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- (71) Applicant: **GENVEC, INC.** [US/US]; Building 96, 13th Street, Charlestown Navy Yard, Charlestown, MA 02129 (US).
- (72) Inventors: **DINSMORE, Jonathan, H.**; 28 White Place, Brookline, MA 02445 (US). **JACOBY, Douglas, B.**; 34 Clovelly Road, Wellesley, MA 02481 (US). **DerSIMONIAN, Harout**; 3 Louis Drive, Wellesley, MA 02481-1164 (US).
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(54) Title: IMPROVED INJECTION SYSTEM

(57) Abstract: Novel methods of injecting agents including cells into organs, tissues, or tumors using a side release needle and, optionally, a carrier that aids in retention of the cells at the injection site, or a tissue sealant or film to seal the injection site are provided. The use of side release needles and, optionally, a carrier, sealant, or film prevents the leakage of the injected agent back out of the injection site. Agents which may be injected using the inventive method include drugs, small molecules, peptides, proteins, polynucleotides, viruses, cells, *etc.* Any type of cells including myoblasts may be used in the invention. The cells may be injected into any organ including the heart, brain, pancreas, liver, *etc.* These injection methods may find use in tissue engineering, gene therapy, and tissue/organ repair. Kits with the side release needles used in carrying out the present invention are also provided.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/24565

A. CLASSIFICATION OF SUBJECT MATTER IPC(7) : A 61M 5/32; C12N 5/00 US CL : 604/272,274,164,280,158,273; 424/93.1 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) U.S. : 604/272,274,164,280,158,273; 424/93.1 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 practicable, search terms used) Please See Continuation Sheet																										
C. DOCUMENTS CONSIDERED TO BE RELEVANT <table border="1"> <thead> <tr> <th>Category *</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>Y</td> <td>US 5,449,351 (ZOHMANN, W) 12 September 1995 (12.09.1995) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y</td> <td>US 5,848,996 (ELDOR, J) 15 December 1998 (15.12.1998) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y</td> <td>WO 00/18414 (DIACRIN, INC) 6 April, 2000 (06.04.00) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y</td> <td>WO 99/64580 (GEORGIA TECH RESEARCH CORPORATION) 16 December 1999 (16.12.1999) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y</td> <td>WO 96/12794 (DIACRIN, INC) 2 May 1996 (02.05.1996) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y, P</td> <td>US, 6,547,769 (VANTASSEL R., et al.,) 15 April 2003, (15.04.2003) see entire document, Abstract in particular</td> <td>1-61</td> </tr> <tr> <td>Y</td> <td>US 5,997,509 (ROSENGART, T et al) 7 December 1999 (7.12.1999) see entire document, Abstract in particular</td> <td>1-61</td> </tr> </tbody> </table>			Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	Y	US 5,449,351 (ZOHMANN, W) 12 September 1995 (12.09.1995) see entire document, Abstract in particular	1-61	Y	US 5,848,996 (ELDOR, J) 15 December 1998 (15.12.1998) see entire document, Abstract in particular	1-61	Y	WO 00/18414 (DIACRIN, INC) 6 April, 2000 (06.04.00) see entire document, Abstract in particular	1-61	Y	WO 99/64580 (GEORGIA TECH RESEARCH CORPORATION) 16 December 1999 (16.12.1999) see entire document, Abstract in particular	1-61	Y	WO 96/12794 (DIACRIN, INC) 2 May 1996 (02.05.1996) see entire document, Abstract in particular	1-61	Y, P	US, 6,547,769 (VANTASSEL R., et al.,) 15 April 2003, (15.04.2003) see entire document, Abstract in particular	1-61	Y	US 5,997,509 (ROSENGART, T et al) 7 December 1999 (7.12.1999) see entire document, Abstract in particular	1-61
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☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.																										
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Date of the actual completion of the international search 28 October 2004 (28.10.2004)		Date of mailing of the international search report 24 NOV 2004																								
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer Michail A Belyavskiy <i>[Signature]</i> Telephone No. 571-272-1600 For																								

INTERNATIONAL SEARCH REPORT

PCT/US03/24565

Continuation of B. FIELDS SEARCHED Item 3:

BIOSIS, CAPLUS, SCISEARCH, MEDLINE, EMBASE, WEST,

Search terms: Dinsmore J., Jacoby, D; DerSimonian, H; needle, side port, sealing, cell delivery