МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
СУМСЬКИЙ ДЕРЖАВНИЙ УНІВЕРСИТЕТ
КАФЕДРА ІНОЗЕМНИХ МОВ
ЛІНГВІСТИЧНИЙ НАВЧАЛЬНО-МЕТОДИЧНИЙ ЦЕНТР

# МАТЕРІАЛИ XI ВСЕУКРАЇНСЬКОЇ НАУКОВО-ПРАКТИЧНОЇ КОНФЕРЕНЦІЇ СТУДЕНТІВ АСПІРАНТІВ ТА ВИКЛАДАЧІВ ЛІНГВІСТИЧНОГО НАВЧАЛЬНО-МЕТОДИЧНОГО ЦЕНТРУ КАФЕДРИ ІНОЗЕМНИХ МОВ

# “TO MAKE THE WORLD SMARTER AND SAFER”

(Суми, 23 березня 2017 року)

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SUMY STATE UNIVERSITY
FOREIGN LANGUAGES DEPARTMENT
LANGUAGE CENTRE

# MATERIALS OF THE ELEVENTH ALL UKRAINIAN SCIENTIFIC PRACTICAL STUDENTS', POSTGRADUATES' AND INSTRUCTORS' CONFERENCE OF LANGUAGE CENTRE OF THE FOREIGN LANGUAGES DEPARTMENT

## "TO MAKE THE WORLD SMARTER AND SAFER"

(Sumy, March 23, 2017)

**To make the world smarter and safer:** Матеріали XI всеукраїнської науково-практичної конференції студентів аспірантів та викладачів лінгвістичного навчально-методичного центру кафедри іноземних мов (23 березня 2017 р.) / за заг. ред. доцента Литвиненко Г.І. – Суми : СумДУ, 2017. – 99 с.



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## SECTION 1 HIGH TECH WORLD

### THE INTERNET AS A SEPARATE MODERN COUNTRY

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Notably, nowadays no one will contest that technologies affect almost every part our lives. Furthermore, most of these innovations and solutions are connected with global network – the Internet. Considering this, almost everyone has many accounts on different sites from social networks to banking systems. As a result of this, we literally live online. Despite the fact that many people are discussing the problem of Internet addiction, we will review the opportunity of including the Internet in the list of current world's countries.

According to analyses of International Telecommunication Union (ITU), United Nations specialised agency, in 2016 about 3,5 billion individuals were using the Internet around the world. As an illustration, this number is greater than the sum of populations of 4 most populous countries (China, India, US and Indonesia).

In fact, we cannot consider the Internet as usual familiar to us state or country by definition. According to Cambridge Academic Content Dictionary, a country is an area of land that forms an independent political unit with its government. To be honest, the Internet almost entirely corresponds to the definition, excluding attachment to the territory or land. However, the world is still changing with enormous speed. We use word 'virtual' more and more often while speaking about usual things, for example, virtual banking cards, virtual/online shops, virtual learning, virtual friends and so on. Why can't we call the Internet a virtual modern country with its population, laws, citizen rights and other significant things?

While talking about networking infrastructure, we cannot forget IT companies that deliver devices to access global network, content and websites and other internet related stuff to us. As IT firms have become very powerful and influential, that is why some countries are beginning to treat them like they are actual some kind of nation states. With this intention, in January Denmark's government decided to establish a new kind of ambassadors - 'a digital ambassador' to operate country's relationships with some of the world's biggest IT organisations like Microsoft, Google and Apple. It is the first time in the world's history that government is trying to set up a special post for co-operation and regulation of relations with tech corporations.

Seeing that, we can assume that these companies play the role of a theoretical government, which people entrust their personal data (which is not always wise act). It is an industry that dictates the trends and rules of its users.

We can predict with a high probability that shortly we will consider the Internet as a separate modern country. In conclusion, we must remember that the Internet is just a virtual world and we cannot forget about the reality and keep in touch with it.

# THE KEPLER MISSION

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Kepler is a space observatory launched by NASA to discover terrestrial planets, especially those in the habitable zone of their stars where liquid water might exist on the surface of the planet. Named after astronomer Johannes Kepler, the spacecraft was launched on March 7, 2009, into an Earth-trailing heliocentric orbit.

The scientific objective of the Kepler Mission is to explore the structure and diversity of planetary systems to:

- determine the percentage of terrestrial and larger planets that are in or near the habitable zone of a wide variety of stars.
- determine the distribution of sizes and shapes of the orbits of these planets.
- determine the properties of those stars that harbor planetary systems etc.

Crash on Kepler spacecraft in May 2013 brought an end to science mission to search for transiting exoplanets. Developed over the months following this failure, the K2 mission continued scientific observations with the Kepler space telescope. K2 became fully operational in May 2014 and is expected to continue operating until 2017 or 2018.

It is anticipated that K2 will:

- determine if hot gas giants exist around young stars, or whether they migrate to small orbits at a later epoch by tidal or other interactions.
- determine the relationship between stellar structure, rotation and activity within stellar associations over a range of ages and metallicity.
- identify the progenitors of Type Ia supernovae from photometric structure in the rise to outburst maximum.
- participate in multi-mission, multi-band monitoring campaigns of ecliptic targets along with other space-based hardware or ground-based telescopes etc.

# QUASISTATIC CAVITY RESONANCE (QSCR)

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Nowadays our life continuously connects various kinds of gadgets. Most of these devices work using an accumulator. But the reserve of energy in batteries is emptying very fast. We need to charge the battery over and over again for using gadgets to continue our work.

Often the battery has a low energy level unexpectedly: when we have not a charger or there isn't any rosette nearby. But even if we can charge the device we almost cannot move on while the battery is charging.

So, sometimes a wire charger is very inconvenient. As an alternative, there are powerbanks. But in this case, we have not to forget to charge the powerbank.

The solution of this problem was found in the company "Disney". "Disney Research" has built a room, where devices can be charged without any wires. In this room, the copper pole locates in the centre. In the middle of the column, there are several capacitors, and aluminium panels are built into the walls. This technology is called a quasistatic cavity resonance (QSCR). It is based on the delivery of energy using a seamlessly magnetic field.

The main advantage of this technology is its power. Ten different devices could be charged in the room during the experiment. The result of it showed that it would be possible to charge 320 smartphones at the same time. Also, this technology has the opportunity to make the room bigger. It just needs to increase the number of columns. It can be used in different places: either it would be a small room in the office or large storages in the docks.

The quasistatic cavity resonance is a new technology, and it has not been ready yet. We do believe that in the nearest future people will be able to use it, and our life will become much better and easier. Furthermore, QSCR opens new horizons in science and takes new opportunities for next steps in humanity growing.

# SMART CITY

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A smart city is defined as a city that engages its citizens and connects its infrastructure electronically. The smart city concept has been introduced to solve a number of problems that arise in the management of any big city, especially megalopolises. Special attention is paid to the development of business and city through the construction of a favorable business infrastructure. The smart-city researchers have identified six characteristics that are essential to explain the concept. *Economy*. It includes dynamic business processes, labor market flexibility, etc. *Smart people*. Human capital recognizes the rights of all communities who are open minded and cosmopolitan. *Intelligent control*. Intelligent government put objectives of a strategic nature, involves rational decision-making processes, creating strategic plans. *Smart safe transport and information infrastructure.* This allows cities and districts within it, to be accessible for the outside individuals. *Environment*. It involves wise use of natural resources and the orientation on sustainable development, as well as reducing environmental pollution. *Intelligent life in the city.* Intelligent life in the city means the presence of cultural, health, educational facilities centers, etc. Each characteristic determines an economic function. It significantly affects individuals and businesses as far as life quality improvement, and increases economic opportunities.

Technology is crucial for building a smart and secure city. The city management needs to empower the public by engaging them in the decision-making process. It should value their citizens' feedback by encouraging them to participate and contribute to solving problems. Moreover, local citizens must be fully aware of the community challenges and must take part in shaping the budget allocations, local taxes, etc.

Cities face many risks and challenges, such as poverty, unemployment, traffic jams, cyber-attacks, high crime rates, and slow processing of business transactions by bureaucratic city

systems. The smart city concept is closely connected with the improvement of the efficiency of individual buildings, residential areas, infrastructure facilities, recreation areas or entire cities. "Smart" approach to the planning of urban areas has a common problem with the "green" approach: reducing the load on the municipal network, energy efficiency, improving the connectivity space and increasing comfort for users.

Technological devices are an important part of the smart city concept. As a rule, they can be designed with special sensors. Sensors are small measuring devices that use electronics to detect certain sounds, odors, or levels of variation. There are two types of them: passive and active. Passive sensors do not have to take action, they just collect the data. They are mainly used for measuring weather conditions such as wind speed, level of ground-level ozone, or ultraviolet levels of the sun. Active devices, on the other hand, use electronics for data processing and taking appropriate action, e.g. traffic lights or parking sensors that use electronics for calculation the collected data and then take actions based on satisfaction of a certain threshold value. A network of physical devices or "things" that work in close cooperation through the collecting, exchanging and processing of data is known as the Internet of things (IoT). City can use it for remote monitoring these sensors via a wired or wireless network. IoT can be used for improvement of plan ability. The data will also allow city officials to focus on smart planning of infrastructure, e.g. in the areas where water leakage was the most.

So, smart city is based on the data analisys. Data collection provides understanding of citizens' needs. There should be more services and platforms in the cities to collect feedback from the citizens. People, processes, and technology are three pillars of smart city initiatives that can be utilized to alleviate such challenges. The implementation of this concept will enhance the life quality of citizens and create beneficial influence on development of urban infrastructure, will help to deal with many problems and risks, such as unemployment, poverty, traffic congestion, high crime rates, cyber-attacks and slow bureaucratic city systems for processing business transactions.

# SAVING THE ENVIRONMENT FOR THE FUTURE GENERATIONS

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What is ecology? Ecology is the science that studies how to save the nature on the planet Earth, improve life of its inhabitants including people, animals and plants and the conditions of their habitat for the sake of present and future generations.

The image of a sick planet has become firmly established in the public mind. A few years ago the word "ecology" hardly meant anything for the majority of people. Nowadays we try to think about it more often, because of the fast industrial development which can make harm to the environment.

Over the past few years we have been frequently speaking about volcanic eruptions, floods, different natural disasters, ozone holes, about food contaminated with chemicals. And, of course, we cannot forget about the greenhouse effect, which is a result of carbon dioxide emission.

Factories burn fuels to run machines, and these burning fuels release poisons into the air. It also causes a kind of water pollution called acid rains. Some factories produce liquid wastes that are dumped into rivers and as a result fish cannot survive in this acid water. It's like a vicious circle.

The pollution of the environment is the result of people's careless interaction with nature. They are paying for this with their health.

On the one hand, if we have enough technological innovation and economic development, it'll help us to figure out different ways of saving our planet for future generations. On the other hand, we need to learn from nature and encourage only environmentally-friendly methods. The answer is somewhere between these two point of views.

So, let's try to find out what steps will help us to make our planet safer.

For solving lots of environmental burning problems it is necessary for people:

- To combine efforts and raise safety standards at all industrial facilities
- To create international space laboratories to monitor the state of environment
- To set up an international center for emergency environmental assistance
- To teach people how to use the rule of three “R” (recycle, reuse, reduce)
- To explore the clean energy sector
- To using electric cars
- To follow environment-related laws and regulations

All these measures can prevent us from dangerous illnesses and diseases.

Some people don’t understand the value of the natural resources, they don’t use it wisely and, what is more important, rationally. But the scientific and technological progress can help us to cut down all kinds of pollution and create new devices.

Don’t forget that technological innovations have the potential to harm our environment, so every person of the 21st century should be technologically educated.

The achieving of this purpose would be a good push for the government of every country to educate more qualified and professional scientists, who will find ways to fix all problems that we have and give some pieces of advice to the next generations how to fight with such barriers in the future.

Some initial steps have been already made in this direction. The countries, members of the UNO, have discussed problems facing ecologically poor regions. Some groups of people try to persuade enterprises to stop polluting activities. Scientists are doing much to find the ways to reduce pollution from automobiles and factories.

# POPULAR TECHNIQUES IN OBJECT RECOGNITION

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Creating artificial intelligence is the most challenging task in computer science nowadays. If we review the ideas of science fiction writers, the task of computer vision will be described as a valuable one. Basically, computer vision is a process of object localization and recognition.

The object in computer science is a name of data structure that can be identified. Localization of the object is searching for the subwindow that covers the object of interest. Step by step the frame moves on the image in programmed direction. The classifier gets information about negative scored background that must be known in advance. When the classifier finds positive scored unknown element that must be marked as object of interest, the step decreases for each iteration, until the classifier finds the background again. Subwindows in specified forms can not cover the object of interest tightly. As a result, the desired subwindow around the object may not be optimal. This task has inspired a great number of scientists to create different algorithms for optimization subwindow size or to avoid sliding-window techniques using the so-called swarm optimization. The swarm in computer science is a set of points chaotically spreaded on the image. All of them get the information about positive or negative featured parts of picture. All points get closer to the object on every step of spreading.

But as for recognition task, human imagination creates really fantastic technologies to answer the challenge. There are two popular solutions: intelligent expert system and neural network. Expert system is a system based on the images vector representation, where every pixel gets its number in RGB color system. Texture classes must be set at the beginning of the experiment. They are called training matrix and they are used to find out the background of the image, which also needs to be represented as a matrix. All matrices should be transformed to binary interpretation with the help of specified tolerance system. Then the etalon vector is counted for

every training matrix. It helps classifier to guess the radius of the container in multidimensional space and to make decision to what specified classes the image fragments belong.

The neural networks is considered to be a very popular technology nowadays. It`s common knowledge that scientists are inspired to make inventions which are linked to nature creatures. It Submarines, sonar and planes are the best example. In the computer sciences and object recognition the best instrument for image processing and recognition is human brain. Neurons that are organized as networks in our heads are used to direct impulse from the starting neuron to the correct finishing one. It means that our brains are being trained throughout the life to connect the input and output neurons and to rapidly make decisions about the object as soon as we see it. This logic was implemented in computer realization as a system of a neuron layers formation, which is used to find out suitable weight coefficients on the entry layer for every input signal to direct it to the correct output layer.

To find out the pros and cons of that technique, let`s review main types of neural networks. The main difference in networks is if it is supervised or not. For the supervised one the supervisor, who controls the training process, needs to mark correct and incorrect recognitions for network to be able to make corrections by itself. It`s unnecessary for unsupervised networks, but it may result mistakes in final recognitions.

Trained network can recognize objects extremely fast. There is one problem – most of the networks can find classes, which are already known. If there is unknown input signal, feedforward network will try to direct it to the most similar exit neuron. Such task can be done with the help of counter propagation networks. Recognition process in such networks works with both input and output neurons, sacrificing the recognition speed. Links between neurons form a line from the input layer to the output layer for known classes and vice versa for the detection of unknown classes.

Computer vision is one of the most interesting and difficult tasks for scientist nowadays. But it only means that the numbers of

scientists will increase in future and the problem will be solved. It would be a great step for creating the artificial intelligence.

## THE USE OF NANO-ROBOTS IN MEDICINE

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Today, more and more people question the treatment without surgery. Thanks to modern research and the efforts of scientists a new possible way to use nano-robots was invented. The first thing to know about nanorobots in medicine is that they're not like the robots you're probably imagining. Scientists who build nanorobots are building tiny packages that can complete tasks in an automated way.

The design and use of such devices will bring a number of advantages. Moreover, they will provide medication or, at least, control or reduction of the impact of diseases. Also they will provide valuable empirical evidence for improvement and further development of such machines. Practical information received from these transactions at the microscopic level will eliminate a number of false paths and point the way to more effective methods in solving the problems inherent in working at this level.

Firstly, we must decide which way to introduce these robots into the body. The most likely way is to put them in the blood because the human body is penetrated by blood vessels and capillaries, and sizes of robots almost comparable with them. Another goal is to decide on a way to deliver nanobots to problem zones. There are two options: the first - the robot will get it to the right place automatically, moving through bloodstream, and the second is to manage it using special devices. The very first Feynman prize in Nanotechnology was awarded to William McLellan for building an electric motor that fits within a cube 1/64th of an inch on a side. This is probably smaller than we would need for our preliminary microrobot. One or several of these motors could be used to power propellers that would push (or pull) the microrobot through the bloodstream. We must create design propellers which would not cause damage to tissues. One idea is to create a robot with remote

control over the actions and movements that can be observed with the camera. We will be able to control the actions of nanorobots and guide it to the right place.

Secondly, we must decide how nanobots will determine the threat or damaged area (tissue). There are several ways to solve this problem. First, enter a radioactive substance into a blood stream so that it couldn't cause significant harm to the body, and will be controlled by means of a fluoroscope or some other radiation-sensitive imaging system. The main advantage of this method is that the substance will move with the bot and will be fully traceable from the beginning to the end. The second way is to use ultrasound waves that will pass through the tissue and bounce back. This will enable to determine the material through which the signal passed.

Since the control of nanomachines is not a difficult issue, then delivery of this robot to the body will not be problematic. We must repeat the same procedure to remove this unit out of the body (through the blood vessels) or do it in a natural way. The second method is the most reasonable for use, but in this case we can inflict the most damage to the structure. We have to reduce all risks to ensure that it is not necessary to eliminate nanobots surgically.

In conclusion, we claim that our most important goal for today is to create effective and practical nanorobots, reframe technology which already exists. It should be our scientists and engineers' priority. The era of incurable diseases will soon come to its end and we eyewitness this process. A concerted development effort could have a working model of the microrobot ready within a year or two, and this would certainly advance the development of nanotechnology.

# ENERGY RESOURCES: WAVE POWER

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The topic of renewable energy is an evergreen subject, especially, in a world dominated by fossil fuels. Renewable energy is widely discussed in the contemporary world because it is unlimited, which means it's sustainable and does not emit greenhouse gasses that are harmful to the environment and human life. A classic example of renewable energy is wave energy.

