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The proceedings are the papers of students, undergraduates, doctoral students and young researchers on topical issues of natural and technical sciences and humanities.

В сборник вошли доклады студентов, магистрантов, докторантов и молодых ученых по актуальным вопросам естественно-технических и гуманитарных наук.

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В ходе работы был выделен и идентифицирован комплекс антибиотиков феназинового ряда бактерии P. aeruginosa, штамм 67. Было установлено, что наиболее эффективным методом выделения феназинов является двукратная экстракция. На основе спектральных данных и температур плавления были установлено, что данный комплекс представлен феназин-1-карбоновой кислотой и 2-гидроксифеназином.

Была определена зависимость качественного и количественного состава феназинов от времени культивирования и состава питательной среды. Выявили, что после трех дней культивирования в культуральной жидкости синегнойной палочки находится только феназин-1-карбоновая кислота, которая является предшественником производных феназина. На 3-4-й дни культивирования часть РСА превращается в 2-гидроксифеназин, но при этом продолжается продукция РСА. На 7-й день культивирования активность продуцента незначительна. Оптимальным временем культирования приняли 5 суток на среде Кинг В.

В работе было изучено влияние различных минеральных солей на продукцию антибиотиков феназинового ряда от культуры синегнойной палочки, выявлены ингибиторы и кофакторы биосинтеза феназинов. Так, ионы меди и цинка являются ингибиторами биосинтеза 2-гидроксифеназина. Установлено, что присутствие в среде соли NH_4NO_3 способствует продукции феназин-1-карбоновой кислоты и 2-гидроксифеназина.

Список использованной литературы

1. Zhang Y., Nakkeeran S., Fernando W. G. D. Biosynthesis of antibiotics by PGPR and its relation in biocontrol of plant diseases // Biocontrol and Biofertilization – 2005. – Vol. 3. – P. 67 – 109.
2. Couillerot O., Prigent-Combaret C., Caballero-Mellado J., Moënne-Loccoz Y. Pseudomonas fluorescens and closely-related fluorescent pseudomonads as biocontrol agents of soil-borne phytopathogens. // Letters in Applied Microbiology. - 2009. - Vol. 48. №5. - P. 505–512.
3. R.J. Cook [et al.] Molecular mechanisms of defense by rhizobacteria against root disease // Proc. Natl. Acad. Sci. USA. – 1995. – Vol. 92, № 10. – P. 4197–4201.
4. В.В. Смирнов, Е.А.Куприянова Бактерии рода Pseudomonas // АН УССР, Ин-т микробиологии и вирусологии им. Д. К. Заболотного.—Киев : Наук, думка, 1990.— 264 с.
5. Whipps, J.M. Microbial interactions and biocontrol in the rhizosphere / J.M. Whipps // J. Experiment. Botany. – 2001. – Vol. 52, № 1. – P. 487–511.
6. Боронин, А.М. Ризосферные бактерии рода Pseudomonas, способствующие росту и развитию растений / А.М. Боронин //Соросовский образовательный журнал. –1998. – № 10. – С. 25–31.
7. Бриттон Г. Биохимия природных пигментов: пер. с англ. - М.: Мир, 1986. - 419 с.
8. Laursen J. B., Nielsen J. Phenazine natural products: biosynthesis, synthetic analogues, and biological activity // Chem. Rev. – 2004. – Vol.104. – P. 1663 – 1685.
9. Price-Whelan A., Dietrich L. E. P., Newman D. K. Rethinking «secondary» metabolism: physiological roles for phenazine antibiotics. // Nat. Chem. Biol. – 2006. – V. 2. – №2. – P. 71-78.
10. M.E. Levitch, E.R. Stadtman // A study of the biosynthesis of phenazine-1-carboxylic acid – Archives of Biochemistry and Biophysics, 1964, Vol. 106, p.194-197

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ACHIEVEMENTS OF GENETIC INGENEERING

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Genetic engineering is the branch of molecular biology and genetics. Also this science is relatively young, but very promising. In this article we consider achievements of genetic engineering. The opportunities in the genetic engineering of humanity both in fundamental science and in many other areas, are very large and often even a revolutionary way. Genetic engineering allows the industrial mass production of necessary proteins, facilitates of technological processes for fermentation products - enzymes and amino acids, and may in the future be applied to improve plants and animals, as well as in the treatment of hereditary human diseases. It has many advantages (otherwise, why all this would was done) is a manifold increase in productivity, hardiness, pest resistance of crops, milk and animal organs for medical purposes and other prospects are virtually unlimited. Thus, genetic engineering, being one of the main directions of scientific-technical progress, actively promotes solutions to many problems, such as food, agriculture, energy and environmental.

