



**Planul Național pentru
Cercetare-Dezvoltare
și Inovare II**



Denumirea proiectului: „**MASURAREA MECANICII INTERACTIUNII LIGAND-RECEPTOR LA SUPRAFATA CELULARA**”

Contract nr.: **15/ 03.06.2008, AAd. Nr. I/01.10.2009**

Durata contractului: **1 an si 6 luni**

Valoarea contractului: **157500 lei**



Title: **Measurement of cell surface ligand-receptor interaction mechanics**

Contract no.: **15 / 03.06.2008, AAd. No. I/01.10.2009**

Duration: **1 year and 6 months**

Funds: **157500 lei**

Finanțare: **Buget de Stat -Autoritatea Nationala pentru Cercetare Stiintifica**

Programul : **CAPACITATI**

Categoria de proiect: **modulul III**

Funds: **State Budget – National Authority for Scientific Research**

Program: **CAPACITATI**

Project Category: **modulus III**

Partener roman

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Acces la facilitatile laboratorului

Laboratorul de Biofizica si Biotehnologie Celulara este deschis pentru studentii master si doctoranzi precum si pentru partenerii din proiectele de cercetare in zilele de Luni-Vineri, orele 8-20.

[Program for research visitors \(Master and Ph.D.students, research partners\)](#)

[Monday –Friday, 8-20](#)

Lista echipei proiectului-partener roman

Conf. Dr. Savopol Tudor - director de proiect

Sef lucr.Dr. Constantin Vlad - specialist

Dr. Stanciu Liana - specialist

Fiz. Surleac Marius - tanar cercetator

Drd. Paraico Iurie - tanar cercetator

Project team - romanian partner

Assoc. Prof. Dr. Savopol Tudor (chemist) - romanian project coordinator

Lecturer Constantin Vlad (medical doctor) - researcher

Stanciu Liana (medical doctor) - researcher

Surleac Marius (physicist) - young researcher

Paraico Iurie (medical doctor) - Ph.D. Student, young researcher

Lista echipei proiectului-partener ungar

Conf. Miklós Kellermayer - director de proiect

Drd. Zsolt Mártonfalvi - specialist

Project team - hungarian partner

Assoc. Prof. Miklós Kellermayer - hungarian project coordinator

Zsolt Mártonfalvi – Ph.D. Student, researcher

Obiectivele generale

Principalul scop al proiectului a fost acela de a pune la punct o metoda de masurare a fortelor de interactiune intercelulara prin utilizarea pensetei optice. Avantajul unei astfel de metode consta in acela ca se pot determina forte de interactiune intermoleculara la nivel individual, adica este o tehnica « single cell » si care poate fi dezvoltata cu mijloace relativ simple. Astfel de masuratori pot aduce contributi esentiale in intelegerea mecanismelor de comunicare intercelulara, atat in situatii normale cat si patologice.

In vederea atingerii acestor scopuri s-au efectuat urmatoarele activitati :

- s-a construit dispozitivul de penseta optica pe microscopul existent in dotare;
- s-au efectuat operatiile de masurare a puterii diodei laser utilizate ca sursa pentru penseta optica;
- s-au efectuat calibrarile de forta ale pensetei optice ;
- s-au efectuat masuratori de forta intercelulara pe eritrocit uman expus simultan unui camp dielectroforetic.

In urma derularii proiectului se va propune o aplicatie in cadrul unui program FP7 tip Capacitati, impreuna cu partenerul maghiar, precum si alti parteneri europeni (Universitatea din Leipzig - Germania, Universitatea Complutense Madrid- Spania, Universitatea Tehnica din Atena-Grecia si Universitatea Trieste - Italia).

In cadrul proiectului au fost achizitionate urmatoarele echipamente :

1. Componente pentru dezvoltare penseta optica compuse din diverse piese optice necesare asamblarii pensetei optice (sursa pentru laser, stand optic, microviza etc) ;
2. Echipamente calculator utilizate pentru comanda automatizata a pensetei optice.

Din cadrul acestui proiect a fost finantat salariul unui tanar cercetator (Marius Surleac).

General aims of the project

Main objective of the project was to establish a method for the measurement of intercellular interaction forces using an optical trap. The major advantage of such a method consists in the possibility to measure these forces at individual level, which means this is a "single cell" technique, which also can be implemented by relatively simple technologies. Such measurements can bring valuable information about intercellular communication mechanisms for normal and/or pathological situations.

In order to achieve these goals, the following activities were performed:

- we built the optical trap on the existing microscope in our laboratory;
- we performed measurements of the power of the laser photodiode as well as for the optical trap;
- we calibrated the force of the optical trap;
- we made measurements of force on human erythrocyte exposed to dielectrophoretic fields.

Consequently to this project we intend to apply to a FP7 call (Capacities, FP7-REGPOT-2010-1) in cooperation with Germany (Leipzig University), Spain (Complutense University), Italy (Trieste University) and Greece (Technical University of Athens).

Within the frame of this project we both the following equipment:

1. Components to develop the optical trap, consisting in different optical assemblies (source for the laser diode, optical stand, microvisa etc);
2. Computer equipments, used to command and monitor the optical trap.

A young researcher (Marius Surleac) was supported from this program.

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