Invention ID	Invention Reference	Invention Title	Summary	Inventor(s)	Patent Application	Patent	Commercialization Manager
81920324	202004616	UV-based mitigation of airborne transmission of COVID-19	A UV device is described which can be used to achieve minimum survival rate of corona viruses. Predicting the spread of aerosol droplets in a typical building zone and transport of the aerosol to other zones of the building are also described.	Kashif Nawaz Brian A Fricke	Pending		Matthew W Garrett
81920199	202004613	Composition and Method of Drug Delivery for Treating COVID-19	The invention provides a composition and method of drug delivery.	Joseph C Ellis	US 16/848,397		JENNIFER T CALDWELL
81918360	202004564	Methods for targeted manipulation of microbial community composition and function	The invention relates to a method for targeted manipulation of microbial community composition and function.	Joshua K Michener Alyssa A Carrell Cory D Hauck Hoang A Tran Melissa A Cregger Alex Ruzicka Jessica A Moore	Pending		JENNIFER T CALDWELL
81835421	201804255	Rapid Native Single Cell Mass Spectrometry	Single cell metabolomic and lipidomic information is crucial when studying disease progression at the cellular level. Cells are naturally heterogeneous yet most analytical technologies measure average cellular chemistry or require molecular probes to investigate the chemistry in a single cell, the latter of which may have unforeseen consequences on cellular chemistry. This invention describes an innovative methodology for rapid, in situ molecular characterization of single cells suspended in their native media. This invention enables quantitative, targeted and/or untargeted chemical analysis of single cells without extensive sample preparation procedures while being able to measure single cells with high throughput. Current technologies require an involved preparation procedure and use of matrix matched standards to quantitate cellular metabolites. This invention provides a simple method for absolute determination of the concentration of target analyte(s) within a single cell. Further, many single cell analysis techniques trade chemical coverage for sampling throughput. This invention will provide untargeted mass spectrometric analysis of single cells with the throughput necessary to obtain statistics of cellular populations.	John F Cahill	US 16/685,740; PCT/US2019/61802		JENNIFER T CALDWELL
81833728	201303123	Bioactive polymer surface supports for high avidity cell capture and proliferation	Microbial exopolysaccharides (EPS) play a critical and dynamic role in shaping the interactions between microbial community members and their local environment. The capture of targeted microbes using surface immobilized lectins that recognize specific oligosaccharide moieties offers a non-destructive method for functional characterization of microbes based on EPS expression. The invention provides a support. This micostructured block-copolymer support architecture combines high recepter/ligand density and three-dimensional structure to promote more efficient and robust capture of cells, cellular material, macro- and small molecules from solution. This could significantly improve the selectivity and sensitivity of commercial assays or sensors based on bio-recognition.	Scott T Retterer Bradley S Lokitz Jamie M Messman Sidney M Kilbeyli Jennifer L Morrell-Falvey John F Ankner Ryan Hansen Juan P HinestrosaSalazar	US 14/215,552	US 10,131,899	JENNIFER T CALDWELL
81833227	201202950	Local thermal actuation of material surfaces via micro- and nanowire heating for the prevention of cellular attachment and biological fouling	In many cases antibiotic therapy proves difficult or ineffective due either to microbial antibiotic resistance or to the formation of a biofilm on the device that resists penetration of the antibiotic. On-demand in situ techniques for actively disrupting infection/fouling, aside from systemic antibiotic treatment, are virtually non-existent. Here we describe A new application of micro- and nanowire technologies to facilitate localized thermal actuation of material surfaces that can be used to prevent early stage protein adsorption and cellular attachment associated with infection and biofilm formation is described.	Scott T Retterer Steve L Allman Mitchel J Doktycz David P Allison	US 14/451,967	US 10,179,180	JENNIFER T CALDWELL

