fractures or other effects the aging of the polymer. Restoration and maintenance of the normal occlusal relief depend equally on modelling and the quality of the DRC. Research efforts are directed towards obtaining DRC resistant to occlusal



impact such as vita enamic. The first hybrid ceramic with a double structure absorbs occlusal forces optimally and this product is the first dental ceramic with a double structure combining the positive properties of ceramic and composite materials, offering a perfect combination of stability and elasticity. VITA ENAMIC provides minimally invasive restorations, keeping as much substance on two levels of dental translucency, providing a natural and aesthetic result.

**Keywords:** *aesthetic restorations, dental technology, minimally invasive restorations.*

#### **14. MARGINAL CLOSURE IN THE CONJUNCTIVE DENTURE ALGORITHM**

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##### **Abstract**

In prosthesis, the prophylactic aspect included in the prosthesis of the teeth is a priority. Perfect marginal closure is mandatory for all types of prosthetic prostheses made on tooth posts. Besides returning to the teeth, for the marginal closing it is necessary to ensure that there is a correct cementation of the unidirectional prostheses, but also the return of the cervical microbial colonies difficult to remove at the level of the dentoprotetic joint. The marginal closure results in the correctness of the proprosthetic executions in the cabinet of the application of the executive technological norms in the laboratory and essentially by the processing of the materials. Marginal closure is possible to clinically check and imperfections at this level require repeat of executions.

**Keywords:** *prosthesis, conjunctive denture algorithm, dental technology.*

#### **15. TECHNICAL EXECUTIONS THAT ENSURE THE HARMONIZATION OF THE PROSTHETIC BASE - THE PROSTHETIC FIELD AT THE TOTAL EDENTATION**

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##### **Abstract**

The rule that directs the treatment of total edentation involves the harmonization of three levels of congruence: the ATM congruence, which is clinically established and transferred to the articulator, under the name of a centric relationship; according to the programmed data, in the articulator there is realized the congruence of the teeth, which by fitting provides the central terminal occlusion and the mandibular movements with dental contact. In order for the three congruences to have a permanent character, the congruence of the prosthetic base-prosthetic field, expressed by a perfect stability and balance of the prosthesis on the prosthetic field, must be achieved. The congruence prosthetic base - prosthetic field is clinically performed by tissue conditioning manoeuvres. Subsequently, it is ensured by technological manoeuvres that comply with the basic constructive rules and the use of materials adapted to the working steps. Post prosthetic manoeuvres must make sure that the three levels of congruence coexist continuously.

**Keywords:** *prosthesis, conjunctive denture algorithm, dental technology.*

#### **16. THE MOLECULAR LEVEL OF SENSITIZATION TO PROSTHETIC BIOMATERIALS**

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### **Abstract**

The composition of biomaterials up to the molecular level has direct implication in fulfilling the biological principle, referring to biocompatibility. In addition to ceramic materials, all dental materials suffer degradations in the oral environment due to mechanical, physical and chemical aggressions. Metals by corrosion release ions from the alloy composition, which affect both the quality of the cladding material and the oral tissues. Polymers always suffer aging phenomena, releasing secondary products of polymerisation phenomena, and in the case of RDC a minimum percentage of the polymer suffers aging phenomena and implicitly releases secondary products. All of these phenomena have also been proven by our research on cell cultures, resulting in aggression including aqueous extracts on living cells.

**Keywords:** *prosthetic biomaterials, ceramic materials, dental technology.*

## **17. THE PREVALENCE AND PATTERN OF PARTIAL EDENTULISM AMONG ADULT PATIENTS IN DOLJ, ROMANIA**

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### **Abstract**

**Objective.** The objective of this study is to assess the prevalence of different partial edentulism types and determine how it is influenced by the different socio-demographic factors. **Materials and methods.** The study group included 584 patients who came to Oral Rehabilitation Clinic of the UMF Craiova. The patients were divided into 3 age groups: 18-30, 31-60 and over 60 years. The patients agreed to participate in the study signing the informed consent. **Results and discussion.** In the younger group of patients, Kennedy class III edentulism was found in about 27% of cases. In adult patients, Kennedy class III had an increased prevalence again (42%). For elderly patients, predominated Kennedy class I and II (31%). **Conclusions.** Among the subjects studied, Kennedy class III was the most common form of partial edentulism in both jaws. With aging, the prevalence of Kennedy class III form of edentulism decreased and Kennedy class I and II increased.

**Keywords:** *edentulism, oral rehabilitation, Kennedy class.*

## **18. ROOT RESORPTION: RADIOLOGICAL FEATURES**

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### **Abstract**

**Introduction.** Root resorption is a pathological process characterized by loss of dental root substance, caused by bacterial infections, traumatic injury, or chemical irritation. The study aims to highlight characteristic radiological aspects for the different types of root resorption, that can be observed on OPG, in order to ease the radiological diagnosis of root resorption. **Materials and methods.** To identify the most representative images, we have used the X-ray base from the Oral

Rehabilitation and Dental Prosthetics Clinic of UMF Craiova. 240 OPGs were analyzed, of which 16 suggestive images were selected. **Results and discussion.** The most encountered type of resorption was inflammatory external, especially in molars. **Conclusions.** Root resorption is commonly diagnosed on OPGs, having low cost advantages and view of the whole dental arch, but also disadvantages, due to magnification errors or overlapping of the dental structures, which may lead to an underestimation of the extent of the lesions.

**Keywords:** *Root resorption, radiology, dental arch.*

## E. HIGHLIGHTS IN MEDICINE - THE PRACTICIONER'S PLATFORM - GENERAL MEDICINE AND GENERAL NURSING

### 1. THE NT-PRO-B VALUES IN HYPERTENSIVE PATIENTS WITH HEART FAILURES II-IV NYHA

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#### Abstract

**Introduction.** The natriuretic peptide, type B (BNP), is a hormone responsible for numerous physiological effects on the cardio-vascular system. The purpose of the research is the study of NT pro-B values among a group of hypertensive patients with heart failures II-IV (NYHA), and its relation to the ejection fraction (FE) and the telediastolic diameter (DTD) of the left ventricle. **Material and methods.** The study included 50 patients with heart failure II-IV (NYHA), admitted at SCM. Sf. Treime. **Results.** Taking into account the NT pro BNP value, the patients were divided into two sets. The first set included 30 patients, average value of NT pro-BNP  $\pm 2884,53$ pg/ml, average FE  $\pm 51,29\%$ , average DTD  $\pm 51,41$ mm. The second set included 20 patients with average value NT pro-BNP  $\pm 201,95$ pg/ml, average FE  $\pm 56,54\%$ , average DTD  $\pm 49,81$ mm. **Conclusions.** The values of the natriuretic peptide type B do not discriminate between the patients with a low FE or low DTD with heart failure II-IV NYHA.

**Keywords:** *hypertensive, heart failure, natriuretic peptide, type B (BNP).*

### 2. CLINICAL EVOLUTION IN PATIENTS WITH PECTORAL ANGINA UNSTABLE AFTER 6 MONTHS OF STATIONARY TREATMENT

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#### Abstract

**Introduction:** Despite the proven clinical efficiency of the complex treatment with antiplatelet agents, coronary revascularization, vasodilators, statins, some coronary patients display recurrent ischemic events. The purpose of the paper: The study of the unstable pectoral angina (API) in patients after 5 months of stationary treatment in correlation with the cardio-vascular risk factors. **Material and methods:** The research included 58 patients with the API diagnosis, surveyed dynamically in

a period of 6 months of complex treatment (coronary revascularization, antiplatelet agents, vasodilators and statins). **Results:** In a period of 6 months there was established an association between the occurrence of the recurrent ischemic events (repeated API, non-fatal IM, cardiac arrest) and cardio-vascular risk factors- diabetes-75%, obesity-33.3%, body mass index- 25%, smoking-32% and dislipidemia-65%. **Conclusions:** Coronary patients require the personalised complex treatment associated with the strict control of the cardio-vascular risk factors.

**Keywords:** *complex treatment, recurrent ischemic events.*

### 3. SERIC EOSINOPHILIA AMONG PATIENTS WITH CHRONIC OSTRUCTIVE BRONCHOPNEUMOPATY AND CARDIO-VASCULAR CO-MORBIDITIES

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#### **Abstract**

The relation between the inflammation and the chronic obstructive pulmonary diseases is a matter of interest because of the effects of the associated pathogens. Among the inflammatory markers present in BPOC, the seric eosinophilia seems to have a specific role in the local and systemic inflammatory process, involved as well in other clinical manifestations associated with BPOC. The increase of the eosinophiles in the blood can be an acceptable substitute for the eosinophilia of the airways and can be an easily-detected biomarker for the assessment of the patients with BPOC. The purpose of the study was the assessment of the seric eosinophilia in patients with accelerated chronic obstructive bronchopneumopathy and cardio-vascular co-morbidities. The clinical study was made on a set of 100 patients with BPOC GOLD I-IV, admitted for the disease acceleration in ISMP Sfânta Treime. The level of the sericeosinophiles can be used in clinical practice for the identification of the patients with BPOC who display an increased risk of developing a new acceleration.

**Keywords:** *chronic obstructive bronchopneumopathy, seric eosinophilia.*

### 4. SYSTEMIC LUPUS ERITEMATOS AND ITS SOCIO-ECONOMIC IMPACT

Prof. PhD Minodora Mazur<sup>1</sup>, Assoc. Prof. PhD Lucia Mazur-Nicorici<sup>1</sup>

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#### **Abstract**

The management of the systemic lupus eritematos (LES) requires the assessment of the development of the disease, organic damage, quality of life. The observation of the co-morbidities and the medical and social impact of the disease is necessary as well. Lupus is an autoimmune chronic disease with a significant social impact. Therefore, it is necessary to research the socio-economic status and to establish its correlations with the patients` disability, the quality of life and matrimonial status according to the age and the debut of the disease. We have established the reliability of the instruments used to assess the adherence to the treatment, general satisfaction and well-being, accelerations and co-morbidities and the determination of the costs and predictive factors in order to lower the expenses. Conclusively, lupus eritematos has significant social and economic consequences.

**Keywords:** *LES. social impact, economic values.*

## 5. LESIONS CHARACTERISTIC TO THE HIV INFECTION- KAPOSI SARCOMA

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### Abstract

The infection with the human immunodeficiency virus, with a durable stadial evolution, progressive, with a possible exitus, is accompanied by opportunistic infections and neoplasias. The KAPOSI sarcoma is a malignant tumor associated with the AIDS disease, rapidly progressive, and comprises the precocious extracutaneous damage, at the level of the oral mucosa, superior airways, lymphatic ganglions, gastro-intestinal or pulmonary tracti. Morbidity remains high in a short while from the occurrence of the first manifestations of the disease. The Regional HIV/ AIDS Centre within the Clinical Hospital for Infectious Diseases Iași comprises approximately 1610 patients, HIV positive, under periodical and retroviral treatment, originating from the north-eastern area of Romania. In the period January 2015- January 2019, out of the total number of sero-positive patients, evaluated periodically, 6 cases displayed mucosal-cutaneous manifestations, specific to the Kaposi sarcoma. Mainly male patients had an altered viral-immunological status. The adherence to the anti-retroviral therapy is prevalent especially in these particular cases, imposing a need to co-operate on a multidisciplinary level among the infectionist, dermatologist, hemato-oncologist, gastro-eneterologist.

**Keywords:** HIV INFECTION, KAPOSI SARCOMA, infection.

## 6. HEALING THROUGH PRAYER

Pr. PhD Student Cristian Ioan Loghin<sup>1</sup>, Pr. Prof. PhD Gheorghe Petraru<sup>1</sup>, MD Isabela Loghin<sup>2,3</sup>, MD Victor Dorobăț<sup>4</sup>, Prof. PhD Carmen Dorobăț<sup>2,5</sup>

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### Abstract

The pleading and continuous prayer recommended by Christ (Luke 18, 2-7) facilitates numerous gifts to the ailing believer and it is considered to be the breathing of the soul. In the present context, when the communication with the surrounding people represents the prevalent concern, talking with God is largely diminished. Jesus` prayer is a healing one because by saying it organizes the undisciplined mind and defends sinful thoughts. Specific prayers within the Euchologion, said by the priest, for the restoration and the consecration of the Man, require a proper spiritual behaviour. One of the new frontier fields of the medicine, the psycho-neuro-immunology, based on detailed and long studies, established the connection between the body and soul, between the mind and the consciousness, between the bodily functions and the psychic functions, and the manner in which these interconnect. It is certain that prayer made with intensity, refreshment and sincerity creates inside the soul a high stage of trust and well-being, and this one, at its turn, makes the immune system to experience an improvement, up to a maximum functionality.

