

Project Guide ▶▶▶

SPECIFICATIONS FOR RESEARCH PROJECTS CONTEST

1. **MEF Educational Institutions** has been organizing “Research Projects Contest” among the high school level students for twenty-two years in order to support the science education in Turkey, to motivate the students who are capable in this area to perform scientific research and enable them to be grown up as the “Scientists of the Future”
2. All the students of high schools from Turkey and abroad and giving an education based on the primary school education can take part in the contest.
3. A separate contest shall be organized exclusively for international projects.
4. The research projects shall be prepared in **Physics, Chemistry, Biology** branches.
5. A student can take part in the contest with only one project. The projects can be prepared by a single student or a group (maximum 2 students and 1 teacher). (The awards shall be given to the project without taking the number of the people into consideration).
6. **The Project Application Forms** to be filled by the students applying the contests shall be sent to the mailing address of MEF Educational Institutions or e-mailed to proje@mef.k12.tr together with their annexes after they are signed by the relevant school management to be delivered to our school no later than **21 February 2014**. The applications after the deadline shall not be accepted.
7. The projects shall be evaluated by a jury consists of the academicians from the uni-versities.
8. The jury shall have the right to change the scientific branch of the project on the basis of the project content. For example if the content of a project sent for chemistry branch is dominant with biology, this project shall be evaluated under biology branch.
9. The owners of the projects that are chosen to be exhibited shall be informed about the date and place of the exhibition to be held in April in Istanbul.
10. The exhibition arrangements (supplying the tables and the stands) shall be made by **MEF Educational Institutions**.The materials required to be used for the projects should be notified to **the Project Contest Coordination Office via the telephones assigned for this purposes and negative/positive confirmation should be obtained**.
11. Transportation fees of foreign participant teachers and students who have projects will be paid by themselves.



12. The accommodation expenditures during the exhibition for the contestants from other cities and abroad shall be paid by our institution. The room arrangement in the accommodation plan is for 2 or 3 persons. This plan is made on the basis of the information forms filled and send by you.
13. During the exhibitions meals (breakfast, lunch and dinner) will be provided by our instution.
14. The students who get the first, second and third places and encouragement awards and their project guide teachers shall also be awarded with money at the amounts stated below and certificate of success and memory plackets shall be given to all the students, teacher and/or school managements taking part in the contest.
15. Besides this "jury special awards" shall be given to a number of projects deemed suitable by the jury.

PLACE	STUDENT PRIZE	TEACHER PRIZE
FIRST PLACE	1,550 \$	1,550 \$
SECOND PLACE	1,350 \$	1,350 \$
THIRD PLACE	1.200 \$	1.200 \$
ENCOURAGEMENT PRIZE	1.000 \$	1.000 \$
JURY SPECIAL PRIZE	750 \$	750 \$

For detailed information

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MEF EDUCATIONAL INSTITUTIONS

23rd RESEARCH PROJECTS CONTEST AMONG THE HIGH SCHOOL STUDENTS

MEF Educational Institutions holds the 23rd Traditional RESEARCH PROJECTS CONTEST among the high school level students in Turkey. As it is already known, this contest which attracts great interest and appreciation is held on PHYSICS, CHEMISTRY and BIOLOGY categories.

In this organization, MEF Educational Institutions aims to encourage the capable and eager high school students that shall create the Turkey of tomorrow to study on the basic and applied sciences.

The application deadline (21 February 2014) is stated in the application and evaluation forms sent to your school. The high school students who want to take part in the contest shall fill in the application and evaluation forms before the deadline and sent them to our school after having them approved by their school management.

The applications shall be examined by a jury consists of the academicians from several universities and the projects to be exhibited shall be determined.

STAND ARRANGEMENT

The main purpose of the exhibition is to demonstrate and explain the project work to the visitors of the exhibition. For this purpose, MEF Educational Institutions shall give a 100x140 cm table and a 100x140 cm board to the students. The students shall exhibit the experimental arrangements or application models on the table and the project report written in A4 papers shall be exhibited on the board.

