



US 20080119381A1

(19) **United States**

(12) **Patent Application Publication**

Wang et al.

(10) **Pub. No.: US 2008/0119381 A1**

(43) **Pub. Date: May 22, 2008**

(54) **BIOFUNCTIONAL MATERIALS**

(22) Filed: **Nov. 22, 2006**

(75) Inventors: **Ping Wang**, Hudson Village, OH (US); **Minjuan Zhang**, Ann Arbor, MI (US); **Hongfei Jia**, Ann Arbor, MI (US); **Archana H. Trivedi**, Mumbai (IN); **Masahiko Ishii**, Okazaki (JP)

Publication Classification

(51) **Int. Cl.**
C11D 1/10 (2006.01)
C11D 1/20 (2006.01)

(52) **U.S. Cl.** **510/365; 510/392; 510/490; 510/109**

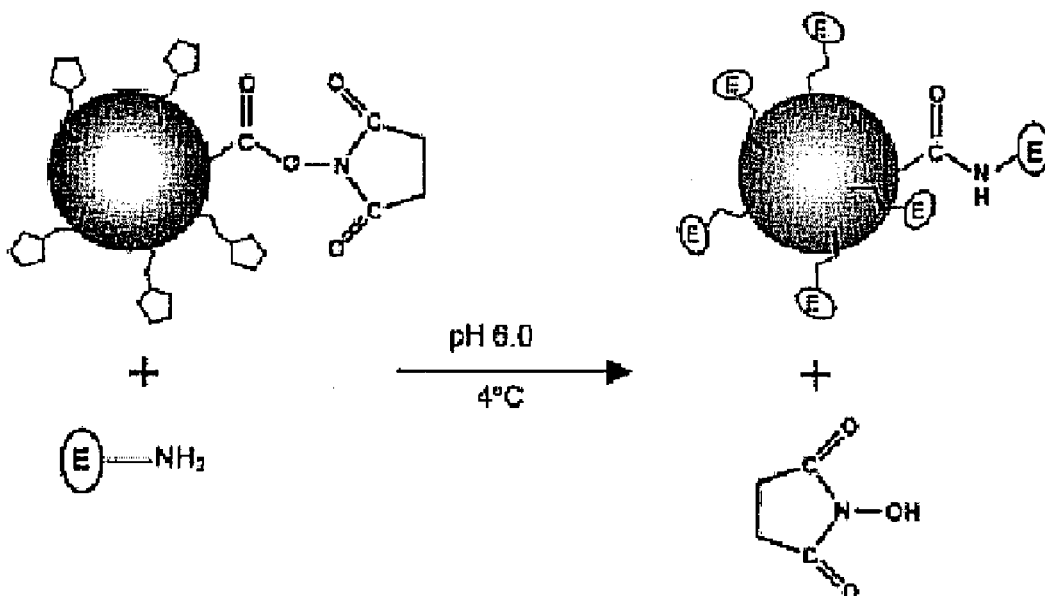
Correspondence Address:
**GIFFORD, KRASS, SPRINKLE,
ANDERSON & CITKOWSKI, P.C.
P.O. BOX 7021
TROY, MI 48007-7021**

(57) **ABSTRACT**

The present invention relates to compositions and a process in the field of self-cleaning system using digestive proteins. One composition includes a substrate, a digestive protein capable of decomposing a stain molecule, and a link moiety bound to both said digestive protein and said substrate. An alternative composition includes a digestive protein capable of decomposing a stain molecule and a coating substrate wherein said digestive protein may be dispersed in said coating substrate. The process claim includes binding a substrate to a surface and forming a linker moiety between a digestive protein and said substrate.

(73) Assignees: **Toyota Motor Corporation**, Toyota (JP); **University of Akron**, Akron, OH (US); **Toyota Engineering & Manufacturing North America, Inc.**, Erlanger, KY (US)