**Keywords:** healing, prayer, psycho-neuro-immunology.

## 7. WHAT CAN BE HIDDEN BEHIND A HYPERTHYROIDISM?

Prof. PhD Liliana Groppa<sup>1</sup>, Univ. Assist. PhD Iuliana Radu<sup>1</sup>

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### Abstract

**Introduction.** One out of eight women suffers for damage to the thyroid. The number of the people who suffer from hyperthyroidism is significant and continues to increase one year after another. One of the co-morbidities in hyperthyroidism is the damage to the locomotor system. **A case study.** It is described the clinical case of a patient who because of the hyperthyroidism developed the damage to the locomotor system in the form of osteoporosis and carpal tunnel syndrome (STC). By underlining the clinical and paraclinical signs the diagnosis was confirmed, and the selective anti-osteoporotic treatment and local uses proved their efficiency with a positive development of the patient's state. **Discussions.** The clinical case described presents an exemplary pattern of damage to the locomotor system in patients with hyperthyroidism, proven through pathognomonic aspects, and the efficiency of the local and the anti-osteoporotic treatment as well. **Conclusions.** The results of the study support the hypothesis that the clinical and paraclinical picture can help as major determiners in the diagnostic of the osteoporosis and STS in patients with hyperthyroidism.

**Keywords:** *hyperthyroidism, osteoporosis, carpal tunnel syndrome, locomotor system.*

## 8. THE MANAGEMENT OF THE FACTORS CONTRIBUTING TO THE TUBULAR DYSFUNCTION

Assoc. Prof. PhD Cornelia Ursu<sup>1</sup>, Assist. Prof. PhD Otilia Eva<sup>1</sup>, Assist. Prof. PhD Laura Romila<sup>1</sup>

<sup>1</sup>Apollonia University of Iași, Romania

### Abstract

The tubular dysfunction holds a major role in the occurrence of the chronic inflammatory pathology with an otic location. Any disturbance of the tubular functions through the mechanic obstruction or of a functional nature leads to the occurrence of specific symptoms of which the most acute is the hypoacusis. The purpose of the present study is to demonstrate the role of the auditory tube (whose dysfunction was underlined through the presence of the chronic adenoitis, the chronic hypertrophic rhinitis, the deviated septum, the nasal polyps) in the occurrence of the chronic otitides. The patient selection for this study was made according to specific clinical and paraclinical criteria. The major contributing factor in the occurrence of the tubular dysfunction was represented, in the studied set, by the chronic adenoitis or the deviated septum according to the age group, although with the prevalence of the chronic adenoitis in patients with otic damage. The conclusions of the study bring into light once again the significance of the preventive stage within the management of the chronic otic inflammatory impairments, in which we ought to identify the contributing factors which should be correctly assessed in each case, with the determination of the proper antibiotherapy and the surgical treatment according to the chronic form of the disease.

**Keywords:** *tubular dysfunction, contributing factors.*

## 9. DENTAL DAMAGES IN THE CHRONIC NASAL OBSTRUCTION

Assoc. Prof. PhD Cornelia Ursu<sup>1</sup>, Assist. Prof. PhD Diana Gheban<sup>1</sup>, Prof. PhD Liliana Sachelarie<sup>1</sup>, Assist. Prof. PhD Cătălina Gârbea, Assist. Prof. PhD Otilia Eva<sup>1</sup>, Assist. Prof. PhD Oana Caunii<sup>1</sup>

<sup>1</sup>Apollonia University of Iași, Romania

### Abstract

The nasal obstruction owes its importance to its frequency in the pathology of the upper airways, nonetheless to the consequences it has on the development and operation of the whole body. Regardless of the etiology, it determines the modification of the permeability of the upper airways and the compensatory transition to the oral breathing. If the management in the nasal obstruction is mainly the otorhinolaryngologist's responsibility, dentists with orthodontic interests approach the dental and maxillary abnormalities which occur in these patients. The study which we have made aimed at the identification of the causes of the nasal obstruction concerning a selected group of teenagers and the determination of the correlations related to the presence of the dental and maxillary abnormalities. The data collected led to the conclusion according to which the causes contributing to the nasal obstruction are multiple, but once they are detected they require a medical and surgical treatment with the purpose of the reduction of the needs of subsequent correction through orthodontic treatments or orthognathic surgery.

**Keywords:** *nasal obstruction, dental and maxillary abnormalities.*

## 10. ASPECTS CONCERNING THE PEDIATRIC INFECTIONS WITH *KLEBSIELLA PNEMONIAE* ESBL

Assoc. Prof. PhD Letiția-Doina Duceac<sup>1</sup>, Assist. Prof. PhD Daniela-Luminița Ichim<sup>1</sup>, Assist. Prof. PhD Cezarina Dragomirescu<sup>1</sup>, Assist. Prof. PhD Cristina-Maria Jitoreanu<sup>1</sup>, Assist. Prof. PhD Liviu Stafie<sup>1</sup>, Assist. Prof. PhD Sergiu Straticiu<sup>1</sup>

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### Abstract

Infections with ESBL-producing *Klebsiella spp.* are a challenge for hospitals antibiotic management and a problem for community healthcare. The purpose of the study was to evaluate descriptively a group of paediatric patients with infections with ESBL-producing *K. pneumoniae* strains. **Material and method.** The study was conducted on 24 patients admitted to the "Sf. Maria" Children's Emergency Clinical Hospital from Iasi. **Results.** Most cases were reported in infants 0-12 months (75.00%) in the second trimester, with a predominance of cases in boys admitted in Acute Therapy and Intensive Care Unit. The most frequent prelevates were hypopharyngeal aspirates (29.16%) and urocultures (16.67%). All 24 isolates were ampicillin-resistant and amoxicillin with clavulanate-resistant, but 18 of them (75.00%) were resistant to cephalosporin. **Conclusions.** The problem of ESBL-producing *K. pneumoniae* strains should be to the attention of medical professionals, especially in pediatric units, to perform the most appropriate guidelines for antibiotic use, in order to control the infections with multidrug resistant microorganisms.

**Keywords:** *Infection, KLEBSIELLA PNEMONIAE, paediatric patients.*

## 11. THE IDENTIFICATION OF THE PARTICULARITIES IN THE PROCESS OF COMMUNICATON REGARDING THE SPECIALISED TEAM MEMBERS IN THE SANITARY FIELD WITH THE PURPOSE OF EFFICIENT CO-OPERATION WITHIN THE MEDICAL PRACTICE

PhD Student Gabriela Ciolpan<sup>1</sup>

<sup>1</sup>Doctoral School of Economics and Business Administration, Iași, Romania

### Abstract

The present paper is based on a fundamental study of knowing the communication process inside the medical teams of the health system. This combines an experimental study with the purpose of identification of the obstacles which appear in the communication process and the establishment of an optimal pattern to be applied, with the purpose of improving the efficiency of the caring service for the patient. Considering the specialized literature, we have established a qualitative analysis through a prospective study by reviewing 19 articles from publications and grey literature (peer reviewed and non-peer reviewed) - where authors underlined the interaction among the team members, the way of accomplishing the performance stage, the development of the team spirit, which we can say it leads to the elevation of the quality standard.

**Keywords:** *sanitary field, medical practice.*

## E. HIGHLIGHTS IN MEDICINE – MOLECULAR MEDICINE BETWEEN CONCEPT AND PRACTICAL APPLICATION

### 1. MOLECULAR MEDICINE: FROM DIAGNOSIS TO THERAPY

*Prof. PhD Sorin Riga<sup>1,2,3</sup>, Prof. PhD Dan Riga<sup>1,2,3</sup>, Assoc. Prof. PhD Magdalena Budişteanu<sup>2,3</sup>, MD Bogdan Budişteanu<sup>3</sup>*

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<sup>3</sup>*Clinical Psychiatric Hospital "Professor Doctor Alexandru Obregia", Bucharest, Romania*

#### Abstract

Linus PAULING (1901-1994), USA - the double Laureate Nobel (Chemistry - 1954, Peace - 1962), founded a series of innovative concepts and sciences: molecular biology, molecular genetics (1949), molecular diseases (1949), molecular medicine (1951) and ortho-molecular psychiatry (1968), orthomolecular medicine (1973), orthomolecular institute (1973). In Romania, these concepts were developed and completed as pioneers in the field: Victor SĂHELĂNU (1924-1977), in his book of gnostic synthesis of the initial structures of life - *Chemistry, Physics and Mathematics of Life* (1965), Ioan COTĂESCU (1915-1995), in his monograph of structural-physiological synthesis of the cell-*Living Matter* (1968), Ilie Th. RIGA (1908-1977), in the integrative holistic vision essay on evolution - *From Matter to Human* (1977), and Dan RIGA and Sorin RIGA team, through studies published in *Brain Research* in 1974 and world-wide patented orthomolecular therapy *Antagonic-Stress*<sup>®</sup>: 27 patents in 5 continents. Molecular medicine centers diagnosis - evaluation - screening and prophylaxis - therapy - recovery to molecular level: genetic (genomic, proteomic, metabolomic etc.), fluids (blood, plasma, urine, LCS, saliva, exudates), tissues (biopsies, light and electron microscopies, histo- and cytochemistry etc.), markers (viral, bacterial, tumoral etc.), pre-clinical analyses (from ions detection, bioelements, carbohydrates, lipids, enzymes, hormones, vitamins, etc.). Molecular medicine causes continued progress in medical sciences: - molecular, metabolic, subcellular - organic - systemic antagonism: metabolites ↔ anti-metabolites, vitamins ↔ anti-vitamins, hormones ↔ anti-hormones, agonists ↔ antagonists (of Ca, Na, K etc.), enzymes ↔ anti-enzymes (synthesis → degradation),



receptors (stimulation ↔ blocking), pre-post-synaptic action, oxidation ↔ anti-oxidation, pro-inflammation ↔ anti-inflammation, acidifiers ↔ alkalinizers, coagulants ↔ anti-coagulants, histamines ↔ antihistamines, arrhythmogenic ↔ anti-arrhythmic, laxative ↔ anti-diarrhea, (ortho) simpatico: mimetic ↔ lytic, parasimpatico: mimetic ↔ lytic etc. - medicine and therapy: causative (etiopathogenic) → symptomatic (effects), precursors, pro-drugs → drugs → post-drugs (active metabolites - inactive), (ortho)molecular, metabolic, physiological, nutraceutical etc. Molecular medicine and orthomolecular therapy are also demonstrated eloquently by *strategy - invention - anti-stress and anti-aging orthomolecular therapy Antagonic-Stress®* - Dr. Dan Riga & Dr. Sorin Riga, Bucharest, Romania.

**Keywords:** *molecular medicine, diagnosis, therapy.*

## 2. THE VALUE OF THE INFLAMMATORY SYNDROME IN THE PRECOCIOUS DIAGNOSIS OF THE HIDEBOUND SPONDYLARTHROSIS

*Prof. PhD Liliana Groppa<sup>1</sup>, Assoc. Prof. PhD Eugeniu Russu<sup>1</sup>, Assoc. Prof. PhD Lia Chişlari<sup>1</sup>, Assoc. Prof. PhD Larisa Rotaru<sup>1</sup>, Univ. Assist. PhD Student Cazac Victor<sup>1</sup>, Assoc. Prof. PhD Svetlana Agachi<sup>1</sup>*

*<sup>1</sup>„Nicolae Testemiţanu” University of Medicine and Pharmacy, Chişinău, Republic of Moldova*

### **Abstract**

**The aims** of this study were to compare clinical, lab and imaging data of the patients with SA and to correlate them to the activity level of the disease. **Results.** Stratification according to BASDAI $\geq 4$  proved significant statistical differences in the majority of the clinical parameters - with the exception of the inflammatory activity, determined either through PCR or RMN: patients with SpAaxrn with a BASDAI $< 4$  score comparative to those that got a score  $\geq 4$   $0,9 \pm 1,4$  and  $0,5 \pm 0,6$  inflammatory/patient lesions, respectively, ( $p > 0,05$ ), while patients with SA had  $3,6 \pm 3,7$  and  $2,7 \pm 3,0$  inflammatory/patient lesions, respectively, ( $p > 0,05$ ). **Conclusions.** A remarkable aspect revealed during the study was that the results of the patients' reports presented only one difference between those with a high and those with a low degree of activity in terms of illness. This aspect is more representative for the pain and the general evaluation of the patient than for the general evaluation of the doctor.