EVALUATION

The jury members shall evaluate the projects by visiting the exhibition and having interviews with the students. The evaluations shall be gathered by the MEF Educational Institutions contest execution board. The execution board shall determine the ranking on the basis of the average of the marks given for each project and prepare the list to determine the students who win the prizes. The Fund Management shall announce the winners on the basis of this list. The prizes for these students and the certificate of achievements for all the students taking part in the exhibition shall be given to them with a ceremony to be held in the exhibition hall.



WHAT IS SCIENCE AND SCIENTIFIC WORK?

Science is the set of knowledge that has been accumulated regularly by the human being since the first ages. This knowledge is a result of the works of human being performed in order to understand themselves and everything surrounding them and to explain the events happening around them.

Lots of scientists from different parts of the world have had contributions to science and these contributions shall continue in the future. On the basis of the science which can be defined as “the result of the joint work of several scientists” lay the ability to think, creativity and systematic work of human beings.

HOW IS SCIENTIFIC RESEARCH PERFORMED?

1. The research subject is determined.
2. The previous works on this subject are examined.
3. Pre-experiments are made in order to observe the event to be searched and the experiment methods and experiments to be performed are planned.
4. The data obtained from the experiment is arranged.
5. It is checked if there is a meaningful relationship among the arranged data.
6. Hypotheses are established under the light of the findings.
7. The meaningful relations found are examined and specific conclusions are obtained.
8. The results and findings obtained are recorded in the written form in order transfer to the scientists and future generations.

HOW SHOULD THE PROJECT REPORT BE WRITTEN?

Project report on your research subject is one of the most significant steps in your project work. Project report is recording the results of the observations, experiments and measurements and demonstrating the obtained results in written format. In this way the information you obtained at the end of your work shall be saved and transferred to the others and the future generations. Furthermore, please keep in mind that your project report shall have a significant role in the evaluation of your work.

Therefore, while writing your report, you should give a great care both in writing and content.

Please avoid from extending your report with unnecessary extensions and repetitions. Write your report in the following format

Project Title

It shall be written shortly and briefly in a single sentence and give an idea about the project work.

Introduction and purpose

In this part, give information about your work and talk about the previous works performed on this subject. State the different aspects of your work than the previous ones and write your goals in this project work clearly.

Methodology

In this part write the followings clearly and briefly:

- The method employed in the project work
- Materials and measurement tools employed
- Experiments performed
- How the controlled experiments have been performed
- Data collection and statistical analysis methods
- Your observations
- Calculations made to draw the graphs

Conclusion and discussions

In this part, write the results obtained from the project work. This is the most important part in your report. Your findings might be numeric values, mathematical equations or verbal expressions. Please express your numeric results in the form of graphs and drawings as much as possible (the findings should be in compliance with the international unit systems).

While discussing your findings, define the validity limitations and if there are any reasons affecting the results negatively please explain them. Compare your own findings with the findings of the previous works on this subject. State the level of achievement to reach your project goals. Talk about the further research that can be performed in the same subject and make proposals for those interested in the subject.

References

Referring the sources for the scientific research is both a requirement of the science ethics and a proof for the validity and reliability of the basis of the work.



The aims of referring the sources for a scientific research are given under the title of “Why the sources are used in a scientific study?”

WHY THE SOURCES ARE USED IN A SCIENTIFIC STUDY?

The sources should be employed in scientific studies for the following reasons:

1. To show the contribution of the researcher by giving the sources and respect the right of the real owners of this knowledge,
2. To support the opinions and/or the findings of the researcher,
3. To enable the reader to check the reliability and validity of the knowledge sub-mitted to the reader,
4. To offer new sources to those who want to carry out further research on the same subject.

While referring 1the sources, the information about the source should be correct and com-plete.

HOW SHOULD YOU REFER THE SOURCES EMPLOYED IN YOUR WORK?

When you refer to a book;

Name and surname of the writer (or the Initial of his name and point), name of the book, if exists the name and surname of the arranger, preparer or translator, edition number, publisher, place and year of publish should be given. For example:

- GÜNDÜZ T., Quantitative Analysis Course book, Ankara University, Faculty of Science Publishers, Ankara, 1975
- BRAUN, R.D. Introduction to Instrumental Analysis, Mc Graw Hill Book Co. New York, 1987.
- MAHAN, B.H. University Chemistry, Translated by C. Şenvar and E. Edgüer, 5th edition, Hacettepe University Publications, Ankara, 1989.

