Cancer-related Extracellular Matrix Signatures and Related Methods and Products

Technology #15501

Applications

The extracellular matrix (ECM) signature can be used in detection, diagnosis, monitoring, and treatment of cancers. The signature sets can be used to profile the stage of cancer as well as monitor the progression over time. Antibodies against proteins in these signature sets can also be used to target chemotherapy drugs to treat cancer or detectable agents to image the tumors.

Problem Addressed

Large data sets of mutations, gene expression, and protein expression have been generated to understand the biology and progression of cancer with the hopes of identifying ways to treat cancer. However, understanding the role of ECM in disease progression using ECM as a way to target cancer has been mostly limited. This is because ECM proteins are insoluble and are crosslinked, thus, are intractable for large scale protein analysis. The current invention utilizes recently developed proteomic methods to identify ECM signatures associated with cancer and its progression, which can be used to diagnose, prognose, and treat cancer.

Technology

Current invention uses quantitative mass spectrometric profiling of ECM proteins of non-metastatic primary tumors and metastatic tumors compared to normal tissue. This allowed for generation of signature sets of ECM proteins that are deregulated in tumors and also between different progression stages of cancer. These signature sets can be used to profile progression stage of cancer biopsies. Using antibodies targeted against the proteins in the signature sets, it is also possible to deliver conjugated agents such as imaging agents or chemotherapeutic agents for imaging and treatment of cancer.

Advantages

- Cancer-related ECM signatures identifies targets that are significantly enriched in tumors compared to normal tissue, which can be used to diagnose and prognose cancer
- Proteins in ECM signatures can be targeted using conjugated antibodies, thus, limiting systemic exposure

Categories For This Invention:

Life Sciences
Clinical Applications
Oncology
Diagnostics

255 Main Street, room NE 18-501
Cambridge, MA 02142-1601
Phone: 617-253-6966 Fax: 617-258-6790
http://tlo.mit.edu
Contact the Technology Manager: tlo-inquiries@mit.edu

Protein
Imaging
Research Tools
Therapeutics

Intellectual Property:

Cancer-related extracellular matrix signatures and related methods and products
Issued US Patent
9,526,800
Cancer-related extracellular matrix signatures and related methods and products
Issued US Patent

Inventors:

Alexandra Naba
Richard Hynes
Steven Carr
Karl Clauser
Kenneth Tanabe

Publications:

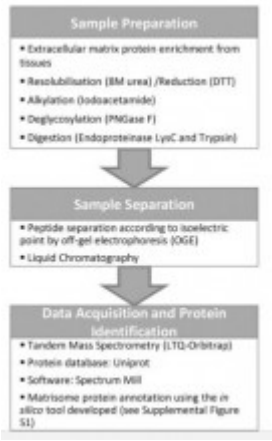
The Matrisome: in silico Definition and in vivo Characterization by Proteomics of Normal and Tumor Extracellular Matrices.
Mol Cell Proteomics
2012 Apr;11(4):M111.014647. doi: 10.1074/mcp.M111.014647. Epub 2011 Dec 9.
Extracellular Matrix Signatures of Human Mammary Carcinoma Identify Novel Metastasis Promoters.
Elife
2014 Mar 11;3:e01308. doi: 10.7554/eLife.01308.
Extracellular Matrix Signatures of Human Primary Metastatic Colon Cancers and Their Metastases to Liver.
BMC Cancer
2014 Jul 18;14:518. doi: 10.1186/1471-2407-14-518.

External Links:

Hynes Lab
https://hynes-lab.mit.edu/

Image Gallery:

255 Main Street, room NE 18-501
Cambridge, MA 02142-1601
Phone: 617-253-6966 Fax: 617-258-6790
http://tlo.mit.edu
Contact the Technology Manager: tlo-inquiries@mit.edu



255 Main Street, room NE 18-501
Cambridge, MA 02142-1601
Phone: 617-253-6966 Fax: 617-258-6790
http://tlo.mit.edu
Contact the Technology Manager: tlo-inquiries@mit.edu