**Keywords:** *inflammatory syndrome, spondylarthritis.*

## 3. THE THERANOSTIC CONCEPT AND THE PHARMACOLOGICAL MECHANISM OF MOLECULAR THERAPY

*Prof. PhD Xenia Patraş<sup>1</sup>, Prof. PhD Vasile Burlui<sup>1</sup>, Assist. Prof. PhD Oana Darabă<sup>1</sup>, Prof. PhD Liliana Sachelarie<sup>1</sup>, Assoc. Prof. PhD Gabriela Mihalache<sup>1</sup>, SR PhD Maria Fortuna<sup>2</sup>*

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*<sup>2</sup>Macromolecular Chemistry Institute “Petru Poni”, Iaşi, Romania*

### **Abstract**

The theragnostic refers to tests in order to diagnose the efficiency of pharmacotherapy for individualising treatment by creating stratified medicines and offering them only to the priority tested patients who respond correctly to the treatment. There is a diversity of individuals as well as of pathological manifestations and therefore illnesses, including cancer, can become unique. Cancer appears through multiple mechanisms (approximately 100): of activation, growth, multiplication that produce the same number of clinical manifestations. Some of the tumoral cells produce proteins

which inhibit the immune system and it becomes unable to recognize and kill them. For example, when it comes to breast cancer, some patients present in the cancerous cells receptors for estrogens and they can be treated with antiestrogenic drugs (tamoxifen); others present HER2 receptors and respond to the treatment with the monoclonal trastuzumab (herceptin) antibody. There is consensus when it comes to the paradigm shift of the therapeutic strategy of cancer, mainly the shift from a statistical approach to an individualized approached targeted for every patient or clinical manifestation. Personalizing medication is correctly performed after conducting a prior testing: either of chemiosensitiveness with the initiation of a cytostatic therapeutic plan in accordance with the patient's answer to certain substances or through testing the molecular, including genetic profile (pharmacogenetic) and initiating a targeted therapy plan in accordance with the identified genetic mutations at the tumour level. Pharmacogenetic testing substantially reduces the need for hospitalization as well as the costs due to adverse drug reactions, the production of new drugs for patients with specific genotypes: "the stratification of medicine"

**Keywords:** *theragnostic, pharmacogenetic testing, personalized approach, stratified medicine.*

#### 4. PHARMACOLOGICAL RECEPTORS: "TARGET MACROMOLECULES" IN INDIVIDUALISED THERAPY

*Prof. PhD Xenia Patraş<sup>1</sup>, Prof. PhD Rodica Ghiuru<sup>1</sup>, Prof. PhD Simona Slătineanu<sup>1</sup>, Assist. Prof. PhD Petru Plamădeală<sup>1</sup>, Prof. PhD Doinița Rădulescu<sup>1</sup>*

<sup>1</sup>*Apollonia University of Iași, Romania*

##### **Abstract**

Although the human species is homogenous, there are significant differences among individual regarding the way in which they respond to xenobiotic factors and especially to drugs. One of the fundamental problems of modern medicine is connected to the failures in drug therapy. Even when they are efficient, medicinal substances are frequently associated with significant adverse reactions which represent a major source of morbidity and mortality. Understanding the fact that the individual does not only represent the product of the genetic information contained in his genes, but the result of the interaction between heredity and the environment is vital in order to define the concept of personalised therapy. The new concept of personalised medicine presents the involvement of "the 3 Ph's" in the individual differences of the responses to medication: Pharmacology, Pharmacoepidemiology and Pharmacogenetics. The action location of the medicinal molecules is represented by specialised portions of cell structures: the receptors. Receptors represent macromolecules with the role of transmitting information within a biologic system. They have the function of translators, transforming a particular piece of information (brought by a chemical messenger) into a cell response. From a chemical point of view there are molecules who connect selectively, satiable and with ligand affinity. The type of receptors for each cell is genetically determined and the polymorphisms of this structure will obviously lead to a variation in the responses towards the medication. The solution to the problem consists in identifying the individuals who are susceptible of benefiting from the respective pharmacological treatment and removing the patients with a high risk of severe toxicity. The aim of pharmacotherapy consists in determining the doze that has to be given to the patient so that he experiences the minimum toxicity possible. Creating a therapeutic strategy based on forecasting the efficiency and individual toxicity will change medical practice turning it from "an art" into "a science" – personalised medicine – which incorporates a combination of multiple physiological, biochemical, genetical, epidemiological and ecological variables.

**Keywords:** *pharmacological receptors, target macromolecule, genetic polymorphisms, personalised therapy.*

## 5. ASPECTS OF THE CHRONIC INFLAMMATORY SYNDROME IN THE DENTAL PRACTICE

*Prof. PhD Vasile Burlui<sup>1</sup>, Assist. Prof. PhD Oana Darabă<sup>1</sup>, Univ. Assist. PhD Student Oana Cucoveică<sup>1</sup>, Univ. Assist. PhD Student Paula Merlușcă<sup>1</sup>, Assist. Prof. PhD Doina Spaiuc, Prof. PhD Xenia Patraș<sup>1</sup>*

*<sup>1</sup>Apollonia University of Iași, Romania*

### **Abstract**

The advanced research made on the pathogenesis of the chronic inflammatory disease reveals the complex mechanism of the recruitment and releasing signals of the host organism with the help of chemokines which promote the dissemination of leukines in the affected tissue. There is little known about the adhesive interaction of the leukocytes endogen inhibitors. Also, we are finding an upsurge interest in the research medical field that is concentrated on the identification of the complex involvement of the initiation and dissemination of the chronic inflammatory disease in the entire body. Many researchers have dedicated their entire intellectual resources on the understanding of the immune response that is released in the interaction of the chronic inflammatory syndrome. Due to the chemical, oxidative, physical and mechanical stress that is typical to the chronic inflammatory syndrome, the host organism is prone to release defence signals against the aggressive factors from the outside of the organism. The high prevalence of the chronic inflammatory syndrome in patients has many consequences that involve social, scientific and medical factors with an important impact on the global economy. In dentistry, the chronic inflammatory syndrome can be analysed and found in three situations: in patients with chronic inflammatory disease on a stomatognathic system level, patients with inflammatory chronic disease syndrome that are receiving dental treatments and patients with inflammatory chronic syndrome that manifest oral symptoms. This conference highlights the general and local mechanisms associated with the chronic inflammatory syndrome that can pass easily undiagnosed, but with a throughout analysis, the progressive pathogenesis should be quickly recognized and treated appropriately.

**Keywords:** *chronicinflammatory syndrome, dental practice, immune response process.*

## 6. THE CICATRISATION CASCADE IN THE ORAL IMPLATOLOGY FIELD

*Univ. Assist. PhD Student Oana Cucoveică<sup>1</sup>, Prof. PhD Vasile Burlui<sup>1</sup>, Prof. PhD Carmen Stadoleanu<sup>1</sup>, Assist. Prof. PhD Aurel Apintilesei<sup>1</sup>, Univ. Assist. PhD Student Oana Popescu<sup>1</sup>, Assist. Prof. PhD Cezarina Dragomirescu<sup>1</sup>*

*<sup>1</sup>Apollonia University of Iași, Romania*

### **Abstract**

The osseointegration process in the oral implantology domain reveals many mechanisms and interactions between the human body and the dental implant itself. The prevalence of edentulism in patients of various ages has increased and therefore a lot of patients are benefiting from the procedures that involve the dental implant therapy. In this context the understanding of the cicatrisation process represents a vital part of the therapeutic process that is necessary in order to obtain viable results. After the insertion of the dental implant in the oral cavity the human body responds to the tissue aggression by triggering the healing process. There is a specific pattern in every kind of tissue regeneration that involves a relative number of stages that should occur precisely. Every healing stage

is unique and it is defined by the interactions of the main cells involved in the cicatrisation process. These stages can develop consecutively or at some point they can intertwine. There are many factors and criteria that modulate the tissue healing process such as cellular intercommunication, hormonal levels, the sufficient intake of vitamins and amino acids, the isolation of infections, the blood intake and the integrity of the innervation area. As the body's response to tissue aggression, the healing process is triggered. The pattern of cicatrisation is relatively the same for most tissues in the human body and involves a cascade of cellular and molecular events. The factors that are influencing the tissue healing process include the stretching of the lesion, the edema, the haemorrhage, the vascularization, the tissue separation, etc. A number of conditions are modulating the spontaneous tissue healing such as time frame and the intercellular communication. Therefore, we can establish that the whole cicatrisation process has a cascade effect of molecular and cellular events, that if perfectly synchronized, allow the relative biological integration process of the dental implants.

**Keywords:** *oral implantology, cicatrisation process, relative biological integration.*

## 7. TERTIARY DENTIN - MOLECULAR BASES

*Assoc. Prof. PhD Alexandru Andrei Iliescu<sup>1</sup>, Prof. PhD Andrei Iliescu<sup>2</sup>, Assist. Prof. PhD Laura Romila<sup>3</sup>*

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### **Abstract**

The persistence of pulp stem cells in adults and the implication of growth factors are the main elements involved in generating tertiary dentin, both that of irritation and that of reparation. The article presents the molecular mechanisms through which the dental pulp subjected to permanent or temporary progressive aggression of the carious process generated by conservatory dental treatment manages to preserve its vitality together with the formation of a protective mineralised barrier from the tertiary dentin. It describes the modern involvement aspects of the primary odontoblasts and also of those that are not formed from pulp stem cells in preserving the local tissue haemostasis, by means of chemokine and bioactive molecules which control the formation of the dentine matrix and its mineralisation. Last but not least, the article highlights the role of the growth factors sequestered in the dentine and freed in the pulp through induced pathological demineralisation by the advancement of the carious process. A special place is occupied by the generation mechanisms of the tertiary dentin which represent the basis of the successful clinical usage of the new generation of bioactive ceramic cements.

**Keywords:** *tertiary dentin, stem cells, molecular mechanisms.*

## 8. THE ORAL MICROBIOME AND DENTAL PATHOLOGY

*Prof. PhD Georgeta Sinițchi<sup>1</sup>, Prof. PhD Carmen Stadoleanu<sup>1</sup>, Assist. Prof. PhD Oana Darabă<sup>1</sup>*

<sup>1</sup>*Apollonia University of Iași, Romania*

### **Abstract**

The analysis of the biomolecular techniques such as genomic, epigenetics, bioinformatics and DNA sequencing, led to understanding the role of microbiome in the immunoallergic, nutritional or dental pathology. The oral cavity is colonised by pathogenic microbial and saprophytic factors which basically represent immune protectors and form the microbiome. The oral microbiome consists of over 700 bacterial species. Dysbiosis refers to breaking the balance with lies at the origin of tooth

pathology: caries, periodontitis. Conclusions: Knowing the oral microbiome is essential for prevention, treatment and the preservation of an ecological state of the holobionts.

**Keywords:** *oral microbiome, dysbiosis, stomatitis periodontitis, dental pathology.*

## **9. MOLECULAR METHODS OF DIAGNOSTIC AND TREATMENT IN POLYCYSTIC KIDNEY DISEASE**

*Prof. PhD Rodica Ghiuru<sup>1</sup>, PhD Cristina-Maria Gavrilescu, PhD Florin Grozdan, Prof. PhD Xenia Patraş<sup>1</sup>, PhD Florina Popescu<sup>2</sup>*

<sup>1</sup>*Apollonia University of Iaşi, Romania*

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### **Abstract**

The concept of molecular diagnostic refers to the new diagnostic technologies (such as hybridization of the nucleic acids, polymerase chain reaction and DNA sequencing) that study the DNA and RNA. The molecular tests offer a certitude of the diagnostic in an increasing number of diseases by identifying the mutations or their effect (the abnormal protein). Genetic tests sometimes provide the presymptomatic or prenatal disease. The genetic knowledge has highly contributed to the development of new genetic strategies of treatment. The two major forms of polycystic kidney disease are: the autosomal dominant form (ADPKD type 1 and type 2) and the autosomal recessive form of polycystic kidney disease (ARPKD), which is much rarer and is often lethal early in life. Autosomal dominant polycystic kidney disease (ADPKD) is characterized by the progressive development of cysts and is an important cause of end-stage renal disease. Molecular testing for ADPKD is recommended for patients in whom a firm positive or negative diagnosis can't be obtained by imaging analysis alone, as molecular diagnostics is expensive and does not provide usable data in every case. But once a mutation has been identified in a family, the presymptomatic diagnosis in the family members that are at risk can be made relatively inexpensively by just screening for the known mutation.

**Keywords:** *polycystic kidney disease, molecular diagnostic.*

## **10. MOLECULAR MECHANISMS INVOLVED IN PULP REGENERATION UNDER THE INFLUENCE OF BIODENTIN**

*Assoc. Prof. PhD Constanța Mocanu<sup>1</sup>, Univ. Assist. PhD Student Nicolae Baranov<sup>1</sup>, Univ. Assist. PhD Student Adrian Vizitiu<sup>1</sup>, Univ. Assist. PhD Student Corina Budău<sup>1</sup>, Assist. Prof. PhD Smaranda Nazarie<sup>1</sup>*

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### **Abstract**

The main concern of any clinician is the preservation of pulp vitality. As a result, immune functions are preserved, and is well preserved the regenerative potential of the pulp-dental complex. The success of this therapy depends mainly on the ability of the material used to initiate cell repair and dental bridge formation. Biodentine™ belongs to a group of bioactive materials called bioceramics. Their main component is the tricalcium silicate cement and can induce dental pulp stem cell proliferation and differentiation. As a result of Biodentine™ effects, different chemokines and adhesion molecules can regulate stem cells adhesion, migration, and growth. Any injured tissue (including the dental pulp) or organ needs cell migration and adhesion for homeostatic tissue maintenance and the regeneration of injured areas. The use of Biodentine™ as capping material for

the dental pulp, exposed as a result of trauma or carious lesion can lead to complete dentinal bridge formation and the absence of inflammatory pulp response.

