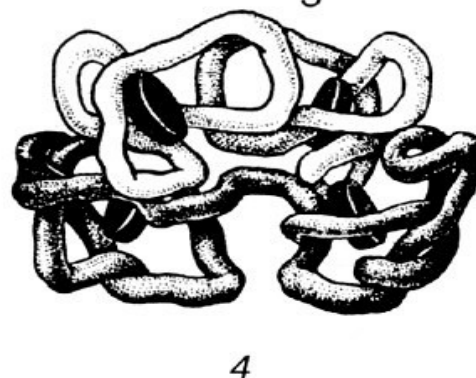
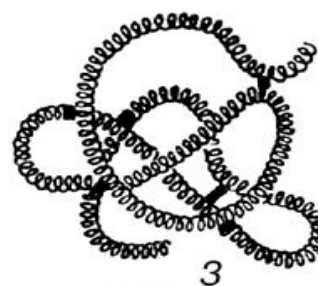
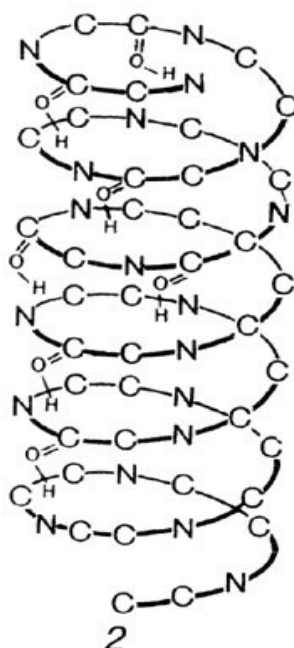
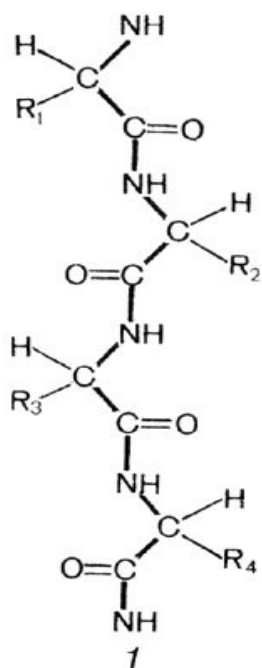


National Research Saratov State University

Department of English and Intercultural Communication

Department of Biology



ADVANCES IN BIOSCIENCE AND BIOTECHNOLOGY

Friday, May 4, 2018

Saratov

Convenor: Ariadna Yu. Chumakova (Senior Lecturer, Department of English and Intercultural Communication, SSU)

Chairman: Angelina I. Matyashevskaya (Ph.D. in Linguistics, Associate Professor, Department of English and Intercultural Communication, SSU)

Chairpersons:

Evgeny Yu. Melnikov (Associate Professor, Ph.D. in Biology, Department of Biology, SSU)

Matvey V. Kanevskiy (Engineer, Assistant, Ph.D. in Biology, Department of Biology, SSU)

Executive Secretary: Elena V. Tiden (Senior Lecturer, Department of English and Intercultural Communication, SSU)

1) Features of Seed Reproduction of Antarctic Populations *Deschampsia antarctica* Desv.

Abramenko Evelina — Master's student, Department of Biology

The purpose of the paper was to study the characteristics of seed reproduction of *D. antarctica* plants growing in the Antarctic Sea. The researcher concludes that plants of the Antarctic populations of *D. antarctica* are characterized by the same size of pollen grains and the amount of pollen formed in the anthers. The degree of defectiveness of pollen varies from 13.8% (Population of Barcelot Island) to 40.0% (Population Indicator). The structure of germinal sacs is typical for the cereals.

Instructor — Tiden E.V.

2) Peculiarities of Reproduction of *Brachypodium Pinnatum* (L.) Breauv

Komissarova Alina — 4 year, Department of Biology

The article provides an overview of the reproductive peculiarities in *Brachypodium pinnatum* (L.) Breauv. The data on the plant growth in a various forest vegetation communities in the national park «Khvalynsky» (Saratov region) is given. It is established that *B. pinnatum* is characterized by a sexual mode of seed reproduction and obligatory allogamy. Its reproductive strategy is based on the combination of vegetative and seed reproduction. The effectiveness of seed reproduction depends both on the degree of plants illumination, and the degree of the habitat humidification.

Instructor — Tiden E.V.

3) Conversion of Quercitin by the Growth of *Azospirillum Brasilense* Sp7 on a Rich Medium

Dymo Alina — 4 year, Department of Biology

Flavonoids, which are secondary metabolites of higher plants, together with other aromatic compounds, can be released into the soil by roots. One of the main

functions of flavonoids is to participate in a symbiosis between bacteria and plants. The most well-known example is the legume-rhizobial symbiosis, where flavonoids mediate the formation of specific pairs between legumes and rhizobia and contribute to the formation of nodules on the roots of plants. Scientists are actively studying the splitting and metabolism of flavonoids after their use by bacteria. The research is aimed at studying the conversion of quercetin during the growth of bacteria on a rich medium.

Instructor — Chumakova A. Yu.