Wave energy also known as ocean energy or sea wave energy, which is harnessed from ocean or sea waves. We should distinguish wave power from tidal energy, which is received from underwater equipment that gets the constant movement of ocean currents powered by gravity and the Earth's rotation. Wave energy is caused by wind passing over the surface of the sea or the ocean. A large amount of energy is stored in waves and we are now able to use it to generate electricity.

There are three main types of wave energy technologies. One type uses floats, buoys, or pitching devices to generate electricity using the rise and fall of ocean swells to drive hydraulic pumps. A second type uses oscillating water column (OWC) devices to generate electricity at the shore using the rise and fall of water within a cylindrical shaft. The rising water drives air out of the top of the shaft, powering an air-driven turbine. Third, a tapered channel, or overtopping device can be located either on or offshore. They concentrate waves and drive them into an elevated reservoir, where power is then generated using hydropower turbines as the water is released. The vast majority of recently proposed wave energy projects would use offshore floats, buoys or pitching devices.

But the main problem of these technologies today is cost. The cost of installing and maintaining a large wave plant is too expensive versus other alternatives such as wind farms.

Nevertheless, there is great potential for wave energy to become a major renewable energy source in the future because it is free (no fuel needed, no waste produced) and not expensive to operate and maintain. It can also produce a great deal of energy.

# INTERNET MEME

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In the modern world, it's hard to imagine a young pal who had never heard about "memes". As we all know, meme is some picture or video, which furiously became popular and went all over the world in the matter of days. Among them we see "Gangnam style", "Dratuti" and "Crazy frog".

But is it a modern phenomenon? Actually, no! Scientists have been studying memes for a long time already. In the ancient times they called the fact meme if some information spread very quickly among the population of some tribe or nation. First to propose such a term was Richard Dawkins in 1976 in his book "The Selfish Gene." He tried to explain how the information is spread among the human species.

How can we use such an ancient and powerful tool in our advantage? The best way for it is using it in marketing. Nowadays a lot of advertisements are based around the memed photos, phrases, videos. But the main goal of my research is to find some disadvantages and problems when using such methods. The main problem I see is keeping up-to-date. The main problem with memes is their main advantage. The quickness of their spread makes them go blurry very fast too. So, managers, who are responsible for the advertisement strategy of some factory, have to be really active, make quick calls and react to the change of conditions.

But is it worth a shot to try and use such risky methods in serious deeds? Not really. It may be worth a shot if your company is small, can rapidly change its policy and is creating a product whose natural interest in the Internet is not to be in doubt. But if you are a representative of a big company, who has an authority and is respected, you should not connect yourself with such a blurry and unsure source of the Interest. It is a big problem that some memes are hard to interpret and also sometimes offensive, what make them even more dangerous.

# INTERNATIONAL SPACE STATION

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The International Space Station (ISS) is a space station in low Earth orbit. Its first parts were launched in 1998. The ISS is the largest artificial body in orbit. The ISS consists of modules, solar arrays, and other components. ISS components have been launched by Russian rockets, and American Space Shuttles.

The ISS maintains an orbit with an altitude of between 340 and 435 km. It completes 15.54 orbits per day. It weighs almost a million pounds. It flies at 4.791 miles per second (7.71 km/s). That is fast enough to go to the Moon and back in one day.

The ISS is a revolutionary research asset with authentic microgravity facility. Space station researches physical, chemical and biological processes. The microgravity lab has hosted over 1,500 experiments involving scientists from more than 65 countries. It has science labs from the United States, Russia, Japan and Europe.

Scientists study what happens to people when they live in space. 211 people from 15 countries have visited the ISS. The ISS hosted its first one-year crew in 2015-16. NASA has learned how to keep a spacecraft working for a long time. These lessons will be important in the future.

The ISS crew provides opportunities for students on Earth by running experiments and demonstrations.

The critical systems are the atmosphere, water supply, food supply facilities and fire detection system.

The space station is as big inside as a house. It has two bathrooms, a gymnasium and a big bay window. Six people can live there. It is big enough to cover a football field.

The ISS is also the symbol of the end of Cold War and the development of international understanding.

# UNMANNED GROUND VEHICLE

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In the broadest sense, an Unmanned Ground Vehicle (UGV) is any piece of mechanized equipment that moves across the surface of the ground and serves as a means for carrying or transporting something, but explicitly does not carry a human being. The main parts of UGV are: sensors, platform, control, human machine interface, communication and system integration.

UGVs have many potential applications and the demand for them is ever increasing. It can be used in many situations, such as rescue operations, space applications, industrial and home usage, transportation of resources and humans and, of course, in combats. They have been used in military operations since 1960s. For example, UGVs were used for inspection at checkpoints in Iraq and Afghanistan. The number of robots used in Iraq increased from 150 in 2004 to 5000 in 2005. They disarmed over 1000 roadside bombs in Iraq at the end of 2005. By 2013, the U.S. Army had purchased 7,000 machines and 750 had been destroyed. The military is using UGV technology to develop robots outfitted with machine guns and grenade launchers that may replace soldiers.

The use of UAV in transport is becoming more popular. Google has recently presented self-driving cars technology. This technology may deliver the biggest impact on improving road safety and mobility for everyone. Their sensors and software can detect pedestrians, cyclists, vehicles, work on the roads from a distance of two football fields away in all directions.

# SOLAR ENERGY IS AN ENERGY ALTERNATIVE SOURCE

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Our relationship with the environment is bilateral. If we want to live in clear world that takes care about us we must take care about the environment. It is evident that healthy population and high quality of life is possible only in healthy environment.

Nowadays we have some negative effects on the environment that caused by results of coal, oil and gas burning. People use these resources everyday: while driving a car, cooking a breakfast, turning on the heat in the house and etc. All these activities lead to "greenhouse effect" that changes the climate of our planet. Ultimately we get air pollution, acid rains, climate changes which destroy flora and fauna, kill thousands of people around the world and make millions of humans ill. Presently the quality of our life and health is becoming worse and worse.

We must change this situation; one of the possible solutions is to reduce consumption of fossil fuel. Alternative sources of energy that do not consume coal, oil, gas and fossil fuel are used for this purpose. They are widely available, environment friendly and cause little or almost no pollution. Actually, there have been carried out several alternative energy projects in various countries aimed at the reduction of our dependence on traditional fossil fuels, such as Solar

Energy, Wind Energy, Geothermal Energy, Hydroelectric Energy, Biomass Energy, Ocean Energy, Hydrogen Energy.

Solar energy is one of the alternative sources of energy which can be used everywhere. However, we can get only 30 percent of the sunlight, because the rest of it is reflected back into the space. The available amount of sunlight usually depends on geographical location and climatic conditions. Getting solar energy in the regions with colder climate is less effective than in the regions near the equator. Spreading of solar power plants leads to the increase of ecologically safe energy generation. As a result we don't have to use so much fossil fuel for energy producing, which, in its turn, leads to reduction and prevention of negative influence on environment, such as green house effect, pollution emissions, etc. Besides, construction and exploitation of solar power station create employment and competition on the energy market of energy which cause decrease of energy prices.

Solar energy is renewable source of power that doesn't pollute air and may be used all over the world. It is one of the keys that can stop global climate changing. We must take care of the environment if we want to live in pure world and to be healthy.

## SECTION 2 ADVANCEMENTS IN MEDICINE

### INNOVATIONS IN MEDICINE

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Medicine does not stand still. Scientists are finding ways to treat increasingly complex diseases through innovations in medicine every year. Is innovation in medicine a good or bad thing? On the one hand, new methods of treatment do not require surgical intervention, long recovery and patient care. On the other hand, the old methods which helped most people are nearly forgotten nowadays.

In this paper, I'd like to show how important it is to update resources in such industry as medicine. All of us are quite aware of close connection of innovation in medicine and human health, how the work of new equipment can bring a person back to life within seconds. Medicine is the area that should develop every year, because human diseases increasingly embrace our body and become more resistant to various methods of treatment.

Biotechnology is gaining popularity and relevance in our time. More than 3000 genetic diseases are caused by a single replacement in DNA, a grandiose breakthrough in genetic engineering takes place with the help of CRISPR. Scientists plan to learn how to get rid of all the diseases and mutations for good. But consider the pros and cons of such an innovation. Cas9 is very accurate, like a DNA surgeon. CRISPR allows you to turn on and off the genes of living cells and study specific DNA sequences, besides accuracy, cheapness and ease of use. The CRISPR-Cas system is much more convenient. The function of the incision is taken by the Cas9 protein. The project allows for homologous recombination when similar or identical DNA regions exchange nucleotide sequences among themselves. However, all these medical applications have one drawback. They are limited to one patient and will die with him, if the scientists do not use them on reproductive cells. Unknown errors can occur in any part of the DNA and go unnoticed. All these prospects are opened thanks to the recent revolutionary discovery of the protein CRISPR-Cas9.

What is the working principle of such a protein? The virus inserts its genetic code into the bacterium. Bacteria try to resist unsuccessfully, but in most cases their protective mechanisms are too weak. But sometimes bacteria survive. Then they can activate their most effective antivirus system. They retain some of the DNA of the virus in their genetic code. When the virus again attacks, the bacterium creates an RNA copy from the DNA archive and forms the Cas9 protein. He scans the bacterium for virus interference. When there is a 100% match, it activates and cuts the DNA of the virus, making it useless, thus protecting the bacterium.

In 2015, scientists used CRISPR to remove the HIV virus from patients' cells and proved that it was possible. A year later they conducted another experiment with rats. The HIV virus was found in virtually all of their cells. The scientists injected CRISPR into their tails, and were able to remove more than 50% of the virus from the cells throughout the body. The UK government allowed scientists to change the DNA of human embryos for research purposes using the CRISPR system. In early February 2016, Chinese scientists conducted experiments on human embryos even before such studies were permitted in the UK. In April 2016, geneticists reported that they changed the genes of embryos to make them immune to HIV. They introduced a gene that occurs in people not susceptible to infection using CRISPR.

CRISPR is able to help in the treatment of blood cancer. Scientists can take samples of the tissues of the hematopoietic organ of the patient himself, correct the defective stem cells, free them from a fatal mutation, and then transplant them instead of looking for a bone marrow donor. A team led by oncologist Lu Yu introduced modified cells to a patient with aggressive lung cancer. The researchers removed the immune cells from the recipient's blood, and then disconnected the gene with CRISPR-cas9. The disabled gene encodes a PD-1 protein that "puts the brakes" on the immune response of the cell. Dr. Lu says that the treatment went smoothly, and that soon the participant will receive a second injection.

Thus, innovative developments reduce the cost of treatment. CRISPR gives us the means to edit our immune cells and make them the best hunters for cancer cells. The technology CRISPR/Cas9 is able to change the attitude of mankind to hereditary diseases. If

before they were either completely incurable, now it is possible to treat them "truly", that is to eliminate the very cause of the disease.

## NANOTECHNOLOGY IN MEDICINE

A. Svikolnik – Sumy State University, group LS – 501
L. A. Denisova – E L Adviser

In today's world often facing humanity faces global problems. Significant help in solving various problems can provide nanotechnology. In some biology and other sciences often use them is crucial.

I have said that over the past few decades was found about thirty infectious pathologies. Among them we should mention AIDS, "bird flu" virus, Ebola and others. Every year millions worldwide are diagnosed new cases of cancer. Mortality from these pathologies is around five hundred thousand people a year.

Nanotechnology in medicine is of great importance for all humanity. The advantages of using advanced methods over traditional therapy are obvious. Nanotechnology in medicine mainly involves chemical effect on a particular disease by administering drugs. Examples of the use of nanotechnology in medicine are a lot. Thus, scientists have created a new class of particles. Nanoparticles endowed with unique properties of optical character. These elements, having a microscopic diameter can move freely through the blood system. To the surface liners attached antibodies. The purpose of the application of nanotechnology in medicine is the destruction of cancer cells. A few hours after the liner into the body, made an infrared light irradiation. Inside is the formation of a special power by which cancer cells and destroyed.

Scientists suggest that this and other nanotechnology in medicine will contribute to the development of operational and inexpensive diagnostic methods and eliminate abnormalities early. In addition, new developments in the field of drugs may permit repair damaged DNA structure.

Using nanotechnologies, science can provide personal immortality to people due to implementation in an organism of molecular robots. They will be able to prevent cell aging, reorganize

tissues of human body, resuscitate treatment for hopelessly sick people who have been contemporarily frozen using cryonic methods.

## INNOVATIONS IN MEDICINE

D. Taranyuk – SSU, group PM – 61
S.G. Zolotova – E L Adviser

Whether it's the technology that allows us to peer deep into the body or medicines that extend the lives of those with chronic diseases, it's easy to see how advances in health and medicine have touched the lives of nearly every person on the planet. The list below encompasses 10 Medical Breakthroughs in health and medical practices that have changed - and in many ways continue to change - the world today.

The bionic eye takes a video signal from a camera built into sunglasses and wirelessly transmits that image to implants in the retinas of people who have lost their vision. The system isn't perfect. It lets a blind person regain basic functions like walking on a sidewalk without stepping off a curb, and distinguishing black from white socks. Plus, as the retina itself heals over the implant, the quality of vision decreases. The bionic eye is currently only approved for people who have lost their sight from retinal pigmentosis.

The seizure stopper is a new innovation for epileptics suffering people. It is like a defibrillator for brain, the system includes sensors implanted in the brain that can spot the first tremors of an oncoming seizure. Then it sends electrical pulses that counteract the brain's own haywire signals, stopping the seizure in its tracks.

Until recently, treatment for hepatitis C fell into the good-but-not-great category, with only around 70 percent of patients being cured. The new drug Sofosbuvir is a much more potent killer of hep C, with success in as many as 95 percent of patients.

The idea of taking someone else's poop and giving it a new home in your own colon may sound repulsive, but the treatment has proven remarkably effective in curing infections of C. difficile-a nasty bacteria that kills 15,000 people each year. You're simply gaining some of the helpful bacteria living in the donor's gut. The fecal transplant is a good way to save people life.

New drug called Serelaxin is a heart-saving hormone, that has upped the odds of survival by as much as 37 percent, according to a University of California, San Francisco study. It's a synthetic version of the hormone relaxin, which is produced by pregnant women to help with the increased stress carrying a fetus places on the heart. It not only opens up your blood vessels to supply your organs oxygen, but it has anti-inflammatory properties.

The cancer gene fingerprint helps to know the subtype malignancy in our brain. Not all cancers are equally lethal - cancer in your prostate means a longer survival rate than a malignancy in your brain. But even prostate cancer comes in multiple flavors ranging from manageable to very bad. By analyzing the mutated genome of a tumor, doctors can now pinpoint whether a cancer is sensitive to a certain chemotherapy, or one that doesn’t respond at all to current treatments. Knowing the subtype might mean jumping directly to a clinical trial that could save life.

# INNOVATIONS IN MEDICINE

S. Mishchenko-Sumy State University, group LS-18
D. Marchenko – E. L. Adviser

Little do we know how quickly our medicine is developing nowadays. More and more methods of treating diseases are being used in our society. But far more are to come. Thanks to the development of electronics many new devices continue to appear every day. Some of them are the following:

For people who suffer from migraines, headaches and other causes of chronic head, the "take two aspirins and call me in the morning" method is pointless. Doctors have long associated with the sphenopalatine ganglion (SPG), but haven't yet found a treatment that works on the SPG long-term. A new technology is a patient-powered tool for blocking SPG signals at the first sign of a headache. The system includes the implant of a small nerve stimulating gadget in the upper gum on the side of the head to be affected by headache. The implant is connected with the SPG bundle. When a patient feels a headache, he or she puts a handheld remote controller on the cheek near the implant. A patient stops to suffer from a headache. It is called an electronic aspirin.

Diabetes is a very wide-spread disease. It causes the constant need to take blood for glucose testing and the need for daily insulin shots. Diabetes is also connected with the risk of infection from all that poking. Continuous glucose monitors and insulin pumps are today's best options for automating these processes. Scientists are working on technologies that would replace the poke with a patch. They are improving a transdermal biosensor that reads blood analyses through the skin without drawing blood. The device can collect one reading per minute. It also tracks glucose levels all over the time.

To sum up I would like to reiterate about the importance of developing medicine. New devices make a person's treatment more effective and productive. They help a patient to recover easily and quickly. Moreover, our lives and lives of future generations depend on innovating ways in medical treatment.

# APPLICATIONS FOR PEOPLE WITH HEALTH DISABILITIES

*V. Maximova – Sumy State University, group LS – 501*
*L.A. Denisova – EL Adviser*

There are such diseases that people had to live with all their lives. Such simple actions as talking on the phone, going downstairs or even determining the expiration date of milk can become difficult for people with disabilities. We present a selection of mobile applications that make life of people with disabilities easier.

Yandex.Razgovor. Recently the company Yandex has issued an application that helps deaf and hard hearing people communicate with acquaintances and strangers due to the fact that it transforms spoken speech into text and vice versa.

Be My Eyes. Be My Eyes is a crowdsourcing application that uses video chat to connect blind people and volunteers who are ready to help them in different everyday situations, for example, checking the expiration date of products or crossing the street.

Look At Me. The Look At Me application was developed by Samsung Company. It helps to successfully socialize the children with autism. With the help of game interaction, the application teaches you to establish view contact, recognize emotions, remember faces, and also better express your own feelings.

Dexteria. Dexteria is a series of applications from Binary Labs which are made to develop children's motor skills, as well as restoring of motor functions for people who have had a stroke. A set of exercises for hands helps to train strength, control and dexterity of movements and to track your progress.

MySugr Diabetes Logbook. With the help of mySugr Diabetes Logbook application, people with diabetes of the first and second degree can control eating food, taking medicine, the blood sugar level and others.

In the list not all useful applications are displayed. Their quality and quantity are constantly increased. You will have to choose that mobile assistant, which will be more convenient for a person with health disabilities.