(21) Appl. No.: **11/562,503**



Reactive Surfaces Ltd. LLP

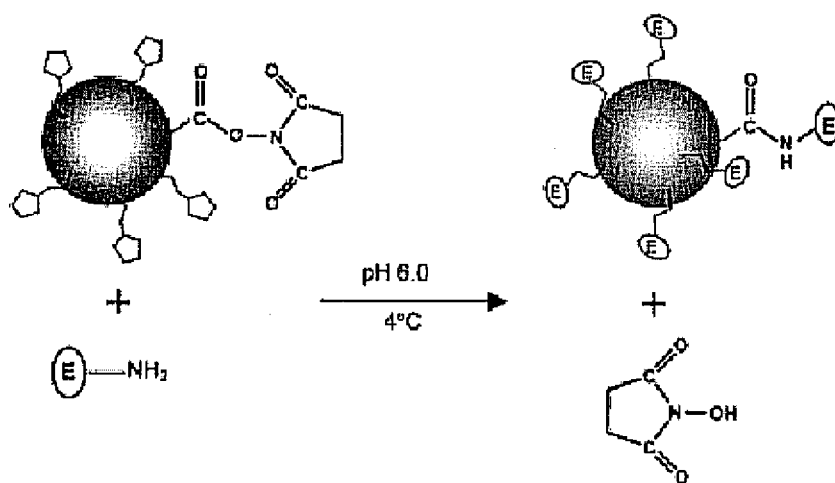
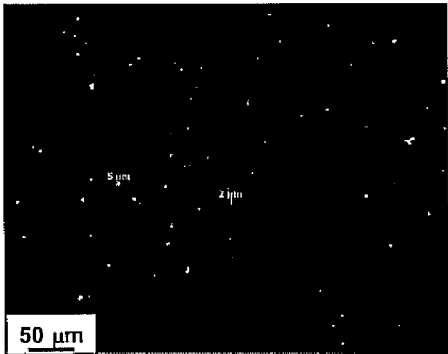
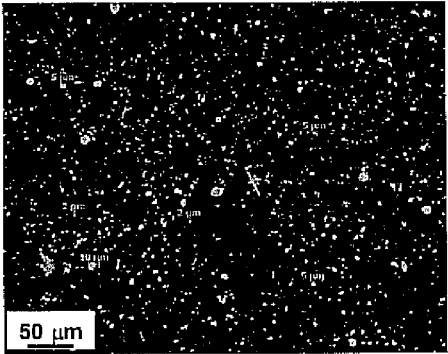


FIGURE 1



Physical Adsorption



Covalent Crosslinking

FIGURE 2

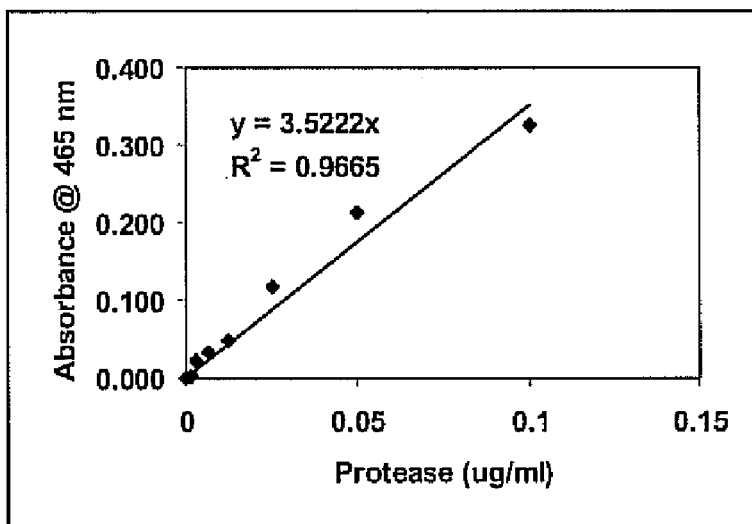


FIGURE 3

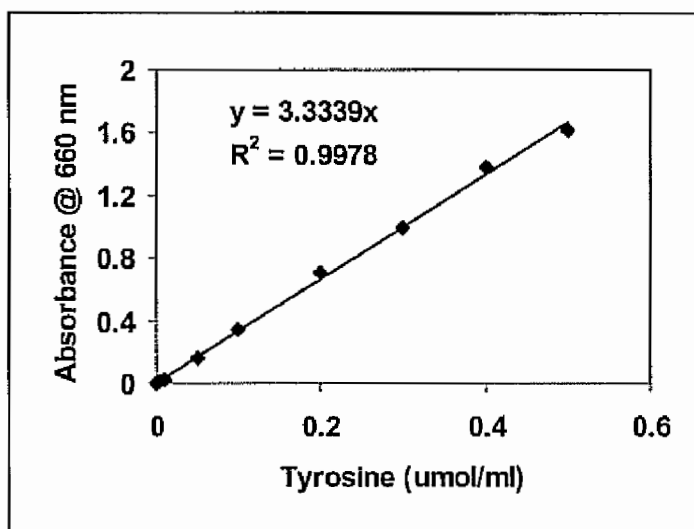


FIGURE 4

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.