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LLNL-TR-744870

Optimization of Diode Laser System to Treat Benign Prostate Hyperplasia Final Report CRADA No. TSB-1154-95

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Optimization of Diode Laser System to Treat Benign Prostate Hyperplasia

Project Accomplishments Summary CRADA No. TSB-1154-95

Date: August 29, 2000

Revision: 3

A. Parties

The project is a relationship between the Lawrence Livermore National Laboratory (LLNL) and Indigo Medical Corporation.

University of California
Lawrence Livermore National Laboratory
7000 East Avenue,
Livermore, CA 94550

Indigo Medical Incorporated
10123 Alliance Road
Cincinnati, OH 45242

B. Background

Benign prostate hyperplasia (BPH) is a pervasive condition of enlargement of the male prostate gland which leads to several urinary difficulties ranging from hesitancy to incontinence to kidney dysfunction in severe cases. Currently the most common therapy is transurethral resection of the prostate (TURP) utilizing an electrosurgical device. Although TURP is largely successful, new BPH therapy methods are desired to reduce the cost and recovery time, improve the success rate, and reduce side effects. Recently, lasers have been introduced for this purpose. *Indigo Medical Inc.* is currently engaged in the development, testing, and preparation for sales of a new diode laser based BPH therapy system. The development is based on laboratory experiments, animal studies, and a limited FDA-approved clinical trial in the US and in other countries. The addition of sophisticated numerical modeling, of the sort that has been highly developed at Lawrence Livermore National Laboratory, can greatly aid in the design of the system and treatment protocol. The benefits to DOE include the maintenance and advancement of numerical modeling expertise in radiation-matter interactions of the sort essential for the stockpile stewardship, inertial confinement fusion, and advanced manufacturing, and the push on advanced scientific computational methods, ultimately in areas such as 3-D transport.

C. Description

The objective of this project has been to improve the design, treatment protocol, and understanding for the Indigo BPH therapy system via a combination of numerical simulations of the laser-tissue interaction phenomena performed at LLNL and laboratory and clinical experiments performed by Indigo and its clinical collaborators. The methods and technical results are described in the accompanying Technical Report.

D. Expected Economic Impact

The objective of this project has been to improve the design, treatment protocol, and understanding for the Indigo BPH therapy system via a combination of numerical simulations of the laser-tissue interaction phenomena performed at LLNL and laboratory and clinical experiments performed by Indigo and its clinical collaborators. The methods and technical results are described in the accompanying Technical Report.

E. Benefits to DOE

The project has benefited DOE by enhancing the core competency of large scale numerical modeling of radiation-matter interaction events. The LLNL investigators are all DP supported people and work on DP programs (i.e. ICF). The computer program used for this project was developed largely under DP funding. The project has enhanced the capabilities of radiation transfer modeling by exercising algorithms in new regimes. Code errors were found, the correction of which is important for mainline DP programs.

F. Industry Area
Medical Device Industry

G. Project Status
This project is completed.

H. LLNL Point of Contact for Project Information
Richard A. London, L-477, LLNL, Livermore, CA 94550,
phone: (510) 423-2021 FAX: (510) 423-9208

I. Company Size and Point(s) of Contact
Industrial Partner: Ethicon Endo-Surgery, Inc. (Formerly Indigo Medical Incorporated)
Company size: approximately 100
Annual sales: (proprietary)
Current contact: Mark Byrne
Ethicon Endo-Surgery, Inc. (Formerly Indigo Medical Incorporated)
4545 Creek Road, Cincinnati OH 45242 Phone: (513) 337-8018
Original contact: Dr. Victor Esch (ended employment with Indigo Medical in August 1997)

J. Project Examples
None

K. Subject Inventions

This small value contractual mechanism did not anticipate any generation of Intellectual Property (IP) including subject inventions. The LLNL contributors and the company participants both indicate that no new intellectual property was generated.

L. Release of Information

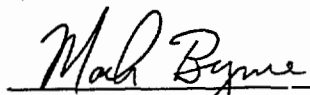
I certify that all information contained in this report is accurate and releasable to the best of my knowledge.


Karena McKinley, Director
Industrial Partnerships
and Commercialization

12/19/00
Date

Release of Information

I have reviewed the attached Project Accomplishment Summary prepared by Lawrence Livermore National Laboratory and agree that the information about our CRADA may be released for external distribution.


Mark Byrne, Group Team Leader for R & D
Indigo Medical Inc.

November 28, 2000
Date