



技術名稱

造影劑增強超音波於藥物制放量之定量

(中華民國專利發明第 I405583 號；美國專利 US 9, 144, 414 B2，如附件)

創作發明人

洪碩徽、陳潤秋、蔡東湖

技術內容簡介

本發明係關於定量藥物制放量之方法，其特徵在於利用一造影劑增強超音波測量周邊血管之訊號強度，以定量一目標區之藥物制放量。本發明之方法可用於定量超音波觸發氣泡破裂之靶向藥物釋放、定量長效型藥物於目標物體內之未釋放總量，以及用於協助制定超音波開啟血腦屏障之治療時間表等應用。

預期利用範圍

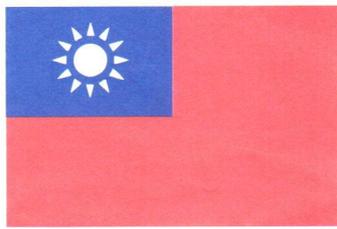
1. 用於組織結構分析，以定量之微氣泡來呈現不同介質之影像，以獲得準確之診斷率。
2. 範圍：腫瘤科、心臟科、消化內科、一般外科等超音波檢查。

預期產品

超音波儀器

參與資格

1. 產業類別：醫療產業
2. 應具備之專門技術：超音波儀器
3. 應有之機具設備：製作微米級或奈米級微氣泡相關設備
4. 應有之研究人員或技術人員(數)：2~數名
5. 其他條件：



中華民國專利證書

發明第 I 405583 號

發明名稱：造影劑增強超音波於藥物制放量之定量

專利權人：台北市立聯合醫院

發明人：洪碩徽、陳潤秋、蔡東湖

專利權期間：自 2013 年 8 月 21 日至 2031 年 11 月 2 日止

上開發明業經專利權人依專利法之規定取得專利權

經濟部智慧財產局
局長

王美花

中華民國

102



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21

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注意：專利權人未依法繳納年費者，其專利權自原繳費期限屆滿後消滅。



US009144414B2

(12) **United States Patent**
Hung et al.

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(45) **Date of Patent:** Sep. 29, 2015

(54) **METHOD FOR QUANTIFYING DRUG DELIVERY USING CONTRAST-ENHANCED ULTRASOUND**

(75) Inventors: **Shuo-Hui Hung**, Taipei (TW);
Ran-Chou Chen, Taipei (TW);
Tung-Hu Tsai, Taipei (TW)

(73) Assignee: **Taipei City Hospital**, Taipei (TW)

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(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
A61B 8/14 (2006.01)
A61B 8/08 (2006.01)
A61B 8/00 (2006.01)

(52) **U.S. CL.**
CPC **A61B 8/085** (2013.01); **A61B 8/0808**
(2013.01); **A61B 8/4477** (2013.01); **A61B**
8/481 (2013.01); **A61B 8/0891** (2013.01)

(58) **Field of Classification Search**
USPC 600/458, 407, 437
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,312,383 B1 *	11/2001	Lizzi et al.	600/437
2001/0021808 A1 *	9/2001	Shi et al.	600/438
2003/0220563 A1 *	11/2003	Schutt	600/431
2007/0207194 A1 *	9/2007	Grayburn et al.	424/450
2008/0269668 A1 *	10/2008	Keenan et al.	604/24
2008/0281205 A1 *	11/2008	Naghavi et al.	600/458
2010/0158815 A1	6/2010	Wang et al.	
2010/0196284 A1	8/2010	Lindner et al.	
2011/0125080 A1 *	5/2011	Shi et al.	604/20

OTHER PUBLICATIONS

Ting, et al., "Concurrent blood-brain barrier opening and local drug delivery using drug-carrying microbubbles and focused ultrasound for brain glioma treatment", *Biomaterials* 33, 2012, pp. 704-712.
Eisenbrey, et al., "Development and optimization of a doxorubicin loaded poly (lactic acid) contrast agent for ultrasound directed drug delivery", *Journal of Controlled Release* 143, 2010, pp. 38-44.
Lampaskis, et al., "Investigation of the Relationship of Nonlinear Backscattered Ultrasound Intensity with Microbubble Concentration at Low MP", *Ultrasound in Medicine and Biology*, vol. 36, No. 2, 2010, pp. 306-312.

(Continued)

Primary Examiner — Joel F Brutus

(74) *Attorney, Agent, or Firm* — Muncy, Geissler, Olds & Lowe, P.C.

(57) **ABSTRACT**

The present invention relates to a method for quantifying drug delivery with the characteristic of measuring the signal intensity of peripheral vessels with a contrast-enhanced ultrasound to quantify the drug delivery at a target site. The present invention can be used for quantifying UTMD (ultrasound triggered microbubble destruction) targeted drug delivery, also for qualifying the unreleased amount of the long-acting drug in the tested object, and for helping setting the treatment schedule for ultrasound disruption of blood-brain barrier.

14 Claims, 8 Drawing Sheets