# OSTEOPATHIC APPROACH IN UKRAINE

O. Sharova – Sumy State University, group PhD-61
Morozova I.A. – E L Adviser

Osteopathy is a practice of medicine based on the manipulations of bones and muscles. It was first promoted in 1874 by Kansas physician A.T. Still.

Osteopathy is a branch of Western medicine that incorporates alternative perspectives. Osteopathic physicians use all conventional methods of diagnosis and treatment. Additionally, they are trained to place additional emphasis on the achievement of normal body mechanics as central to maintaining good health. There are different levels of recognition in different countries. For example, it is often covered by medical insurance in the USA since osteopaths are licensed now to practice in all 50 states. Doctors of osteopathy or DO's undergo the same level of training that MD's do. They can prescribe medicine and perform surgeries, and often select a specialized area of practice, such as neurology, pediatrics etc. At the same time Quebec is the only province with a regulatory body for osteopaths in Canada. Different extent of regulations is also observed in countries of Western Europe. In Ukraine Ukrainian Osteopathic Association has been registered. You can receive a license to perform a private practice. But it's not necessary to have MD diploma for practice. Having the qualification of a nurse is enough. This medical approach is still new for our country but its popularity is growing.

Osteopaths believe that they can treat any ailments using this approach. Scientific research data is still being collected. The evidence of the effectiveness of osteopathic treatment for pediatric conditions remains unproven due to the paucity and low methodological quality of the primary studies. Osteopathy is proved to be effective on pain control associated to spinal cord injury and low backache. There are also positive results of management of initial orthostatic hypotention. The literature regarding the effectiveness of osteopathy is mixed in both quality and results. Although the quality of the randomized control studies vary greatly, the result of the studies is encouraging, particularly with the recently

published studies. This medical approach is emerging as a strategy with tremendous potential.

## INVENTIONS IN MEDICINE THAT ARE MAKING OUR LIFE LESS TROUBLESOME

D. Yakimenko – Sumy State University, group LS-614
N.G. Horobchenko – EL Adviser

Today humanity is fighting with many diseases caused by infections, environmental pollution, hereditary disorders and others. A lot of specialists are trying to find new treatments for diseases and prevent their occurrence. They publish information about these inventions in the Internet, magazines and television. In particular: creation of artificial organs (heart, kidney, liver, pancreas and many others), production of prostheses and implants, development of new vaccines and medicines, tumor removal, regeneration of tissues and organs of the body. I am extremely interested in all the inventions in the field of traumatology. Because I think that every person has got traumas in his life (bruise, fracture, hematoma etc.) Treating of fractures is the biggest problem in traumatology as the repair can take a long time. Moreover, the patient feels pain and discomfort. Therefore, scientists have developed new treatments for fractures. A number of them can be described here:

- Scientists invented an analog of gypsum. This can be a thermoplastic or polymer bandage. The material becomes soft at a temperature of 90° C. When applied to the damaged part of the body, it acquires the desired shape and hardens in 30-40 minutes. Advantages: much lightweight than gypsum, it does not cause allergies, looks neat, material is breathable (this allows you to bathe in it).

- Ukrainian inventors have created a way to rapid healing of fractures with a special gel. This gel is based on the patient's own blood. It has been proved that the gel helps bones grow together twice as fast.

- Concerning complex fractures: conservative methods are useless and are replaced by minimally invasive operations. The

method is that doctors make punctures and through them deliver the technique to a fracture. In this case the patient receives fewer injuries. The process is monitored by the doctor - by translating the image onto the monitor. When using this method, complex fractures heal at times faster.

- British scientists have invented a special frame. The bones grow faster when doctors use this frame. The peculiarity of frame: it has pores (for germination vessels) and the body does not reject the material. This method is used for treatment of complicated fractures. Bones become recovered within 4-8 weeks.

- In 2013, the material «Arxis» was invented. This is a liquid substance, which consists of nucleic acids. The material hardens at a temperature of the human body. After that, it forms a substance with a multitude of pores and becomes very similar to bone tissue.

- Scientists from Israel have developed a special membrane to speed up the treatment of fractures. This membrane is implanted into the patient. Its feature is the ability to resorption with the time.

The problem of injuries, especially fractures, is very relevant. Because the recovery of the patient takes months and this process is painful. This is due to the ever-growing car accidents. Also causes are accidents at factories, aircraft crashes and others. So it is not surprising that a huge number of scientists around the world are inventing all new methods of treatment in the field of traumatology.

In my opinion, this progress in traumatology has a positive impact for all the people. In addition, it would be very good if medicine combines the accessibility and effectiveness. Because the main problem nowadays is that more and more people can't afford such treatment. But I hope, that in the nearest future medicine will make big steps forward.

# STROKE IS A “VASCULAR ACCIDENT”

D.S. Plyuschyk – Sumy State University, group LS-511
V.S. Kurochkina – EL Advisor

A stroke is a medical emergency in which the blood supply to any portion of the brain is interrupted or reduced. Alternative names: Cerebrovascular accident/ disease (CVA), Cerebral infarction, Cerebral hemorrhage.

Stroke is the second leading cause of death in the Ukraine. Every year 111,000 people suffer a new or recurrent stroke, and of those, 40,000 will die.

The symptoms of a stroke depend on which part of the brain has been damaged.

A sudden development of one or more of the following symptoms usually indicates a stroke: paralysis or weakness in the face, arms and/or legs; confusion; personality changes; sudden change in eyesight; decreased motor skills; severe headaches.

The symptoms suggest the diagnosis, but the doctors usually run diagnostic tests to correctly identify the presence and type of stroke. These tests include Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Cerebral Angiography: identify responsible blood vessel, Electrocardiogram (ECG): underlying heart conditions, Echocardiogram: blood clot from heart, Carotid Duplex: carotid artery stenosis, Heart monitors, blood work and many more other tests.

There are two main types of stroke: ischemic (about 80%) and hemorrhagic. Ischemic Stroke: a blood vessel becomes blocked and the blood supply to that part of your brain is blocked. There are two types of Ischemic strokes: Thrombotic Stroke and Embolic Stroke. Hemorrhagic Stroke: a small blood vessel in the brain becomes weak and ruptures. There are two types of hemorrhagic stroke: Intracerebral hemorrhage (ICH) and Subarachnoid hemorrhage.

The major risk factors for both types of stroke are Atherosclerosis, High cholesterol levels, High blood pressure, Diabetes and Smoking.

The main strategy for preventing a first stroke is managing the major risk factors.

# SANDMAN FUTURA:

A. Nikolenko – Sumy State University, group SM 502
O.I. Nefedchenko – E L Adviser

Micro air abrasion is a new modern method for removing decay and old fillings. It is used a fine stream of aluminium oxide powder and compressed air. Micro air abrasion was discovered in 1940 in USA. Sandman's unique patented whirl system and special hand pieces secure a unique precision and working condition of the aluminium oxide powder. Dentists can obtain optimal results using the unit with a working pressure between 1½ - 3 bars. In comparison, other systems are used pressure working area of 4 - 8 bars.

Scientists of Clinical Research Associates Newletter lines pointed advantages of micro air abrasion: cut without need for anaesthetic; provide ideal way to treat patients who are afraid of needle or are sensitive to anaesthetics; allow treatment of lesions in more than one quadrant at the same appointment; remove organic plug to see if caries exists; eliminate noise, vibration and negative psychological connotation of dental hand piece; cleaning and preparation of tooth structure and castings for cementation.

Professor Lambrechts tested this modern equipment in 2005. He made a list of indications specific for using Sandman future: 1) Conservative cavity preparation including pit, fissure and tunnel preparation without anaesthesia. 2) Roughening of enamel, dentin and cleaning cavity before coronal restoration. 3) Removal of aggressive stains, smokers' discoloration and amalgam tattoos from dentin and enamel. 4) Removal of composites and adhesives. 5) Conditioning of metals, composites and amalgam for maximum bonding. 6) Conditioning of porcelain before silane treatment. 7) Previous to the application of lingual orthodontics. 8) Previous to the application of adhesive resin for prosthesis repair. 9) Facilitation of lab procedures. 10) Gloss reduction on instruments used under intense light. 11) Cleaning of rubber-dam clamps.

This new methods of treatment is suitable for every dental clinic because electrical connection is not necessary in using modern devices. The working pressure is controlled by the foot control.

Dentists consider Sandman Futura a new step in medicine.

## THE ARTIFICIAL HEART IS THE STEP IN THE FUTURE

N. Isayeva – Sumy State University, group LS-507
D. Marchenko – E L Advisor

Nowadays the problem of heart diseases is actual and current. Speaking about our country the situation is even worse than all over the world. Since 1991 the amount of cardiovascular system pathologies has been increasing every year. It`s a pity, but there are many young people among patients of the cardiac centres and hospitals.

In Ukraine the most effective treatment for these diseases is medicamental therapy. Sometimes it is possible to hear about heart operations. As usual they are held in the Heart Center or in the Amosov National Institute of Cardiovascular Surgery in Kyiv. But if it is impossible to help a person in such a way, the modern science proposes us an artificial heart.

The first attempt to create such a device was recorded in 1937 in the Soviet Union, but the world saw the original artificial heart only in 1969 in America, where the first transplantation was realized by American surgeon D. A. Cooley.

Since then there have been provided more than 200 operations all over the world. And only one of them was in Ukraine. This «wonder» of implantation gives a possibility for a person to wait for a donor heart for a long time.

As in Ukraine the law forbids the transplantation of the heart from one person to another, the artificial heart is a good chance for sick people. It gives them the time to find the donor and to organize the operation abroad.

The first implantation of the artificial heart in our country took place in summer 2016 in the Heart Center in Kyiv. Without any doubts, the price of this pleasure is very high: €120 000. It is impossible or very difficult for ordinary Ukrainian to find such great sum of money. So many charitable funds helped P. Doroshenko (the first person with artificial heart in Ukraine) to store the money up.

I think that the main task of our government is to provide better life in our country in the way of improving the possibilities of medicine, working conditions of doctors and leaving conditions of patients.

# THE USE OF STEM CELLS IN MODERN MEDICINE

A.Kravchenko – Sumy State University, group LS – 508
Y.S. Kozachenko – EL Adviser

The list of diseases the treatment of which can be successfully applied stem cell transplantation, increases to several dozen. The focus is on the treatment of malignancies of various forms of leukemia and other blood diseases. There are reports of successful transplantation of stem cells in diseases of the cardiovascular and nervous systems. Developed by international protocols of treatment of multiple sclerosis. Multicenter study conducted in the treatment of myocardial infarction and heart failure. There are searched approaches to treating stroke, Parkinson's disease and Alzheimer's

Currently, researchers in the medical field believe that stem cells have the potential to change the appearance of human diseases. There are many treatment methods that are based on the stem cells. But still not determined is public and scientific position on the ethical aspects of the use of stem cells in medicine.

Our task is show that this is an entirely new way in the science, which is a huge benefit, but there are possible contraindications and complications after the use of stem cells.

The discovery of stem cells has fundamentally changed the possibilities of medicine. Our bodies are so unique that can activate the spare cells and direct them to the area of damage where they

update the old cell, or replace "broken" in the new. Deciphering this mechanism in the future will be able to manage, enhance and use directed. These cells are unique for their ability to detect faults in the many systems in the body and is directed there. Nowadays medicine has made a huge step forward. Now you can 'program' stem cells, making them almost completely create healthy new body. Such so worn out tissues and organs acquire new life.

**Conclusions.** The future of cell therapy and transplantation, and, perhaps, medicine in general is connected with using stem cells for the purpose of replacing the structural and functional failure of various organs.

In addition, to restore lost functions of organs and tissues, stem cells can inhibit uncontrolled pathological processes such as inflammation, allergies, cancer processes of aging. Cell and gene therapy technologies are the most versatile modern approaches to treatment. Technology stem cells could lead to new understanding of cell differentiation and how and why certain developing tissue why emerging diseases and how to treat them. It shall be possible to clone individual tissues to whole organisms.

# MEDICAL COSMETOLOGY − MESOTHERAPY

M. V. Vereshchagina- Sumy State University, LS – 513
N. M. Usenko – EL Advisor

Mesotherapy − is a new technique, but it has very old roots. This procedure is relevant because it can be removed from various shortcomings of the skin, eliminate or prevent age-related skin changes, make the correction cheekbones and oval face, to achieve a lifting effect, remove cellulite. It was developed in 1950 in France.

With the help of mesotherapy, it is possible to reduce the fat in the "spot" treatment with particular emphasis on the notorious problem areas such as the buttocks, love handles, inner thighs, neck and chin. Many practitioners also claim that mesotherapy can help drastically reduce cellulite, eliminate wrinkles, remove scars and even stimulate hair growth.

The procedure itself is fairly straight-forward. A special "cocktail"' of vitamins, minerals and medications is injected directly into the layer of fat located just beneath the skin. Once injected, this cocktail theoretically "melts" away the fat by breaking fat cells down to the point where they can be flushed out through the bowels and kidneys.

It should be stressed on side effects of mesotherapy such as bruising, heightened sensitivity, damage to the liver, itching, swelling, redness and burning.

There are two basic types of mesotherapy: "classical mesotherapy" and "needle-free mesotherapy". The first one is basic. It is divided into manual and hardware. The second type of mesotherapy is for patients who are afraid of pain and prefer mesotherapy, using devices for electrophoresis, phonophoresis and devices that inject drugs under oxygen pressure.

It is natural that at the beginning of the third millennium health and beauty are still important, but you should be ready to get the desired result not only using methods that are proven for thousands of years but with new technologies.

# USING OF IONS ELECTIVE ELECTRODES IN MEDICINE

A. Denysenko – Sumy State University, group LS – 501
L.A. Denisova – E L Adviser

Electrodes (from electrochemistry) – are a part of electrochemical system, that contains conductor and surrounding solution. Systems of two opposite electrodes can be used as chemical resources of electricity and as electrolyzer in case of direct current using.

Ions selective electrodes are electrodes or chemical sensors, the signal of which depends only on containing some ions in solution.

Although, containing of other ions actually affects or even doesn't affect the sensibility of these electrodes. Thus, these electrodes are sensitive only to particular concentration of some type of ions. This peculiarity is called selectivity, that`s why electrodes are called selective.

Ionometry with ions selective electrodes is widely used in medicine and has a lot of advantages comparing with other analytic methods.

This is quite fast and accurate analytic method that can be automatized. It needs only a few grams of liquid to use it in further analyses. It can help in determination of both inorganic and complex organic ions in a short period of time.

Even small changes of ions concentration in liquids of human homeostasis can cause functional disorders in many organism systems. Although, the vital side of $Na^+$, $K^+$, $Ca^{2+}$, $Cl^-$ ions are widely known, their dynamics in bioliquids is not studied enough.

Biological systems are various in their structure and features, so they need highly selective electrodes for potentiometric analysis.

For medicial-biological analyses hydrogen and glass kation-sensitive electrodes are used. Glass pH-electrodes can be considered as perfect ones because of their high sensitivity to $H^+$ ions. Analyses in out-cells liquids require using of macroelectrodes.

Nowadays mini- and microelectrodes are in a developing process; they are the future of medical ionometry.

# HARDNESS OF WATER AND ITS IMPACT ON THE HUMAN BODY

D. Shvachko – Sumy State University, group LS – 503
Y.S. Kozachenko – EL Adviser

We all know that water is one of the most important molecules in the earth and the human body, so our work is dedicated to the research of the physical parameter as water hardness and its impact on the human body. It is known that hard water can have a negative impact not only on the technical and communication devices, but also on living beings. Therefore, the research of the effect of this indicator, depending on its quantitative value to the organism in any region is very important.

First of all under water hardness we understand the presence in it of magnesium and calcium ions. Hard water is considered if it contains salts of these metals in concentrations greater than 6 mEq / L. There are constant and temporary (carbonate) hardness. Constant water hardness is defined by the presence of chlorides and sulfates of magnesium and calcium. Temporary hardness due to carbonates and bicarbonates of these metals can be eliminated by boiling.

The human body for normal functioning of all life support performance in specific norms that ensured homeostasis. In violation of water and electrolyte balance due to excess salts, magnesium and calcium ions changes permanent structure that can carry negative consequences. First of all, hard water has a negative effect on human skin - there it dry. This is due to the closing of pores soap molecules that are unable to lather in hard water. Also hard water can promote the development of dermatitis. With an excess hardness salts may stay in the kidney tubules, causing urinary stone disease. There is a theory that hard water may contribute to cardiovascular disease, but because water is composed of many components that interact with the body in the complex, it has not been proven. However, very soft water (less than 2 mEq / L) has effects on the body - may decrease calcium ions flow to the tissues.

In this research, we discovered the concept of water hardness, sustainable and temporary demonstrated the major impact of water hardness on the human body.

# TOP 3 INNOVATION IN MEDICINE

A.Shatrjuk-Sumy State University, group LS-517
V.E. Pronyaeva – E.L.Adviser

Nowadays we cannot image our life without achievements in different spheres of life and medicine. These 3 top device are aimed to help patients and doctors to diagnose and prevent its consequences. One of the greatest discoveries is FRM in medicine.

Frictionless Remote Monitoring

Taking into consideration the aim of modern technology “to make the world smarter and safer” it`s worth saying that medical science is not staying at one place. A recent study has estimated that 20% of American adults are wearing a device that collects data on anything from exercise and sleep habits to heart rate and blood pressure. The holy grail of wellness monitoring simultaneously measures and analyzes four main things: air quality, activity, food choices and stress levels. To think that millions of sick patients can directly benefit by using wearables that are monitoring data with every breath or chemical change in the body. One of attractive market has been diabetes. Needle-free glucose monitoring would allow a device to be worn using biosensors on the skin to detect glucose levels constantly monitoring and alerting patients and doctors if a dangerous situation arises. Innovation devices that offer frictionless platforms predict a surge of vital medical data in 2016.

