US009410147B2

(12) **United States Patent**
Gundling

(10) **Patent No.: US 9,410,147 B2**
(45) **Date of Patent: *Aug. 9, 2016**

(54) **COMPOSITIONS AND METHODS FOR NUCLEIC ACID EXTRACTION**

(71) Applicant: **Abbott Molecular Inc.**, Des Plains, ID (US)

(72) Inventor: **Gerard J. Gundling**, Lake Forest, IL (US)

(73) Assignee: **Abbott Molecular Inc.**, Des Plaines, IL (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/212,799**

(22) Filed: **Mar. 14, 2014**

(65) **Prior Publication Data**

US 2014/0288293 A1 Sep. 25, 2014

Related U.S. Application Data

(60) Provisional application No. 61/799,768, filed on Mar. 15, 2013.

(51) **Int. Cl.**

C07H 21/00	(2006.01)
C09K 3/00	(2006.01)
C12N 15/10	(2006.01)
C07H 19/16	(2006.01)
C07H 1/08	(2006.01)

(52) **U.S. Cl.**
CPC ***C12N 15/1003*** (2013.01); ***C07H 1/08*** (2013.01); ***C07H 19/16*** (2013.01)

(58) **Field of Classification Search**
CPC C07H 1/08; C07H 19/16; C12N 15/1003
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,683,195	A	7/1987	Mullis et al.
5,208,160	A	5/1993	Kikyotani et al.
5,464,773	A	11/1995	Melendez et al.
5,688,644	A	11/1997	Lott et al.
6,686,195	B1	2/2004	Colin et al.
7,638,309	B2	12/2009	Das et al.
8,029,991	B2	10/2011	Hillebrand
2004/0072215	A1	4/2004	Rudi et al.
2009/0011469	A1	1/2009	Timo
2012/0077969	A1	3/2012	Petzel et al.

FOREIGN PATENT DOCUMENTS

WO 2012159089 A1 11/2012

OTHER PUBLICATIONS

Lipke, et al., "Cell wall architecture in yeast: new structure and new challenges" Journal of Bacteriology; Aug. 1998; pp. 3735-3740.
Salazar, et al., "Enzymatic lysis of microbial cells" Biotechnol Lett.; Jul. 2007; vol. 29, Issue 7; pp. 985-994.
Leeson and Lesson, "Histology" W.B. Saunders Co.; 1981; pp. 6-8.
Hallsworth, et al. "Compatible Solutes Protect against Chaotrope (Ethanol)-Induced, Nonosmotic Water Stress" Applied and Environmental Microbiology; Dec. 2003; vol. 69; No. 12; pp. 7032-7034.
Cray, et al. "A universal measure of chaotropicity and kosmotropicity" Environmental Microbiology; 2013; vol. 15; No. 1; pp. 287-296.
Cray, et al. "Chaotropicity: a key factor in product tolerance of biofuel-producing microorganisms" Current Opinion in Biotechnology; 2015; vol. 33; pp. 228-259.

Primary Examiner — Lawrence E Crane
(74) *Attorney, Agent, or Firm* — Pierce Atwood LLP; Kevin M. Farrell; David J. Wilson

(57) **ABSTRACT**

Compositions and techniques for the extraction, enrichment and isolation of nucleic acids from fresh, fixed or fixed and embedded cells, tissues, biological materials and cellular source material using amine monomers are disclosed herein.

24 Claims, 25 Drawing Sheets