**Keywords:** *molecular mechanisms, pulp regeneration, biodentin.*

## 11. MYOCARDIAL INFARCTION AND THE MOLECULAR ROLE OF VASOACTIVE PEPTIDES

*Prof. PhD Rodica Ghiuru<sup>1</sup>, PhD Florina Popescu<sup>2</sup>, PhD Dragoş Munteanu<sup>3</sup>*

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<sup>3</sup>*"Grigore T. Popa" University of Medicine and Pharmacy, Iaşi, Romania*

### **Abstract**

In acute coronary syndromes (ACS), which included myocardial infarction, the risk stratification has been previously based on the severity of acute clinical presentation, presence of cardiovascular comorbidities, and abnormalities of ischemia-specific biomarkers, most importantly troponins. Natriuretic peptides (NPs), which become elevated upon increased myocardial wall stress, are established diagnostic and prognostic biomarkers in patients with heart failure. Brain natriuretic peptide (BNP) is cardiac neurohormone synthesized and released from the cardiac ventricular cells owing to increased wall tension such as volume or pressure overload. The precursor of circulating BNP (active peptide) and NT-proBNP (inactive peptide) is a 134 amino acid pre prohormone, which yields a 108 amino acid prohormone molecule, a precursor molecule stored in cardiomyocyte. The prohormone is released during hemodynamic stress from the left and right cardiac ventricle in response to ventricular volume expansion and pressure overload. Modern data suggest that LV diastolic wall stress and wall stiffness may be the predominate triggers of BNP release. The renin angiotensin system and, implicitly, AT2-R expression is closely related to inflammation, especially acute inflammatory process. These vasoconstrictive vasoactive substances are counterbalanced by vasodilators to maintain internal homeostasis and cardiac tissue function. Following acute myocardial infarction, angiotensin II does not only serve as a vasoactive peptide but also as a regulator of cytokine synthesis and inflammatory substances contributing to the survival of affected myocytes and recruitment of inflammatory cells in the affected area. Overall, the modern study extends previous knowledge on the prognostic value of NPs in ACS, thus suggesting a possible role to predict recurrent fatal ischemic events, most significantly in patients exhibiting preserved or mildly reduced LVEF after the acute event.

**Keywords:** *myocardial infarction, vasoactive peptides, NT-proBNP.*

## 12. THE MOLECULAR LEVEL OF SENSITIZATION TO PROSTHETIC BIOMATERIALS

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<sup>1</sup>*"Apollonia" University of Iaşi, Romania*

### **Abstract**

The composition of biomaterials up to the molecular level has direct implication in fulfilling the biological principle, referring to biocompatibility. In addition to ceramic materials, all dental materials suffer degradations in the oral environment due to mechanical, physical and chemical

aggressions. Metals by corrosion release ions from the alloy composition, which affect both the quality of the cladding material and the oral tissues. Polymers always suffer aging phenomena, releasing secondary products of polymerisation phenomena, and in the case of RDC a minimum percentage of the polymer suffers aging phenomena and implicitly releases secondary products. All of these phenomena have also been proven by our research on cell cultures, resulting in aggression including aqueous extracts on living cells.

**Keywords:** *prosthetic biomaterials, molecular level, cell cultures.*

### **13. THE MOLECULAR SUBSTRATE OF ANTI-INFLAMMATORY THERAPY IN THE AMBULATORY DENTO-ALVEOLAR SURGERY**

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*<sup>1</sup>"Apollonia" University of Iași, Romania*

#### **Abstract**

The dento-alveolar surgeon meets frequently in ambulatory condition, situations that imply anti-inflammatory drug therapy. In case of surgical procedures, the codes of good practice recommend apart from surgical solution of this diseases, to administer simultaneous NSAIDs in order to obtain the best results regarding the postoperative comfort, as well as the recovery of the patient. NSAIDs drugs are a heterogeneous class of compounds that have in common: analgesic, anti-inflammatory and antipyretic effect, with various magnitudes which act locally in the prevention and control of inflammation. In oral surgery, the epithelium has a high regenerative capacity due to cellular memory and its regeneration (epithelialization) takes place. In this process, are involved complex immune and genetic mechanisms. The molecules of immune system belong to large families respectively: complement system, interferons, cytokines, chemokines and immunoglobulins. The most accepted theory on NSAIDs mechanism of action is concerned to inhibiting the synthesis of prostaglandins by cyclooxygenase (COX) inhibition. NSAIDs inhibit non-selective or selective cyclooxygenases (COX) by a competitive mechanism with acidular hydrides, preventing the formation of prostaglandins (PG), prostacyclin (PGI<sub>2</sub>) and thromboxanes (TX) which mediators of the inflammatory process. At the lesion site, the mediators formed in the arachidonic acid cascade, will contribute to both vascular and cellular changes in the inflammatory process. NSAIDs, are blocking selectively or non-selectively the action of cyclooxygenase which will prevent the formation of pro-inflammatory mediators, generating an anti-inflammatory effect.

Through the anti-inflammatory effect, medication will significantly reduce, besides the inherent issue response phenomena to surgical procedures, and markedly reduces pain and other symptoms associated with inflammation.

**Keywords:** *NSAIDs, inflammation, NSAID. mechanism, activities of NSAIDs.*

## E. HIGHLIGHTS IN MEDICINE – MOLECULAR MECHANISM IN THE PATHOLOGY OF THE NERVOS SYSTEM

### 1. NEW FRONTIERS IN INTRACRANIAL ANEURISM

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#### Abstract

Aneurysm neurosurgery has always been the tip of the spear in neurosurgery. The authors present a series of cases managed by multiple teams in multiple centers both by surgical and endovascular approach. There were 668 cases treated using open surgery. Most cases (305 cases - 45,6%) were between 41 and 50 years old. Male is the preponderant sex - 454 cases (68%). The symptoms were dominated by: headache (98%), neck stiffness (94%) focal neurologic deficits (71%), seizures (52%) etc. Hunt and Hess (H&H) grade II (342 cases - 51.2%) There were 51 (7.7%) difficult cases in H&H IV and no cases operated in H&H V. We mention two centers dedicated to Endovascular procedures: (i) Chefneux et al.: 285 cases using endovascular approaches. Important complications of breaking the aneurysm during the procedure (4 cases - 1,4 %) to ischemic stroke (36 cases - 12,6%); (ii) Mihalea et al: 26 cases Kremlin-Bicetre were treated according to the newest guides and available methods for endovascular flow-diverters, endovascular stents, coils, etc.. Therefore, case series shift from having to deal with acute patients in various states of disability to a group that includes fewer such patients, but more and more residual aneurysms post coiling and a growing number of unbroken aneurysms. The surgical and endovascular methods should not be exclusive because they are in a competitive relation. Each case`s treatment must be managed independently and from a financial point of view.

**Keywords:** *Intracranial Aneurysm, SAH, clipping, coils, endovascular treatment.*

### 2. ENDOVASCULAR TREATMENT IN THE CEREBRAL ISCHEMIC VASCULAR ACCIDENT

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#### Abstract

**Introduction.** In the hyperacute period of ischemic stroke (AVC), the primary focus is restoring the blood flow. The benefit of intravenous thrombolysis in patients with high artery occlusion is less than 30%. Endovascular treatment has the potential to restore perfusion in such cases. **Methods.** All patients were treated using the mechanical thrombectomy. Clinical-demographic data, NIHSS and TICI scores, and the complications were noted. **Results.** 3 patients (average age-60 years, mean NIHSS = 17.6) were treated with thrombectomy ± rTPA-66%, only 33% thrombectomy.



In 100% of the cases the occlusion was in the previous run. The average time from the onset of stroke to the end of the procedure was 6 hours. Revascularization was successful in 100%. mRS $\leq$ 2 at 10 days was obtained at 66%, and 0% mortality. The average admission period was 16 days (66% were discharged  $\leq$  12 days). **Conclusions.** Our analysis suggests that thrombectomy in patients with occlusion of large vessels is safe and has the potential to have good results.

**Keywords:** *ischemic stroke (AVC), thrombolysis, thrombectomy.*

### 3. METABOLIC-BIOLOGICAL STRESS AND NEURODEGENERATION

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#### **Abstract**

**Introduction.** Hans SELYE (1907-1982) founded a new science - stressmedicine, stressology (1930-1982): the stressconcept (1930, 1936, 1973), General Adaptation Syndrome - GAS (1946) and stress-dependent pathology. **Methods.** Stress bio-medicine origins balance of life: - (+) in health and longevity (anti-aging medicine and longevity sciences); - or antagonistic, (-) in mental, psychosomatic, behavioral, organic (pathology and mortality) diseases. **Results.** Stress (the metabolic-biological stress system) is amplifying, advancing and aggravating, causing oxidative stress + inflammation  $\rightarrow$  wear and tear  $\rightarrow$  senescence + senility  $\rightarrow$  polypathology (acute - chronic, degenerative - proliferative). In the brain, anti-homeostatic damages by oxidative stress accumulate lipopigment (lipofuscin and ceroid) and inflammatory stress causes wear and tear and aging (inflammaging) and neurodegeneration (tauopathy  $\rightarrow$  neurofibrillary tangles + proteinopathy  $\rightarrow$  amyloid cascade  $\rightarrow$  amyloid plaques). **Conclusions.** In antithesis, homeostatic adaptation and regulation produce neuroprotection (anti-oxidant + anti-inflammation) and neurotoxicity decrease, with neurodegeneration reduction, and ultimately health consolidation (neurobiological, neuropsychic, behavioral) and increased longevity (healthy and active).

**Keywords:** *stress, neurodegeneration, neurotoxicity, longevity.*

### 4. THE COANDA EFFECT AND INTRACRANIAL ANEURYSMS - A WORKING HYPOTHESIS

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#### **Abstract**

**Introduction.** Throughout the cerebral vascular pathology, fluid leakage was deepened by attempting to determine elementary prognostic rupture of aneurysm and also to perfect occlusion with minimal postoperative complications. In this situation, the Coanda Effect has been studied both from the point of view of fluid mechanics and various simulations by neuroradiology. **Methods.** The Coanda Effect (1930, 20 years after first reactive flight) is a phenomenon known to mechanical engineers since the 19<sup>th</sup> century and had practical applications since the mid-20<sup>th</sup> century. The Coanda

Effect might explain the reason behind intracranial aneurysms occlusion postoperative sequelae (i.e. ischemia). If a jet effect is created in the blood-flow before a bifurcation due to aneurysm clipping, most of the blood-flow might be directed to only one of the branches. Once this situation occurs, blood might also be entrained from the already affected branch due to pressure differences, further depriving that region of blood. This phenomenon is the Coanda Effect and it can explain why some patients have complications even though the intervention went perfectly, and no thrombosis was present. **Results.** The Coanda Effect does not affect the aneurysm and has no predicting factor for its rupture but can explain postoperative ischemia phenomena downstream from the intervention. We debate the implications of the Coanda Effect, based on theoretical with the support of angio-MRI data. Although we have not acquired yet any clinical data, the Coanda Effect can explain in theory the frequency of ischemic complications in aneurysm occlusions. The authors study the effect of Coanda on each aneurysm as intracranial localization and phenomenon separated in small, medium, large and giant aneurysms; the endovascular device greatly influences blood flow turbulence. **Conclusion.** All studies in literature on Coanda Effect and fluid mechanics generally aim to obtain a perfect occlusion of intracranial aneurysm through endo or exovascular procedures with minimal inschemic complications and maintain the appropriate postoperative vascular flow.

