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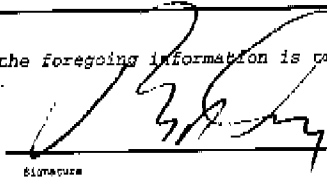
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Dowell & Dowell Fax No. 703 415 2559

FORM PTO-1595
(REV. 6-93)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICERECORDATION FORM COVER SHEET
PATENTS ONLY

Our Docket No.: 14590

To the Honorable Commissioner of Patents and Trademarks:
Please record the attached original documents or copy thereof.

1. Name of conveying party(ies) and execution date: The University of Toronto 8/7/02 Additional name(s) of conveying party(ies) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	2. Name and address of receiving party(ies) Eugenia Kumacheva of 382 Ellerslie Ave., Toronto, Ontario, Canada M2R 1B9 Additional name(s) & address(es) attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
3. Nature of conveyance: <input checked="" type="checkbox"/> Assignment <input type="checkbox"/> Merger <input type="checkbox"/> Security Agreement <input type="checkbox"/> Change of Name <input type="checkbox"/> Other _____	
4. Application number(s) or patent number(s): If this document is being filed together with a new application, the execution date of the application is: _____ Title: MULTICOLORED POLYMER NANOCOMPOSITES FOR OPTICAL MEMORY STORAGE AND SECURITY DATA ENCRYPTION A. Patent Application No.(s) 10/758,269 B. Patent No.(s) Additional numbers attached? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
5. Name and address of party to whom correspondence concerning document should be mailed: Name: Ralph A. Dowell Internal Address: _____ Street Address: Suite 406, 2111 Eisenhower Avenue Alexandria, VA 22314 (703) 415-2555	6. Total number of applications and patents involved: <u>1</u> 7. Total fee (37CFR 3.41).....\$ <u>40.00</u> <input type="checkbox"/> Enclosed <input checked="" type="checkbox"/> Authorized to be charged to deposit account 8. Deposit account number: 04-1577 <small>(Attach duplicate copy of this page if paying by deposit account)</small>
9. Statement and signature. To the best of my knowledge and belief, the foregoing information is true and correct and any attached copy is a true copy of the original document. Ralph A. Dowell 26,868 Name of person signing  Signature <u>7/20/05</u> Date Total number of pages including cover sheet, attachments and documents: <u>7</u>	

Mail documents to be recorded with required cover sheet information to:
 Commission of Patent & Trademarks, Box Assignments
 Washington, D.C. 20231

CH \$40.00 041577 10758269

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PATENT
REEL: 016549 FRAME: 0080



University of Toronto

OFFICE OF THE VICE-PRESIDENT — RESEARCH AND INTERNATIONAL RELATIONS

ASSIGNMENT OF RIGHTS FROM THE UNIVERSITY OF TORONTO

In consideration of the terms and mutual covenants hereinafter contained and other good and valuable consideration in the sum of Two Dollars (\$2.00) of lawful money of Canada paid by each of the parties to the other, the receipt and sufficiency of which are hereby acknowledged, **The Governing Council of the University of Toronto**, its successors and assigns (collectively the "Assignor"), and **Eugenia Kumacheva**, her heirs, executors, administrators and assigns (collectively the "Assignee") covenant and agree as follows:

1. Definitions

As used in this Assignment, the following terms shall have the following meanings:

- (a) "Net Revenues" shall mean the royalty, licensing and other revenue directly or indirectly received by the Assignee from all rights held by the Assignee in the Invention less legal and other fees that the Assignee incurs directly in the process of establishing and maintaining the legal protection of those rights.
- (b) "Equivalent Revenues" shall mean the fair market value of non-cash consideration directly or indirectly received by the Assignee from all rights held by the Assignee in the Invention.
- (c) "Invention" shall mean the **"Coatings for Security Paper and Labels"** described in Appendix A annexed hereto.
- (d) "Aggregate Revenue" shall mean the aggregate of Net Revenues plus Equivalent Revenues.

2. Assignment of Rights

The Assignor hereby assigns to the Assignee all right, title and interest, whatever the same may be (but without any representation or warranty as to the nature, extent or validity thereof) which the Assignor now has or may in the future have in the Invention including without limitation all copyrights, trade secrets and the right to apply for patents in Canada, the United States of America and any other country, the right to receive any letters patent that may issue from any such applications and the right to sell or license the Invention.

3. Licence to Use

Notwithstanding the rights granted above, the Assignor shall retain a royalty-free, non-exclusive licence to use the Invention for research, educational and administrative purposes.

4. Consideration for Rights

In consideration of the rights granted the Assignee pursuant to this Assignment, the Assignee agrees to pay the Assignor 25% of the Aggregate Revenue (the "Assignor's Share of Revenue").

5. Annual Report

The Assignee agrees to provide the Assignor with an annual report on or before the thirtieth day following the anniversary of the execution of this Assignment outlining the patent, license and ownership status of the Invention.

6. Payments

The Assignor's Share of Revenue shall be paid to the Assignor annually on or before the thirtieth day following the anniversary of the execution of this Assignment accompanied by a statement of the Net Revenues and Equivalent Revenues received by the Assignee during the previous twelve months and a computation of the Assignor's Share of Revenue. The Assignor's Share of Revenue, as and when received by the Assignee, shall be deemed to be held by the Assignee in trust for the Assignor until such time as it is paid in full to the Assignor.