Also genetic engineering opens particularly great opportunities before medicine and pharmaceutics as application of genetic engineering and the gibridomy of methods can lead to radical restructurings of medicine. Many diseases for which there are no adequate methods of diagnostics and treatment now (cancer, cardiovascular, viral and parasitic infections, nervous and mental disorders), by means of genetic engineering and biotechnology will become available to both diagnostics, and treatment. Under the influence of biotechnology the medicine can turn from mainly empirical into fundamentally theoretically reasonable discipline with clear understanding of the molecular and genetic processes happening in an organism

An important part of biotechnology is genetic engineering. Born in the early 70's, it has made today a great success. Methods of genetic engineering are transforming cells of bacteria, yeast and mammals in factories for large-scale production of any protein. This gives the opportunity to analyze the structure and functions of proteins and their use as medicines. Also, infectious diseases can be treated by implanting genes that code for antiviral proteins specific to each antigen. Animals and plants can be 'tailor made' to show desirable characteristics. Genes could also be manipulated in trees for example, to absorb more CO2 and reduce the threat of global warming. (1, 17)

There are both disadvantages and advantages of genetic engineering. To start with advantages Genetic Engineering could increase genetic diversity, and produce more variant alleles which could also be crossed over and implanted into other species.

It is possible to alter the genetics of wheat plants to grow insulin. Escherichia coli (E. coli) became a supplier of important hormones such as insulin and somatotropin. Previously, insulin was obtained from cells of the pancreas of animals, so the cost was very high. To obtain 100 g of crystalline insulin is required 800-1000 kg pancreas, and one iron cow weighing 200 to 250 grams. Insulin was expensive and difficult to access for a wide range of diabetics. In 1978 researchers from the company "Genentech" first received insulin engineered strain of Escherichia coli. It has been shown that it does not contain proteins of E. coli, endotoxins and other impurities, no side effects as insulin, animals, and biological activity is not different from them. 1000 liters of the culture fluid, we can get up to 200 grams of hormone that is equivalent to the amount of insulin secreted from 1600 kg pancreas of a pig or cow. (2)

Over the years here are some of the experimental 'breakthroughs' made possible by genetic engineering. We can know a lot from examines and experiments in this field. At the Roslin Institute in Scotland, scientists successfully cloned an exact copy of a sheep, named 'Dolly'. This was the first successful cloning of an animal and most likely the first occurrence of two organisms being genetically identical. Interesting work of Russian and Belarusian scientists who have transplanted human gene responsible for producing the protein lactoferrin. This protein, which will in large quantities kept in goat milk will be indispensable for children who are bottle-feeding, in order to build up their immunity. There are a lot of experiments in the field of genetic engineering.

Scientists have recently isolated the gene responsible for the poison in the tail of a Scorpion, and began to look for ways of introducing it into the cabbage. Why poisonous cabbage? To reduce the use of pesticides and at the same time not to allow the caterpillars to spoil the harvest. This genetically modified plant will produce a poison that kills caterpillars when bitten leaves, but the toxin is modified so as to be harmless to people (3, 55)

For us to understand chromosomes and DNA more clearly, they can be mapped for future reference. More simplistic organisms such as fruit fly (Drosophila) have been chromosome mapped due to their simplistic nature meaning they will require fewer genes to operate. At present, a task named the Human Genome Project is mapping the human genome, and should be completed in the next ten years.

The process of genetic engineering involves splicing an area of a chromosome, a gene that controls a certain characteristic of the body. The enzyme endonuclease is used to split a DNA sequence and split the gene from the rest of the chromosome. For example, this gene may be programmed to produce an antiviral protein. This gene is removed and can be placed into another organism. For example, it can be placed into bacteria, where it is sealed into the DNA chain using ligase. When the chromosome is once again sealed, the bacterium is now effectively re-programmed to replicate this new antiviral protein. No doubt there are advantages and disadvantages, and this whole subject area will become more prominent over time. (4, 37)

Genetic engineering enables scientists to create plants, animals and micro-organisms by manipulating genes in a way that does not occur naturally.

These genetically modified organisms (GMOs) can spread through nature and interbreed with natural organisms, thereby contaminating non 'GE' environments and future generations in an unforeseeable and uncontrollable way. Because of commercial interests, the public is being denied the right to know about GE ingredients in the food chain, and therefore losing the right to avoid them despite the presence of labelling laws in certain countries.