Airing

Sleep apnea is a very common problem that doesn't have a very viable or practical solution. Sufferers of sleep apnea stop breathing while they sleep and often choke or gasp throughout the night. Meanwhile no oxygen is getting to the sleepers brain since they aren't breathing. Over time this leads to heart and metabolic

diseases as well as many other health problems. Today the most common solution is bulky masks fitted with hoses and straps that deliver airway pressure while the user sleeps. These masks are uncomfortable and hard to sleep with. And while they are a solution they aren't very good or well like one airing is billed as the first homeless maskless and cordless device for sleep apnea sufferers,-It weighs just under an ounce and would only cost three dollars. Airing is powered by zinc-air batteries which are small but contain a lot of energy and compare the device for around eight hours.

Non-Invasive Fetal DNA Tests

Some pregnant women especially those that are older and age have an increased chance of developing a condition responsible for genetic diseases and missing or extra chromosomes in the fetus. The screening process to check for such conditions like Down syndrome often involves the uncomfortably invasive procedure known as amniocentesis in which a clinician must stick a needle into the womb to collect cells. Not only do expectant mothers have to stress out about getting the test but there's also a small chance of having a miscarriage. A new test which isn't regulated by the FDA and has only been on the market since October of 2011 involves nothing more than a simple blood test.

Every day young scientists discover the simpliest but very important decision of different medical problems. Enormous technological changes are heading our way. If we are unprepared for the future, we`ll lose all abilities to diagnose the disease faster without having doubt.

# INNOVATIONS IN MEDICINE

V. Skorobogatska – Sumy State University, group LS – 512
L. A. Denisova – E L Adviser

Nowadays the problem of improving healthcare services through implementing new investments or improvements, medical devices and software is burning. Innovations in medicine make a valuable contribution into saving human lives. In this light, a few mainstreams within the general tendency of introducing medical inventions and improvements should be mentioned.

People who suffer from liver, lungs diseases, prostate cancer, uterine myoma can be diagnosed with ultrasound treatment. A purpose of this diagnostic method is to enable treatment in more gentle ways, to effectively destroy tumor cells. In this process ultrasound waves are to destroy diseased tissues. This phenomenon provides highly valuable information about the structure, mechanical properties and activity of individual living or dead cells. It causes no damage and requires no toxic chemicals to work.

Using specially designed MRI scanner like this for diagnosing different diseases without an invasive surgical biopsy and anesthesia is quite a promising technique nowadays. This procedure lets the patients avoid surgery scars and reduces the costs spent. This procedure lets the patients avoid surgery scars and reduces the costs spent.

Another aim of modern healthcare system is introducing new radiotracer to diagnose and monitor one of the leading cause of death - prostate cancer. Significantly, the tracer is consistently able to identify approximately 90% of tumors, metastatic lymphatic nodes and bone lesions in patients in early stages by targeting multiple biomarkers.

New ways of treating pathologies of brain tumors with SRH technology is another trend in modern medical researches. A new approach uses virtual coloring to highlight all the cellular features of brain tumors, detect microscopic ones. Such technology provides an important tool to understand the activity of our brain by turning on and off the brain cells using light to see which ones go wrong.

As far as we know, one of the most vital topics of innovations is connected with realistic 3-D visualization, particularly, of unborn babies. A new technology enables to transform MRI and ultrasound data into virtual reality high-quality image of a fetus.

Undoubtedly, it can recreate entire internal structures, detail a view of all the organism systems and improve the understanding of certain anatomical characteristics.

It cannot be passed in silence that heart diseases are increasingly common today. That is why recently the new pacemaker, called Micro Transcatheter Pacing System, was invented. It is the first one to be approved for use only in the USA. Their leading role is to generate electrical impulses to treat the pathology of the heartbeats. The small size allows to be placed in the right ventricle chamber of the heart.

A unique application such as laser-based camera is used to improve a view of cardiovascular elements, diagnose and treat it. Such device is able to help physicians to know who is at risk of heart pathologies by providing a better vision of potential problem areas. This technology allows to see the surface of the vessels and any lesions, cholesterol and blood sugar levels.

One of the main tools doctors use to detect diseases and injuries is the scanning fiber endoscope, which is invented to make a clear image of cancer cells, regions of the carotid artery that are currently invisible with clinical endoscopes. In addition, SFE can determine artery reconstructions, atherosclerosis, some biological features associated with an increased risk of heart attacks in the future. Such data could help doctors to find a treatment from cardiovascular diseases.

National Institute of Biomedical Imaging and Bioengineering has developed a non-invasive technique that can detect skin cancers, identify melanomas, carcinomas and abnormal cells. Skin cancer is the most common type of cancer that is extremely rapid in early stages.

Summing up, new medical technologies are used to make a breakdown in all the spheres of life, turn modern treatment into a powerful tool for diagnosing and treating in much better ways.

# ABSORBABLE STENTS FOR THE TREATMENT OF VASCULAR THROMBOSIS

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Scientific supervisory – V.E Pronyaeva.

Diseases of the heart and blood vessels - one of the leading causes of death and disability among the population all over the world. According to the World Health organization, cardiovascular disease is causes death of 16.7 million people per year. In Ukraine, during the last 15 years there has been increase in mortality in this pathology. In general the structure of mortality in Ukraine, cardiovascular diseases account for more than half. New technologies such as endovascular procedures and coronary artery shunting are becoming widely applied in Ukraine. The introduction of the new methods of myocardial revascularization expanded treatment options for patients with coronary artery diseases.

Atherosclerosis affects the artery wall. Due to the loss of elasticity, enough space for expansion is lost. The deposition of atherosclerotic plaques inside causes the narrowing of the diameter of the vessel, making it difficult to deliver nutrients. At the same time, clinical symptoms of heart hypoxia (lack of oxygen)begin to manifest. This fact gives explanation of heart strokes.

Complete blockage of the coronary arteries leads to the development of necrosis region (necrosis) in myocardial infarction. In the world, this pathology is still considered one of the main causes of death among adults.

Timely stenting vessels of the heart, prevent the development of serious complications of atherosclerosis.

The term "stent" refers to surgical fixation of the stent within the artery that leads to mechanical expansion of the narrowed portion and in restoring normal blood flow. The operation relates to endovascular (intravascular) surgical procedures

Surgical procedures is not only established coronary stenting (heart blood vessels), but also has a stent in the carotid artery in order to eliminate the signs of cerebral ischemia in the femur - the treatment of atherosclerotic changes in the lower extremities of the abdominal aorta and iliac - overt signs in the presence of atherosclerotic lesions.

How operation is performed

For vessels in cardiac stenting femoral artery catheter at the end of which a tiny balloon stent put on it. Under the control of the X-ray device of the catheter is introduced into the mouth of the coronary arteries and is moved to the desired part of the restriction. As a result - the blood flow is restored.The circuit of the stent within the vessel

Operation stenting has been held for nearly forty years. Methodology and technical support is constantly being improved. Expanding indications, there is no age limit. It is recommended for all patients with coronary artery disease not to be afraid of consulting a surgeon, it is possible to extend the active life.

In conclusion it is worth saying that this method of treating vascular diseases is a great achievement of modern medical science. But I think it will be constantly improving and I hope, we are future medical workers will make our contribution in its development.

# ROBOTICS SERVING SURGERY

Ye. S. Streletskyi – Sumy State University, group SU-31
S. S. Strizhak – Sumy State University, group LS-308
L. A. Denisova – E L Adviser

In operating rooms of the future robotics will become an extension or substitution of surgeon hands. They are more acute and allow to provide operations via distant control.

In many cases doctors are made to perform operations being out of the optimal circumstances: with no access or little sizes of operational region, lack of vision area, importance of being maximum acute. Doctor must be mostly highly qualified and able to use several tools simultaneously. That's why using of surgical robot makes operations easier and risks lower. Such robots are being controlled by the high-qualified professionals who passed specialization in world robotics centers and know this device for good enough.

Most of operations before robotics era were performed in opened way or laporoscopically (minimal invasive surgery). Operations with robots both reduce cutting gap sizes and provide surgeon to access regions that it's unable to access without it. Indeed, robot enhances surgeon abilities to several times.

The most common operation performed with the surgery robots is complete deletion of prostate due to malignant tumor. Using of robots during this operation allowed to substitute one big cutting gap with four-to-six minimal gaps for robohands entering and laporoscopic access. Robot-surgeon also increases precision if surgeon's actions what decreases complications risks and chance to lost the control over urine.

Probably the most common robot for use in surgical medicine is Da Vinci Robot. It's serial robot for performing surgical operations by the American company Intuitive Surgery. Da Vinci Robot is adopted by several hundreds of clinics across the World.

Da Vinci Robot makes surgeon's actions more mobile and more accurate. As steel is more strong then bones and muscles, robohands are more powerful. Cameras on the hands of this robot give a closer 3D-look to the infected area.

So, Da Vinci Robot is a perfect tool-helper for every surgeon.

# EMERGENCE OF ANTIMICROBIAL RESISTANCE IN BACTERIA: IS IT A POINT OF CONCERN?

I. Tkachenko – Sumy State University, PhD-61
I.A. Morozova – E. L. Adviser

Pathogenic bacteria or pathogen is responsible for occurrence of infectious diseases in humans and animals. Medical intervention in an infection primarily involves attempts to eradicate infecting pathogen using substances that actively inhibit or kill it, which are known as antibiotics.

In the animal production sector, antimicrobials are used for the treatment of infections in single animals and in flocks. Prophylactic application of antimicrobials is used to prevent the spread of infections from sick to healthy animals in the same production unit. Antibiotics are also used for growth promotion purposes.

However, their application has led to the emergence and spread of antibiotic resistance. Since revolutionary discovering of penicillin, almost simultaneously, scientists faced to the problem of resistance of bacteria to antibiotic. According to scientific researches, on the one hand, sub-therapeutic use of antimicrobials as feed supplements has been recognized as a potential driving force in accelerating the emergence of antimicrobial-resistant bacteria. On the other hand, the clinical use of antimicrobials also drives the emergence of antimicrobial-resistant bacteria.

Thus, the intestinal flora of healthy animals is considered to be the most important reservoir of resistant bacteria and genes (INFOSAN 2008). As contamination of carcasses with fecal flora during slaughtering occurs, animal-origin foods may serve as a vehicle to transport resistant bacteria and genes between animals and humans (van den Bogaard and Stobberingh 2000).

Antimicrobial resistance in foodborne pathogens and commensals is of global concern due to its public health consequences. European Food Safety Authority (2008) reports about evidence of the link between extensive antimicrobial use in the food-producing animal sector and the appearance of resistant strains in human beings. There are many reports regarding prevalence of antimicrobial-resistant bacteria, that have been recovered from various foods, including vegetables, confectionary, milk and dairy products, but the majority of resistant strains have been isolated from traditional retail meats and poultry.

Constant inadequate usage of antimicrobials in the animal producing sector leads to occurrence of "superbugs" – multidrug resistant bacteria, including those resistant to clinically important, frontline antimicrobials. Infections with resistant pathogenic bacteria often result in reduced treatment efficacy, prolonged illness, increased morbidity and mortality. This fact emphasizes the public health value of continuing efforts to educate animal producers in due handling, consumers in proper food handling and preparation methods, as well as the importance of sustained surveillance of isolates from throughout the food production area to detect emerging antimicrobial resistance phenotypes.

## PECULIARITIES OF LIPID PROFILE DISORDERS FOR PATIENTS WITH TYPE 2 DIABETES MELLITUS AND ARTERIAL HYPERTENSION

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S. Zolotova – E L Adviser

Dyslipidemia is one of the key risk factors of cardiovascular disease (CVD) for patients with type 2 diabetes mellitus (DM). Endothelial and vascular dysfunction in large arteries and microcirculation are caused by chronic hyperglycemia,

hyperlipidemia, and hyperinsulinemia. Previous studies have indicated that treatment of dyslipidemia is very important for prevention cardiovascular complications.

The purpose of our study was the determination of particular qualities, connected with lipid profile, for patients with DM and coexistent arterial hypertension (AH) for improving of treatment and prevention cardiovascular complications.

Participants and methods. We examined 198 patients with type 2 DM and AH during our clinical trial. They were treated in Sumy City Clinical Hospital № 1 from October 1, 2015 to February 15, 2016. People from the first (I) group had coexistence of type 2 DM and AH. The second (II) group includes 49 practically healthy people. Such components of lipid profile as general cholesterol (GH), triglycerides (TG), high density lipoproteins (HDL), low density lipoproteins (LDL) were defined in blood by biochemical method. All data were analyzed with the help of statistical methods (Excel 2013). In addition, we evaluated the Student criteria (t), Pearson ratio (r) and the veracity of differences (p) for assessment results.

Results. The mean duration of type 2 DM was (9,57±0,73) years and of AH - (4,58±0,34) years. The mean levels of GH for persons of I and II group were (28,56±2,1) mmol/l, (4,6±0,3) mmol/l, $t=2,03$, $p<0,05$; TG - (2,49±0,19) mmol/l, (1,7±0,3) mmol/l, $t=2,49$, $p<0,05$; HDL - (1,15±0,03) mmol/l, (1,47±0,1) mmol/l, $t=3,07$, $p<0,01$; LDL - (2,82±0,02) mmol/l, (2,61±0,1) mmol/l, $t=2,06$, $p<0,05$. All data were clinically significant.

Conclusion. In addition, there are the disorders of lipid profile for people with type 2 DM and coexistent AH. In our clinical trial we determined the significant increase of atherogenic lipoproteins, which leads to cardiovascular complications for patients with type 2 DM.

## SECTION 3 SOCIAL AND LINGUISTIC CHALLENGES

### PATRIOTIC MOTIVATION IN ADVERTISING SLOGANS AS A REFLECTION OF POLITICAL CHANGES IN THE COUNTRY

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S.V. Mikhno – Sumy State University, instructor of Foreign Languages Department

Advertising and marketing use patriotism for commercial purposes. Historical events and personalities, the achievements of past years create a new image of the prosperity of a country in advertising. This method builds the fantom brand and such advertising is intended for naïve or emotional audience. Patriotism towards the Fatherland refers to emotional advertising motives, for the Ukrainian mentality this motive is dominant in recent years.

In the time of political changes and major cultural events the image of the homeland as an object of patriotism requires a detailed study. The motherland is no longer perceived as a given, the image begins to be positioned as a brand, which is closely connected with reminding people about positive emotions and bright visual images. Patriotism is no longer focused on national isolation and self-sufficiency, it aims at the presentation of the cultural heritage of the nation in the world with the use of modern information and communication technologies [1]. At the same time patriotism is an incentive for consumers to buy goods and services of Ukrainian producers, and advertisers are turning to national motives and symbols.

Euro 2012, has become the first stage of the "new patriotism" in Ukraine. The football euphoria, which the Ukrainians experienced, objectified in the national symbolism, which then could be seen everywhere. All the politicians repeated that Ukraine is cool, and they had been heard [2].

Advertisers also tried to integrate it in the minds of consumers with the football and associated values, such as patriotic ones. Commercials in the period of Euro-2012, aim primarily at solving marketing tasks and use such consumer motives as: victory, satisfaction, faith, unity, pride, patriotism.

Such slogans as: "Ukraine welcomes guests" (Lvivske), put a t-shirt team – support team (Adidas) demonstrate the desire of

advertisers to use the idea of patriotism for the sake of profit, to keep current values of the population. In General, the value of patriotism is visualised in symbolic images and rituals: the Cossacks with the flag, rye field, fans with the right hand near the heart. The Championship is like a unity. Euro 2012 became for Ukrainians a united idea, which in turn is used by the customers and advertisers, aiming at the consolidation of their audience [2].

The new wave of patriotic commercial services and goods began with the changes of people's sentiment toward revolution (Euromaidan of the 2013-2014) and continues until now even after the relative political disputes. It means that the changes which were caused by the events of the Euromaidan were quite powerful and the influence on the use of motives in commercial advertising after its completion is also considerable.

As it was noted by Elena Mykytenko [3], in the Maidan time the tents with Ukrainian souvenirs, embroideries and other trifles with Ukrainian symbols were placed on the scorched ground. From the journalistic investigation we can conclude that the sellers of these products do not care about the ethical side of the trade.

Thus, we can trace three waves of the rise of patriotic motivation in advertising slogans during 2012-2016 years. Attitude of the target audience is the main factor in choosing the motivation. It is a required component in commercial advertising, which will be used for the most effective sales promotion. So people's attitudes exactly correlate and encourage the use of patriotism in commercial advertising. It is also understood that the preferences of the masses are never static, and therefore in the hierarchy of motives significant changes are possible soon.

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# STUDENT INDEPENDENT EDUCATION ACTIVITIES THAT DEVELOP THEIR LEADERSHIP QUALITIES

S.V. Mikhno – Sumy State University, instructor of Foreign Languages Department
V. Gres – Sumy State University, group EL-62

Today's world and society is changing. Young generation is becoming more independent, creative and initiative. The aim of education is to provide students with all the skills necessary to become a successful personality. That's why developing students' leadership skills and abilities is a very important issue of today.

We will consider implementing the education activities that develop leadership qualities of Ukrainian students at Sumy State University using foreign languages (for example, English).

Leadership activities for students may include organizing, writing and presenting information to others, such as participation in conferences or making speeches; solving problems and thinking critically, for example, preparing projects. Extracurricular clubs or participation in international programmes are also popular activities that develop students' leadership qualities. At the Foreign languages department of Sumy State University there is a Student Leadership Office in foreign languages. Every week students meet for regular sessions and try to make speeches, organize debates in English, discuss famous leaders and their ways to communicate with people. We would like to mention that activities for students are enjoyed more if they are held in a way of a game. For example, a game "ice breaker" can help us reinforce our relationships. Such games as "true that double true", "silent line up", "memory game (remembering famous leaders' faces)", quizzes on facts from the lives of famous

leaders and others can help us try the role of a leader and learn to work in a team. After a while students can create their own games and organize them, thus showing the acquired leadership skills.