7. Accounting Records

The Assignee agrees to maintain proper accounting records in respect of the Net Revenues and Equivalent Revenues received for the Invention. The Assignor and/or its representatives shall have the right once each year at the Assignor's expense to inspect and make copies of such books and accounting records (the "Records"). If following such inspection the Aggregate Revenue is found to have been understated by more than 5%, then the Assignee shall pay the costs of such inspection provided that such understatement had not been uncovered and corrected by the Assignee. In the event that the Assignee fails to maintain satisfactory Records according to generally accepted accounting principles, the Assignor shall have the right without the Assignee's consent to engage at the Assignee's expense a firm of chartered accountants (the "Accountants") for the purpose of maintaining the Records. In fulfilling their responsibilities, the Accountants may notify any interested person to direct to the Accountants any Net Revenues and Equivalent Revenues and the Accountants may deduct their fees in respect of their services from the share of the Aggregate Revenue payable to the Assignee.

8. Indemnity

The Assignee agrees to indemnify and save the Assignor harmless from and against any loss arising out of or pursuant to any claims or demands in connection with the Invention and all costs, damages and expenses (including reasonable legal fees) incurred by the Assignor in connection therewith.

9. Release

Save and except for the right to enforce the terms contained in this Assignment, the Assignor releases the Assignee from any and all claims that the Assignor may now have or may in future have in respect of the Invention.

10. Consent to Further Assignment

Notwithstanding anything in this Assignment, the Assignee shall not assign or license any or all of the Assignee's rights to the Invention, or amend any such agreements, without the prior written consent of the Assignor, such consent not to be unreasonably withheld.

11. Use of Name

The Assignee shall not use the name of the Assignor or any part thereof nor any modification or abbreviation thereof or cause or permit the same to be used in any way in association or connection with the Invention or in the development, exploitation, sale or licensing thereof, without the prior express written consent of the Assignor.

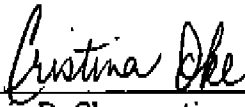
12. Titles

Paragraph titles in this Assignment are for purposes of convenience only and shall not be used in the interpretation of this Assignment.

Executed at Toronto, Ontario this 7th day of August, 2002.

**The Governing Council of the
University of Toronto**



Carolyn Tuohy
Interim Vice-President
Research and International Relations


for Louis R. Charpentier
Secretary

Inventor(s)


Eugenia Kumacheva

Witness



APPENDIX A



UNIVERSITY OF TORONTO CONFIDENTIAL INVENTION DISCLOSURE

Office of the Vice-President - Research and International Relations

27 King's College Circle, Room 133-S

Tel: (416) 978-7833

Fax: (416) 978-5821

email: monique.mcnaughton@utoronto.ca

1. Title of Invention

"Coatings for security paper and labels"

2. Inventors

SURNAME, GIVEN NAMES	UNIVERSITY PERSONNEL NO.	DEPARTMENT (LIST ANY CROSS APPOINTMENTS OR AFFILIATED INSTITUTIONS)	AFFILIATION WITH UNIVERSITY (i.e. FACULTY, ASSOC., STUDENT, STAFF, VENDOR, etc.)	UNIVERSITY ADDRESS, PHONE, FAX, EMAIL
Eugenia Kumacheva		Chemistry	Faculty	80 St. George street, Tel/Fax 416-978-3576 ekumache@alchemy.chem.utoronto.ca EK
Hung H. Pham		Chemistry	Post Doctoral Fellow	80 St. George HP
Ilya Gourevich		Chemistry	Post Doctoral Fellow	80 St. George IG

3. Description of Invention

(Please highlight the novelty/patentable aspect; attach more detailed description)

This invention relates to production of polymer-based coatings containing information encoded by incorporating in it colloid spheres with a particular size, arranging them in an ordered array, and incorporating in the spheres photo-sensitive species.

(Covered by US Provisional Patent Application filed January 29, 2002 entitled "Multicolored Polymer Nanocomposites for 3D Memory Storage and Security Needs")

Rec'd: NOV 19 2003

Amended: February 13, 2003

PATENT

REEL: 016549 FRAME: 0084

DATE RECEIVED: **NOV 19 2000**
Amended: February 13, 2003

DISCLOSURE REFERENCE NO.: **R15 933**
(For Research Services use only)

Confidential Invention Disclosure

Page 1 of 2

Revised Dec/98

4. How was the research funded?

SPONSOR	GRANT OR CONTRACT FUND #	INTELLECTUAL PROPERTY TERMS & CONDITIONS
	Premier Research Excellence Award	

5. Where was the research carried out?

University of Toronto

6. Is the invention related to any Material Transfer, Confidentiality or Non-Disclosure Agreement?
☐ NO ☒ YES (if YES please provide details)

7. Has the invention been publicly disclosed? Will it be soon?
(Please give details)

8. What are the potential application(s)?

Potential applications include all applications related to security paper labeling and printing.

9. Warranty

I/We have read, understood and agree to all of the preceding and declare that all of the information provided in this disclosure is complete and correct. To the best of our knowledge, all persons who might legally make an ownership claim on this invention are identified in Section 2.

Signature

Typed Name:

Date

Signature

Typed Name: Hung H. Pham

Date

Signature

Typed Name:

Date

Signature

Typed Name: Ilya Gourevich

Date

For more information on University of Toronto intellectual property policies, please call 978-7833 or access <http://www.library.utoronto.ca/techtran/>.

For information on commercialization, patentability, protection costs, and time constraints when publication is

ABSTRACT

There is disclosed herein a 3D optical data storage device comprised of periodic nanostructured polymer-based material produced from core-shell particles containing one dye in the core and a second dye in the shell. The combinations of dyes can be UV-Vis-dyes or Vis-NIR or UV-NIR. It is shown that *selective* single-photon photobleaching of the two dyes leads to increase in density of data storage and allows one to employ single-photon photobleaching to achieve the same storage density as in two-photon-writing.