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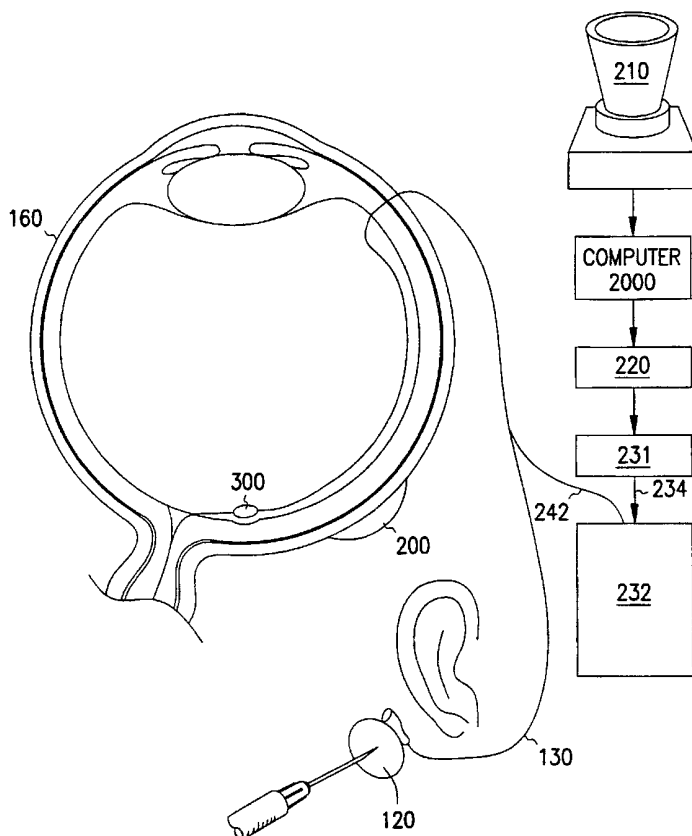
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[Continued on next page]

(54) Title: **METHOD AND APPARATUS FOR STIMULATING NEUROLOGICAL TISSUE**



(57) Abstract: A drug delivery system includes a plurality of sites, a fluid channel for delivering a drug to one of the plurality sites, and a light channel for delivering light to an area near one of the plurality of sites. The fluid channel is a micro fluidic channel and the light channel is a wave guide. The light channel may also be a fiber optic cable. The light channel directs light at the fluid channel wherein light from the light channel does not substantially exit to the major surface. The drug delivery system selectively delivers drugs to various types of neurologic cells. In operation a solution of a photoactivatable neuroactive drug is delivered to a preselected area in vivo and photoactivated in the solution at the preselected area to stimulate neurological tissue. The neuroactive drug could be an antagonist or agonist of neuronal activity.



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## INTERNATIONAL SEARCH REPORT

International Application No

PCI/US 01/19298

## A. CLASSIFICATION OF SUBJECT MATTER

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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 A61N A61M

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)

INSPEC, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 820 786 A (CORDIS CORP) 28 January 1998 (1998-01-28)  column 1, line 22 - line 25 column 4, line 8 - line 47 ---	1-4, 7, 9, 29-32, 34-38
X	US 5 505 726 A (MESEROL PETER M) 9 April 1996 (1996-04-09) abstract ---	30-32
E	WO 01 49346 A (ACKLEY DONALD E ; REDEON INC (US)) 12 July 2001 (2001-07-12)  page 4, line 10 - line 27 ---	1-3, 6, 7, 18-20, 29-32, 36
A	US 3 900 034 A (KATZ JOSEPH J ET AL) 19 August 1975 (1975-08-19) abstract ---	1, 15, 18, 29, 30, 34
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Patent family members are listed in annex.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 377 547 A (SPECTEC S A) 11 July 1990 (1990-07-11) column 4, line 47 -column 5, line 32 ----	1,18
A	US 5 935 155 A (DE JUAN JR EUGENE ET AL) 10 August 1999 (1999-08-10) abstract; figure 1 -----	28

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCI/US 01/19298

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0820786	A	28-01-1998	US 5709653 A CA 2211219 A1 EP 0820786 A2	20-01-1998 25-01-1998 28-01-1998
US 5505726	A	09-04-1996	US 6231593 B1 WO 9704836 A1	15-05-2001 13-02-1997
WO 0149346	A	12-07-2001	AU 2736501 A WO 0149346 A2 US 2001053891 A1	16-07-2001 12-07-2001 20-12-2001
US 3900034	A	19-08-1975	DE 2515697 A1 FR 2267122 A1	23-10-1975 07-11-1975
EP 0377547	A	11-07-1990	FR 2643561 A1 EP 0377547 A1	31-08-1990 11-07-1990
US 5935155	A	10-08-1999	AU 3077099 A EP 1061874 A1 WO 9945870 A1	27-09-1999 27-12-2000 16-09-1999