Another important aspect of such activities is that they help to develop students' talents and gifts providing they are given more freedom of choice while studying and their independence and initiatives are encouraged.

But who is a leader? Using heuristics students try to come up with their own definition of a leader. According to some definitions, a leader is a person who makes the wright decisions. A leader must be confident, responsible, and smart. Enabling others to act and being independent are also important qualities of a leader.

So, we consider weekly sessions of Student Leadership Office in foreign languages which are organised by the Foreign languages department of Sumy State University to be an important extracurricular activity that stimulates students' independence, leadership skills and abilities using the language of international communication. Students of technical majors have an opportunity to practice their English and other necessary skills to become a successful personality.

# RECENT INNOVATIONS

D. Kholin – Sumy State University, group RK-62
T.V. Pochatko – E L Adviser

Innovation can be defined simply as a "new idea, device or method". We live in the age of science. People live, move and think in terms of science. Science has improved the quality of our life. Water, air, time and space have been conquered. People constantly use natural resources. There are wonderful innovations in all spheres of our life:

*Coastline cleaner*

An ocean-cleaning innovation finally became a reality in 2016 after five years of research, prototypes and creativity.

Dutch entrepreneur Boyan Slat first proposed an ocean cleanup machine at only 17 years old. But a prototype of the buoyant boom-like device — called Boomy McBoomface — was finally put into action in 2016.

Slat's device floats along a coast and creates an artificial coastline, catching debris on the surface of the ocean. A connected conveyer then lifts the garbage into a central tower, where it is sorted for disposal.

*The printable strips for in-home testing of infectious diseases*

Researchers at Florida Atlantic University have created paper and plastic strips for in-home diagnostic testing of HIV, E.coli, Staphylococcus aureas and other bacteria, as well as a smartphone app that could detect these bacteria using images remotely.

According to Fast Company, the E.coli test is made of paper (cellulose) and printed with a mixture of antibodies and gold nanoparticles. If bacteria is found, a color change indicates a positive result.

*Sidewalk traffic lights for those glued to their phones*

Let's face it: You simply can't be trusted to peel your eyes away from your phone — even when crossing the street.

That's why German public transportation provider Stadtwerke Augsburg embedded traffic lights in some city crosswalks around the country. The company hopes the new lights will help tech-focused pedestrians to cross streets safety — even if they refuse to look up.

So, innovation is an integral part of modern life. A modern human with growing income needs more and more new products or services which will make our life simpler, brighter, and fuller.

# MAERSK LINE: HOW TO PROMOTE A B2B COMPANY IN SOCIAL MEDIA

K. Teslenko, A. Borshenko - Sumy State University, Group PR – 51
N.V. Malovana – E L Adviser

There are a few types of companies in a modern market and we can recognise some of them as B2C and B2B companies: B2C (business-to-consumer)and B2B (business-to-business).

B2B means that business company works for another business company and the goods and services of this company are produced for the other businesses. B2B relationships are long-term and based on development and trust. The final customer of B2C company is the consumer not a business. Cleaning services, fast-food restaurants, shops and supermarkets are the examples of B2C companies. B2C companies' sales cycle, moreover, is shorter. The buyers are encouraged to get the product immediately.

Understanding the difference marketers may distinguish a set of tools of marketing campaign for both types. For example, social media are traditionally used by B2C companies to attract and retain customers, to increase a brand recognition. Familiar for B2C companies, Social Media is still unknown for many B2B companies who nowadays cannot even imagine their strategy without this tool. Nevertheless, there is the example of successful Social Media campaign developed by B2B company.

Shipping and energy company Maersk is presented by Maersk Oil, APM Drilling, Maersk Line and APM Terminal.

According to the Maersk web-page (maerskline.com), Maersk line is "the world's biggest container shipping company with operations in 150 countries and 250,000 employees, known for reliable, flexible and eco-efficient services and operates 610 container vessels providing ocean transportation in all parts of the world".

Moreover, container shipping is very conservative field of business. The main goal was to increase the recognition of the company, to research the market and to become closer to the clients. Maersk Line wants to come from closed doors and secrecy to openness and customer-centric, even if it was hard for B2B company.

So, in 2013 Maersk group got 1.5 million followers on Facebook and about 10,000 fans on Twitter.

It's also very hard to count the effect of SMM: there isn't any universal recipe. It will be a different way for every company. For Maersk Line, for example, it is very important to develop corporate culture. HR managers proposed to ask newcomers about how their choice was affected by information and content about the company in Social media.The target group of Maersk line in Social Media were defined: existent and potential customers; shipping professionals, NGOs, shipping press; existent and potential employees; management.

Maersk line has also found the importance of sharing engaging content, taking the time to interact and care of its fans. They provided a concept of "communication, not marketing" way of using social media.

It is necessary to mention a difference between general understanding of the social media current trends and what Maersk Line is going to do. The usage of Smartphones is going to grow and continue to play very important role in customers' life.

The trends of modern world are changing rapidly but SMSs, push notifications, geo targeting that's something are been looked at closely. Consumers are the spectators of social commerce development, popularity and sharing of content, especially video content. In other words, becoming more refined and the online space is a much more competitive space today. So, the potential social media Maersk Line may be involved in are new social channels, platforms, Periscope, Ello.

They have surprisingly well engaged the users of different social media channels to give their own input and that way all the users are active members of this social media overview. Active members give insights and this is valuable. For example, the high-end discussion groups in Linkedin includes top people of the industry, debating hot topics. It could happen Maersk would not be able to even talk to these people, but because they happen to manage the high-end discussion of the industry, that way they can have access to the information and these people.

This is so markable that the Social Media channels want to talk with Maersk how they have managed to do this, it shows that they are the pioneers of Social Media in (business- to- business) sector. They must come up with their own measurement of tools for measuring their own performance in Social Media.

# PROJECT: HAND-MADE STUDIO

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Podolkova S.V. – E.L. Supervisor

The quantity of talented craftsmen who skillfully create interesting attractive things that make a competition to similar factory products rises every year. Hand-made have separated in single creative direction. Hand-made production is gaining increasing demand among consumers in the domestic market. Despite of this tendency there are precious few shops in Ukraine where buyers could buy only hand-made goods.

So my project could solve this problem. The objective of my project is to create Hand-Made Studio.

The Studio will be unique in Sumy. It's planned organizing there creative events, teaching creative crafts and sailing original products, which can't be found on the shelves of retail stores.

This Studio leads two-sized activity. On the one hand, Hand-Made Studio offers customers a wide range of handmade goods at reasonable prices. The products assortment includes creative gifts, accessories, jewelry, home decor, etc. On the other hand, Studio offers collaboration with the creative habitants of the city that constitutes the services of implementation, advertising in social networks, promoting creative products, organization and supporting workshops.

Studio income is artists' charge for the studio services. Studio deals with organizational and technical point of workshops realization. It means that Studio gives territory and provides all necessary comfortable conditions for these workshops; Studio also looks for potential trainees and clients, promotes craftsmen and their activity on the Internet. Studio also receives revenue from so-called "sailing" places on the shelves. Craftsmen bring their production, establish desired prices that remain unchangeable and wait until their goods will be sold.

So, Hand-Made Studio is quite profitable project because it doesn't demand many expenses that include only payment for accommodation and basic furniture.

## ANOTHER SIDE OF NEW TECHNOLOGIES

V. Bezvershenko – Sumy State University, group EL – 63
I. A. Morozova – E L Adviser

Everybody knows that new technologies today do not only make our life easier, sweeter, more secured and comfortable, they mainly show the economical, political, social development of the country. Every leading country tries to invent something absolutely new or redevelop old production in the way to show that this country has enough money, education and scientists. Nowadays we can not imagine our life without high-tech gadgets we use every day. We use them to communicate, to eat, to travel, to be healthy and so on. But in this very sphere we should adhere golden middle. Otherwise, novelties can turn against us.

There are some reasons why new technologies are not always useful for people. The first reason of this is the environment protection. Production and usage of the new technologies, which are not aimed to save the environment, can cause many problems such ozone depletion, deforestation, pollution and energy consumption. Take for example a factory which produces synthetic materials for new gadgets. This factory emits tones of exhaust. These emissions can be a reason for acid rains. The second reason is unemployment. Nowadays mane people can not get a job, but with the creation of robots that are able to substitute men labour, the number of unemployed people dramatically increases. Of course, for the employers to use robots is really profitable; they do their work accurately, they do not need payments, rest, social benefits and so on. As a consequence, a lot of people stay unemployed. Thirdly, not every government or country can peacefully use new technologies. Take, for example, some countries with their development of atomic weapons. It is the threat to all Earth inhabitants.

One more reason is that people become lazier with new technologies. Now we rarely read newspapers to get to know the news because it is easier to switch on the computer and find news in the Internet. We use mobile phones to talk with each other, but do not meet each other face to face. Nevertheless what can happen if all these good things in our life disappear?

There is no doubt that new technologies help us to develop, increase life level, prolong our life time and so on. However I am strongly concerned that they should be used only in peaceful purposes, not to damage our environment and our lives.

# EFFECTIVE WAYS TO SUCCESSFUL JOURNALISM

Karina Hachataryan - Sumy State University, gr. JT - 61
Ph. D. Maliovana N. V. - E L Adviser

Journalism is not just a profession, it is a kind of lifestyle, choosing which you are forever prires to keep abreast of events in the world.

Before becoming a journalist it is needed to realize a simple truth: money is not worth the work, the work is worth the money! And writing is for the welfare of society, not their own!

They said: "If you love your job, you don't have any work's day!" For anybody it's not a secret that journalism is one of the professions which has the most busy work schedules. But no "great" journalist never complained about the lack of free time!

Journalists are called the «fourth power». And such an honour can only be worn by people with a clear conscience and an ardent desire to carry the truth to people. To become a «fourth power», enough to have a higher education, we must grow spiritually to the title in the wings.

So, if you're already on the path of service to the people through journalism, the first thing you need to do is to memorize the code of ethics of the Ukrainian journalists!

A real journalist – not the one that is beautifully said, and the one that knows how to listen! The one who learns to respect the public opinion, even if it contradicts your beliefs – too much significant.

Journalism, like any other profession can be compared to the kitchen. But the fire in journalism is considered to be the facts, and that they must be handled with extreme caution.

People say that one can judged by clothes. If you want to be a successful journalist, to look good is not enough, you need to have a high level of intelligence, which is not bad to combine with knowledge of several languages, especially English!

It is important to always appreciate those people who help you on your way to success.

Another key to the success of the modern journalist is following the rules "before you do – think!" Nothing in our time doesn't just happen, everything has to be held accountable.

Especially of great importance is the veracity of the statements. Ignorance can be forgiven always, but deliberate deception and deliberate distortion of information – ever.

In today's world the originality is appreciated. To be unique is very fashionable. The same trend applies in journalism. Success at the singular point of view, unusual thoughts, in a creative approach. Have your own style – this is an advantage. Style comes with time, but you must never steal other people's ideas. Plagiarism – leads to the unsuccessful career of a journalist.

You should not needlessly use the name of any. Advertising and PR can sometimes pay off, but it will never bring you recognition in the circles of quality media.

And from the point of view of morality, one should never envy the success of colleagues in Peru. Personal achievements and professional growth of each journalist is an invaluable contribution to the public wealth.

The way of the journalist is impossible without the development of the character traits such as objectivity, integrity and benevolence. No sharpness, no superiority, no amount of rudeness can't be your behaviors.

The effective way of becoming a reasonable journalist is one of the human traits - simplicity. Without any doubt people say: "Be more ordinary and people will like you ". A journalist, especially a beginner, is not a star and he needs to be surrounded by people.

You should be advised not to waste the opportunity to be in search of any kind of work. You can start your career even working for any local newspaper. You have to remember that television does not welcome everyone who has his first working day in journalism. Success comes with experience and only practice makes perfect!

Respect yourself, respect people! If you're going to use the authority among others, and most importantly – you will not have problems with the law, you'd be on your halfway to your career.

# WAYS TO PROTECT YOUR IDEAS

T.V. Pochatko, Sumy State University

Nowadays the protection of intellectual property is very important in our society. Several forms of legal protection are available for your creations. Which you should use depends on what you have created.

**Copyrights** protect the creators of literary, dramatic, musical, artistic, and other intellectual works. Any printed, filmed, or recorded material can be copyrighted. The copyright gives its owner the exclusive right to reproduce ("copy"), sell, or adapt the work he or she has created. Copyright law covers reproduction by photocopying, videotape, and magnetic storage.

In the USA the Copyright Office, Library of Congress, will issue a copyright to the creator or to someone the creator has granted the right to reproduce the work. (A book, for example, may be copyrighted by the author or the publisher.) Copyrights issued after 1977 are valid for the lifetime of the creator plus 50 years. Copyrights issued prior to 1977 are good for 75 years.

Technically, copyright protection exists from the moment you create the material. When you distribute a work, place a notice on copies that includes the term "copyright" or an abbreviation, the name of the author and the year of publication — for example, "Copyright 1986 Jane Doe". Works can be registered with the Copyright Office for $10.

A **trademark** is any word, name, symbol, or device used to distinguish the product of one manufacturer from those made by others. A service mark is the same thing for services. McDonald's golden arches are one of the most visible of modern trademarks. Brand names can also be registered as trademarks. Examples are Polaroid, and Chevrolet.

If property registered and renewed every 20 years, a trademark generally belongs to its owner forever. Among the exceptions are popular brand names that have become generic terms, meaning that they describe a whole class of products. A brand-name

trademark can become a generic term if the trademark has been allowed to expire.

It is a good idea to have a patent attorney do a "clearance search" before you begin using a mark to be sure it isn't already in use. There's filing fee of $175 for registration with the Patent and Trademark Office. Registration protects your mark for 20 years, and you may renew every 20 years.

A **patent** protects the invention or discovery of a new and useful process, an article of manufacture, a machine, a chemical substance, or an improvement on any of these. Issued by the U.S. Patent Office, a patent grants the owner the right to exclude others from making, using, or selling the invention for 17 years. After that time, the patent becomes available for common use. On the other hand, patent law guarantees the originator the right to use the discovery exclusively for a relatively long period of time, thus encouraging people to devise new machines, gadgets, and processes. On the other hand, it also ensures that rights to the new item will be released eventually. Other enterprises may be able to make use of it more creatively than its originator.

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# FUßBALLCLUBS BRAUCHEN KEINE JOURNALISTEN MEHR

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M.M. Dunaeva - wissenschaftlicher Leiter

In Großbritannien sperren Vereine unliebsame Journalisten aus und machen stattdessen eigene, glatt polierte Nachrichten.

Journalisten müssen immer öfter vor dem Stadion bleiben. Nicht nur, aber vor allem in Großbritannien. Neben den Glasgow Rangers haben auch die Clubs aus Southampton, Sunderland, Blackpool, Port Vale, Rotherham, Newcastle, Nottingham Forest und Swindon Town unliebsame Journalisten verbannt. Die britische Journalistenvereinigung National Union of Journalists (NUJ) warnt vor einem Trend. «Wir bewerten das als Zensur und werden das nicht akzeptieren», - sagt die NUJ-Sprecherin Frances Rafferty.

Der Pressemann des Clubs übernimmt diesen Job. Die Fragen zur Taktik oder zur Führung des Vereins wird er wohl keine haben.

Fans des Clubs finden Nachrichten künftig nur noch in einer App, die vom Verein gefüttert wird.

«Die lokalen Medien brauchen uns mehr als wir sie», - sagt Lee Power ist der Besitzer des englischen Drittligisten Swindon Town. Eine Todeserklärung an den Journalismus.

Möchte ein Verein nicht, dass ihm unbequeme Fragen gestellt werden, bedeutet das meistens vor allem eines: Dass er keine gute Antworten hat.

In Großbritannien werden gerade grundsätzliche Fragen ausgehandelt: Sollen Fußballfans nur das erfahren, was ihr Verein will? Oder auch das, was er nicht will?

In Großbritannien wird heftig debattiert. In einer Radiosendung entlarvte Tim Luckhurst, ein BBC-Journalist, der nun am Journalismus-Zentrum der University of Kent arbeitet, sagt er: «Es ist PR mit dem klaren Ziel. Eigenwerbung».

Der Premier-League-Club Newcastle United hat eine Art Belohnungssystem für freundliche Berichterstattung eingeführt. Als

im Juni Steve McLaren als neuer Coach präsentiert wurde, durfte nur der Daily Mirror ein Exklusivinterview führen.

Geld gegen Interviews, das ist der Deal. Die Trennung von Anzeigen und redaktionellem Inhalt wird aufgeweicht. «Eine unabhängige Berichterstattung ist nicht mehr gesichert», - sagt Frances Rafferty vom Journalistenverband NUJ.

Heute ist das anders: Die Clubs bedienen eigene Kanäle, produzieren TV-Shows und bejubeln sich dort selbst.

In Deutschland einige Medien versuchen, neue Bindungen zu Vereinen zu schaffen und gehen Marketing-Partnerschaften einVielleicht ein Vorbild für Sportjournalisten: Tore bejubeln können die Vereine längst selbst, kritisch hinschauen eher nicht.

## THE TECHNOLOGY OF CREATING A SOCIAL PROJECT: A PARK FOR STUDENT'S YOUTH

Bardak. V. – Sumy State University, group UPm-61
Podolkova S.V. – E.L. Supervisor

Lately, project managers from all over the world have started paying attention to projects designed to achieve a specific social effect. We decided to develop the concept of own social project. It's a park for student youth.

The first step in the development phase of the project was to define the problem. Its definition has been carried out through the following steps: firstly, a problem has been chosen (Students living in the hostels don't have a place for recreation. We wanted to help and create it); secondly, we have thoroughly analyzed the problem.

