



US007189366B2

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

(10) **Patent No.:** **US 7,189,366 B2**
(45) **Date of Patent:** **Mar. 13, 2007**

- (54) **MOLECULAR TAG READER**
- (75) **Inventors:** **William F. Krise, Bozeman, MT (US);**
John L. Sternick, Mansfield, PA (US)
- (73) **Assignee:** **The United States of America as**
represented by the Secretary of the
Interior, Washington, DC (US)
- (*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 225 days.

5,674,698 A *	10/1997	Zarling et al.	435/7.92
5,804,451 A *	9/1998	Wang et al.	436/93
6,066,448 A *	5/2000	Wohlstadter et al.	435/6
6,086,737 A *	7/2000	Patonay et al.	204/461
6,191,278 B1 *	2/2001	Lee et al.	546/41
6,236,456 B1 *	5/2001	Giebler et al.	356/318
6,249,085 B1 *	6/2001	Arai	313/506
6,342,395 B1 *	1/2002	Hammock et al.	436/518
6,395,562 B1 *	5/2002	Hammock et al.	436/518
6,397,150 B1 *	5/2002	Izmailov	702/20
6,593,148 B1 *	7/2003	Narayanan	436/546

OTHER PUBLICATIONS

Baars et al. Ultrasensitive detection of closely related angiotensin I peptides using capillary electrophoresis with near-infrared laser-induced fluorescence detection. *Analytical Chemistry*, 1999, vol. 71, pp. 667-671.*

Ekong et al. Immunological detection of *Clostridium botulinum* toxin type A in therapeutic preparations. *Journal of Immunological Methods*, 1995, vol. 180, pp. 181-191.*

* cited by examiner

Primary Examiner—Long V. Le

(74) *Attorney, Agent, or Firm*—Mark Homer; Joan Gilsdorf

- (21) **Appl. No.:** **09/864,373**
- (22) **Filed:** **May 25, 2001**
- (65) **Prior Publication Data**
US 2002/0182150 A1 Dec. 5, 2002

- (51) **Int. Cl.**
B01L 3/02 (2006.01)
 - (52) **U.S. Cl.** **422/100; 422/68.1; 422/82.05;**
422/82.08; 435/287.1; 435/287.3; 435/287.7;
435/288.7
 - (58) **Field of Classification Search** **422/68.1,**
422/82.05, 82.08, 100, 57-59; 435/4, 6,
435/7.1, 7.9, 283.1, 287.1-287.3, 288.2-288.5,
435/288.7, 808; 436/164, 172, 518, 524,
436/528, 805, 823
- See application file for complete search history.

- (56) **References Cited**
U.S. PATENT DOCUMENTS

4,515,889 A *	5/1985	Klose et al.	435/4
5,313,264 A *	5/1994	Ivarsson et al.	356/73
5,571,388 A *	11/1996	Patonay et al.	204/461

(57) **ABSTRACT**

Near infrared molecular assays can be used to detect small quantities of a molecule of interest in vivo or in vitro using laser dyes. A hand-held portable device is provided which can rapidly read small quantities of selected molecular tags in tissues of fish or other animals in the field. The device is composed of four components:

- (1) a light source, such as a laser diode;
- (2) a sample holder;
- (3) an optical system; and
- (4) a detector.

9 Claims, 7 Drawing Sheets