**Keywords:** *Coanda Effect, neurosurgery, fluid mechanics, intracranial aneurysms*

## 5. EPILEPSY WITH NOCTURNE EPILEPTIC SEIZURES. GENERALITIES

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### Abstract

**Introduction.** Epilepsy with nocturnal epileptic seizures presents a challenge in medical practice, especially because of difficulties in differential diagnosis. We present some results from a prospective study over 10 years based on epileptic seizures in patients with epilepsy. **Materials and methods.** The study was conducted in the Neurobiology and Medical Genetics Laboratory of USMF "N. Testemițanu" between June 2006 and August 2017. A total of 5071 cases were analyzed, out of which 875 video-EEG night-time monitoring (Deltamed video-EEG recording system, Coherence software, scalp electrodes placed on the 10-20 international system). Video-EEG data were independently analyzed by 2 neurophysiology specialists. **Results.** There were 55 hyperkinetic epileptic seizures (6.29% of 875 nocturnal video-EEG or  $7 \pm 6$  seizures per patient) during 16 nocturnal recordings performed in 8 patients (0.28%) ( $2 \pm 1$  records per patient). **Conclusions.** In this study type II hyperkinetic seizures was predominant (62.5%). The onset of hyperkinetic epileptic seizures was at an early age ( $16.7 \pm 8.9$  years). All hyperkinetic epileptic seizures occurred during slow sleep. The loss of contact with the patient and the retrograde amnesia of the event were not strictly characteristic signs. Changes in interleukin epileptiform EEG were more relevant (7 patients, 87.5%), compared with icicle (3 patients, 37.5%).

**Keywords:** *Epilepsy, nocturnal epileptic crisis, amnesia.*

## 6. LONG-LASTING VIDEO-EEG IN MYOCLONIC EPILEPSY

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### Abstract

**Introduction.** In myoclonic epilepsy, EMG-EEG simultaneous polygraphy is a crucial tool for defining the characteristics of myoclonic movements. The aim of this study was to investigate the clinico-neurophysiological particularities in patients with myoclonic epileptic seizures. **Material and methods.** We performed clinical and neurophysiological (video EMG-EEG nighttime monitoring video - 10 hours) in 51 patients with myoclonic seizures (mean age  $25 \pm 9$  years, 15 males). **Results.** At 36 patients from 51, 49 myoclonic seizures have been observed. Clinically, the combination of myoclonic seizures with generalized tonic-clonic - 53% prevailed. It was pointed out that the combination of "primary generalized + focal left hemisphere" changes were found in myoclonus at the upper right member and vice versa. The vEEG ictal route reveals primary generalized epileptiform changes in all patients (36 with myoclonic seizures recorded). **Conclusion:** Clinical-neurophysiological assessment of patients with myoclonic epileptic seizures demonstrates the presence of characteristic features that, although not strictly distinctive, suggest various mechanisms that underlie the generation of myoclonus.

**Keywords:** *myoclonic epilepsy, neurophysiological nighttime monitoring video.*

## 7. MYTH OR REALITY IN- „STARRY NIGHT” (1889) DID VINCENT VAN GOGH PAINT HIS MORBUS LOCI? WHIRLPOOL GALAXY, HIPPOCAMPAL FORMATION OR JUST A PAINTBRUSH MOVE?

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### Abstract

Vincent Van Gogh was a Dutch painter of post-Impressionist style. His works have deeply influenced the art of the nineteenth century. A mark of his works is the vivid colors, the wrinkling character of the traces left by the brush and the emotional effect that catches the viewer. The artist was born March 30, 1853 in Groot-Zundert, in the south of Holland. A key moment in his artistic career was the encounter with the French Impressionists in 1886 when he moved to Paris and then to the town of Arles. During this period, he met his friend and collaborator painter, Paul Gauguin (1848-1903), who was to be involved in the enigmatic incident in which Vincent Van Gogh cut off his ear because of mental illness. After this incident, Vincent Van Gogh was admitted to Saint-Remy-de-Provence Hospital for one year, until 1889. Van Gogh has made over 2,000 works of art, around 900 paintings and 1,100 drawings and sketches. He was little appreciated during his life, his fame grew in the years after his death. Today the artist is considered to be one of the most important painters in history. His career can be divided into 4 stages: Paris (1886-1888), Arles (1888-1889), Hospital in Arles (December 1888) and the most interesting: Saint Paul Asylum (1888-1889). In the Saint Paul Asylum, the artist made a tripartite nocturne series of paintings consisting of *Café Terrace at Night* (September 1888), then *Starry Night Over The Rhône* later that same month and last *The Starry*

*Night*. The artist considered "The Starry Night" which one day would rank among his most famous works, to be a failure, according to what he wrote to his brother. Starry Night depicts a dreamy interpretation of the artist's asylum room's sweeping view of Saint-Rémy-de-Provence. It offers a rare nighttime glimpse into what the artist saw while in isolation. The authors consider that the visual approach between the anatomical / radiological structure of the hippocampus and the formation painted by artist Vincent Van Gogh is just a coincidence. The artist did not have neuroanatomic knowledge and therefore could not paint his morbus loci, the structure is a simple brush motion. An interesting approach to the interpretation of this structure is that it could represent a galaxy as it was designed a few years before Starry Night by Sir Wiliam Parsons. Artistic works, either paintings, sculptures or literature, depend on a subjective view of the viewer / reader, the lover of „beauty”, so it is difficult to formulate a clear opinion on the various elements of a creation.

**Keywords:** *Van Gogh, epilepsy, Starry Night, hippocamp.*

## 8. ILLUSTRATIVE MOLECULAR MODELS OF DELAYED MEMBRANE HYPERPOLARIZATION IN NERVOUS TRANSMISSION

*Prof. PhD Liliana Sachelarie<sup>1</sup>, Assoc. Prof. PhD Gabriela Mihalache<sup>1</sup>, Assist. Prof. PhD Cristina Dobre<sup>1</sup>, Assist. Prof. PhD Simona Nichituș<sup>1</sup>, Assist. Prof. PhD Laura Romila<sup>1</sup>, Prof. PhD Simona Slătineanu<sup>1</sup>*

<sup>1</sup>*University „Apollonia” from Iași, Romania*

### **Abstract**

How does change in membrane potential trigger and what cause the hyperpolarization and depolarization of membrane potential? A typical neuron has a resting potential of -60–60 to -70–70 millivolts. This means that the interior of the cell is negatively charged relative to the outside. Hyperpolarization is when the membrane potential becomes more negative on the neuron's membrane, while depolarization is when the membrane potential becomes less negative (more positive). Depolarization and hyperpolarization occur when ion channels in the membrane open or close, altering the ability of particular types of ions to enter or exit the cell. The research done indicate two illustrative molecular models, designed to explain the hyperpolarization delay, are proposed and analyzed. The first model uses adsorption or desorption of phospholipid molecules on the surface of the assumed protein K<sup>+</sup> channel or gate. The second model involves the translocation of the charged subunits of the channel in the hyperpolarizing electric field.

**Keywords:** *hyperpolarization, depolarization, nervous transmission.*

## E. HIGHLIGHTS IN MEDICINE – ANTICIPATION AND MEDICINE

### 1. ANTICIPATING MEDICINE: THE NEW MEDICINE OF THE FUTURE

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## Abstract

**Introduction.** The ancient medicine strategy is an essence of anticipation: *Excellent doctors prevent disease ...* (the first Chinese medical text, 2600 BC), *The disease must be frustrated before it comes* (Persian proverb), *Resist the beginnings, the cure comes always too late* (Publius Ovidius NASO, 43 BC-17/18 AD, Civilization of the Roman Empire). **Methods.** Strategy, science, anticipation medicine is back to top. It is now doubled by the revolutionary progress: scientific, technological, informational in the knowledge society. The top representatives of the field, who fundamented the domain - Prof. Dr. Eng. Mihai NADIN (born in 1938 in Brasov in Romania, later scientific work in Germany and USA) and Prof. Dr. Med. Luc Antoine MONTAGNIER (born in 1932 in France, Professor at the Louis Pasteur Institute in Paris, after retiring scientific activity in the USA and then in China, now full-time professor at Jiao Tong University in Shanghai, China University considered MIT of the East) - Laureate of the A. Nobel Prize for Physiology or Medicine in 2008 (for the discovery and characterization of the Human Immunodeficiency Virus - HIV, between 1981 and 1984). Luc Antoine MONTAGNIER has founded the Medicine of the 4 (four) P: Predictive (Anticipation), Preventive (prophylactic), Personalized (individualized) and Participatory (conscientious, educated patient, participant in the prevention - therapy - recovery). **Results.** Predictive medicine is inextricably, complementarily and synergistically linked to: - molecular bio-medicine and (ortho)molecular therapies (Riga & Riga, 1994-2005); - with adaptation, vitality and resilience; - with sanogenesis - health and healthy human medicine; - with anti-stress and anti-aging medicine, longevity sciences and health-longevity medicine (Riga & Riga, 2012); - with the social delimiters of health: work, nutrition, movement and continuous education; - with the health of society and nature, ecology. **Conclusions.** Anticipatory medicine and 4 (four) P medicine require a change of paradigm and strategies: - from Pyramid (supply, resources) of medical services (somatic, mental) - WHO / OMS (2007); - at the Pyramid of Health- Longevity Services (Riga & Riga, 2009).

**Keywords:** *anticipating medicine, molecular bio-medicine, molecular therapies.*

## 2. THE PROACTIVE ROLE OF PROPHYLAXIS

Assoc. Prof. PhD Letiția Duceac<sup>1</sup>, Assist. Prof. PhD Liviu Stafie<sup>1</sup>, Assoc. Prof. PhD Gabriela Mihalache<sup>1</sup>, Univ. Assist. PhD Student Cristina Dobre<sup>1</sup>, Univ. Assist. PhD Student Cristina Jitoreanu<sup>1</sup>, Assist. Prof. PhD Sergiu Straticiu<sup>1</sup>

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### Abstract

The concept of preventive medicine and its methodology have gradually emerged as human society develops. Expression of anticipation, i.e the successful actions the body performs in general for life to be maintained and helping achieve the desired results is evidence empirical for the existence of this concept at the vial level. Data on anticipatory processes has been accumulated in a variety of areas of knowledge. In the current context of technology development, alongside the concept of anticipatory medicine, other concepts have been developed, such as precision medicine, personalized medicine, participatory medicine, layered medicine. Modern medicine is increasingly focusing on prevention and is moving its efforts towards achieving a lasting balance between man and his living and working environment. The major objective of health services is to protect the environment, naturally and socially, in order to promote community health.

**Keywords:** *preventive medicine, anticipatory medicine, concept.*

### 3. PROJECTING THE DEVELOPMENT OF SJOGREN SYNDROME IN PATIENTS WITH SISTEMIC SCLERODERMY

Assoc. Prof. PhD Svetlana Agachi<sup>1</sup>, Prof. PhD Liliana Groppa<sup>1</sup>, Assoc. Prof. PhD Elena Deseatnicova<sup>1</sup>, Assoc. Prof. PhD Eugeniu Russu<sup>1</sup>, Univ. Assist. PhD Student Lucia Dutca<sup>1</sup>

<sup>1</sup>State University of Medicine and Pharmacy "Nicolae Testemitanu", Chisinau, Republic of Moldova

#### Abstract

**Introduction.** Detecting factors contributing to the development of Sjogren's syndrome in patients with systemic scleroderma (SS). **Materials and methods.** 150 patients with SS were investigated, only 6 were male. Mean age - 42.3 years, mean duration of illness - 13.6 years. **Result.** Using the discriminatory statistical analysis, the following factors influenced the development of sicca keratoconjunctivitis in patients with SS - disease duration over 10 years, presence of arthralgia and arthritis, interstitial pneumopathy, rheumatoid factor in serum, high disease activity. Using these factors one can predict the development of sicca cheratoconjunctivitis in patients with SS with an accuracy of 78.2% and its absence - 71.6%. **Conclusions.** The presence of factors in SS patients can predict the development of sicca keratoconjunctivitis with an accuracy of 78.2% - duration of disease over 10 years, arthralgia and arthritis in the clinical picture of the disease, presence of interstitial pneumonia, rheumatoid factor in serum, high activity of the underlying disease.

**Keywords:** Sjogren's syndrome, systemic scleroderma, sicca keratoconjunctivitis.

### 4. AN EXPERIMENTAL METHOD OF PRODUCING HYDROXYAPATITE

Prof. PhD Daniela Jumanca<sup>1</sup>, Assist. Prof. PhD Atena Gălușcan<sup>1</sup>, MD Anamaria Matichescu<sup>1</sup>

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#### Abstract

**Introduction.** Hydroxyapatite (HA) is one of the biomaterials representative for resorbable materials, with a calcium phosphate composition. Nano-HA particles synthesized in the laboratory are similar as morphology and structure with the enamel crystals of the tooth enamel. Studies show that nano-hydroxyapatites have the potential to stabilize lesions on the enamel surface. Nano-HA based products for the remineralisation of sub-surface lesions have been synthesized. **Methods.** The purpose of this study was to produce and then analyze the HA properties produced experimentally in the SETICO laboratories. For the analysis of the HA emulsion the following devices were used: The zeta potential analyzer: WALLIS and the VASCO particle size analyser. **Results.** We performed the size analysis, respectively the stability for the two selected HA samples, with the two measuring instruments described above. **Conclusions.** The contribution of this method is that it provides information and results for the situation where pure HA is used without secondary reaction products.