There is an abandoned territory located between the hostels № 2 and № 3 of Sumy State University. As we know from local mass media information, a lot of negative situations (some of them even had criminal character) are connected with this place (cases of violence, use of alcohol and drugs, assaults, etc.).

The business idea of the project is to create a comfortable and safe place for students' recreation. It could solve a number of

problems, including of criminal ones. Our project is unique for Sumy because there is no other students' park in the city.

As project participants we implement different interests in the process of project's creation and form the demands in accordance with its scope and motivation.

The stakeholders of our project are: 1) the project team; 2) the administration and employees of Sumy State University; 3) students' council; 4) city administration; 5) local law enforcement bodies; 6) the department of ecology and natural resources protection; 7) students that live in the hostels; 8) parents of the students; 9) their guests and friends; 10) inhabitants of the private sector; 11) students from other universities of the city.

It's common knowledge that the project budget is a plan realized in quantitative (mainly monetary) dimension, which reflects revenues and costs necessary for project implementation. The administration of Sumy State University is expected to finance the project. Having analyzed the order of works, their terms and resource requirements, we came to the conclusion that our work will last 79 days (from 15 of April to 3 of July 2017).

Modeling of the project's product is very important for developers. So, we plan to fence the park protecting it from unwanted visitors, set up benches and tables, plant trees, flowers and bushes there. In future, the students will be able to have concerts on the territory of the park, as we are going to set a stage here.

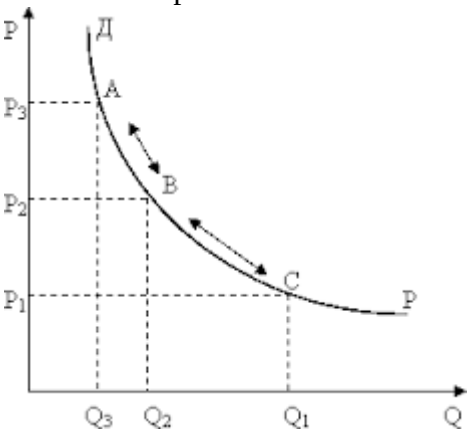
Implementation of social projects is an important part of European integration processes. So, it was the motivation for the creation of this project.

# WHAT FACTORS AFFECT DEMAND IN UKRAINE?

P. Kucherenko – Sumy State University, group E-61
N.V.Maliovana – Sumy State University, English Language Adviser

One of the most important building blocks of economic analysis is the concept of demand. It is the ability and willingness to buy specific quantities of a good/service at alternative prices in a given time period.

A demand exists only if someone is willing and able to pay for a good/service – that is, exchange money for a good or a service in the marketplace.




A demand curve is a graphical illustration of a demand schedule. Each point on the curve refers to a specific quantity that will be demanded at a given price. [1]

Economists speak of a movement along demand curve as a change in quantity demand. Such a movement represents buyers` reaction to a change in the price of the good/service in question, other things being equal. The degree to which price changes affect demand will depend upon the elasticity of demand for a particular item.

What factors affect demand in Ukraine?

Answering this question is not an easy thing, first of all it must be considered the kind of a product or a service a consumer wants to buy or use, but some key factors are obvious, such as:

1. The total number of customers in Ukraine and their own income. As real income rises, Ukrainian people buy more of some goods (which economists call normal goods) and less of what are called inferior goods (transport).

2. The needs of Ukrainian consumers in a product/service.

3. Ukrainian consumer expectations (for income, price, tastes). If people expect the price of a good to rise relative to the prices of the goods or expect the opportunity cost of acquiring the good to increase in some other way, they will step up their rate of purchase before the change takes place.

4. Tastes (desire for this or that good). Sometimes these changes happen rapidly, i.e. in such areas as popular music, clothing, styles and fast food. The demand curves for these goods/services shift often.

5. Other goods (their availability and price). Another influence on demand is the price of substitutes.

6. Capacity market.

7. Climatic conditions. [2]

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## IMPROVEMENT OF THE MECHANISM OF REAL ESTATE MARKET DEVELOPMENT IN UKRAINE.

Shershnev E., group Em-62
EL Adviser O.R. Gladchenko

Transition period in Ukraine is characterized by active real estate market formation, which reflects all the problems of the economy and uneven development of its separate segments, incomplete legal framework and low purchasing power of citizens and low investment potential entities.

Real estate is one of the main types of market, which with the market of goods and services and capital market economic mechanism determines the characteristics of modern economy.

Formation of the property market and the functioning of commodity-related manufacturing reflect the degree of development.
Real estate should be considered as a system of relations (direct or indirect) between buyers and sellers which operates through the price mechanism, taking into account social significance, peculiarities of legal regime of appropriation of natural properties.

The features of property market:

- Low level of research
- An imbalance of supply and demand
- Increased value of property
- Low liquidity
- High level of promotional costs
- A limited number of sellers and buyers

The main functions of the real estate market include**:**

- Information about the price, supply and demand;
- Establishment of links between consumers, supply and demand;
- Formation of real estate prices and protection of the holder rights;
- Reallocation of investments between the real estate;
- Freedom of entrepreneurship;
-The effectiveness of resolving social programs

The mechanisms which stimulate the development of real estate market should be determined as follows:

1. Organizational and economic measures that can provide the infrastructure market.
2. Financial and economic measures, which would allow to ensure the participation of the average income in the mortgage lending.
3. Investment that would form the investment attractiveness of real estate specific regions.
4. The tax, which would create conditions and the installation of tax property based on its attractiveness with differentiated rates.
5. Legal measures would form a transparent and well-regulated nature of the relationship between market participants.

# ECONOMIC INDICATORS OF SUSTAINABLE DEVELOPMENT

A. Pietukhova, group Edm-61
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The emergence and evolution of the concept of sustainable development changed the principles for economic development, so an unlimited economic growth was displaced by balanced development. It helps to meet the needs of the present without compromising the ability of future generations to meet their own needs. This concept became the complex of three components: environmental unity, economic efficiency and social justice.

The group of economic indicators includes:

- international cooperation to accelerate sustainable development and related domestic policy;
- changing consumption patterns;
- financial resources and mechanisms;
- transfer to environmentally friendly technologies, cooperation and capacity building in this area.

The most common economic indicators of sustainable development that used on practice are:

1. Environmentally Adjusted Net Domestic Product (EDP) is the value added obtained by subtracting the imputed environmental costs (use of economy assets and use of non-economy assets) from Net Domestic Products (NDP).
   Thus, *EDP = (NDP – DPNA) – DGNA,* NDP means Net Domestic Product, DPNA – Depletion of Natural Resource, DGNA is the cost estimate of environmental damage.
2. Genuine Savings (GS) is an indicator that aims to assess an economy's sustainability based on the concepts of extended national accounts.

Thus, *GS = (GDS – CFC) + EDE – DPNR – DMGE*, GDS means Gross Domestic Savings, CFC – value of the depreciation of productive asserts EDE – amount of Expenditure on Education; DPNR – amount of natural resource depletion; DMGE – Damage from Environmental Pollution.

3. The Human Development Index (HDI) is an example of social and economic indicator that includes both patterns of development. It is a comparative measure of life expectancy, literacy, education and standards of living for countries worldwide.
4. Genuine Progress Indicator (GPI) has been suggested to replace gross domestic product (GDP) as a metric of economic growth. GPI is an attempt to measure whether a country's growth, increased production of goods, and expanding services have actually resulted in the improvement of the welfare (or well-being) of the people in the country.

So, we can come to the conclusion that sustainable development becomes a required worldwide strategy. Each of three components is valuable and characterized by different peculiarities. Speaking about the economic component it is realized with the usage of special indicators such as EDP, GS, HDI and GPI. Every indicator helps to evaluate the level of progress and maintain the points of sustainable development.

# NATIONAL INCOME AND ITS ROLE IN SOCIAL REPRODUCTION

Victoria Mirgorodska, group F- 41
EL Adviser O.R. Gladchenko

The theory of consumption and accumulation is an important component of economic system of views of any society, but in the conditions of transitional economies special novelty of research problems of accumulation and consumption is determined by the new conditions and challenges that are related to the need to develop and implement a strategy for sustainable economic growth.

National income is the cost of a newly created society, not only in the sphere of material production, transport, trade, public catering and communication sphere, but also in the service during a certain period of time. Its magnitude is one of the most important macroeconomic indicators, which shows the most complete picture of the level of economic development of the country, its potential to ensure well-being of the population and solving social problems.

In its movement the national income passes the following stages of social reproduction: production, distribution (primary and secondary), redistribution, exchange and consumption. The distribution is a key step in the process of social reproduction. This separation allows to distinguish between different ways of using the GNP, which influences the state and dynamics of national economy of the country:

1) the fund of accumulation is a part of national income which is used for expanded reproduction, increase of non-productive assets, creation of state reserves and stocks;

2) the fund of consumption is a part of national income, which is used to meet non-productive needs (private and public), to maintain organizations and in non-productive sphere.

These directions are related dialectically. Theoretically the boundary between them is conditional. However, , a clear definition of proportions between accumulation and consumption is very important as well as specific funds of accumulation and

consumption, because they affect the pace and quality of economic growth.

The ratio of funds is determined by a number of factors: a model of economic development, the intensification of expanded reproduction, household income level; tax system; the cost of factors of production, especially the costs of material resources, labor, capital (the interest rate); amounts of intangible assets (information, technology, etc.); the ratio between supply and demand; the stability of monetary circulation; the stability of political situation; the legislative framework; the condition of the environment etc.

To determine the status and trends of gross capital in Ukraine we analyzed the dynamics of gross savings and gross fixed capital formation and their share in GDP (table 1).

According to analysis during 2006-2016 the level of gross savings has changed as follows: in 2006 – 2009 and in 2011 - 2014 gross savings were less than gross capital base, but in 2010 and in 2015 - 2016 they were more than it, which shows a complete transformation of savings into accumulation.

The analysis of capital accumulation dynamics demonstrates that after the economic crisis of 2008, the share of fixed capital formation decreased from 24 - 27% to 18 - 19%. The economic and political crisis of 2013 - 2014 also had a negative impact, because the proportion of accumulation did not exceed 14% in the post-crisis period.

So, consumption and accumulation are the main directions of national income use. The optimal proportion between them is the ratio of 75% to 25%, but in different socio-economic conditions it can vary depending on the governance priorities and targets and economic development. If the ratio between consumption and accumulation ensures continuous improvement of the absolute size of consumption and accumulation funds, stable economic growth, it can be considered optimal. In any case, speaking about the development of economic public policies you should pay attention to the fact that the speed of accumulation rate to accelerate intensive economic development has its limitations and that capital formation

of GDP must not exceed 30%, otherwise social conditions will

| Indicators / Years | GDP, mln UAH | Gross fixed capital formation, bln UAH | Gross savings, bln UAH | Gross accumulation,% for GDP | Gross savings, % of GDP |
|---|---|---|---|---|---|
| 2006 | 544,2 | 133,9 | 127,0 | 24,6 | 23,34 |
| 2007 | 720,7 | 198,4 | 177,2 | 27,53 | 24,59 |
| 2008 | 948,1 | 250,2 | 197,5 | 26,39 | 20,83 |
| 2009 | 913,4 | 167,6 | 151,8 | 18,35 | 16,62 |
| 2010 | 1082,6 | 195,5 | 197,7 | 18,06 | 18,26 |
| 2011 | 1302,1 | 241,8 | 208,4 | 18,57 | 16,00 |
| 2012 | 1459,1 | 283,2 | 198,6 | 19,41 | 13,61 |
| 2013 | 1522,7 | 247,1 | 152,6 | 16,23 | 10,02 |
| 2014 | 1586,9 | 224,3 | 183,6 | 14,13 | 11,57 |
| 2015 | 1979,5 | 258,8 | 321,5 | 13,07 | 16,24 |
| 2016* | 1649,7 | 222,6 | 286,9 | 13,49 | 17,39 |

deteriorate and population standards of living will reduce.
* during 3 quarters of 2016

Table1. Dynamics of GDP, gross savings and gross fixed capital formation in 2006 – 2016.

# THE ECONOMIC CRISIS IMPACT ON THE EXCHANGE CURRENCY RATE IN UKRAINE

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EL Adviser O.R.Gladchenko

The exchange rate is a standard price at which one currency is converted into another. In fact, its meaning is more important. Due to the fact that it is formed under the influence of a very large number of factors beginning from economic and political and up to psychological, the exchange rate is a kind of barometer that reveals the state of a country compared to other countries and acts as the link between national and world economies.

The main factor that affects the exchange rate is the state of balance of payments. If it is active, then the exchange rate rises and, conversely, if the country's balance of payments is passive on the world market, it means that its currency costs exceed revenues from abroad for some period. Under these conditions the proposal of the country's currency in world markets is growing and when it exceeds demand, its rate decreases. This process is called devaluation and is important for Ukraine.

In 2014 devaluation of the hryvnia was more than 100% because of many factors. Such a sharp decrease in the national currency in Ukraine's history had not ever been before. The value of a dollar compared to hryvnia rose to 23.6 in November 2015. Some researchers think that such situation was caused by a political crisis that is still not resolved in Ukraine. However, it can`t be argued, because not only hryvnia but also other foreign currencies devalue.

For example, the devaluation of Australian dollar was 34.07% in November 2015 and Swedish krona devalued on 27.78% if compared to the beginning of 2013. But Ukraine and Russia have leading positions with these indicators. The devaluation of Ukrainian national currency was 189.36% and it is of Russian ruble was 108.64% respectively in November 2015 compared to January 2013.

There are a number of reasons of sharp hryvnia depreciation in 2015:

- the decrease of Ukrainian golden and foreign exchange reserves in 2015 almost doubled if compared to 2013;

- a deep crisis in all spheres of life;
- speculative actions of commercial banks. There were 18% of banks involved in hryvnia debt to the NBU for example.
- lack of the information concerning the policy of the National Bank of Ukraine;
- constant state of panic of all Ukrainian population. Its excessive demand for foreign currency has contributed to the decline of hryvnia if compared to US dollar.

Sharp collapse of hryvnia which is speculative to some extent is inevitable, because a number of factors limit the possibility of increasing the supply of foreign currency on the foreign exchange market of Ukraine, including the critical reduction of international reserves, the decline of foreign currency from exports and investments and political instability in the country. The main ways which can help to stabilize Ukrainian foreign exchange market are as follows: to strengthen exchange control and increase demand for hryvnia.

Objectively, it is necessary to state currency regulation. The following measures can help to get out of the crisis and stabilize the exchange rate:

-definition of limit profit margins on transactions conducted in the foreign exchange market;
-increasing control of imported services;
-intensive verification of residents` payments for export contracts in foreign currency obligations;
-intensive verification of non-residents` payments in foreign currency state obligations.

To reduce devaluation Ukrainian government and Ukrainian National Bank should solve global economic, political and financial problems.

# DIE MANIPULATIONEN VON DEN INFORMATIONEN, DIE BEITRUGEN DER ANNEXION DER KRIM

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M. M. Dunajewa – Senior Lecturer

Während des russish-ukrainischen Konfliktes, der von den Massenprotesten auf Majdan, vom Wechsel der Regierung, der Annexion der Krim und von den Kriegsoperationen im Osten der Ukraine bemerkt wurde, hat sich der informative Einfluss auf die ukrainische Gesellschaft der russischen Ideologie gesteigert.

Der Mediaraum der Ukraine überfüllt den manipulativen Schemen, über denen die Menschen nicht verdächtigen können, aber den das Denken, das Verhalten, die Auswahl beeinflussen. Die informative Kampagne Russlands anlässlich der Annexion Krim war mit Hilfe der manipulativen Methoden gut geplant und von den Mass-medienkanälen realisiert wurden. Krim, die instabil die Mass-mediengesellschaft durch die zahlreichen nationalen Minderheiten der Region und die schwache informative Sicherheit hatte, wurde nicht widerstanden, und friedlich wurde von der Ukraine abgetrennt.

Unter den manipulativen Methoden waren die Erzählungen der sowjetischen Periode über die Völkerfreundschaft, darüber, dass Krim der Teil der russischen Geschichte ist, darüber, dass Sewastopol die Stadt des russischen Ruhmes ist. Diese Informationen haben krimien zur russischen Zusammenarbeit loyal gestimmt und haben der Durchführung des Referendums in März 2014 geholfen.

Bei den Menschen ist das Gefühl erschienen, dass sie die Subjekte des historischen Prozesses auf dem Referendum wurden, und wurden die Opfer des politischen Spiels nicht. Seinerseits verwendete Russland das Referendum als Illusion der ungezwungenen Annexion. So, Russland verbarg wahrhafte Ziele vor der weltweiten Gesellschaft.

Auf der Zeit der Annexion zunächst sprich die manipulative Idee «der Schutz» an, die die russische Regierung im informativen Raum der Krim für die Rechtfertigung der Aktivität der russischen Militärs auf der Halbinsel schob. In der endlichen Etappe der

Kampagne sprich die Idee «der Wiedervereinigung» an, die von den Saluten und den Massenfeierlichkeiten begleitet wurde**.**

Die Manipulation von den Bedeutungsfiguren hatte den starken Effekt auf die Bewohner der Krim. Zum Beispiel, die starke Figur des Referendums wie die alternativlose Weise für die Lösung der wichtigen Probleme in der Sicherheitssphäre, das materielle Wohlergehen, die Entwicklung der Wirtschaft: die Regierung verwendete die Versprechen, um die Renten, die Löhnungen zu erhöhen; die Losungen, zum Beispiel, «die Rückführung nach Hause von der feindlichen Gefangenschaft zu erhöhen».

Die Bedeutungsfigur «Sewastopol wie die Stadt-Held» bleibt aktuell unter den Bewohnern Sewastopols, deshalb sie verwendeten für die Destabilisierung der Situation auf dem lokalen Niveau während der Massenproteste auf Majdan mehrfach. Die Führer der Meinungen behandelten an die Menschen mit den Losungen, damit «die Faschisten» die Stadt wieder nicht okkupierten.