When you refer to an article

Name and surname of the writer (or the Initial of his name and point), name of the arti-cle, Name of the Magazine (the full name or if exists the international abbreviation),

Volume No, Issue No, first and last pages of the articles Year should be given. For example:

- SMITH MA, “The Nature of Distribution Functions for Colliding Systems” Journal of Chemical Education, Volume 7, Issue 3, pp 218-223, 1993

When you refer to an article in any publishing:

- DİNÇKAYA E. "Alginate peroxides immobilization" IX. Chemistry and Chemical Engineering Symposium Paper Summary Book, KTU Faculty of Arts and Science Publications, p 397, Trabzon, 1993.



PROJECT SUMMARY FOR PHYSICS **(First Place in Physics - 20th Research Projects Contest)**

Project Title : Thermal Photograph
Project Owner : Ada DOĞRUCU, Alp Eren ELÇİ, Kaan KARACA
School : Özel İzmir Amerikan Koleji - İzmir
Guide Teacher : Oktay ÜNAL

INTRODUCTION and PURPOSE

The project aims to process thermal data into a photograph as part of the digital photograph technology and to ensure that computer users may see thermal values as they move the mouse on the photograph by making use of a special computer program.

METHODOLOGY

The most important indication of thermal energy and heat, the embodiment of that energy, is the radiance released by energized materials.

The investigations conducted revealed that photo receptors of digital cameras and web cameras were sensitive to infrared but that there was a glass plate on lenses of cameras to restrain such sensitivity; that is was possible to receive radiance into the lens from infrared section as well in case that glass plate is removed.

In that sense, the project was further improved and a web camera was designed to receive the infrared image of the environment while taking photos of the same environment with a second camera.

To that end, two web cameras of the same model were purchased from a store and one of them were modified as follows.

The infrared restraining glass filter in front of color sensing center in web cameras was replaced with a photo negative to design an infrared sensing web camera.

RESULT AND DISCUSSIONS

The project is now composed of a system embracing a laptop computer and two cameras which requires manual processing of thermal values in infrared picture under certain conditions for the time being. At that point, it should be asserted that the project is still under way to ensure that the process is undertaken digitally as a whole.

The project is anticipated to be suitable for use in a number of sectors from security to defense, medicine, and engineering.

The system shall be able to sense the thermal values of pictures (taken with digital cam-eras). Later on, as the photograph is analyzed, it shall be possible to employ the new technology in a number of areas since thermal values shall also be detected.

REFERENCES

The motive behind the project is truly original yet it should be admitted that several refer-ences were analyzed (from the library and internet) on terms such as thermal-heat-photograph technology-infrared.

In addition, google search engine and google scholar were scanned to confirm that no such project has been designed up to now. It is true that projects on thermal cameras and infrared cameras exist but the project offered is different in that the current project aims to show thermal values through a follow-up program by keeping those thermal values for future use.

Finally, we would like to offer our special thanks to Mr. Oktay ÜNAL, our guide teacher, for assisting and directing us with his suggestions and comments.



PROJECT SUMMARY FOR PHYSICS (First Place in Physics – 21st Research Projects Contest)

Project Title	: Adapting Composite Eye Structure to Multiple Sensor Networks
Project Owners	: B.Özün ÖZKAN, Ö.Ece TOSUN
School	: İzmir Private Türk Science High School
Guide Teacher	: Yelda SERİNDAG

INTRODUCTION- OBJECTIVE

Hartline examined limulus polyphemus, an animal with composite eyes and found that all photoreceptors in each mesh are interconnected so that when any one is stimulated the other is obstructed (lateral obstruction mechanism) which increases contrast in light de-tetection and sharpens shape detection. Our objective is to find out the advantages of lateral obstruction in multiple sensor networks and curved surface by taking inspiration from curved surface.

METHOD-MATERIALS

We prepared a convex and flat mechanism. We used LDR for Ommatidia and LED for the object seen by a living being. We applied lateral obstruction on measurements and compared them to their raw condition. Afterwards, we compared the two mechanisms. We used 2 perforated pertinaxes of 20x30 cm, 50 LDRs, 100 metre copper cable, Keithley Multimetre, 15 aluminium bars of 50 cm, 14 aluminium cubes of 8 cm³.