**Keywords:** Hydroxyapatite, resorbable materials, enamel.

### 5. THERMOGRAPHY IN REAL TIME IN THE NEOALVEOLE OSTEOTOMY

Assoc. Prof. PhD Alexandru Andrei Iliescu<sup>1</sup>, Prof. PhD Andrei Iliescu<sup>2</sup>, Assist. Prof. PhD Laura Romila<sup>3</sup>

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### Abstract

**Introduction.** The osteotomy performed for neoalveolar treatment, the bone bed where the dental implant will be inserted, must follow strict rules to avoid local tissue heating by milling in order not to endanger future osteointegration. The risk and degree of necrosis of the neoalveolar wall is directly related to the thermal friction effect developed during the milling. **Methods.** Although in clinical practice overheating of the bone is technically controlled during osteotomy, avoiding its occurrence, the milling at different depths in alveolar crests with varying degrees of bone density cannot be based on pre-established thermal values. **Results.** The real-time infrared thermographic study in neoalveolar osteotomy shows a disjunction of the thermal effect generated in the milling cutter in the bone tissue, usually the temperatures recorded in the milling are higher than those in the implantation bed of the alveolar crest.

**Keywords:** osteotomy, neoalveolar treatment, real time.

## 6. FOOD AND ANTICIPATION

Prof. PhD Xenia Patraş<sup>1</sup>, Assist. Prof. PhD Andrei Lobiuc<sup>1</sup>, Assist. Prof. PhD Laura Romila<sup>1</sup>, Assoc. Prof. PhD Ştefan Leica<sup>1</sup>, Univ. Assist. PhD Student Emanuel Stavarache<sup>1</sup>

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### Abstract

**Introduction.** A new trend in the food market is “adding value” to food in the sense that it can improve or even prevent disease. **Methods.** This will be done by: introducing a personalized nutrition based on individual genetic differences; identifying the inter-individual differences that generate the risk of obesity and bolicronics, and quantifying this risk; testing individuals to identify genetic polymorphisms and recommending diets based on genetic constitution to reduce the risk of coronary heart disease and even create new foods that bring health benefits to consumers (functional foods) or even correct certain metabolic deficiencies (Nutraceuticals - Foods drugs). **Results.** NuGO 2013 Symposium: The Phenotypic Flexibility Symposium, organized by NutriTech, Bioclaims, PhenFlex and NuGO, introduced the term flexibility as a biomarker for the food industry to establish a healthy diet for an optimal health status, disease prophylaxis, and healthy aging. Following the “evidence-based medicine” model, the new direction in nutrition sciences is to put in place a “evidence-based nutrition” that provides a structured and reliable analysis of existing data on dietary intake and nutritional pharmacology of a nutrient, to alert the medical community to the nutritional health needs. **Conclusions.** The ultimate impact of nutrigenomics at the marketplace will depend on how consumers can link their genetic constellation to different groups of nutrients, but the main obstacle will be changing dietary habits according to this new information.

**Keywords:** nutrigenomics, functional foods, nutritional, nutrition-based evidence.

## 7. ARE THERE ANY SIGNS OF A CERVICAL ADENOPATHY?

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## Abstract

**Introduction.** A patient with a cervical swelling raises a first question: is it an adenopathy or another cervical formation? And if it is an adenopathy, what would be its etiology? **Methods.** Therefore, the algorithm of diagnosis in a cervical adenopathy involves a medical reasoning that should continue with the necessary complementary examinations and sometimes followed by surgical exploratory cervicotomy. **Results.** The cases presented draw attention to clinical signs of an alarm that can provide early diagnosis of metastatic cervical adenopathy, vital for the patient, with cumulative implications in achieving a unitary therapeutic coding. **Conclusions.** The conclusion that emerges insists that cervical adenopathy, encountered in almost any age group and which remains the prestige of many specialties such as otorhinolaryngology, cervical or maxillo-facial surgery, hematology or internal medicine, often involves a close interdisciplinary collaboration.

**Keywords:** *cervical adenopathy, signs of alarm.*

## 8. THERAPIES ... STILL INACCESSIBLE!

*Prof. PhD Xenia Patraș, Assist. Prof. PhD Cristian Tudose<sup>2</sup>, PhD Student Andra Humelnicu<sup>3</sup>, Prof. PhD Carmen Stadoleanu<sup>1</sup>, Univ. Assist. PhD Student Oana Cucoveică<sup>1</sup>*

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## Abstract

**Introduction.** Story scientists of Gregory Stock speak of two unprecedented revolutions that are happening now: - The silicon revolution that has modernized humanity by simplifying and complicating our biological life. (eg we monitor physiological processes with phone applications); - Revolution of genomics, proteomics, metabolomics with the most direct effect in medicine; **Methods.** Genocidal genetics and targeted therapy adapt medication (targeted molecular therapies, new forms of medicine, “polly pills”) and nutrigenomics adapt nutrition to our peculiarities and needs (nutraceuticals). **Results.** These will lead to the control of people’s evolution, modifying ourselves to manipulate the aging process (antiaging therapy by influencing the function of telomerase for example), changing emotions (through specific active principles), or controlling reproduction (by manipulating genes). For now, these are inaccessible therapies but if we get access to them, if we do not get sick anymore, if we reverse the aging process ... then everything will change. Surely if man has access to technology or medication will do this regardless of consequences because it is in the nature of nature. **Conclusions.** The ethics of “knowledge management” is imperative and necessary in order not to trick the evolving programs that guide our lives and behavior. The consequence will be the return to nature: the nutraceutical will make us learn from the mistakes we made by not using the matter that our mother gave us, as Hippocrates said: “Your food will be cured and your cure will either food”.

**Keywords:** *pharmacogenomics, nutrigenomics, antiaging therapy, “knowledge management ethics”.*

## 9. PREVENTION OF OBESITY BY THE SECOND HUMAN GENOM

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### Abstract

**Introduction.** Obesity has become the 21st century epidemic. Microbial genomes can lead to imbalances in the microbial population, and these can lead to health problems: obesity, diabetes, allergic diseases, autoimmune diseases, carcinoma, dermatitis. Numerous bacteria that interfere with the regulation of energy metabolism and body functions can change causing disturbances. **Results.** Today, bacterial genomes are analyzed through interdisciplinary mechanisms involving bioinformatics, biostatisticians, molecular genetic specialists, population geneticists, clinicians, to understand how bacteria adapt for pathogen equilibrium or disequilibrium. **Conclusions.** Molecular, genetic and epigenetic determinations by highlighting the second human genome can prevent obesity ever since childhood.

**Keywords:** *obesity, second human genome, molecular microbiology.*

## E. HIGHLIGHTS IN MEDICINE - MEDICAL RECUPERATION AND BALNEOFIZIOKINETOTERAPY

### 1. ADAPTIVE HEMODYNAMIC CHARACTERISTICS OF THE ADOLESCENT PATIENT

*Prof. PhD Ion Apostol<sup>1</sup>, Assist. Prof. PhD Sergiu Straticiu<sup>1</sup>, Assist. Prof. PhD Cristina Stoica<sup>1</sup>, Assist. Prof. PhD Elena Costescu<sup>1</sup>, Univ. Assist. PhD Student Alexandra Burlui<sup>2</sup>, Prof. PhD Nicolae Georgescu<sup>1</sup>*

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### Abstract

**Introduction.** During daily activities, specific changes occur in the human body, of adaptation of the organism to a given situation, accompanied by physical, psychological and emotional changes. Adolescents, people in one of the evolutionary stages of life, have bodies subjected to slow or sudden adaptive changes that can take place over a few seconds, minutes, hours or even days. Inherent changes include adaptive hemodynamics, with the particularities of the adolescent patient, changes that may be physiological or pathological. **Results.** Physiological changes are absolutely normal, but the occurrence of pathological manifestations requires the physician's intervention, with a perspective focused on reduction of the physiological manifestations. Manifestations present in the pathology of adaptive hemodynamic changes are often accompanied by discomfort, limitations or pain, compelling the patient to refer to a physician for consultation. Obviously, the doctor will make a clinical assessment often encouraged by specific tests and, perhaps, radiological exams, many imperative and conclusive. **Conclusions.** As a result of these findings, the physician will take appropriate measures, so that the adolescent patient can resume their daily activity.

**Keywords:** *modifications, adaptive, hemodynamic, adolescent, patient*

### 2. THE LEVEL OF VITAMIN D IN WOMEN IN POSTMENOPAUSE WITH NORMAL BONE MASS, OSTEOPENIA AND OSTEOPOROSIS IN THE REPUBLIC OF MOLDOVA

*Assoc. Prof. PhD Elena Deseatnicova<sup>1</sup>, Assoc. Prof. PhD Svetlana Agachi<sup>1</sup>, Assoc. Prof. PhD Larisa Rotaru<sup>1</sup>, Prof. PhD Liliana Groppa<sup>1</sup>*

<sup>1</sup>*State University of Medicine and Pharmacy “Nicolae Testemitanu”, Chisinau, Republic of Moldova*

**Abstract**

**Introduction.** Determination of vitamin D in the postmenopausal women group. **Methods:** 136 postmenopausal women were sent for consultation to the Department of Rheumatology in family medicine centers for screening. Patients were tested for risk factors for osteoporosis, DXA testing was performed on Hologic QDR2000 DXA and serum levels of ionized calcium and 25 (OH) vitamin D were determined. 25 (OH) vitamin D level was determined by immunoenzymatic analysis. After DXA testing, all patients were divided into 3 groups based on bone mineral density: women with normal bone mineral density, women with osteopenia, and women with osteoporosis. All data obtained were statistically analyzed. **Results.** The mean age of the patients was of  $56.75 \pm 9.4$  years. The age varied between 45 and 65. The duration of menopause ranged from 1 to 10 years, and the mean duration was  $5.3 \pm 3.4$  years, among the most frequent risk factors included hip fractures in grade I relatives to 15% of those studied, in 12.4% of patients glucocorticosteroids were used for more than 3 months, and 1.1% of patients had arthritis. A decrease in height was recorded in 51.2% of patients, with an average of  $2.1 \pm 0.6$  cm. According to DXA, 28.9% of patients had normal bone mineral density, osteopenia was found in 46.2% of patients and 29.4% of patients had osteoporosis. The T-index in the osteopenia group was  $-1.7 \pm 0.1$  SD, the mean T-score in the osteoporosis group was  $-2.9 \pm 0.2$  SD. The mean age of patients in the normal bone mineral density group was  $49.6 \pm 5.4$  years, when the mean age in the osteoporosis group was  $58.1 \pm 6.2$  years,  $p < 0.05$ . According to IMC, there is a tendency towards decreasing in the group of osteoporosis. A decrease in height also shows a statistical difference in the normal BMD group compared to osteoporosis:  $0.44 \pm 0.2$  vs  $2.4 \pm 0.3$ ,  $p < 0.01$ . The level of ionized calcium is almost within the normal range in all groups. In terms of vitamin D, its suboptimal level was 16.6%, which was identical in all three groups, while the vitamin D deficiency of 25 (OH) was most frequently found in osteoporosis group -62, 2%, with statistical difference with the normal BMD group (46.3%),  $p < 0.05$ . In general, suboptimal level and 25 (OH) vitamin D deficiencies were found in 72.7% of postmenopausal women. **Conclusion.** Osteoporosis according to WHO criteria was established in 29.4% of subjects. We found suboptimal level and significant 25 (OH) vitamin D deficit in the postmenopausal women group, 72.7%. Determination of 25 (OH) vitamin D is recommended in patients with risk factors for the prophylaxis and treatment of osteoporosis.

**Keywords:** *Osteoporosis, vitamin D, postmenopausal women.*

### 3. ANATOMICAL PARTICULARITIES OF MUSCULOSCHELETAL AFFECTION IN PARASITIC INFECTIONS

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**Abstract**

**Introduction.** Parasitic infections have a high share in both tropical and subtropical climates as well as in temperate climates. Most global deaths are caused by malaria. Approximately 660,000 people die annually, most of them small children in Sub-Saharan Africa. Neglected tropical diseases (NTD) have been left without attention by the public health community, although they affect more than 1 billion people across the globe. Parasitic diseases, such as lymphatic filariasis, onchocercosis and Guinea worm disease, cause considerable damage to endemic populations, including loss of ability to go to school or work, impairment of cognitive skills, and the development of young children, and

present a serious economic burden on the affected community. Parasitic infections affect, albeit to a lesser extent, the developed countries. In the Republic of Moldova, parasitic diseases have a high incidence among infectious diseases, yielding only acute respiratory infections and acute diarrheal diseases. In addition to gastrointestinal, visceral, encephalic, cutaneous, parasitosis, the musculoskeletal system is also affected. **Methods.** Research on anatomic particularities of musculoskeletal damage in parasitic infections in the Republic of Moldova Methods. The study included 20 patients with musculoskeletal system disorders and were positively diagnosed with various parasites (*Toxocara canis*, *Toxocara cati*, *Echinococcus granulosus*, *Giardia intestinalis*). The patients were clinically and paraclinically investigated both to exclude other causes of musculo-articular suffering and to evaluate clinical-paraclinical changes. Patients were re-evaluated after antiparasitic treatment. **Results.** In the group of patients, 13 patients (65%) showed diffuse mucus; 12 patients (60%) - localized muscle pain; 17 patients (85%) - arthralgia of which 17.6% - monoarthritis, 58.8% - oligoarthritis, 23.5% - polyarthritis; 7 patients (35%) had swollen joints; 4 patients (20%) - reduction of joint mobility; 10 patients (50%) accused osalgies and 90% (18 patients) -labelled fatigue. After the specific antiparasitic treatments were finalized, diffuse mialgies improved to 77%, muscle pains localized to 92%, arthralgia - 59%, swelling regressed in all patients, mobility restored to 75% have improved to 80% and fatigue has fallen to 83%. **Conclusions.** Parasitic infestations require attention in optimizing the diagnosis of musculoskeletal system alterations for the prompt decision of clinical conduct and therapeutic management.