Das wichtige Element der Manipulation bleibt die stichprobenartige Beleuchtung der Ereignisse in den Massenmedien. Zum Beispiel, auf der Webseite der Zeitung «Ruhm Sewastopols» wurden die Informationen über die Ereignisse auf Majdan verschwiegen.

Am 21. November, im Tag, wenn die ersten Proteste auf Majdan angefangen haben, wurden eine Hauptneuheit der Zeitung «Ruhm Sewastopols» die Informationen über die Annahme von der Werchowna Rada des Gesetzes über der Vergrößerung der Verantwortung der Fahrer im nicht nüchternen Zustand.

Am 8. Dezember ist in Kiew den Marsch Millionen gegangen. Auf Majdan der Unabhängigkeit auf der Volksversammlung hat sich von 500 Tausenden bis zu 1 Million Menschen versammelt. Die Aktivisten «der Freiheit» haben das Denkmal Lenin auf dem Boulevard Schewtschenka niedergeworfen. Und in den Neuheiten der Zeitung nichts ist es über diese Ereignisse gesagt, und Hauptneuheit in der Zeitung wurde das Material «Endlich es ist der Winter» gekommen.

Die Manipulation vom Bewusstsein der Menschen ist ein untrennbarer Bestandteil der informativen Kriege, die von den

Staaten zwecks der Vergrößerung des eigenen Einflusses unter den weltweiten Führern geführt werden. Die informative Kampagne Russlands der Annexion der Krim wurde keine Ausnahme.

## SIGHTSEEING TOURS FOR THE DEAF

K. Shulga– Sumy State University, group UPm-61
S.V. Podolkova – EL Supervisor

Today social projects are among the most promising areas of investors and managers in the management, as it is this category of projects that enables organizations to develop national solution of social problems directly affecting the population. Since each person is an individual who seeks to develop, learn something new, and in addition also relax mentally and physically from the monotony of everyday life and everyday bustle, but unfortunately not all people have the opportunity to join the tourist centers, because of "special" needs, namely, people deprived of hearing. So, we decided to develop a project that will solve the problem of hardly available excursion services for this category of people. Their inability to hear information that is presented to them by a guide is a great problem, because main kind of language perception for these "special" tourists is a sign language.

To develop this project and then its implementation, we developed and analyzed excursions around Sumy. So with the help of a tour guide and a sign language interpreters we created all necessary conditions for the perception of information by tourists.

Due to the social direction the project is relevant and unique for the region. After conducting a statistical analysis of Sumy region, we found that this category of the population constitute 0.8% of residents of Ukraine total population. Statistical data were analyzed in the Ukrainian Society of the Deaf, where every Ukrainian deaf is documented

By our standards, the project is designed not only for people of middle or old age, but also for children and youth. The project will develop the sightseeing tours that will give not only information on selected objects to the people on display, but also diversify their free time. These are the special animation program, training sessions and workshops for educational purposes. Also, tourists will have the opportunity to have not only walking tours, which are very tedious, but to book a bus tour about the city center.

The project budget is 16 thousand grivna ± 20%. It is planned to raise funds of investors, namely the Organization of Youth and Sports of the Sumy city council (80%), Grant funds (social projects of Ukraine).

So, thanks to the pilot project it is expected to enhance the availability of excursions for this category of the population and distribution of such services with the assistance of guide-sign language interpreters in the cities of Ukraine. It is regarded as a social program of tourism development for people with disabilities. The project will be implemented in Sumy and subsequently distributed in other cities of Ukraine, as this category of people live in each city.

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# THE GLOBAL POLITICS OF MOTHERHOOD AND FATHERHOOD

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S.V. Podolkova – EL Supervisor

The global politics of motherhood and fatherhood due to the fact that throughout the twentieth century there was an important economic, social and cultural shifts that defined the changes of institutions, models and practices of fatherhood in contemporary society. Transformation in the sphere of marriage, types of the family affects both the sphere of marital/partner and international relations, and the sphere of relationships of mothers, fathers and children. In particular, fatherhood becomes a rationally planned, reflective, separate from marriage, poses the problem of biological and social fatherhood unity. Motherhood as a special sphere of activities and relationships related to the care and custody of children is included in the broader contexts of family, fatherhood, childhood and gender inequalities, it is a component of social, cultural and demographic processes.

The world is changing fast; our country faces new challenges, what really remains unchanged is the foundation of any society – the family. Family is one of the oldest social institutions, changing their shape, function in all known civilizations and cultures. The functioning of the family is closely linked to social, economic, political, and cultural reality of the country. The family, like a mirror, reflects all the pros and cons of the policy of a particular state.

Gender equity implies the fair treatment of women and men. Security equity requires the access to activities that compensate for historical and social difficulties, which deprive men and women of the possibility to act on the master level. Justice leads to equality. Gender equality involves equal status for men and women. Gender equality means that men and women have equal conditions for

realizing their human rights and the same capacity for the implementation of contribution to national, political, economic, social, cultural development and equal right to enjoy the benefits of this development. Therefore, gender equality means equal evaluation by society of the similarities and differences between men and women, the shift of the roles they play, the recognition of the equality of their powers.

It is evident, that at present time it is very important that the state should not only ratify the necessary international documents on gender equality, but also conduct a gender analysis of national legislation on this issue. First of all, it is necessary to create such social and economic environment, where respect and implementation of women's rights as human rights, became a reality. Such changes will gradually change the old and form a new system of social relations, which is not sexual, with social and legal components. Now this system of social relations is called "gender". Both international and Ukrainian law provides gender equality, but need to install some monitoring and then, in our opinion, gender inequality will gradually disappear.

Men who commit domestic violence often tends to emphasize the superiority of the male, the special responsibility of men for the welfare of the family, the breadwinner role, only because the family exists. This gives them a reason to require from others special respect, fulfillment of all whims.

International law on the protection of human rights interprets domestic violence as a violation of human rights and imposes on all states the obligation to find effective legal means of combating violence. Therefore, the issue of combating violence in the family is the subject of numerous international instruments ratified by many countries in the world.

Another component of functional family is reproductive health. According to the recommendations of the Program of action at the International conference on population and development (Cairo, 1994), reproductive health implies the absence of diseases of reproductive system, disorders of its functions and/or processes, or a state of complete physical and social well-being. This is automatic ability, satisfied and safe sexual life, ability to reproduce (have children) and independent solution of family planning questions. The purpose of social support is the providing of quality and comprehensive social assistance to families, children and youth who are in difficult life circumstances, creating conditions for local people positive life choices and overcoming crisis, a comprehensive and harmonious development of the younger generation, discovering their abilities and creative potential, the adoption of a healthy lifestyle.

Social support for families, women, children and youth as a kind of social work is carried out by the network of social services for family, children and youth. There is a number of various institutions aimed at reviving of shattered social and economic, political, environmental, legal, psychic, pedagogical and other conditions, and providing modern level of juvenile development and survival.

So, today women constitute more than half of the population of Ukraine, and our state should do everything possible to improve their position in the society.

# ANTIBIOTIC RESISTANCE - THE MOST DANGEROUS PROBLEM OF THE XXI CENTURY

A.S. Ivanova – Sumy State University, LS-511
V.S. Kurochkina – EL Advisor

There are a trillion of different bacteria around you. Many of these bacteria are harmless, unfortunately there are a few microorganisms that can cause harmful infections. But today there are amazing medicines designed to fight bacterial infections. They kill or neutralize bacteria. Widespread introduction of antibiotics in the 20$^{th}$ century helped to defeat many previously incurable diseases. But today more and more antibiotics become less effective. Why have they stopped working?

Antibiotics and similar drugs have been used for the last 70 years to treat patients who have infectious diseases. Since the 1940s, these drugs have greatly reduced illness and death from infectious diseases. However, these drugs have been used so widely and for so long that the infectious organisms have adapted to them, making the drugs less effective.

Each year in the United States, at least 2 million people become infected with bacteria that are resistant to antibiotics and at least 23,000 people die each year as a direct result of these infections.

Antibiotic resistance occurs when an antibiotic has lost its ability to effectively control or kill bacterial growth; in other words, the bacteria are "resistant" and continue to multiply in the presence of therapeutic levels of an antibiotic.

Antibiotic resistance is a natural phenomenon. When an antibiotic is used, bacteria that can resist that antibiotic have a greater chance to survive than those that are "susceptible." Some bacteria are naturally resistant to certain types of antibiotics. However, bacteria may also become resistant in two ways:

1) by a genetic mutation or

2) by acquiring resistance from another bacterium.

So, don't abuse antibiotics, that can lead to serious consequences.

# AIRBAGS: SAVING LIVES

Demyanenko A., Zelensky S., SU-41
Mulina N.I., EL Adviser

The airbag system is one of the crucial parts of any vehicle safety components. Proper airbag deployment can ensure that you and your passengers survive a crash.

The air bag was first conceived by John W. Hetrick in 1952. To design the airbag he applied an event he had observed while in the Navy. He was repairing a torpedo which had a canvas covering. When the compressed air that was in the torpedo was released, it quickly inflated the canvas shooting it to the ceiling. He developed his design until he obtained a patent on the device on 5 August 1952.

Airbags deploy at the front of the dashboard in most cars, and many vehicles have airbags along the side of the car as well. When there is an accident, the airbags fill up with air very quickly to provide a cushioning system for the people in the car so that they are not thrown around in the event of a crash.

To deploy airbags need the crash sensors. There are two types of airbag sensors: electrical and mechanical. Electrical sensors vary in design. Some use an electromechanical "ball and tube" mechanism. Other electrical designs are similar in principle, using accelerometer to trip the sensor. Mechanical sensors work independent of the electrical system with a design that actuates a firing pin triggering a small explosion after a crash.

According to engineering study an airbag can deploy in about 55 milliseconds. This is about the same amount of time it takes you to blink your eyes or sneeze.

Airbags have saved 15 thousands of people for 20 years, or they saved 62 people per month, or it equals 2 saved lives per day. Statistic is taken only from the USA.

Swedish concept of world‘s first airbag for cyclists was created by Hovding Company. It protects nearly all of the head while leaving the field of vision open.

# INNOVATIVE ADVERTISING TECHNOLOGIES ON THE BASIS OF THE HOLOGRAM AND INTERACTIVE COMMUNICATION

Y. Hritsenko, Sumy State University, group RK−31
N. M. Usenko, ELA

Advertisement has been appearing in the life of consumers since prehistoric times, but I suggest with the development of this sector becoming more difficult to attract people's attention to the advertised product. Today any advertisement does not communicate with people but people talk to advertising.

Innovative technologies actively take root in the advertising of the 21st century, using interactive communication, such as video advertisement in places of a mass congestion of people with **InDoor TV technologies**. The technology of the three-dimensional image allows to go beyond the screen, and then to return back, making impression on the people passing by.

One more innovation of modern advertising is **Just Touch technology**. It allows to monitor the movement of hands of the consumer and to use them for management of functions of the menu located on a special board. The consumer has an opportunity to easily find information, check existence of goods and study the program of places. At such system, any window can turn into a full-function sales channel.

The bigger number of influence of effects has other innovations – **technologies Ground of FX**. This technology allows the user not only to watch an advertising plot, but also to take part in it that is reached by projection of the three-dimensional image on a flat surface.

The special attention is paid to the **Free Format Projection technology**. This technology creates feeling of presence of characters or other objects full-scale, close to the consumer. Animated heroes have made a speech at MTV ceremony as leaders.

To my mind use of modern technologies in the field of advertising is a considerable step forward. It was revolution which

has opened to the world innovative advertising and therefore it's the efficiency considerably surpasses all traditional methods.

## DETACHABLE JOINTS OF DETAILS FROM THE CARBON FIBER COMPOSITE

A. Dovgopolov – SSU, postraduate student;
S. Nekrasov, PhD;
S. Zolotova — EL advisor.

Nowadays the constructions from metals, plastic and filled plastics that contain detachable joints of details are widely applied in various constructions, machine components, building, mechanical engineering and other branches. But the primary target of applied devices and machines constructions improvement is their weight and size reduction with simultaneous improvement of endurance characteristics, reliability and durability increasing. For the task solution in some branches of mechanical engineering they replace traditionally applied metals and their alloys by carbon fiber composites that according to the physicomechanical characteristics are equal with some structural materials.

Carbon-filled plastics are the composites that contain carbon fibers as a filler. This relatively new class of composite materials has gained the most intensive development in recent years. Production of detachable joints from the carbon fiber composite is a complex engineering challenge. For its successful solution it is necessary to calculate optimum characteristics of joint components material which will depend on number of composite layers, their directions and sequence.

Endurance of the most widespread metallic compounds (rivet, bolt, threaded) considerably exceeds the endurance of similar construction joints from the carbon fiber composite. A big contribution into development of the shaping theory by surface cutting of carbon fiber products was made by the famous domestic and foreign scientists: T. Roik, V. Gaydachuk, Y. Karpov, D.

Krivoruchko, G. Teters, M. Masuda, G. Spur, E.Reyssner, etc. The majority of works is performed, as a rule, within approximate design models. At the same time, the shaping theory by

surface cutting of carbon fiber products isn't considered enough therefore more detailed development of this theory will allow to expand the carbon fiber composite usage in mechanical engineering.

The major task of researches is to improve already existing ways of a shaping of detachable joints from carbon fiber composites by means of reliability, durability and joint accuracy improvement and also to develop new ways of detachable joints of details from the carbon fiber composite and usage of new geometrical forms of these surfaces.

## HISTOLOGICAL FEATURES OF RED BONE MARROW IN RATS

Yu. Lyndina – Sumy State University, PhD student
S.G. Zolotova – E L Adviser

Bone marrow is the flexible tissue in the interior of bones. In humans, red blood cells are produced by cores of bone marrow in the heads of long bones in a process known as hematopoiesis. The hematopoietic component of bone marrow produces approximately 500 billion blood cells per day, which use the bone marrow vasculature as a conduit to the body's systemic circulation. Bone marrow is also a key component of the lymphatic system, producing the lymphocytes that support the body's immune system. Information about the normal structure of the bone marrow is a key step in understanding its changes under the influence of negative environmental factors.

Objectives. To investigate the histological features of the red bone marrow in mature rats and compare them with the human red bone marrow.

Material and Methods. The study was conducted on the iliac bones of mature white laboratory rats. The material was fixed in 10% neutral formalin for 24 hours. The decalcification process took place in a solution of formic acid. After that paraffin blocks were made of it. Then sections with the thickness of 3-4 mm were made and they were subjected to the standard process of dehydration in xylol and alcohols of rising concentration. They were stained with

hematoxylin-eosin and by Romanovsky-Himze. Histological preparations of human bone marrow used to compare with rat bone marrow.

Results. Microscopic analysis of histological preparations of mature laboratory rats showed that the stromal as well as hemopoetic tissue was presented in red bone marrow. Stromal tissue is presented by bone, adipose tissue, reticular and collagen fibers, sine wave, macrophages, fibroblasts, osteoblasts and osteoclasts. Parenchyma (hematopoietic cells) is presented by shoots formation of granulocytes, monocytes, lymphocytes, erythrocytes and platelets.

Comparing quantitative and qualitative indicators of rats and humans red bone marrow, a significant percentage differences were not found, although rat‘s hematopoietic cells were characterized by some features. Most of eosinophils and neutrophils had annular core because granulocyte development in rats passed by ring type. Granularity of neutrophilic granulocytes are very small, their nuclei are more segmented (5-8 segments). Large size of basophilic granulocytes is founded as single cells. Lymphocytes and monocytes are erythroid.

Conclusions. Because of the lack of significant anatomical, morphological and histological differences of rats and humans red bone marrow, it can be argued that forming organs of hematopoiesis in rats occurs on the same principles as in humans, although it has certain patterns.

## ISOLATED SYSTOLIC HYPERTENSION

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S. Zolotova – E L Adviser

The problem of high blood pressure is relevant today, despite the progress achieved in diagnosis and treatment of this disease. The number of hypertensive patients are growing every year. In medical practice we often meet hypertensive patients, which have only elevated systolic blood pressure (SBP) more than 140 mmHg. If the SBP is elevated (>140) with a normal (<90) diastolic

blood pressure (DBP), it is called isolated systolic hypertension (ISH). ISH can be represented as a variant of primary hypertension, it is usually seen in the old people, or it may carry a secondary character (secondary isolated systolic hypertension), being a manifestation of different pathological states.

Study subjects: 657 patients (41 % males and 59 % females) were included into the study. Participants of the study were admitted to the Hospital WWII veterans therapeutic department. The average age of the participants was 67,4 ± 2.45 years.

Materials and methods: clinical protocols and recommendations, statistics analyze.

Results and Discussion. We diagnosed hypertension in 453 patients which were hospitalized in the therapeut ic department last year. We noticed ISH in 234 hypertensive patients. It was found that the average SBP in patients with ISH was 145,42 ±1,32 mmHg, and diastolic 80,21±0,82 mmHg. In recent years the increasing number of cases ISH in elderly and also in young peolple was observed. Much research aimed at finding the causes which are associated with a significant increase in the incidence of ISH. Similar studies in this area are limited and contradictory. In my further research, I try to establish the relationship between genetic factors and prevalence ISH in Ukrainian population.

## THE INTERRELATION BETWEEN ALBUMIN TO CREATININ RATIO AND URIC ACID FOR PATIENTS WITH TYPE 2 DIABETES MELLITUS AND ARTERIAL HYPERTENSION

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Patients with diabetes mellitus (DM) are especially vulnerable to hypertensive injury. The coexistence with arterial hypertension (AH) has a significant impact of the poor prognosis for patients with DM because of its effect on the micro and macro vasculature.

