



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : C12Q 1/68, G01N 33/533, 33/58</p>	A3	<p>(11) International Publication Number: WO 00/29617</p> <p>(43) International Publication Date: 25 May 2000 (25.05.00)</p>
<p>(21) International Application Number: PCT/US99/21793</p> <p>(22) International Filing Date: 24 September 1999 (24.09.99)</p> <p>(30) Priority Data: 60/101,748 24 September 1998 (24.09.98) US 60/131,987 30 April 1999 (30.04.99) US</p> <p>(71) Applicant: ADVANCED RESEARCH AND TECHNOLOGY INSTITUTE, INC. [US/US]; Suite 100, 1100 Waterway Boulevard, Indianapolis, IN 46202-2156 (US).</p> <p>(72) Inventors: NIE, Shuming; Apt. #24, 612 Nightridge Road, Bloomington, IN 47401 (US). CHAN, Warren, C., W.; 1411 W. Allen Street, Bloomington, IN 47403 (US). AMORY, Steven, R.; 274 Garver Lane, Los Alamos, NM 87544 (US).</p> <p>(74) Agents: HASAN, Salim, A. et al.; Leydig, Voit & Mayer, Ltd., Two Prudential Plaza, Suite 4900, 180 North Stetson, Chicago, IL 60601-6780 (US).</p>	<p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 9 November 2000 (09.11.00)</p>	
<p>(54) Title: WATER-SOLUBLE LUMINESCENT QUANTUM DOTS AND BIOCONJUGATES THEREOF</p>		
<p>(57) Abstract</p>		
<p>The present invention provides a water-soluble luminescent quantum dot, a biomolecular conjugate thereof and a composition comprising such a quantum dot or conjugate. Additionally, the present invention provides a method of obtaining a luminescent quantum dot, a method of making a biomolecular conjugate thereof, and methods of using a biomolecular conjugate for ultrasensitive nonisotopic detection <i>in vitro</i> and <i>in vivo</i>.</p>	<p>The diagram illustrates the structure of a quantum dot conjugate and its interaction with target nucleic acid. At the top, a large circle represents the 'Loop', which is attached to a 'Stem' (a vertical line with a bracket). The stem is connected to a 'Quantum dot' (a small circle with a diagonal line) and a 'Quencher' (a small circle with a diagonal line). Below this, a plus sign indicates the addition of 'Target Nucleic Acid' (represented by a wavy line). An arrow points down to the resulting 'Hybrid' structure, where the target nucleic acid has hybridized with the stem, bringing the quantum dot and quencher into proximity. The quantum dot is shown emitting light (represented by a sunburst), indicating that the quenching effect has been relieved.</p>	

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/21793

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 C12Q1/68 G01N33/533 G01N33/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12Q G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, BIOSIS, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BRUCHEZ MARCEL JR; WEISS SHIMON: "Semiconductor nanocrystals as fluorescent probes for biology" CYTOMETRY (XIX INTERNATIONAL CONGRESS OF THE INTERNATIONAL SOCIETY FOR ANALYTICAL CYTOLOGY; COLORADO SPRINGS, COLORADO, USA; FEBRUARY 28-MARCH 5, 1998), vol. SUPPL. 9, 1998, page 26 XP000925744 abstract ---	1-60
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search

28 July 2000

Date of mailing of the international search report

11/08/2000

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PCT/US 99/21793

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
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