

## Technology Offer

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# Innovative carrier for drug or gene delivery (based on Lysine Dendrimers)

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### Summary

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*A French company developed a poly L-Lysine nanostructure product which can carry an active product ingredient or a gene for biological applications. Its patented technology is based on DendriGraft of Lysine (DGL) Technology which makes spherical-shaped nanoparticles up. This product is already on the market. The company is looking for commercial agreements with technical assistance with biotech and pharmaceutical partners.*

<b>Creation Date</b>	12 December 2013
<b>Last Update</b>	23 February 2015
<b>Expiration Date</b>	23 February 2016
<b>Reference</b>	TOFR20131209002

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### Details

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#### Description

A French company offering a poly L-Lysine nanostructure product which can carry an active product ingredient or a gene for biological applications, is looking for commercial agreements with technical assistance with biotech or pharmaceutical companies.

DendriGraft of Lysine (DGL) is a spherical-shape platform exclusively constituted of L-Lysine. The structure is a hundred percent composed of L-Lysine, in a tree-like generated structure. Based on numerous surface point attachments, it can be customized depending on intended application as for gene or drug delivery.

This technology allows to:

- Improve solubility of an active pharmaceutical ingredient for better bioavailability (i.e the fraction of an administered dose of unchanged drug that reaches the blood circulation).
- Amplify the therapeutic effect of a drug.
- Protect Active Principle Ingredient (API) to control half-life.
- Target the specific organ, tissue or receptor that has to be treated.

#### Advantages and Innovations

- Non-immunogenic
- High structure flexibility (so it can interact with more biological receptors)
- Natural Biocompatibility (the unique component which is Lysine, and also because the synthesis process is using water as solvent)
- Non-viral vector

- Water soluble (cationic DendriGraft of Lysine)
- Multifunctional / Customizable.
- Reproducibility of the synthesis of DendriGraft of Lysine thanks to the precipitation of each generation (hydrophobic property) provides DendriGraft of Lysine (DGL) with exactly the same size for each new batch.

### Stage of Development

Already on the market

### Comments Regarding Stage of Development

The company already possesses partners using this technology.  
This product has already shown highly potent activities for Tumor-targeting therapy or diagnosis and for Central Nervous System targeting therapy or diagnosis.

### IPR Status

Patents granted

### Comment Regarding IPR status

Worldwide patent

### Profile Origin

Private (in-house) research

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## Keywords

### Technology

006004 Micro- and Nanotechnology related to Biological sciences

### Market

005002004 Drug delivery and other equipment (including kidney dialysis machines)

### NACE

Q.86.9.0 Other human health activities

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## Client

### Type and Size of Organisation Behind the Profile

Industry SME <= 10

### Year Established

2008

### Turnover

<1M

### Already Engaged in Trans-National Cooperation

No.

## Languages Spoken

English

French

## Client Country

France

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## Partner Sought

### Type and Role of Partner Sought

Biotech or pharmaceutical industry that already has an API and wants to formulate it.

### Type and Size of Partner Sought

SME 11-50, University, R&D Institution, SME <10, 251-500, SME 51-250, >500

### Type of Partnership Considered

Commercial agreement with technical assistance

## Technology Offer

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# Laser-beam diagnostic complex for treatment of oncologic diseases by methods of surgery and photodynamic therapy as well as operative diagnostics on a real-time basis

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### Summary

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*A Russian company operating in the field of laser medical equipment manufacturing has developed a production technology for the laser medical-diagnostic complex with a feedback system intended for the treatment of oncologic diseases and operative diagnostics on a real-time basis. Use of the given complex will help to lower the excessive thermal action on healthy tissues. The company searches for partners to transact commercial agreements with technical assistance and for technical cooperation.*

<b>Creation Date</b>	18 February 2015
<b>Last Update</b>	23 February 2015
<b>Expiration Date</b>	23 February 2016
<b>Reference</b>	TORU20150218001

