Jun 16; 281(24):16681–16690. [PubMed: 16527811]

3. Dixit VD, Yang H, Sun Y, Weeraratna AT, Smith RG, Taub DD. Ghrelin promotes thymopoiesis during aging. *J Clin Invest.* 2007 Oct; 117(10):2778–2790. [PubMed: 17823656] Note: Article highlighted in this issue of JCI.

4. Yang H, Dixit VD, Patel K, Vandanmagsar B, Collins G, Sun Y, Smith RG, Taub DD. Reduction in hypophyseal growth hormone and prolactin expression due to deficiency in ghrelin receptor signaling is associated with Pit-1 suppression: relevance to the immune system. *Blood Behav Immun.* 2008 Nov; 22(8):1138–1145. [PubMed: 18602461]

5. Dixit VD, Yang H, Cooper-Jenkins A, Giri BB, Patel K, Taub DD. Reduction of T cell-derived ghrelin enhances proinflammatory cytokine expression: implications for age-associated increases in inflammation. *Blood.* 2009 May 21; 113(21):5202–5205. [PubMed: 19324904]

Relevant Reviews

6. Dixit V and Taub DD. Ghrelin and immunity: a young player in an old field. *Exp. Gerontol.* 2005 Nov; 40(11):900–910. [PubMed: 16233968]

7. Taub DD. Novel connections between the neuroendocrine and immune systems: the ghrelin immunoregulatory network. *Vitam Horm.* 2008; 77:325–346. [PubMed: 17983863]

8. Taub DD. Neuroendocrine interactions in the immune system. *Cell Immunol.* 2008 Mar–Apr; 252(1–2):1–6. [PubMed: 18619587] Note: Image from article used on the cover of this issue.

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10. Patel K and Taub DD. Role of neuropeptides, hormones, and growth factors in regulating thymopoiesis in middle to old age. *F1000 Biol Rep.* 2009 May 28; 1. pii: 42. [PubMed: 20948643]

11. Taub DD, Murphy WJ, Longo DL. Rejuvenation of the aging thymus: growth hormone-mediated and ghrelin-mediated signaling pathways. *Curr Opin Pharmacol.* 2010 Aug; 10(4):408–424. [PubMed: 20595009]

Patent Status: U.S. Patent Application No. 11/596,310 filed 06 Jun 2008 (HHS Reference No. E–016–2004/0–US–07) and related international applications.

Licensing Status: Available for licensing.

Licensing Contact: Sally H. Hu, PhD, M.B.A.; 301–435–5606; *hus@mail.nih.gov.*

Collaborative Research Opportunity: The National Institute on Aging is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize Methods of Inhibiting Proinflammatory Cytokine Expression Using Ghrelin. Please contact Nikki Guyton at 301–435–3101 or *guytonn@mail.nih.gov* for more information.

Dated: March 29, 2011.

Richard U. Rodriguez,

Director, Division of Technology Development and Transfer, Office of Technology Transfer, National Institutes of Health.

[FR Doc. 2011–7925 Filed 4–1–11; 8:45 am]

BILLING CODE 4140–01–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Government-Owned Inventions; Availability for Licensing

AGENCY: National Institutes of Health, Public Health Service, HHS.

ACTION: Notice.

SUMMARY: The inventions listed below are owned by an agency of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally-funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

ADDRESSES: Licensing information and copies of the U.S. patent applications listed below may be obtained by writing to the indicated licensing contact at the Office of Technology Transfer, National Institutes of Health, 6011 Executive Boulevard, Suite 325, Rockville, Maryland 20852–3804; telephone: 301–496–7057; fax: 301–402–0220. A signed Confidential Disclosure Agreement will be required to receive copies of the patent applications.

Diagnostic and Prognostic Serum Biomarkers for Cancer Patients Treated With Cancer Vaccines

Description of Technology: Although antibodies are a critical element of the immune response, the role of antibody responses in cancer vaccines is still unknown. Carbohydrate antigens, which are directly or indirectly involved in most types of cancer vaccines, are a class of antigens that has been largely understudied but play a significant role in the immune response of cancer vaccines.