Genetically modified organism (GMO) is an organism genotype of which has been artificially altered using genetic engineering techniques. At present, specialists of the obtained scientific evidence about the absence of high-risk products from genetically modified organisms compared to traditional products.

Today it is difficult for some people to get food. There are a lot of starving men in African countries, for example. Because of this fact scientists created genetically modified food. Some of the researchers are sure that GMO will help those, who are out at heels. But some others claim that eating it is too risky. I am all for the last view.

To begin with, it is difficult to understand how someone can eat product if he knows that it was mixed from moth and potato. It is unpleasant, isn`t it? What is more, it is a deception that GMO may rescue men from the hunger. There is enough food for everyone on the planet (it is just not offered to hungry people), but famine happens to be. If genetically modified food is distributed all over the world, this situation will get worse. More men will die because some powerful ones make money from other’s lives. Moreover, it is risky to use GMO.

GMO may become a necessity for Kazakhstan Director of Kazakhstan National Biotechnologies Center Yerlan Ramankulov said that genetically modified products might become a necessity for Kazakhstan. According to him, the possibility of a negative effect of use GMO (genetically modified organisms) is important and should be considered. Ramankulov said that there were currently no confirmed facts of any negative effect of GMO use on people’s health. He added that no types of GMO are officially registered in Kazakhstan, but, according to him, genetically modified goods are already supplied to Kazakhstan and their flow increases every year. Ramankulov said that it was necessary to remember that our climate was changing amid the global warming; the rainfalls would shrink and the areas of dry lands would expand. GMO might become a necessity in such conditions. That’s why breeding drought-resistant GM-cultures might save Kazakhstan’s crop production. We shouldn't use GMO, breed and produce GMO-containing goods, but the state had to control this sector. The expert noted that producers of such goods have to bear responsibility for informing the consumers who have a right to make a conscious choice. (5)

As observed from the outset of this article, it is the general belief in the scientific community that genetic engineering, whether it deals with medical applications or with agricultural production, offers some of the greatest opportunities for mankind to make breakthroughs in areas that will greatly enhance the quality of life. Because of the magnitude of the changes that are being implemented through the new sciences of genetic engineering, there are certain unknowns who pose risks for those businesses that are engaged in the development and distribution of such products and processes.

- With genetic engineering, most of the diseases and illnesses can easily be prevented through detecting the animals, plants and people who are genetically prone in a certain hereditary diseases.
- There are also infectious diseases that can also be treated with the use of genetic engineering through implanting the genes that are associated with antigen and antiviral proteins.
- With genetic engineering, plants and animals can easily determine their desirable characteristics. The genes can be manipulated especially in trees since when the carbon dioxide is being absorbed and this is one of the reasons why the threat for global warming is highly reduced.
- Genetic engineering has the ability to increase the genetic diversity as well as produce variant alleles that can be implanted to other species. It is also possible to change the heredity of the wheat plants and grow insulin.

However, the risk benefit analysis clearly favors the benefits that are to be obtained from further strides in genetic engineering and the essential function of insurance is to provide the necessary protection to those business entities that are faced with the risks that may attach to genetic engineering. The coverage issues that could develop with respect to genetic engineering will probably not be unique unless the insurance industry develops specific coverage language or exclusions that are directly related to genetically engineered products and processes. As the scientific developments, and criticisms thereof, continue to accrue, policyholder businesses and the insurance industry will be looking more closely at this field and the coverage issues, or lack thereof, will be elucidated in the next several years.

References:

1. Егорова Н.С. «Основы биотехнологии». Москва – 2012.
2. http://www.biotechnolog.ru/ge/ge1_1.htm
3. Биотехнология. Принципы и применения. – Пер. с англ./ Под ред. И.Хиггинса, Д.Беста, Дж. Джойса. – М.: Мир. – 1988
4. Мишустин Е.Н. Биотехнология. Сб.: Знание. – 1988. – 64с
5. http://m.tengrinews.kz/en/science/GMO-may-become-a-necessity-for-Kazakhstan-12074

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ПОЛУЧЕНИЕ МОНОКЛОНАЛЬНЫХ АНТИТЕЛ К РЕКОМБИНАНТНОМУ АНТИГЕНУ VP1 ВИРУСА ЯЩУРА СЕРОТИПА АЗИЯ

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Ящур – высоко контагиозное, остропротекающее заболевание сельскохозяйственных и диких парнокопытных животных, наносящая огромный экономический ущерб. Способность вируса ящура к быстрому распространению среди восприимчивых животных