FINDINGS

Lateral obstruction increases contrast. The mechanism is more satisfactory on convex surface.

DISCUSSION

Lateral obstruction and convex surface use shall increase efficiency in multiple sensor networks.

BIBLIOGRAPHY

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2. Joseph Rosen and David Abookasis, "Seeing through biological tissues using the fly eye principle"
3. Özçelik, E., July 2006, Ardışık görüntüler ile piksel altı bilgi çıkarımı ve çözünürlük iyileştirme, MS Thesis, İTÜ, İstanbul

PROJECT SUMMARY FOR PHYSICS (First Place in Physics – 22nd Research Projects Contest)

Project Title : “Hand-Made Optical Tweezers”
Project Owners : Nazlı GÖLLER - Pınar DEMETÇİ
School : TEV İnanc Turkes Private High School
Guide Teacher : Meral UĞURLU

INTRODUCTION - PURPOSE

Developing an affordable optical system to manipulate the micrometrical particles without contact by applying optical force

METHOD AND MATERIAL

We aimed at trapping ferment cells through the optical tweezing apparatus which was installed using materials very easy to find. We used hand-made microscope apparatus, infrared laser and dichromatic mirror to make our own optical tweezer. We used one microscope objective with four lenses and installed microscope apparatus to reduce the cost and work more comfortably. We used ocular instead of the camera’s lens to scan the trapping, providing a function similar to CCD camera for cheap.

DISCOVERIES

We compared various laser types. We used the laser which has Gauss density profile that can focus on a very small volume. We created our own lens apparatus instead of microscope to reduce the cost. Ferment cells were moved almost 85µm through our apparatus. So our apparatus is available for micrometrical level manipulation.

ARGUMENT

When we compare the look of our own apparatus to optical tweezers, we saw that the difference was image quality and zoom. Difference in zoom can be removed by using different convex lens. However since the aim of optical tweezing is manipulation, difference in image quality does not really matter. Our apparatus can be used in studies which require molecule array and cell manipulation in university laboratories. The biggest difference of our apparatus from the general optic tweezers is that it is an apparatus relatively easier to move with fewer materials. We are aiming at making our apparatus movable in the next stages.



SOURCES

We got information/equipment support from Dear Assoc.Prof.Dr. Alper Kiraz and Doctoral Student Dear Alexandr Jonáš.

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2. Brown, K.A., Aguilar, J.A., Westervelt, R.M., (2010), Coaxial Atomic Force Microscope Tweezers, Applied Physics Letters 96, Massachusetts, USA.
3. Jonas A., Zemanek, P., (2008), Light at work: The Use Of Optical Forces For Particle Manipulation, Sorting, And Analysis, Electrophoresis 29, sayfa: 4813-4851, Weinheim, Germany.

PROJECT SUMMARY FOR CHEMISTRY (First Place in Chemistry - 20th Research Projects Contest)

Project Title	: An Economical Model for the Purification of Antibody: Molecular-Pressurized Heat-Sensitive Intelligent Polymers
Project Owners	: Furkan ÇETİN – Kemal İNECİK
School	: Özel Samanyolu Fen Lisesi - Ankara
Guide Teacher	: Zeynel Abidin BÜTÜNER

INTRODUCTION and PURPOSE

We were familiar with antibodies due to our projects for Olympics (Silver Medal for Chemistry in 18th National Science Olympics of TÜBİTAK) and our high school studies. 75-80% of antibodies in blood are known to be composed of Immunoglobulin G (IgG).

