



US007010340B2

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

(10) **Patent No.:** **US 7,010,340 B2**  
(45) **Date of Patent:** **Mar. 7, 2006**

(54) **METHODS, SYSTEMS, AND ASSOCIATED IMPLANTABLE DEVICES FOR DYNAMIC MONITORING OF PHYSIOLOGICAL AND BIOLOGICAL PROPERTIES OF TUMORS**

(75) Inventors: **Charles W. Scarantino**, Raleigh, NC (US); **H. Troy Nagle**, Durham, NC (US); **Lester C. Hall**, Hollywood, FL (US); **Jeffrey Mueller**, Winston Salem, NC (US); **Bahram Ghaffarzadeh Kermani**, San Diego, CA (US)

(73) Assignees: **North Carolina State University**, Raleigh, NC (US); **Sicel Technologies, Inc.**, Morrisville, NC (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 316 days.

(21) Appl. No.: **10/078,310**

(22) Filed: **Feb. 18, 2002**

(65) **Prior Publication Data**

US 2002/0137991 A1 Sep. 26, 2002

**Related U.S. Application Data**

(62) Division of application No. 09/407,359, filed on Sep. 29, 1999, now Pat. No. 6,402,689.

(60) Provisional application No. 60/102,447, filed on Sep. 30, 1998.

(51) **Int. Cl.**  
**A61B 6/00** (2006.01)  
**A61B 5/07** (2006.01)

(52) **U.S. Cl.** ..... **600/436**; 128/903; 600/302; 600/549

(58) **Field of Classification Search** ..... 600/361, 600/355, 364, 549, 436, 302; 128/903  
See application file for complete search history.

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*Primary Examiner*—Eric F. Winakur

(74) *Attorney, Agent, or Firm*—Myers Bigel Sibley & Sajovec PA

(57) **ABSTRACT**

Methods of monitoring and evaluating the status of a tumor undergoing treatment includes monitoring in vivo at least one physiological parameter associated with a tumor in a subject undergoing treatment, transmitting data from an in situ located sensor to a receiver external of the subject, analyzing the transmitted data, repeating the monitoring and transmitting steps at sequential points in time and evaluating a treatment strategy. The method provides dynamic tracking of the monitored parameters over time. The method can also include identifying in a substantially real time manner when conditions are favorable for treatment and when conditions are unfavorable for treatment and can verify or quantify how much of a known drug dose or radiation dose was actually received at the tumor. The method can include remote transmission from a non-clinical site to allow oversight of the tumor's condition even during non-active treatment periods (in between active treatments). The disclosure also includes monitoring systems with in situ in vivo biocompatible sensors and telemetry based operations and related computer program products.

**38 Claims, 16 Drawing Sheets**