**Keywords:** *Parasitic infections, tropical diseases, musculoskeletal system.*

#### 4. RENAL AFFECTATION IN THE GOUT

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##### **Abstract**

**Introduction.** Study of renal impairment in patients with gout. **Methods:** A retrospective study was performed on gout patients - 100 patients (acute gout - 12 (12%) patients, chronic gout - 38 (38%) patients, chronic gout tofacee - 50 (50%) of patients). Mean age -  $42.5 \pm 0.89$  years. Maladia lasted up to 5 years in 20 patients (20%), 5 to 10 years - in 28 patients (28%), 10 to 15 years in 18 patients (18%) and in disease over 15 years had 34 patients (34%). They received the following remedies: Allopurinol - 67 (67%) patients and Adenuric - 33 (33%) patients and in disease aging: NSAIDs - 100% patients, Colchicine - 89 (89%) patients, Glucocorticosteroids 66 % of patients. **Results.** Urinary renal lithiasis at  $42.0 \pm 4.15\%$ , gouty nephropathy at  $52.0 \pm 5.17\%$  of patients. In 6 (6%) of acute gout patients, no renal impairment was observed. **Conclusions.** 1. The most frequent renal impairment in gout is leukocyturia  $58.0 \pm 6.03\%$  of patients, followed by hematuria  $44.0 \pm 4.38\%$  of patients, albuminurie  $36.0 \pm 3.73\%$  of patients, sample analysis renal function has been shown to increase blood creatinine levels in  $34.0 \pm 3.57\%$  of patients with gout, glomerular filtration decreased  $40.0 \pm 4.13\%$ , increased blood urea levels was recorded in  $28.0 \pm 2.98\%$  of patients. 2. Renal disease prophylaxis is critical in gout, because renal dysfunction leads to a decrease in uric acid excretion, thus creating a vicious circle in gout progression.

**Keywords:** *gout, urinary renal lithiasis, blood creatinine.*

## 5. GENERAL AND PARTICULAR ASPECTS OF ETHICS IN MEDICAL RECOVERY

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### Abstract

**Introduction.** Compared to other specialties, the patient's journey in the medical recovery service is long and requires the most efficient and correct communication and information and permanent collaboration with the entire recovery team. **Methods.** The patient has a functional somatic deficit (from partial disability impairment) chronic, often irreversible. Considering these issues, the specialist and the Medical Recovery team are confronted with specific ethical issues that they need to take into account in relation to the patient and family, starting with identifying patients receiving recovery programs; establishing realistic goals, adapted to pathology, stage and form of evolution. **Results.** Analyzing the complex and long-term patient-physician and recovery team; professional and team issues; the obligations and rights of family members; quality of life and cessation of treatment; and ending with resource allocation, chronic medical insurance and implications for medical recovery, all these issues require ethical evaluation. **Conclusions.** The challenge is to respect ethical principles and give importance to potential conflicting moral obligations.

**Keywords:** *medical recovery, somatic deficit, ethical principles.*

## 6. LOGOPOEDIC INTERVENTION IN OROFARINGIAN DISEASE OF NEUROLOGICAL ORIGIN

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<sup>1</sup>Hospital Hermanas Hospitalarias, Madrid, Spania

### Abstract

**Introduction.** Cerebral lesions often have an impact on the nervous and muscular mechanisms of the structures responsible for normo-functional swallowing and create instability at the clinical level, affecting the quality of life of the patient. **Methods.** Causes can be different, so over the years different techniques and methods of therapeutic intervention have been discovered. **Results.** Neuro-rehabilitation specialists play a leading role in diagnosing and treating this pathology, following a series of stages, as well as the evolution of the subject once the diet changes according to the profile presented. Rehabilitation is an essential process in recovering the function of affected structures, as well as the development of a complete registry of standardized tests and protocols set up to organize the information, visualizing the alterations made by brain injuries. **Conclusions.** The attributions of speech therapist are currently unknown populations internationally, despite being indispensable in various daily pathologies encountered.

**Keywords:** *orofaringian disease, cerebral lesions, rehabilitation.*

## F. BIONANOTECHNOLOGIES WITH APPLICATIONS IN NANOMEDICINE

### 1. LAYER-BY-LAYER POLYELECTROLYTE ARCHITECTURES WITH ENHANCED SORPTION/DESORPTION PROPERTIES FOR HEAVY METAL IONS

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#### Abstract

Daisogel microparticles modified with thin films was used for loading/release of heavy metal ions. The films, consisting of poly(ethyleneimine) (PEI) and poly(acrylic acid) (PAA) were layer-by-layer (LbL) deposited onto Daisogel particles. The amount of metal ions sorbed onto the LbLs depend on the number of polycation layers. The importance of deposition conditions on the loading/release capacity and reusability of composite silica microparticles with LbL cross-linked (PEI)<sub>n</sub> films was investigated. After LbL deposition of the (PEI/PAA)<sub>n</sub> or (PEI<sub>4</sub>-Cu/PAA) onto silica followed by cross-linking and PAA extraction from multilayer in basic medium, the composite microparticles [silica/ / (PEI)<sub>n</sub>] were tested in multiple loading/release cycles of Cu<sup>2+</sup> ions. Daisogel/ / (PEI)<sub>4.5</sub> 1.00% cross-linked, represent solid matrix in sorption/desorption of different pollutants classes.

**Keywords:** *heavy metal ions, daisogel microparticles, sorption/desorption properties.*

**Acknowledgements:** This work was supported by a grant of Romanian Ministry of Research and Innovation, CCCDI-UEFISCDI, project nr. 26PCCDI/2018, *Integrated and sustainable processes for environmental clean-up, wastewater reuse and waste valorization (SUSTENVPRO)*, within PNCDI III.

### 2. AS1411-CONJUGATED LIPOSOMES AND THEIR POTENTIAL FOR BASAL CELL CARCINOMA THERAPY

*Sci. Ast. PhD. Anca Niculina Cadinoiu<sup>1</sup>, Sci. Ast. PhD Delia Mihaela Rață<sup>1</sup>, Prof. PhD Leonard Ionut Atanase<sup>1</sup>, Assist. Prof. PhD Oana Darabă<sup>1</sup>, Sci. Prn. Daniela Gherghel<sup>2</sup>, Sci. Prn. Gabriela Vochița<sup>2</sup>, Prof. PhD Vasile Burlui<sup>1,3</sup>, Prof. PhD Marcel Popa<sup>1,3</sup>*

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#### Abstract

AS1411 is a quadruplex-forming DNA oligonucleotide that functions as an aptamer to target nucleolin, a protein present on the surface of cancer cells. In this research, we obtained a new formulation based on aptamer-functionalized liposomes for delivery of 5-fluorouracil (5-FU), as an anticancer drug widely used in the treatment of BCC. Aptamer conjugation increased liposome size and, as expected, the negatively charged DNA aptamer reduced the surface potential of the liposomes. The drug encapsulation efficiency was between 6.8 and 8.7%. Vertical Franz diffusion cells with artificial membranes were used to evaluate the *in vitro* release of 5-FU. The *in vitro* cell viability, *in vitro* targeting capability and apoptotic effects of aptamer functionalized liposomes on the human

dermal fibroblasts cell line were also evaluated. The results obtained were satisfactory and will be the basis for new tests to prove the effectiveness of these formulations in the treatment of BCC.

**Keywords:** *liposomes, cell carcinoma therapy, biomaterials.*

**Acknowledgements:**

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**3. HYDROGELS FILMS BASED ON BIOPOLYMERS CONTAINING CURCUMIN IMMOBILIZED WITH APPLICATIONS IN WOUND HEALING**

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**Abstract**

Curcumin has antibacterial and anti-inflammatory activity and in topical applications was successfully used to treat rashes and skin infections. In a first stage were obtained gellan/bovine serum albumin (BSA) films by ionic cross-linking with magnesium acetate at pH=7.8, in which the  $\beta$ -cyclodextrin/curcumin inclusion complex was incorporated at pH=7.8. The films obtained were subsequently polyelectrolytically complexed with 1% pectin solution at pH=3.5. BSA was used due to its therapeutic effects that can lead to an improvement in the biocompatibility of the hydrogel film. The films obtained were characterized by the swelling degree, SEM, FT-IR, TGA, mechanical tests and the cytotoxicity was evaluated. It was evaluated the stability of curcumin included in the film to UV radiation and at different pH values, the antioxidant tests were performed and the protective role of the polymer matrix was proved. The release kinetics studies of curcumin from the polysaccharides films were performed in two different pH mediums (5.5 and 7.4) and a higher release efficiency was observed in slightly basic medium.

**Keywords:** *hydrogels, biopolymers, curcumin.*

**4. IONIC CURDLAN HYDROGELS FOR MEDICAL AND PHARMACEUTICAL APPLICATION**

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**Abstract**

Tissue engineering is a major challenge for biomedical research because it ranges from repairing damaged tissue to bioactive molecules release. Among the numerous systems proposed in this field hydrogels seem to have the most attractive characteristics. Hydrogels are three-dimensional polymeric networks capable of absorbing large amounts of water or biological fluids. In recent decades, natural polymers (polysaccharides) have frequently been used to design intelligent hydrogels owing to their biological superior properties (e.g., biodegradability, renewability and biocompatibility). Native curdlan, a bacterial polysaccharide made of linear repeating units of (1→3)-b-D-glucose, has been found to have immune-modulatory effects and anti-tumor activity. However, the current applicability of the curdlan is still limited due to its insolubility in water,

attributed to triple-helical structure and the extensive number of intra/intermolecular hydrogen bonds. In this respect, the present work, was focused on obtain of new anionic hydrogels based on monobasic curdlan phosphate, and on the study of their adsorption capacity for different drugs adsorption.

**Keywords:** *curdlan hydrogels, pharmaceuticals, tissue engineering.*

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## **5. PHARMACOLOGICAL ASPECTS OF CAFFEINE AS A THERAPEUTIC AGENT IN ALLOPATHIC MEDICINE**

*Prof. PhD. Lăcrămioara Ochiuz<sup>1</sup>, Univ. Assist. PhD Monica Crețan Stamate<sup>1</sup>, Prof. PhD Cristina Mihaela Ghiciuc<sup>1</sup>*

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**Abstract**

Caffeine is a drug substance primarily known in the form of refreshing and energizing drinks such as tea, coffee, hot chocolate, etc. Although the origin of using coffee beans 'toners' is lost in the darkness, scientific data on this substance, classified as cortical stimulant, are relatively recent and start in 1820 when it was isolated from coffee beans. This paper aims to present the main therapeutic effects underlying caffeine use in topical medication, with an initial brief description of the pharmacodynamic actions of caffeine after its absorption into the systemic circulation. The use of caffeine in adjuvant therapy of skin conditions such as cellulitis, alopecia, erythrodermatitises, photoaging and even non-melanoma cancer leads to new scientific data that reinforce the caffeine position as an active substance at the dermal level through complex cellular and molecular mechanisms, some of which are known, others in research.

**Keywords:** *caffeine, antioxidant, photoaging, cellulite, alopecia.*

## **6. METAL-BASED ANTICANCER DRUGS**

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**Abstract**

These studies were directed toward the development of new metal complexes based on a library of specifically modified thiosemicarbazones with antitumor activity. The antiproliferative effects were examined in several human cancer and one noncancerous cell lines: Human cervix carcinoma cells (HeLa), lung adenocarcinoma cells (A549), colon cancer cells (LS-174) and human fetal lung fibroblast cells (MRC-5). Several of the compounds showed high cytotoxicity and marked selectivity for cancer cells and deserve further investigation into the mechanisms of antiproliferative and R2 inhibition activities as potential anticancer drugs.

