(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

G00002

(43) International Publication Date
31 January 2002 (31.01.2002)

PCT

(10) International Publication Number
WO 02/007773 A3

(51) International Patent Classification[7]: A61K 47/48, 49/14

(21) International Application Number: PCT/US01/23072

(22) International Filing Date: 20 July 2001 (20.07.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/220,244 21 July 2000 (21.07.2000) US

(71) Applicant *(for all designated States except US)*: **ESSENTIA BIOSYSTEMS, INC.** [US/US]; 656 Hale Street, Palo Alto, CA 94301 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **WAUGH, Jacob** [US/US]; 395 Vallejo Drive, #46, Millbrae, CA 94030 (US). **DAKE, Michael** [US/US]; 665 Gerona Road, Stanford, CA 94305 (US).

(74) Agents: **KEZER, William, B.** et al.; Townsend and Townsend and Crew LLP, Two Embarcadero Center, 8th floor, San Francisco, CA 94111 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, 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, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, 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, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

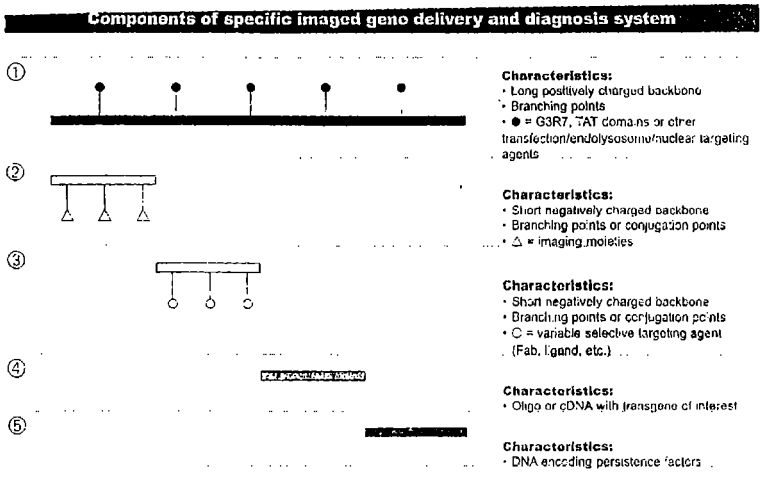
Published:
— *with international search report*

(88) Date of publication of the international search report:
30 January 2003

[Continued on next page]

(54) Title: MULTI-COMPONENT BIOLOGICAL TRANSPORT SYSTEMS

162162



Combinations of components above give enhanced specificity ③, diagnostic imaging ②, and gene delivery ④ with high efficiency ① and persistence ⑤.

(57) Abstract: Compositions and methods are provided that are useful for the delivery of therapeutic agents, including nucleic acids. The compositions comprises a non-covalent association complex of: a) a positively-charged backbone and b) at least two members selected from: I) a first negatively-charged backbone having a plurality of attached imaging molecules; ü) a second negatively-charged backbone having a plurality of attached targetting agents; üi) at least one member selected from RNA, DNA, ribozymes, modified oligonucleotides and cDNA endcoding a selected transgene; iv) DNA encoding at lest one persistence factor; and v) a third negatively-charged backbone having a plurality of attached biological agents; wherein the association complex carries a net positive charge and at least one of the two members from group b) is selected from I) iii) or v).

WO 02/007773 A3

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.