United States Patent [19]

Ruoslahti et al.

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[54] **TETRAPEPTIDE**

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[*] Notice: The portion of the term of this patent subsequent to Mar. 25, 2003 has been disclaimed.

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[22] Filed: **Jun. 17, 1985**

Related U.S. Application Data

[60] Division of Ser. No. 554,821, Nov. 22, 1983, Pat. No. 4,578,079, and a continuation-in-part of Ser. No. 405,239, Aug. 4, 1982, Pat. No. 4,517,686, and a continuation-in-part of Ser. No. 433,457, Oct. 8, 1982, abandoned, and a continuation-in-part of Ser. No. 518,036, Jul. 28, 1983, Pat. No. 4,589,881.

[51] **Int. Cl.**[4] **C12N 0/500**; C12N 11/08; C07K 7/10; C07K 17/02

[52] **U.S. Cl.** **435/240.243**; 435/180; 530/811; 530/330; 530/324; 530/812; 530/815

[58] **Field of Search** 435/240, 241, 244, 180; 530/815, 330, 353, 380

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,883,393 5/1975 Knazek et al. 435/240
4,511,653 4/1985 Play et al. 435/69
4,578,079 3/1986 Ruoslahti et al. 435/178

OTHER PUBLICATIONS

Grinnell et al., Cell 19, pp. 517–525 (1980).
Bernard et al., Biochemistry 22, pp. 5213–5223 (1983).
Kohno et al., Journal of Biological Chemistry 259 (22), pp. 13668–13673 (1984).
Seyer et al., Biochemistry 20, pp. 2621–2627 (1981).
Hynes, R. O., 1987, "Fibronectins: A Family of Complex and Versatile ADhesive Glycoproteins Derived from a Single Gene". The Harvey Lectures, Series 81, at p. 134.
Lam et al., 1987, "Evidence that Argionyl-Glycyl-Aspartate Peptides and Fibrinogen & Chain Peptides Share a Common Binding Site on Platelets". Journal of Biological Chemistry 262: 947 at p. 947.
Babel et al., European Journal of Biochemistry, 143, pp. 545–556 (1984).

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[57] **ABSTRACT**

The peptide X-Arg-Gly-Asp-R-Y wherein X is H or at least one amino acid and Y is OH or at least one amino acid, and R is an amino acid selected from Thr or Cys, or other amino acid, having the same cell-attachent activity as fibronectin and the peptide X-Arg-Gly-Asp-Ser-Y, wherein X and Y, having said activity are disclosed.

11 Claims, 2 Drawing Sheets

CODE	SEQUENCE	CELL ATTACHMENT
FIBRONECTIN		0.10 nmol/ml (+ + + +)
IV	Y A V T G R G D S P A S S K P I S I N Y R T E I D K P S Q M (C)	0.25
IVA	V T G R G D S P A S S K P I (C)	1.6
IVB	S I N Y R T E I D K P S Q M (C)	> 50.0
IVA1	V T G R G D S P A (C)	2.5
IVA2	S P A S S K P I S (C)	> 50.0
IVA1a	V T G R G D (C)	10.0
IVA1b	G R G D S (C)	3.0
IVA1c	R G D S P A (C)	6.0
RVDS	R V D S P A (C)	> 50.0
TGRG	T G R G	—
RGDS	R G D S	+ +
GDSP	G D S P	—