This invention involves the identification of serum biomarkers for cancer that target carbohydrate antigens. The biomarkers are specific sub-populations of serum antibodies present in the serum of patients that bind to various glycan and/or glycoprotein antigens, such as the Forssman antigen.

The biomarkers are useful for (a) predicting a patient's immune responses to a cancer vaccine, (b) measuring the efficacy of a cancer vaccine, and (c) determining the prognosis and long-term survival of cancer patients.

Applications:

- Diagnostic and prognostic test to monitor the progression and long-term survival of cancer patients.
- Predictive indicator of cancer patients' immune response to a cancer vaccine.
- Indicator to monitor the efficacy of a cancer vaccine.

Advantages: The technology is backed by clinical data.

Development Status: Preliminary clinical data; validation studies are ongoing (confirmed findings in two independent patient groups).

Market: Cancer Vaccines are emerging as the forefront treatment regimens for several cancers. Provenge® was recently approved by the FDA for the treatment of prostate cancer. There are several other cancer vaccines in clinical trials.

This technology can be developed into a pioneering test, as no such test to monitor prognosis and efficacy of cancer vaccines currently exists in the market.

Inventors: Jeff Gildersleeve, *et al.* (NCI).

Publications: No publications directly related to this technology.

Patent Status:

- U.S. Provisional Application No. 61/371,537 filed August 6, 2010 (HHS Reference No. E–234–2010/0–US–01).
- U.S. Provisional Application No. 61/443,955 filed February 17, 2011 (HHS Reference No. E–234–2010/1–US–01).

Licensing Status: Available for licensing.

Licensing Contact: Sabarni Chatterjee, M.B.A., PhD; 301–435–5587; *chatterjeesa@mail.nih.gov.*

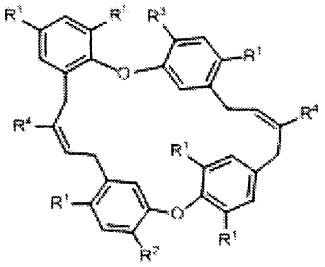
Collaborative Research Opportunity: The Center for Cancer Research, Chemical Biology Laboratory, is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize anti-glycan serum antibodies as biomarkers for cancer or

HIV vaccines and/or as prognostic biomarkers. Please contact John Hewes, PhD at 301–435–3121 or *hewesj@mail.nih.gov* for more information.

A New Class of Antibiotics: Naturally-Occurring Chrysophaetins and Their Analogues

Description of Invention: This invention, offered for licensing and commercial development, relates to a new class of naturally occurring antimicrobial compounds called Chrysophaetins, and to their synthetic analogues. Isolated from an alga species, the mechanism of action of these compounds is through the inhibition of bacterial cytoskeletal protein FtsZ, an enzyme necessary for the replication of bacteria. FtsZ is responsible for Z-ring assembly in bacteria, which leads to bacterial cell division. Highly conserved among all bacteria, FtsZ is a very attractive antimicrobial target.

The chrysophaetin exhibits antimicrobial activity against drug resistant bacteria, methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus faecalis* (VRE), as well as other drug susceptible strains. The general structure of the natural compound is shown below:



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The inventors are working on a synthetic route for the compound and analogs. They have made progress and now have two halves of the molecule. These will be further dimerized to produce a synthetic chrysophaentin. It is expected that the analogues will show similar antimicrobial activity to the natural products and will utilize the same mechanism of action.

The market potential for the disclosed compounds is huge ($24 billion in 2008) due to the very limited number of new antibiotics developed in recent decades and the increased epidemic of infectious diseases. In fact, infectious diseases are the leading cause of death worldwide. In the United States alone, more people die from MRSA than from HIV (Journal of the American Medical Association, 2007) and more than 90,000 people die each year from hospital acquired bacterial infections (Centers for Disease Control). A development of new drugs with distinct mechanism of action and efficacy against resistant bacterial strains may therefore be commercially attractive.