**Keywords:** *anticancer drugs, cytotoxicity, antiproliferative effects.*

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## 7. BIOMATERIAL PROPERTIES EVALUATION OF APTAMER-FUNCTIONALIZED POLYMERIC NANOCAPSULES LOADED WITH 5-FLUOROURACIL

Sci. Ast. PhD Delia Mihaela Rață<sup>1</sup>, Sci. Ast. PhD Anca Niculina Cadinoiu<sup>1</sup>, Prof. PhD Leonard Ionut Atanase<sup>1</sup>, Prof. PhD Vasile Burlui<sup>1,2</sup>, Univ. Assist. PhD Cristian Mihalache<sup>1,3</sup>, Assist. Prof. PhD Oana-Maria Daraba<sup>1</sup>, Prof. PhD Marcel Popa<sup>1,2,3</sup>

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### Abstract

The present study aimed the evaluation of biomaterial characteristics of a nanometric capsules based on chitosan carboxylate functionalized with AS1411 aptamer and poly(N-vinylpyrrolidone-alt-itaconic anhydride) loaded with 5-Fluorouracil, with the potential to improve the treatment of cancer. Functionalization of nanocapsules with AS1411 aptamer will enhance their recognition by tumor cells, due to the interaction with nucleolin, and subsequent endocytosis. Nanocapsules were prepared by interfacial condensation method in the absence of any toxic crosslinking agents. The nanocapsules diameter varies between 100–267 nm as a function of the molar ratio of the polymers. The spherical shape of the nanocapsules was evidenced by scanning electron microscopy. Nanocapsules presented a good 5-Fluorouracil loading and release capacity. Biodegradability and haemolysis tests have demonstrated that the nanocapsules present a low toxicity and a good compatibility with sanguine medium. Furthermore, the nanocapsules did not present in vitro cytotoxicity when they were incubated with human fibroblasts.

**Keywords:** *nanocapsules, fluorouracil, biomaterial.*

### Acknowledgements:

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## 8. NATURAL-BASED POLYMERS FOR BIOMEDICAL APPLICATIONS

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### Abstract

Semitelechelic amphiphilic polymers were prepared by reductive end amination of dextran, of different molar masses, with alkyl amines (dodecyl, hexadecyl and octadecylamine). The polymers were crosslinked or not crosslinked with divinyl sulfone and further modified by quaternization with an equimolar mixture of epichlorohydrin and dimethylalkyl amine (alkyl=ethyl, octyl, benzyl). Crosslinked dextran hydrophobically modified with octadecyl as end groups and having quaternary ammonium groups with benzyl group retained biologically active substances (diclofenac, indomethacin) and released them in a controlled manner. Linear dextran-based polymers with octyl or octadecyl as alkyl end group and quaternary ammonium groups with octyl or benzyl proved to have moderate to good antimicrobial activity against several reference Gram positive (*S. aureus*, *S. lutea*) or Gram-negative bacteria (*E. coli*) and antifungal activity against pathogenic yeasts (*C. albicans*, *C. parapsilosis*, *C. glabrata*).

**Keywords:** *amphiphilic polymers, biomedical applications, antimicrobial activity.*



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## 9. NEW HIGH SOLUBLE COMPLEXES OF KETOPROFEN BASED ON CYCLODEXTRINS - PHARMACEUTICAL APPROACHES

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### Abstract

The aims of this paper are the synthesis and the physicochemical characterization of ketoprofen -hydroxypropyl  $\beta$ -cyclodextrin complexes. The polysaccharides like cyclodextrins represent a class of polymers that have remarkable properties in improving stability, solubility, and bioavailability of poorly water-soluble active ingredients drugs. Ketoprofen is a non-steroidal anti-inflammatory drug, poorly water-soluble used in various topical and oral pharmaceutical forms. Two molar concentrations (1:1 and 2:1) of ketoprofen and hydroxypropyl  $\beta$ -cyclodextrin were used in this study for inclusion compounds. The morphology of the complexes has been studied by Scanning Electronic Microscopy, physicochemical properties by FT-IR spectroscopy and DSC thermogravimetry. The resulted complexes demonstrated the inclusion of ketoprofen in cyclodextrin cavity and high solubility in water at different temperatures. In accordance with the results obtained, new ketoprofen complexes are suitable for pharmaceutical formulation intended for oral or topical administration.

**Keywords:** *ketoprofen, polysaccharides, hydroxypropyl  $\beta$ -cyclodextrin.*

## 10. ASSESSING THE APPLICABILITY OF PPP/PEG-NH<sub>2</sub>/HYS/MAB AMPHIPHILIC MICELLES AS CARRIERS FOR ACTIVE PRINCIPLES

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### Abstract

The paper presents the synthesis of a copolymer of amphiphilic polyphosphazene (PPP / PEG-NH<sub>2</sub> / Hys / MAB) by the cyclomatrix-polyphosphazenes opening polymerization followed by the graft chain reaction of a methoxypolyethylene glycol amine (PEG) -NH<sub>2</sub>) and histamine (Hys), and a methyl-p-aminobenzoate-derived hydrophobic substituent (MAB). Docetaxel belonging to a group of anti-neoplastic drugs called taxoids used in the treatment of various cancers was physically captured inside the PPP / PEG-NH<sub>2</sub> / Hys / MAB micelles in situ using the ultrasonic combined dialysis method, thus highlighting the ability of self-assembly of the amphiphilic polymer. To assess the potential for controlled release of these micelles, in vitro release assays were performed in PBS solutions. The standard MTT test was used to determine the viability of the MCF-7 mammalian cell line in contact with the control micelles and drug-loaded micelles.

**Keywords:** *amphiphilic micelles, active principles, polyphosphazenes.*

## 11. ADVANCED POLYMERIC MATERIALS IN DRUG DELIVERY

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### Abstract

The administration of drugs using controlled release formulations is a great achievement of the researchers and pharmaceutical companies. A large amount of drug is gradually released for a long period, thus improving the efficiency of treatments and increasing patient comfort and compliance. However, this approach is not always suitable since there are some clinical situations when the biologically active molecule should be administered just when normal physiological parameters are disturbed. As a result, new drug delivery systems were proposed and most of them are based on advanced polymeric materials. These polymers have the property to change their inherent characteristics at small variation of the physiological parameters such as pH, temperature, glucose concentration, ionic strength, etc. In the linear form, the polymers change the solubility characteristics while the cross-linked networks swell and collapse releasing a certain amount of drug.

**Keywords:** *drug delivery, polymeric materials.*

**Acknowledgements:** *This work was supported by a grant of Ministry of Research and Innovation, CNCS - UEFISCDI, project number PN-III-P4-ID-PCCF-2016-0050, within PNCDI III.*

## 12. FUNCTIONALIZATION OF SILICA MICROPARTICLES WITH POLYELECTROLYTE MULTILAYERS TO CONTROL THE SORPTION OF ORGANIC POLLUTANTS

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### Abstract

Surface functionalization of silica microparticles with polymeric thin films is a facile route to design new organic/inorganic composite materials for removal of organic pollutants from aqueous environment. Herein, we investigate the construction and stabilization of polyelectrolyte multilayers onto silica microparticles using poly(*N,N*-dimethylamino)ethyl methacrylate partially quaternized with benzyl chloride (PDMAEMA) and chitosan (CHI) as polycations and sodium carboxymethyl cellulose (CMC) as polyanion. The role of polyelectrolyte deposition conditions on charge balance and morphology of the composite microparticles was investigated by potentiometric titrations and scanning electron microscopy, respectively. The new composites were investigated as sorbents for four organic dyes (methylene blue, methyl orange, bromocresol green and Congo red), showing better sorption capacity for the anionic compounds.

**Keywords:** *silica microparticles, organic pollutants, sorption.*

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## 13. POROUS POLY(N-ISOPROPYLACRYLAMIDE-CO-HYDROXYETHYLACRYLAMIDE) HYDROGELS FOR CONTROLLED DELIVERY OF DRUGS

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#### Abstract

It is well-known that the porosity and pore size play a critical role in swelling/deswelling rates of thermosensitive hydrogels. In this matter, N-isopropylacrylamide (NIPAAm) was copolymerized with hydroxyethylacrylamide (HEAAm) in the presence of silica microspheres (SiMs) in order to obtain a porous thermosensitive hydrogels (PHs). The lower critical solution temperature was adjusted to the human body temperature by changing the NIPAAm/HEAAm molar ratio. Subsequently, SiMs were removed by solubilization in aqueous HF solution. Control hydrogels in the absence of SiMs were prepared in similar conditions. The investigations of the morphology, swelling behavior, temperature sensitivity, as well as drug release profiles were performed for both types of hydrogel. The drug release studies from the porous hydrogel were performed in simulated physiological conditions using metoclopramide, as model drug.

**Keywords:** *thermosensitive hydrogels, controlled delivery of drugs, silica microspheres.*

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#### 14. NEW POLYMERIC CRYOGELS FOR BIOMEDICAL APPLICATIONS AS CONTROLLED RELEASE OF ENALAPRIL MALEATE

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#### Abstract

The field of polymeric hydrogels is in continuous development due to applications in the field of medicine and pharmacy. Low and biodegradable composite cryogels were prepared starting from polyvinyl alcohol, pullulan and zeolite L nanoparticles. These materials were obtained by freeze-thaw technique using different concentrations of the components. The drug, enalapril maleate, was incorporated into the hydrogels during the preparation. The hydrogels were characterized by FTIR spectroscopy, SEM and sorption-desorption isotherms. Moisture absorption (determined at relative humidity RH = 82%) had values in the range of 5.28-18.20. Cryogels containing polyvinyl alcohol, pullulan and zeolite L exhibit longer release compared to hydrogels containing only polyvinyl alcohol. The analysis of the in vitro release data of the enalapril maleate drug was performed using three kinetic models: the I order kinetic model, and the Korsmeyer-Peppas kinetic model; the the Korsmeyer-Peppas kinetic model had a best correlation with the experimental data obtained.

**Keywords:** *cryogels, biomedical applications, enalapril maleate.*

#### 15. PREPARATION OF BIOCOMPATIBLE OIL-IN-OIL EMULSIONS STABILIZED WITH PDMS-BASED COPOLYMERS

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**Abstract**

Oil-in-oil emulsions are obtained by the dispersion of oil droplets in an immiscible non-aqueous liquid and stabilized by block or graft copolymers. These copolymers are efficient emulsifiers for stabilizing emulsions composed of two immiscible organic liquids, when each of them is a selective solvent of one of the copolymer sequence. The aim of this study is to prepare drug-loaded polymer particles in a biocompatible organic solvent. These non-aqueous dispersions (NAD) were obtained from the system N-vinyl-2-pyrrolidone (VP) dispersed in a continuous polydimethylsiloxane oil (PDMS) and stabilized by biocompatible well-defined PDMS-PCL block copolymers. The stability of these emulsions as a function of time, temperature and copolymer concentration and molecular characteristics was determined.

**Keywords:** *oil-in-oil emulsions, pdms-based copolymers, drug-loaded polymer.*

**16. PROTOCOLS TO ASSESS THE TOXICITY AND TERATOGENIC EFFECTS OF POLLUTANTS - THE AVIAN MODEL**

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**Abstract**

**Introduction.** The bird embryo (*Gallus domesticus*, *Coturnix coturnix japonica*, etc.) is characterized by a high absorption and filtration capacity of the substances introduced into the egg (in ovo), which allows studying the toxic / teratogenic effects in the short term and / or of the various chemicals involved in the environmental pollution process. **Methods.** The Organization for Economic Cooperation and Development (OECD) has studied and implemented a range of test methods (150) for various potentially polluting chemical substances and materials, methods that have been approved internationally and used in all independent, industrial research laboratories and governmental agencies accredited and licensed in this field. **Results.** This guide provides a number of working methods for in vitro and in vivo toxicity testing, providing a series of systems, four of which are the main ones, namely: FETAX (Frog Embryo Teratogenesis Assay - on *Xenopus laevis*) CHEST (Chick Embryotoxicity Screening Test - on embryos of the species *Gallus domesticus*); Micromass Cultures (using cell masses from undifferentiated mesenchyme of poultry and mouse embryos - this test detects the ability of a chemical component to inhibit cell mass formation); Mammalian Whole-Embryo Cultures (using mouse, rat and rabbit embryos, from the beginning of the fertilization period to the end of the organogenesis, following the teratogenic effects on hematopoiesis, the development of the circulatory system, the growth rate and the development of the embryonic body). **Conclusions.** In the present study we have proposed to present some methods by which bird embryos can be used in experiments to test embryotoxicity (teratogenic effects) of substances, by inoculation and even by exposure of embryonic fragments during the incubation process, while emphasizing the advantages to such research methods.

**Keywords:** *teratogenic effects, avian model, bird embryo.*