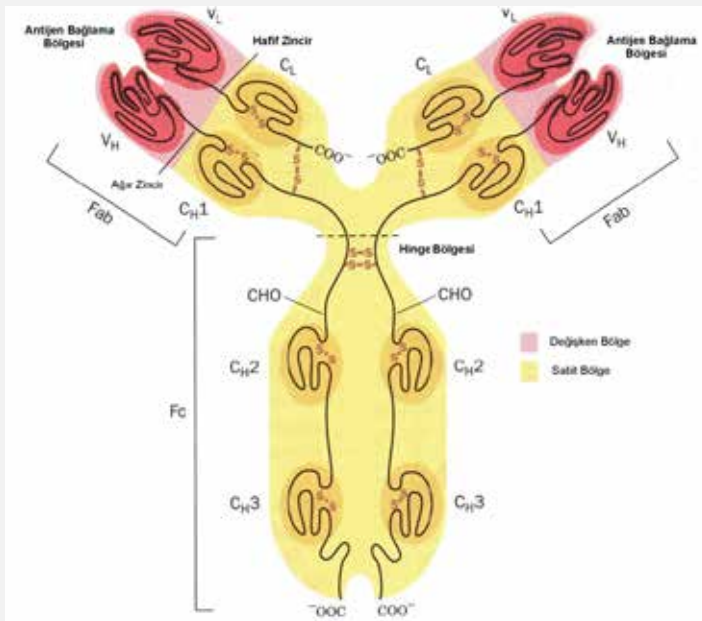
Immunoglobulins (=Antibodies) are synthesized by plasma cells constituted through the transformation lymphocytes undergo due to antigenic stimulation. Chemical, physical, and immunological studies on antibodies have revealed that there are important differences between and among them. Such differences are due to the individual properties of antibody molecules such as their carbohydrate amounts, electrophoresis speeds, molecular weights, amino acid constitutions, and H (=heavy) polypeptide chains they have. In that sense, immunoglobulins have been classified into five groups, namely Immunoglobulin G (IgG), Immunoglobulin A (IgA), Immunoglobulin M (IgM), Immunoglobulin D (IgD), and Immunoglobulin E (IgE). Immunoglobulins are of glycoprotein structure 90% of which is polypeptide and the remaining 10% is carbohydrate. When an Ig molecule is analyzed under electron microscope, it would be seen that it has Y shape. Since Igs are proteins with globulin structure, they are made up of polypeptide chains. There are two types of polypeptide chains in an IgG molecule composed of Monomer (= one essential unit) and each type has two chains.

- **Light chain** = L chain: Short chains with lighter molecular weight. It has two different types known as K (kappa) and (lambda). Both are available in all Ig types. Yet, the two short chains in the same Ig molecule are of the same type and identical to each other; that is, one cannot be different from the other. A single antibody molecule cannot contain two different types of L chain at the same time.

- **Heavy chain = H chain:** Long chains with heavier molecular weight. All five Ig types have different H chain structures, which are named as follows. IgG (gamma) H chain, IgM μ (mü) H chain, IgA (alfa) H chain, IgD (delta) H chain, and IgE (epsilon) H chain.

IgG molecule, as described in detail above, is shaped as Y, has monomer structure and is of 150.000 molecular weight. For adults, 100 ml serum has 1000 mgr IgG. Two antigens could be connected to 2 Fab particles in IgG molecule. That is why IgG bears two values.

In that sense, we aim to prepare and characterize macroporous polymer columns as a more economical method of purifying antibodies from human and animal blood and to contribute to the economy of the country.



METHODOLOGY

The Methodology employed consists of eight main steps:

1. Methacrylamidohistidine (MAH) monomer was synthesized to turn histidine into monomer structure so that it could be blended into polymerine structure.
2. MAH monomer prepared was synthesized into polymer in ethanol cryostat of -20 degrees with NIPA monomer, methylene bisacrylamide cross linker, ammonium persulphate (APS) initiator, and N,N,N,N-Tetramethylendiamine (TEMED) accelerator.

3. LCST (Low Critical Solution Temperature) of p(NIPA-MAH) polymere synthesized was specified as 34oC through the use of SAXS and it was detected that it had inclination to swell under and above 34oC. Besides, nanostructures and reactions to heat were clarified though SAXS. The structure was confirmed through FT-IR Spectrophotometer (Perkin Elmer SpctrumOne, Nicolet 520). It was further characterized by imaging the macroporous structure with Scanning Electron Microscope (SEM) (Low Voltage Electron Microscope, LVEM5).
4. IgG purification experiments with p(NIPA-MAH) polymer were first performed with IgG solution and then with peristaltic pump on steady system after a solution was prepared with the same ratio of proteins in blood.
5. The results acquired for the same experiment was checked in 280 nm wavelength with UV-Visible Spectrophotometer (ShimadzuUV-1601). The second experiment (purification) was checked with SDS PAGE gel electrophoresis.
6. We employed prior complex, polymerization, and target molecule removal practices, as defined in introduction part, to use molecular pressurizing method as we could not achieve the desired results.
7. We could achieve the new results after the repetition of step 4 and 5.
8. We checked the economic advantages of the method through cost analysis.