Advantages include:

- Structurally distinct antimicrobial compounds.
- Attack newly validated antibacterial targeted protein FtsZ.
- These compounds have a unique mechanism of action which works by inhibiting FtsZ GTPase activity.
- The chrysophaentins can be obtained by synthetic routes through dimerization of their synthetic shorter analogues.

Applications:

- Therapeutic potential for curing bacterial infections in vivo, including for clinical and veterinary applications.
- Antiseptics in hospital settings.
- Since FtsZ is structurally similar, but do not share sequence homology to eukaryotic cytoskeletal protein tubulin, these compounds may have antitumor properties against some cancer types or cell lines.

Development Status:

- Initial isolation and chemical structural characterization using NMR spectroscopy have been conducted.
- Antimicrobial testing against MRSA, *Enterococcus faecium,* and VRE were conducted *in vitro* using a modified disk diffusion assay and microbroth liquid dilution assays.
- MIC_{50} values were determined using a microbroth dilution assay.
- Mode of action was elucidated and Saturation Transfer Difference (STD) NMR was conducted to map the binding epitope of one of these compounds in complex with recombinant FtsZ.
- Other experiments on different areas to further characterize these compounds and their mode of action are currently ongoing.
- Shorter analogues of the natural products have shown to be readily synthesized and synthetic chrysophaentins can be obtained from them by chemical dimerization.

Inventors: Carole A Bewley Clore (NIDDK); Peter Wipf (U. of Pittsburgh).

Relevant Publications:

1. A. Plaza *et al.* Chrysophaentins A–H, antibacterial bisdiarylbutene macrocycles that inhibit the bacterial cell division protein FtsZ. J Am Chem Soc. 2010 Jul 7;132(26):9069–77. [PubMed: 20536175].

2. DJ Haydon *et al.* An inhibitor of FtsZ with potent and selective anti-staphylococcal activity. Science. 2008 Sept 19; 321(5896):1673–1675. [PubMed: 18801997].

3. NR Stokes *et al.* Novel inhibitors of bacterial cytokinesis identified by a cell-based antibiotic screening assay. J Biol Chem. 2005 Dec 2; 280(48):39709–39715. [PubMed: 16174771].

4. J Wang *et al.* Discovery of small molecule that inhibits cell division by blocking FtsZ, a novel therapeutic target of antibiotics. J Biol Chem. 2003 Nov 7; 278(45):44424–44428. [PubMed: 12952956].

5. P Domadia *et al.* Berberine targets assembly of Escherichia coli cell division protein FtsZ. Biochemistry. 2008 Mar 11; 47(10):3225–3234. [PubMed: 18275156]

6. P Domadia *et al.* Inhibition of bacterial cell division protein FtsZ by cinamaldehyde. Biochem Pharmacol. 2007 Sep 15:74(6):831–840. [PubMed: 17662960]

7. S Urgaonkar *et al.* Synthesis of antimicrobial natural products targeting FtsZ: (+/−)-dichamanetin and (+/−)-2‴-hydroxy-5″-benzylisouvarinol-B. Org Lett. 2005 Dec 8;7(25):5609–5612. [PubMed: 16321003].

Patent Status:

- PCT Application No. PCT/US2011/026220 filed February 25, 2011 (HHS Reference No. E–116–2010/0–PCT–02).
- U.S. Provisional Application No. 61/446,978 filed February 25, 2011 (HHS Reference No. E–115–2011/0–US–01).

Licensing Status: Available for licensing.

Licensing Contacts:

- Uri Reichman, PhD, MBA; 301–435–4616; *UR7a@nih.gov.*
- John Stansberry PhD; 301–435–5236; *js852e@nih.gov.*

Collaborative Research Opportunity: The National Institute of Diabetes and Digestive and Kidney Diseases, Laboratory of Bioorganic Chemistry, is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize the chrysophaentin antibiotics. Please contact Marguerite J. Miller at 301–451–3636 or *millermarg@niddk.nih.gov* for more information.

Dated: March 29, 2011.

Richard U. Rodriguez,

Director, Division of Technology Development and Transfer, Office of Technology Transfer, National Institutes of Health.

[FR Doc. 2011–7921 Filed 4–1–11; 8:45 am]

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