PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 : C12N 15/09, 15/62, 15/63

A1

(11) International Publication Number: WO 94/18318

(43) International Publication Date: 18 August 1994 (18.08.94)

(21) International Application Number: PCT/US94/00977

(22) International Filing Date: 1 February 1994 (01.02.94)

(30) Priority Data:

013,416	1 February 1993 (01.02.93)	US
176,500	30 December 1993 (30.12.93)	US
189,331	31 January 1994 (31.01.94)	US

(81) Designated States: CA, JP, KR, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.
With amended claims.

(71) Applicant: THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL [US/US]; 300 Bynum Hall, Chapel Hill, NC 27599-4100 (US).

(72) Inventors: KAY, Brian, K.; 18 Wysteria Way, Chapel Hill, NC 27514 (US). FOWLKES, Dana, M.; 632 Brook View Drive, Chapel Hill, NC 27514 (US).

(74) Agents: BALDWIN, Geraldine, F. et al.; Pennie & Edmonds, 1155 Avenue of the Americas, New York, NY 10036 (US).

(54) Title: TOTALLY SYNTHETIC AFFINITY REAGENTS

(57) Abstract

A novel method for producing novel and/or improved heterofunctional binding fusion proteins termed Totally Synthetic Affinity Reagents (TSARs) is disclosed. TSARs are concatenated heterofunctional proteins, polypeptides or peptides comprising at least two functional regions: a binding domain with affinity for a ligand and a second effector peptide portion that is chemically or biologically active. In one embodiment, the heterofunctional proteins, polypeptides or peptides further comprise a linker peptide portion between the binding domain and the second active peptide portion. The linker peptide can be either susceptible or not susceptible to cleavage by zymatic or chemical means. Novel and/or improved heterofunctional binding reagents as well as methods for using the reagents for a variety of *in vitro* and *in vivo* applications are also disclosed.