RESULT AND DISCUSSIONS

The one whose IgG antibody is not pressurized adsorbs 63 mg IgG from its natural milieu whereas the one whose IgG is pressurized adsorbs 86 mg IgG. 97% of IgGs adsorbed by polymer could be recovered with the help of 100 ml 1M NaCl solution at + 4°C.

As for unpressurized cryogel, purity rate is 90%. Purification proved successful in pressurized cryogel.

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- A.Denizli Protein Kromatografisi ve Yeni Nesil Polimerik Sistemler
- El-Kak,A., Manjini,S., Vijayalakshmi,M.A., (1992) Interaction of immunoglobulin G with immobilized histidine: mechanistic and kinetic aspects, Journal of Chromotography A, issue 604, pp. 29-37



PROJECT SUMMARY FOR CHEMISTRY (First Place in Chemistry – 21st Research Projects Contest)

Project Title : Impact Of Surface Modification, pH, And Solution Volume On The Throughput Of Sorption In Connection With Sorption Of Uranyl With PAN Nanofibers

Project Owners : Ahmet Fatih ARSLAN-Ali Burak SARAÇOĞLU

School : İzmir Private Turkish College

Guide Teacher : Aylin ÖĞÜNÇ

INTRODUCTION AND OBJECTIVE

The current prevalent use of nanotechnology has led to an increase in the number of studies that are carried out in this field. The electroweaving method is one of the methods that are widely used to produce nanofibers. PAN is a polymer which is frequently used in the electroweaving method, and its activity can be enhanced through binding of active groups on molecular surface. With this project, it is intended to remove uranyl ions from water by means of surface-modified PAN nanofibers.

METHOD AND MATERIALS

Within scope of the project, the PAN, e.g. a polymer which is required for production of fibers, was synthesized through polymerization of acrylonitrile. The electroweaving process was carried out by means of preparation of a solution containing synthesized PAN in DMF medium. Fiber structures were examined using optical microscopes, and optimum conditions were determined for production of fibers. PAN-oxyme fibers were produced through a process of amidoxymation that involved PAN fibers. Fibers so obtained were added into a solution of 100 ppb uranyl in order to carry out sorption process.

FINDINGS

Various concentrations of the solution were measured by means of ICP-MS both before and after performance of sorption process, and the ability of PAN-oxyme fibers to hold UO_2^{2+} ions in solution was calculated as 81% (± 10), and the weight of metal cations adsorbed by each gram of fiber was calculated as 280 (± 11) μg . Upon repetition of the entire experiment process with different pH values, it was determined that the maximum adsorption percentage was achieved with a pH value of 4. As a result of SPE tests, it was ascertained that an increase in volume of solution passing through fibers did not reduce the percentage of sorption at a meaningful level.

DISCUSSION

It was concluded that PAN-oxyme fibers produced within scope of the project can be used to remove uranyl ions, which are harmful for human health and environment, from water.

BIBLIOGRAPHY

Ji-Huan He¹, Yu-Qin Wan, Jian-Yong Yu "Effect of Concentration on Electrospun Polyacrylonitrile (PAN) Nanofibers" *Fibers and Polymers* 2008, Vol.9, No.2, 140-142



PROJECT SUMMARY FOR CHEMISTRY (First Place in Chemistry – 22th Research Projects Contest)

Project Title : Analysis Of Fluorescence Density Of Coumarin 2 In Different Environments And Effect Of Interaction With Carbon Nanotube Over Fluorescence Performance

Project Owners : Bahadır GENÇTÜRK-Cihan Alper ÇELİKAY

School : Ankara Science High School

Guide Teacher : Murat SARIZ

PROJECT SUMMARY

The purpose of this project was to measure the fluorescence change of fluorophor molecules in different environments and to compare with carbon nanotubes in these environments in order to determine optical characterization. The areas of usage for fluorophor molecules and carbon nanotubes are being highly extended; it is likely for them to come across in common usage. The main target of the project was to examine what kind of interaction would occur when the two molecules were together.