4) FTIR Spectroscopic Study of Poly-3-hydroxybutyrate Accumulation by Rhizobacterium Azospirillum Brasilense at Different Concentration of Ammonium Chloride

Parshina Victoria — 4 year, Department of Biology

Many bacteria can produce and accumulate polyhydroxyalkanoates (PHAs) including poly-3-hydroxybutyrate (PHB) under different stress conditions. These polyesters are a group of carbon and energy storage compounds. They have physical and chemical properties similar to traditional plastics and are of interest to the industry as biodegradable polymers. *Azospirillum brasilense* can produce only PHB, no other PHAs. In our work, PHB synthesis in *A. brasilense* cells (strains Sp7 and Sp245) were studied using FTIR spectroscopy in the transmission mode. Monitoring of PHB accumulation was carried out for 8 days. Bacteria were grown at various concentrations of NH_4Cl (0,05-0,5 g/l). The maximum amount of PHB was synthesized after 3 days at 0,1 g/l NH_4Cl by strain *A. brasilense* Sp7. In the next step PHB was extracted from bacterial cells by chloroform. Thus we determined the optimal conditions for synthesis of the most PHB.

Instructor — Chumakova A. Yu.

5) Methods of High- throughput Plant Phenotyping

Kuznetsov Grigory — 2 year, Department of Biology

The communication gives a brief description of phenomics as a biological science at the intersection of genetics, ecology and bioinformatics. The basic tools and methods of modern phenomics are described. Examples of phenotyping of individual parts of land plants are considered.

Instructor — Chumakova A. Yu.

6) Is Sugar Dangerous?

Antonova Tatyana — 2 year, Department of Biology

The article investigates the effects of sugar on our health. Until recently, added sugar has been one of the most underreported and underestimated health risks. The author carries out an experiment to find out if sugar is really dangerous.

Instructor — Tiden E.V.

7) Why Do We Forget?

Petrov Vsevolod — 2 year, Department of Biology

The article investigates the way our brains work to erase bad memories. The study

has important implications for understanding conditions such as post-traumatic stress disorder.

Instructor — Tiden E.V.

**8) Investigation of Hemodynamics using Windkessel Model (electrical analog)
Kuznetsov Anton — 2 year, Faculty of Nano- and Biomedical Technologies**

To carry out hemodynamics simulations the mathematical models were used. The Windkessel Model consists of eight subsystems that allow to estimate the mechanical properties of the bloodflow. The differential equation is derived for systematic arterial blood pressure. Electronics Workbench was chosen as a simulation platform.

Instructor — Tiden E.V.

9) Modern Methods of DNA Sequencing and Features of their Application

Kovylin Igor — 2 year, Faculty of Physics

The paper provides an overview of the modern methods of DNA sequencing, their working principles and differences as well as practical application in genomics and bioinformatics.

Instructor — Matyashevskaya A.I

10) Adhesives. Their Properties, Use and Safety

Malkov Ilya— 1 year, Department of Biology

The article is devoted to the problem of gluing various materials. Which glue is suitable for a particular case? What precautions should be observed when working with adhesives? The experiment is carried out to answer these questions.

Instructor — Tiden E.V.

11) Study of Cryoprotective Properties of Triterpene Acids on Maize Embryos

Karlov Andrey, Lezhnev Nikita — 1 year, Department of Biology

The aim of this paper was to investigate the effect of cryoprotective properties of triterpene acids on maize embryos when stored in liquid nitrogen. For the first time, comparative studies of the growth and development of maize plants grown from seeds after storage in liquid nitrogen were carried out using triterpene acids, sucrose and glycerin as cryoprotectants. The effectiveness of using traditional cryoprotectants as a buffer during storage in liquid nitrogen has been established.

Instructor — Tiden E.V.

12) The Impact of Indoor Plants on the Psychological and Emotional State of the Person

Efimova Daria — 1 year, Department of Biology

In an urbanized context, the need for a thorough understanding of the relationship between plants and human well-being becomes more and more important. The aim of the study was to reveal the attitude of people towards flowering plants, as well as the emotional state associated with the cultivation of plants in the house. The researcher carries out an experiment to examine psychological and physiological

benefits of interaction with indoor plants.

Instructor — Tiden E.V.

13) Imitating Nature: History and Prospects of Biomimicry

Kozlova Tatyana — 1 year, Department of Biology

The study examines relatively new and developing areas of biotechnology which focus on modelling and replication of biological systems and structures that have possible applications in various fields of human activity. Recent achievements, history of development, current directions and future opportunities of these fields of science are explored.

Instructor — Tiden E.V.

14) Physiology in Our Life

Kechina Polina — 1 year, Department of Biology

The article provides an overview of physiology as the branch of biology that deals with the functions of living organisms and the parts of which they are made. Some of the questions that physiologists investigate include how plants grow, how bacteria divide, how food is processed in various organisms, and how thought processes occur in the brain. Investigations in physiology often lead to a better understanding of the origins of diseases.

Instructor — Tiden E.V.

15) Some General Aspects of Osmoregulation in Animals

Volosova Galina— 1 year, Department of Biology

The article deals with the issue of animal osmoregulation. As is known, water is fundamental to life and to the maintenance of an appropriate environment for physiological functions at the molecular, cellular, and organismal level. Water balance is also the principal mechanism of volume regulation in animals. The physical properties of water have profound effects on all biological structures and their function.

Instructor — Tiden E.V.