Diabetic nephropathy is the leading cause of chronic kidney disease. It is also one of the most significant long-term complications of morbidity and mortality for individual patients with DM. There is the connection between AH and microalbuminuria, which is now recognized as an independent cardiac risk factor, even in the absence of diabetes. On the other hand, blood pressure levels, and genetic predisposition are the main risk factors for the development of diabetic nephropathy.

Epidemiologic and experimental evidence suggests that serum uric acid (UA) is a marker of developing hypertension. Furthermore, hyperuricemia is a true risk factor of chronic kidney disease. Anyway, uric acid could be a prognostic marker of events including myocardial infarction, heart failure, stroke and death.

The purpose of our study was the determination of interconnection between the level of serum uric acid and albumin to creatinine ratio (ACR) in urine for prevention cardiovascular complications in patients with type 2 DM and concomitant AH.

Participants and methods. We examined 82 patients with type 2 DM and AH during our clinical treatment. They were treated in Sumy City Clinical Hospital № 1 from October 1, 2015 to February 15, 2016. Participants were divided in two groups according to the level of ACR in urine.

People from the first (I) group had the normal albuminuria (ACR < 30 mg/g). Microalbuminuria was detected in the second (II) group (30 mg/g < ACR < 299 mg/g). Nobody had macroalbuminuria (ACR > 300 mg/g). We use this biochemical method of diagnostic albuminuria as ACR because of its accuracy. However, the high cost is the main disadvantage of this method. The definition of ACR is more expensive than the measuring of albumin concentration in urine. Furthermore, the level of ACR is an established marker of cardiovascular and cerebrovascular events for patients with type 2 DM. All participants in this group had the third stage of AH.

All data were analyzed with the help of statistical methods (Excel 2007). In addition, we evaluated the Student criteria (t) and the veracity of differences (p) for assessment results.

In conclusion, we compared the level of ACR and UA.

Results. The mean duration of DM was (7,5±1,5) years for the I group and the (12±1,1) years for the II group, $t = 2,42$; $p < 0,05$. Despite, AH was diagnosed during (8,6±1,07) years and (17±0,95) years, $t = 5,87$; $p < 0,001$ for patients from the I and II group respectively. The mean levels of ACR were (28,56±2,1) mg/g and (150,79±23,76) mg/g, $t = 5,12$; $p < 0,001$, of uric acid – (290±20,6) umol/L and (408±36,4) umol/L, $t = 2,82$; $p < 0,01$ for participants from the I and II group respectively. So, patients with higher ACR had the biggest level of UA. In addition, people with microalbuminuria had the higher duration of DM and AH.

In our clinical treatment we determined the interrelation between two risk factors of cardiovascular and cerebrovascular events such as ACR and UA. It is doubt, that the evaluation of them must be necessary for all patients with DM and concomitant AH to prevention complications and mortality.

Some people say that UA is a predictor of microalbuminuria of diabetes. In our clinical trial this aspect was not highlighted, because there was no data what was the primary, up rise of UA or of ACR. May be it will become clear later.

## THE GREATEST DISCOVERIES IN THE HISTORY OF MEDICINE

M. Burda-Sumy State University, group LS-517
V.E. Pronyaeva – E.L.Adviser

The scientists in the branch of medicine always thought about how to safe the most precious for a human, that is our life, and their achievements are astounishing.

Vitamins – the discovery of vitamins by Frederick Hopkins and contemporaries, accomplished through feeding studies using

animals at the start of the 1900s, led to a far better understanding of nutrient and helped to prevent many illnesses and conditions that resulted from deficiencies.

HIV – was discovered in the 1980s by Robert Gallo and Luc Montagnier and following an influx of patients around the time. This discovery led to a greater awareness of the dangers of unprotected sex as well as to the various treatments that exist today to make the condition manageable.

The Circulatory System – The concept of the circulatory system was first described in 1242 by the physician Ibn al-Nafis, and first brought to prominence in 1628 by William Harvey. This led to a far better understanding of the human body in general and to many of the treatments and techniques we now take for granted.

X-Ray – Before X-rays repairing broken bones and identifying the cause of many other problems would have been much more difficult and has played a significant role in our understanding of the human body even further. When Conrad Rontgen first discovered the technique in 1895 he used it to create an image of his wife's hand.

DNA –was discovered by the Swiss physician Friedrich Miescher and was at first known as 'nuclein' . This has led to a much better understanding of a range of diseases , but is likely to lead to many more discoveries in the future as gene therapy becomes more widely used. Of course, the discovery of DNA has also lead to many important discussions on the nature of humanity and our. role in our own evolution.

Insulin – Before the discovery of the hormone insulin in 1920 by Frederick Banting, diabetes was a condition that would lead to a slow and unpleasant death. Today, thanks to this finding, most diabetic patients manage to live normal and full lives.

Anaesthetic – If you ever have been operated without any form of anaesthetic then you would likely have a new appreciation of this discovery . Before anaesthetic you had a rope to bite or have a sip of vodka.

Vaccination – using small doses of microorganisms to teach the body to protect itself from certain viruses – was a controversial

one. However it is only thanks to vaccinations that we have managed to stop the spread of many epidemics and even completely eradicate some of the world's most fatal diseases.

Penicillin – discovered by Alexander Fleming in 1928. Essentially the discovery of penicillin is responsible for the development of all the antibiotics that we use today to combat bacteria.

All these discoveries are vitally necessary in order to make our people healthier, more industrious to change our life for better.

## CANCER IN THE 21 CENTURY

O. Y. Fedorchenko - Sumy State University, group LS - 516
Scientific supervisor - V. E. Pronyayeva

The end of XXth century was marked by giant progress in a theory and practice of oncology. Due to the development of new technologies many of malignant new formations were successfully taken under control. As a result the introduction of the relatively simple screening, in a number of the Western countries it was not only aimed to decide the problem of early diagnostics but also considerably to shorten morbidity (for example, by the cancer of cervix of the uterus). Sizable success is attained with medicinal therapy and accompanying treatment, improvement of life quality and rehabilitation of patients with the different forms of malignant tumors.

The most progressive methods of treatment are genic and neutron therapy. The essence of genic method consists of affecting system responsible for fission, preventing the further reproduction of malignant tumors. Neutron therapy has been improved radically: instead of ordinary irradiation neutrons, it is able to get to the cells of tumor deeper and to affect formation much more effectively, than by traditional methods.

In addition, group of the Israel scientists engaged in actual researches in the field of bioengineering, jointly with their American and Belgian colleagues created the unique DNA-mechanism, salient

as a logical device for the chemical sounding and realization of address delivery of medicinal antitumor preparations devastating cancer.

Unlike a number of analogical developments, this novelty possesses memory, due to what it can be programed on freeing of medicament only in that case, when a cell-target is exactly in a state of "illness" and it`s aims to provide such high specificity that cannot be attained by other methods.

Nanorobots, recognizing the malignantly regenerated cells are very perspective direction of modern medicine and oncology in particular. They play role as original "courier", delivering medications to indicated address. This innovative technology gives an opportunity exactly to deliver preparation to the cancer cells, therefore its use will allow to get rid from extremely undesirable, heavy effects of chemotherapy (antineoplastics are entered in general a way in blood of patient). The main disadvantage of traditional chemotherapy is toxic influence not only on tissues of tumor but also on the whole organism that causes serious complications. As scientists suppose, using different "locks", through nanorobots it will be possible to take aim on any type of cancer cells.

In my opinion, the achievements in the development of nanotechnology is a great progress nowadays. I`m sure, it can become a revolution in a fight against the most frightening and unpredictable disease of 21 century-cancer.

## LUMINEERS – NEXT GENERATION IN THE RESTORATION OF TEETH

V. Kalantaienko, Sumy State University, group SM−402
N. M. Usenko, ELA

Lumineers are ultra-thin, porcelain plates, which are fixed on the surface of the tooth using special cement. Their thickness is not exceeding 0.2 mm. Lumineers provide the reauired shape for teeth, the color without preparation hard tissue of the tooth, as a result, patient’s smile will be naturally beautiful. With this technique it

became possible to help people get rid of the discomfort that they experienced due to defects, deficiencies of their teeth. Aesthetics in dentistry combines restoring function with personality, character and appearance of the patient. Beautiful smile adds more confidence, makes a person more appealing to others. This is important because if a person is ashamed of his smile, it adversely affects his communication, work, health, relationships with other people.

Lumineers are indicated for use in the cases of crooked, cuspidated teeth, the presence of large gaps between teeth, discoloration, mottled or stained enamel. They have many advantages: very strong, almost don't require grinding hard tissues, have no need of anaesthesia, relatively fast process if inatallation don't change color during exploitation, don't exert harmful effects on the teeth, but on the contrary are prevention of caries. Also strengthens enamel because of cement contains fluoride have long life of 20 years.

Among the disadvantages of the lumineers should be noted high cost of the procedure, because original lumineers are made in the USA. When you first visit the dentist he makes an indentation of your teeth which send to a special laboratory, located in California. When the lumineers are made they return them back for installation.

## MEDICAL COSMETOLOGY − MESOTHERAPY

M. V. Vereshchagina- SSU, LS – 513
N. M. Usenko – EL Advisor

Mesotherapy − is a new technique, but it has very old roots. This procedure is relevant because it can be removed from various shortcomings of the skin, eliminate or prevent age-related skin changes, make the correction cheekbones and oval face, to achieve a lifting effect, remove cellulite.It was developed in 1950 in France.

When beauticians advertising mesotherapy, they say that it is possible to reduce the fat in the "spot" treatment, with particular emphasis on the notorious problem areas such as the buttocks, love handles, inner thighs, neck and chin. Many practitioners also claim

that mesotherapy can help drastically reduce cellulite, eliminate wrinkles, remove scars and even stimulate hair growth.

The procedure itself is fairly straight-forward. A special 'cocktail' of vitamins, minerals and medications is injected directly into the layer of fat located just beneath the skin. To treat different areas of face and body using different amounts of the mixture. Once injected, this cocktail theoretically 'melts' away the fat by breaking fat cells down to the point where they can be flushed out through the bowels and kidneys.

It should be stressed on side effects of mesotherapy such as bruising, heightened sensitivity, damage to the liver, itching, swelling, redness and burning.

There are two basic types of mesotherapy: "classical mesotherapy" and "needle-free mesotherapy". The first one is basic. It is divided into manual and hardware. The second type of mesotherapy is for patients who are afraid of pain and prefer mesotherapy, using devices for electrophoresis, phonophoresis and devices that inject drugs under oxygen pressure.

It is natural that at the beginning of the third millennium health and beauty are still important, but you should be ready to get the desired result not only using methods that are proven for thousands of years but with new technologies.

## VENEERS IN DENTISTRY

A. Ivashyna, Sumy State University, group SM−402
N. M. Usenko, ELA

In dentistry a veneer is a layer of material placed over a tooth, either to improve the aesthetics of a tooth or to protect the tooth’s surface from damage. There are two main types of material used to fabricate a veneer: composite and dental porcelain. A composite veneer may be directly placed (built-up in the mouth), or indirectly fabricated by a dental technician in a dental lab, and later bonded to the tooth, typically using a resin cement such as Panavia.

Veneers can improve the colour, shape and position of your teeth. A precise shade of porcelain can be chosen to give the right colour to improve a single discoloured tooth or to lighten your front teeth. A veneer can make a chipped tooth look whole again. The porcelain covers the whole of the front of the tooth with a thicker section replacing the broken part. Veneers can also be used to close small gaps, when orthodontics (braces) are not suitable. If one tooth is slightly out of position, a veneer can sometimes be fitted to bring it into line with the others.

Veneers make teeth look natural and healthy. Because they are very thin and are held in place by a special, strong adhesive, very little preparation of the tooth is needed. Some types of veneers don't need any preparation at all. A veneer takes at least two visits. The first is to prepare the tooth and match the shade, and the second is to fit it. Before bonding it in place, your dentist will show you the veneer on your tooth to make sure you are happy with it. Bonding a veneer in place is done with a special adhesive, which holds it firmly on the tooth. Veneers should last for many years; but they can chip or break, just like your own teeth can. Your dental team will tell you how long each veneer should last. Small chips can be repaired, or a new veneer fitted if necessary.

## MODERN NEW TECHNOLOGIES IN DENTISTRY

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N. M. Usenko, ELA

Nowadays the latest technologies in dentistry allow dental treatment to be completely painless. Also worth noting is the fact that there is already a technique providing the opportunity for dentists to treat tooth decay without the use of a drill. Thus modern technologies combine not only great technical ability, but also the safety, comfort and painless.

One of the most innovative methods considered to be chemical-mechanical system of treatment of carious teeth. Its essence lies in the fact that the infected tooth tissue can be removed completely without pain and noise, thus not be affected and damage

healthy parts.How does this happen. In the area of the tooth affected by caries, a special gel is applied, in which the composition contains three different amino acids, plus sodium hypochlorite. After that the doctor treats the damaged portion of the tooth with the help of special tools, at the same time removes dead skin particles of dentin. As a result of this treatment completely formed a small cavity, and thus also requires less filling than the same drilling.

As for pain relief, it is simply not required, since removed only those parts of the tooth, so that already died. But the patient did not feel any pain. New technologies in dentistry have been successfully used for the treatment of young patients. In this case the most effective air-kinetic method of dental treatment. The essence of the procedure is as follows: a high pressure water jet is applied, the air and abrasive powder. This jet washes easily damaged tooth caries sites, and completely clears the cavity from contamination. This method virtually eliminates damage to healthy tooth areas. Absolutely there is no possibility of transmission since the tool does not touch the tooth. However this method only can be used for teeth that caries damaged quite a bit or secondary caries. In addition to the above, the dental technology offers another innovative method − laser technology, which also allows you to cure the tooth without drilling. The device is able to exert a selective effect on the healthy and diseased tooth tissue. For example, areas damaged by caries, are softer, as they contain more mineral substances and less water. That is why the laser can accurately «evaporate» only infected tissue. It should be noted that the laser is able to disinfect a cavity in the tooth almost immediately.

And finally, there is another way which offers dentistry. Modern technology allows painless dental treatment based on the bactericidal properties of ozone. Also in this case it does not require anesthesia and sometimes not even necessary to install the seal. In just 20-40 seconds of ozone exposure, teeth become almost completely sterile. The microorganisms that cause tooth decay simply die under the influence of the gas. Thereafter, the cavity is treated with a particular composition which has a strengthening effect on dental tissue. After that you can forget about tooth decay.

# HINGLISH

D. V. Levchenko – Sumy State University
N. M. Usenko, ELA

What is this mysterious word "Hinglish"? Hinglish – a mixture of Hindi (the official language of India) and other languages of India and English, which is the second official language in India. According to world statistics, the Indian English is spoken by nearly 350 million people living in Indian cities. Hinglish is very relevant today because at the moment, Indian English is most often used in advertising campaigns, slogans and posters. In this way it is easier to attract attention to the product. The youth greatly affects the formation of speech. The use of English words shows that the brand is contemporary and focuses more on young people. Hinglish is actively practiced in the field of tourism, as a huge flow of tourists every year goes on holiday on the Indian Ocean. In addition, Hinglish are all business meetings of businessmen and politicians in India with partners and colleagues from abroad.

Coupled with the development of television and the Internet, this has led to the introduction of English in the local Hindi that could not cause confusion vocabulary and grammar of different languages. Thus, as a result, we got the dialect, referred to as Hinglish, i.e. English + Hindi, which explains the essence of the newly formed phenomenon.

**The main features of the use of English in Hindi**:

1.The use of the endings -ing, for example: “You must be knowing this actress?” or “Hello! It is nice meeting you!”.

2.The Indians usually avoid to modify verbs time, using them in most cases only in the form of the infinitive without regard to the person. For example, “Yesterday he watch his favourite film again”.

3.Grammar, which is based on the sentence structure in

chinglish mainly takes its roots from Hindi, that is, in the usual order of words can be forgotten, for example, “You will come tomorrow?”

4.Accents are not typical for the English language: Ókay instead Okáy.

In conclusion we can summarize and say that developing over many years Indian Hindi is of great importance in our days and tends to prosperity luring more and more young people. I think that Hindi will soon become one of the most popular languages, as its use becomes enormous proportions in India and in many countries of Europe.

## THE MODERN INNOVATIVE TECHNOLOGIES IN ADVERTISING

L.Tutunyk, Sumy State University, group RK−31
N. M. Usenko, ELA

Now due to increased competition among manufacturers many of them are fighting for the attention of consumers by various methods. Therefore it is the use of modern innovative technologies can be decisive in gaining a good reputation and increasing sales.

The modern innovative technologies in advertising always involve the use of new computer equipment and serious technical support. Obviously it allows transforming advertising into a memorable show.

This method of advertising requires much larger investments than traditional one. However it forms a positive image of the advertised product and enhances customer loyalty to the brand.

The modern innovative technologies in advertising tend to interact with the consumer. For example, the famous apparel brands establish the practice of «smart» mirrors. This is a modern system of visualization and advertising products based on mirror surfaces. According to statistics 83 percent of the customers passing by a

mirror, look into it, and thus see the advertisement. In addition, the commercials do not close the review and do not irritate the customers.

Moreover, the smart mirror can serve as 3D fitting-room that awakens customer's desire to buy a product.

The other innovative advertising technology is X3D video allowing the advertised product to go beyond the screen and then come back.

The Free Format Projection technology creates a sense of the presence of full sized characters or other objects. It is here where the advertiser's imagination can be limitless and he can create a huge chocolate bar walking around the supermarket or a new smartphone dancing in front of the entertainment center.

It is worth saying the holographic advertising becomes widespread.

As for the print media, they are fond of the modern advertising technologies as well. They place small displays showing a video advertising and spreading the sound with a help of built-in speakers on the pages.

To summarize, the advertising industry is not standing still − every day, consumers are faced with some new advertising medium or computer novelties that await them in unexpected places or enter into a kind of dialogue with potential customers.

Thus the advantage of modern innovative technologies in advertising is their novelty and interaction with the consumer.

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