The reaction of fluorophor molecules were determined by optical characterization method when they were exposed to various stimulus then the reaction of fluorophor molecules were determined by optical characterization method when they were exposed to the same stimulus in the presence of carbon nanotube.

The first part of the experiment included examination of fluorophor molecules in dark-light environment with and without oxygen. The changes in light density were observed by optical scanning. The second part of the experiment included preparation of samples with and without nanotube to expose to the same environments. We paid attention to the interaction between the nanotube and the coumarin.

The maximum decrease in radiation density of the samples prepared without a nanotube was observed in oxygenic and light environment, and the minimum decrease was observed in dark and nitrogenous environment. There was no decrease in light density in the samples with a nanotube because of the interaction between the nanotube and coumarin.

This study presented how fluorophor materials, which are used for cell labeling and medical transport, and carbon nanotubes interacted with each other when they were in the same environment, and set an example for the studies

that will use the two materials of which area of usage are being increasingly extended.

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3. Valeur, Bernard, Berberan-Santos, Mario 2012. Molecular Fluorescence: Principles and Applications 2nd ed., Wiley-VCH, p. 64
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PROJECT SUMMARY FOR BIOLOGY (First Place in Biology - 20th Research Projects Contest)

Project Title : Investigation Of The Influence Of Y Chromosome On The 3rd Stage (Embryo-Larva-Pubescence) In Life Cycle Of *Drosophila Melanogaster*.
Project Owners : Berşan ÖZCAN
School : Ankara Fen Lisesi-Ankara
Guide Teacher : Murat SARIZ

INTRODUCTION and PURPOSE

Y chromosome of *drosophila melanogaster* is not influential over sex as it contains a great amount of introns and conveys some genes with short code sequences. Since some of the studies revealed that *drosophila melanogaster* organisms with no Y chromosome could survive for a while, it could well be speculated that Y chromosomes do not undergo transcription under every phase of their life cycle. This study, therefore, investigates whether the existing genes on Y chromosomes have undergone any transcription and in which phases of life cycle (such as embryo, larva, pubescence) they are influential.

METHODOLOGY

DNA isolation, reverse transcription, PCR, and gel electrophoresis procedures were implemented for embryo, larva, and pubescence phases of *drosophila melanogaster* respectively.

FINDINGS

- It was revealed that Su(Ste) and psi3 could be substituted as Y marker in larva and pubescence phases of *drosophila melanogaster*.
- The most suitable PCR method for Su(ste) turned out to be Primary content and temperature of 62 0C.
- Experiments on embryo were repeated with the best PCR method and Su(Ste) primer, that is the most suitable method for pubescence period. nevertheless, the genes on Y chromosome could not be detected on embryos.
- Therefore, it became possible to explain how *drosophila melanogaster* could complete its embryonic evolution although it has no Y chromosome.
- The short lifespan of those with no Y chromosome is due to the fact that the need for Y chromosome increases in parallel with aging. The influence of Y chromosome on larva and pubescence period could easily be observed.

RESULT AND DISCUSSIONS

Only 3 primers turned out to be operational on test experiments. For future experiments, it might be possible to find out a number of primers that could be substituted as Y marker by experimenting with a variety of temperature and content sequences for each primer. Embryonic experiments could be carried out again under different PCR temperatures and primers.

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PROJECT SUMMARY FOR BIOLOGY (First Place in Biology – 21st Research Projects Contest)

Project Title : Determination Of Deformed Tissues Using Optical Properties Of Natural Substances.
Project Owners : Kamile ÖZBEK - Ecem SELİM
School : Private Europe High School - İstanbul
Guide Teacher : Öznur PAMUKÇU GEZER

INTRODUCTION AND OBJECTIVE

In this study, we aimed to provide alternative simplicity in identification, follow up and treatment of deformed tissues using fluorescent properties of quinine compounds, Wernerite stone, a natural mineral, in A1 ultraviolet light. In this context, the properties of these cells to consume a higher level of nutrients and rapid proliferation compared to healthy cells were used.

