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(71) Applicant: VANDERBILT UNIVERSITY [US/US]; 305
Kirkland Hall, Nashville, TN 37240 (US).

(72) Inventors: PRATT, Derek, A.; 2114 Sharondale Drive,
Nashville, TN 37215 (US). DILABIO, Gino, A.; 91 Pear-
son Street, Apartment 8, Aylmer, Québec J9H 6G1 (CA).
VALGIMIGLA, Luca; Via Campo di Marte 51, I-47100
Forlì (IT).

(74) Agent: SHOUSE, Emily, A.; Waddey & Patterson, Suite
2020, 414 Union Street, Bank of America Plaza, Nashville,
TN 37219 (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: NOVEL CHAIN-BREAKING ANTIOXIDANTS

(57) Abstract: Compounds, preferably 5-pyrimidinol and 3-pyridinol derivatives, that act as effective chain breaking antioxidants of both the lipid and water-soluble variety (analogous to the natural Vitamins E and C), many of which are more reactive toward peroxy radicals than the most potent form of Vitamin E. These compounds may exhibit many chemopreventive effects associated with conditions in which free radical-mediated cellular damage or disruption is implicated and Vitamins E and C are shown to have protective effects. Additionally, these compounds should be excellent oxidation inhibitors as additives to fuels, lubricants, rubber, polymers, chemicals, solvents and foodstuffs.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/19969

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C07D 239/34, 213/02; C09K 15/16; A61K 31/505, 31/44; A61P 39/06
 US CL : 544/297, 298; 546/290; 514/269, 349

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. : 544/297, 298; 546/290; 514/269, 349

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):
 CASONLINE, EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 5,521,192 A (HENRIE, II et al.) 28 May 1996 (28.05.1996). See entire document, especially Col. 1-2, formula I and col. 23, step C and col. 43-62, Table I	1-6 and 10
X	US 5,010,193 A (MAURER et al.) 23 April 1991 (23.04.1991). See entire document especially formula V, Table 5 and examples C1- through C16	1-6 and 10
X	US 4,711,888 A (WALKER et al.) 08 December 1987 (08.12.1987). See entire document, especially examples 1-21.	1-6, 10, 26 and 29
X	US 4,554,276 A (LAMATTINA) 19 November 1985 (19.11.1985). See entire document especially examples 1-23.	1-6, 10, 26 and 29
X	US 4,374,136 A (HILL et al.) 15 February 1983 (15.02.1983). See entire document especially col. 3 formula V and example I	1-6 and 10
X	US 5,001,136 A (WALKER et al.) 19 May 1991 (19.05.1991). See entire document, especially col. 2, and example I.	7-9, 11-13, 27-28 and 30-31
X	EP 0 649 880 A1 (EASTMAN KODAK COMPANY) 26 April 1995 (26.04.1995). See page 2 formula I and pages 4-6, TABLE I	7-9 and 11-13



Further documents are listed in the continuation of Box C



See patent family annex

Special categories of cited documents	
* "A" document defining the general state of the art which is not considered to be of particular relevance	* "Y" other documents 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
* "E" earlier application or patent published on or after the international filing date	* "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
* "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)	* "Z" 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
* "O" document referring to an oral disclosure, use, exhibition or other means	* "d" document member of the same patent family
* "P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

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

Facsimile No. (703)305-3230

Authorized officer

Venkataratnam

Telephone No. (703)308-1235

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US01/19969

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.:
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:

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

International application No.

PCT/US01/19969

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Group I, claim(s) 1-6, 10, 14-16, 23, 26 and 29, drawn to pyrimidine compounds and method of use of these compounds.

Group II, claim(s) 7-9, 11-13, 17-22, 24-25, 27-28 and 30-31, drawn to pyridine compounds and method of use of these compounds.

The inventions listed as Groups I and II 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: Groups I and II relate to structurally dissimilar compounds that lack common core namely pyrimidine vs pyridine which are not art recognized equivalent of each other. The sole feature common to the groups which does not vary is a hydroxyl in six-membered aromatic ring group which by itself cannot be considered to define novel contribution over prior art given such fragment with substituents is known in the prior art and therefore would not constitute a special technical feature as defined by PCT Rule 13.2.