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### Details

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#### Description

The photodynamic therapy based on laser technology gains widespread application for the treatment of oncologic diseases. Photodynamic therapy is a method of treatment of the oncologic diseases, some skin or infectious diseases based on application of light-sensitive materials – photosensitizers (including dyes), and, as a rule, visible light of a certain wavelength. When applying photodynamic therapy procedure based on laser technology, there is always a hazard of the excessive thermal action on surrounding healthy tissues and photosensitizer overtreatment. The innovative Russian company has developed a technology of a laser complex manufacturing that can become a basis for creation of a medical-diagnostic instrument base and development of the newest standards for treatment and diagnostics of the oncologic diseases of various localizations by method of photodynamic therapy. The given complex includes two sources of optical radiation, feedback system and special software for the hardware control. Sources of the optical radiation are intended for the realization of the modern methods of the oncologic diseases treatment - the selective laser hyperthermia and photodynamic therapy. Innovative feedback system is implemented in the given complex, which automatically sustains the power of optical radiation on an optimum level during surgical interventions and sessions of photodynamic therapy with the treatment process control on a real-time basis. Use of such instrument in private and state clinics working in the field of oncology, oncodermatology and surgery will give an opportunity to avoid the excessive thermal action on surrounding healthy tissues and photosensitizer overtreatment during photodynamic therapy

sessions. At present stage, almost all complex is made, except feedback system, which is going through registration process in Ministry of Health of the Russian Federation. By the current moment, there are no analogues of a similar complex in the world market. Required partners are the companies operating in the sphere of medical equipment manufacturing. The organization offers the transaction of commercial agreements with technical assistance or the acquisition of a technological know-how by a partner for the subsequent introduction of medical technologies procedures to the world market.

### **Advantages and Innovations**

Novelty of the offered technology lays in an essential difference from traditional procedures of application of laser sources of radiation during photodynamic therapy and surgery:

- 1) The feedback system allowing real-time monitoring of the tumoral tissue volume and the accumulation of a photosensitizer in it during sessions of photodynamic therapy. The software of a laser complex has possibility to create a three-dimensional model of a photosensitizer photoluminescence distribution and to control its real size, as well as the presence of other lesions of the tumoral infiltration invisible during routine endoscopy, in case of a multicentric growth form.
- 2) The medical-diagnostic complex simultaneously includes the following components:
  - An optical emitter based on semiconductor nanoheterostructures (the semiconductor laser) for the selective laser hyperthermia and surgical interventions.
  - An optical emitter based on semiconductor nanoheterostructures (a semiconductor light-emitting diode matrix) for photodynamic therapy.
  - Feedback system for the real-time control and maintenance of the optical radiance emitters' parameters during sessions of the selective laser hyperthermia and photodynamic therapy.
- 3) The built-in monitoring system of temperature of an optical fiber working tip allows to avoid overheat and necrosis of tissues surrounding a surgical field.

### **Stage of Development**

Available for demonstration

### **Comments Regarding Stage of Development**

At this stage, almost all modules of the complex are developed and presented except feedback system, which is going through registration process in Ministry of Health of the Russian Federation. Contracts with leading Russian pharmaceutical manufacturers are concluded on delivery of photosensitizers based on the active chlorophyll extract.

### **IPR Status**

Secret Know-how

### **Profile Origin**

National R&D programme

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## **Keywords**

### **Technology**

006001004	Cytology, Cancerology, Oncology
006001014	Medical Technology / Biomedical Engineering
006001018	Surgery

### **Market**

001006004	Communications services
002007012	Medical/health
003005	Laser Related
005002002	Surgical instrumentation and equipment
005003004	Monitoring equipment

#### **NACE**

C.26.2.0	Manufacture of computers and peripheral equipment
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## **Dissemination**

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### **Send to Sector Group**

Healthcare

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## **Client**

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### **Type and Size of Organisation Behind the Profile**

Industry SME 11-49

### **Year Established**

2004

### **Turnover**

<1M

### **Already Engaged in Trans-National Cooperation**

No.

### **Experience Comments**

The company works closely with leading medical institutions and medical-technical centers of the Russian Federation.

### **Languages Spoken**

English

### **Client Country**

Russia

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## **Partner Sought**

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### **Type and Role of Partner Sought**

Industrial or research organization

- 1) Participation in the development, testing device, and European certification.
- 2). Buying know-how for the implementation of the instrument in the Western market.

**Type and Size of Partner Sought**

SME 11-50,SME <10,SME 51-250

**Type of Partnership Considered**

Commercial agreement with technical assistance

Technical cooperation agreement