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(71) Applicant (*for all designated States except US*): **VOL-
CANO THERAPEUTICS, INC.** [US/US]; Suite 200,
28202 Cabot Road, Laguna Niguel, CA 92677 (US).

(72) Inventor; and

(75) Inventor/Applicant (*for US only*): **BROWN, David, L.**
[US/US]; 102 Dellwood Road, Bronxville, NY 10708
(US).

(74) Agents: **CULLMAN, Louis, C.** et al.; Oppenheimer Wolff
& Donnelly LLP, Suite 700, 840 Newport Center Drive,
Newport Beach, CA 92660-7007 (US).

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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: MEDICAL DEVICES, COMPOSITIONS AND METHODS FOR TREATING VULNERABLE PLAQUE

(57) Abstract: Medical devices, compositions and methods for treating or preventing atherosclerotic plaque rupture are disclosed. Specifically, medical devices that deliver to a treatment site metalloproteinase inhibitors (MMPI) are disclosed. The medical devices include catheters, guide wires, vascular stents, micro-particles, electronic leads, probes, sensors, drug depots, transdermal patches, and vascular patches. Representative MMPIs included zinc chelators, urea derivatives, caprolactone-based inhibitors, phosphoramidates, piperazines, sulfonamides, tertiary amines, carbamate derivatives, mercaptoalcohols, mercaptoketones, antimicrobial tetracyclines, non-antimicrobial tetracyclines, and derivatives and combinations thereof. In one embodiment a self-expanding vascular stent is coated with at least one MMPI and deployed at a site within an artery where vulnerable plaque has been identified.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/07244

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61F 2/06; A61K 31/16, 31/18; A61N 1/18, 1/00, 1/04, 1/05, 1/06

US CL : 514/445, 616; 607/3, 120; 623/1.2, 1.43

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. : 514/445, 616; 607/12, 120; 623/1.2, 1.43

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)
REGISTRY, CAPLUS, WPIDS, MEDLINE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Database MELINE on STN (Columbus, OH, USA), AN 2000329946, DE SMET, B. ET AL. 'Metalloproteinase inhibition reduces constrictive arterial remodeling after balloon angioplasty: a study in the atherosclerotic Yucatan micropig,' abstract, Circulation, 27 June 2000, 101 (25) 2962-7.	1, 2, 4, 5, ----- 8-10, 13-14, 16-17, 20-23

A	Database MEDLINE on STN, (Columbus, OH, USA), AN 1999344209, SKOTNICK, J. ET AL 'Design and synthetic considerations of matrix metalloproteinase inhibitors,' abstract, Annals of the New York Academy of Sciences, 30 June 1999 878 61-72.	1-2, 4-5 ----- 8-10, 13-14, 16-17, 20-23
X	Database CAPLUS on STN, (Columbus, OH, USA), 133:271734, MARCHANT, N. ET AL. 'Inhibition of matrix metalloproteinases with polymers and pharmaceutical applications thereof,' abstract, WO 2000056283 A1, 28 September 2000.	1, 8-9, 20 ----- 16

Y	Database WPIDS on STN, (Columbus, OH, USA), AN 2000-664850, DICKENS, E. ET AL. 'Hydrophilic polymer coating for medical devices, e.g. catheter for use in reducing or inhibiting matrix metalloproteinases in the body, comprises a matrix metalloproteinase inhibiting polymer composition,' abstract, WO 2000056283 A1, 28 September 2000.	1, 8-9, 17, 20-21 ----- 22-23
X		

A		



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:		"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier application or patent published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

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Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703)305-3230

Authorized officer

Rebecca Cook

Telephone No. (703) 308-1235

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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	Database CAPLUS on STN, (Columbus, OH, USA), 134:242750, Lee, C. 'Antimicrobial and anti-inflammatory endovascular (cardiovascular) stent,' abstract, WO 2001021229 A1, 29 March 2001.	1-23

INTERNATIONAL SEARCH REPORT

International application No.

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Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claim Nos.: 3,4,7,11,12,15,18 and 19
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
Please See Continuation Sheet
3. ☐ Claim Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation Sheet

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐
☐

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

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Continuation of Box I Reason 2:

Because of an extremely large number of possible compounds encompassed by the MMPI, the medical devices and the polymer coating compounds, the structures of each which do not constitute a special technical feature, the search was limited to the zinc chelators, the vascular stent and the bioabsorbable polymers.

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

I. Claims 1-7, drawn to a method

II. Claims 8-23, drawn to a device

The inventions listed as Group I, claims 1-7, drawn to a method and Group II, claims 8-23, drawn to a device, do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the inventions are of different scope, the method of Group I, claims 1-7, does not require the device of Group II, claims 8-23.