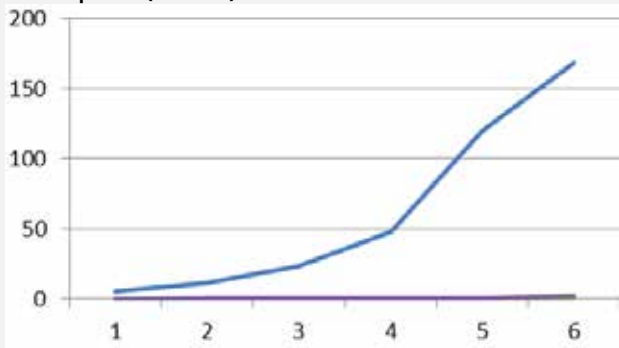
METHODS AND MATERIALS

Our experimental studies were performed on mushrooms which are similar to body cells, with their dense amino acid content. Wernerite suspension and quinine solutions were given to root ends, root environment and soil of mushrooms classified according to the content of materials to be injected. The fluorescence occurring on the mushrooms after absorption of substances was measured using a luxmeter at certain intervals.

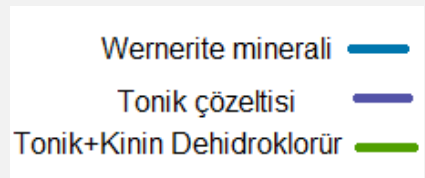
CONCLUSION AND DISCUSSION

The results of our study indicate that the values measured with luxmeter has increased directly proportional to the time past as the indicator of fluorescence. As seen in the graphics, fluorescence was observed mostly in wernerite suspension. This has proven the hypotheses we have developed.

Time past (hours)



Values Measured (Lux)



Considering the determination of deformed tissues located in masses, using optical properties of natural substances, defining the site of the mass and planning the treatment process accordingly, with emphasis on prevention of any harm to healthy cells, it may be used in identifying Alzheimer Disease, vascular diseases and tissues and the low cost of this process makes our method to be different from other methods.

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- "Kanserde alternatif ve tamamlayıcı tıp " Prof.Dr.Erkan Topuz



PROJECT SUMMARY FOR BIOLOGY **(First Place in Biology – 22nd Research Projects Contest)**

Project Title	: Comparison Of The Efficiency Of Various Microalgae Species In Removal Of Nitrogen And Phosphorus From The Refined Waste Water And Production Of Organic Soil
Project Owners	: Helin HOCAOĞLU – İlke Esin AYDINER
School	: TEV İnanç Türkeş Private High School
Guide Teacher	: Elif MOLLAMEHMETOĞLU

INTRODUCTION AND PURPOSE

Refined waste waters, which have high amounts of nitrogen and phosphorus within, cause eutrophication when given to the seas and lakes. Microalgae, added to purification system, are more advantageous for they are more efficient in the removal of nitrogen and phosphorus and has less cost in terms of the system to be installed. Our project aims at comparing the efficiency of *Scenedesmus obliquus*, *Chlorella vulgaris* ve *Chlamydomonas reinhardtii* microalgae in the removal of nitrogen and phosphorus; also using them as soil after the refinement.

METHOD AND MATERIAL

Microalgae species were grown in BBM, autoclaved and non-autoclaved waste water and their optical density were measured for 24 days. We compared the efficiency of removing nitrogen and phosphorus with the water analysis carried out in Tubitak MAM. We observed the productivity of the soil on the bean plant by using centrifuge and stove.

DISCOVERIES

It was observed that *Scenedesmus obliquus* species was more efficient than other possible species in the removal of nitrogen and phosphorus from waste water and production of dry soil.

ARGUMENT

Consequently *Scenedesmus obliquus* species is determined as the most advantageous one. Development of the systems to increase efficiency and researches about use of microalgae in refinements will lead solutions with high efficiency and profit rate that can be put into practice in daily life against eutrophication which is a serious environmental problem.

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