81827569	201202943	Rapid, Reagentless Viral Diagnostic using Isolated Leukocytes	RNA viruses represent a significant portion of the high priority pathogens of concern to both human and animal health. The National Institute of Allergy and Infection Diseases' (NIAID) prioritized listing of human pathogens includes the RNA Viruses: Hanta viruses, Dengue, Ebola, Marburg, Lassa, Hepatitis A and C, West Nile, and a large number of encephalitis viruses. The USDA prioritized list of infectious animal diseases include four RNA viruses within their top six ranked pathogens; Foot and Mouth Disease Virus, Rift Valley Fever Virus, common swine fever virus, and Japanese encephalitis. Viral outbreaks of these pathogens have significant direct impact on human health or dramatic indirect impact by their disruption of food supplies and related economic considerations. Rapid diagnostics are critical elements of an effective response to viral outbreaks, but are limited by both available technology and implementation. The invention provides a method and apparatus for diagnosing active, acute viral infection from small volumes of blood using a highly fieldable, and near reagentless protocol whereby signal is dependent on active viral replication within isolated leukocytes.	Timothy E Mcknight	US 14/212,718	US 9,523,132	EUGENE R. COCHRAN
81832702	201102746	Recommending Personally Interested Contents by Text Mining, Filtering, and Interfaces	We disclose a personalized content recommendation algorithm through mining user dwell times and other implicit user feedbacks derived from a user's previously online reading or browsing activities, which would be captured by a set of novel user interfaces in the form of customized web browsers and eReaders. From the captured user behavior data, we then infer concept level user dwell times in order to understand a user's personal interest. According to the estimated concept level user interest, our algorithm can estimate a user's potential interest over any new content, based on which personalized webpage re-ranking can be carried out.	Songhua Xu	US 13/785,117	US 9,171,068	Matthew W Garrett
81831431	201102560	A Cloud Computing Method for Distributed Clustering of Textual Information	Analyzing large volumes of text requires sophisticated algorithms and racks of computers. This invention removes the need for racks of computers to do this analysis. In this invention, text is analyzed in a cloud computing environment that can be setup in minutes, grown to supercomputer size in minutes, and torn down in minutes, with the only cost is being the use of the cloud computing environment. This makes sophisticated high performance text analysis accessible to anyone at a very low cost.	Thomas E Potok Robert M Patton Robert E Gillen Carlos C Rojos	US 13/480,175	US 8,825,710	Matthew W Garrett
81829979	201002390	Volume modified oxide nanoparticles for multifunctional imaging and diagnostics	The terms nanoparticle, nanotube, nanowire or generally nanomaterials are used to describe a broad class of zero (particles) and one-dimensional (tube or wire) single or composite material architectures that possess at least one functional dimension below 100nm (a few hundred nanometers). In general practice the prefix nano- is assigned liberally and is also commonly applied to architectures with functional dimensions below 1 micrometer. Because of their unique physical architectures and overall size, this class of materials have garnered significant interest for use as: i) contrast agents for imaging techniques; ii) therapeutic delivery agents; iii) biological labeling and cancer diagnostics; iv) industrial fillers and additives; v)catalysts and fuel additives; The invention provide volume labeled oxide nanoparticles, which allow retention of the physical dimensions, properties and surface characteristics of conventional engineered particles while enhancing one's ability to monitor, quantify, diagnostic, and image the transport and fate of that particles through biological and environmental systems.	Scott T Retterer Wei Wang Baohua Gu Mitchel J Doktycz	US 12/881,886	US 9,011,735	JENNIFER T CALDWELL

[81831601](#)	201002377	Detecting Temporal Precursor Words in Text Documents Using Wavelet Analysis	Diagnosing abnormalities from reports is heavily dependent on the time sequences of the patient visits. We take a longitudinal view of the text of a patient's reports to explore the existence of certain phrase patterns that indicate future abnormalities may exist for the patient. Our approach uses various text analysis techniques combined with Haar wavelets for the discovery and analysis of precursor phrase patterns. Invention looks for phrase patterns, and then uses wavelet analysis to transform time-series of word counts into a multi-resolution frequency space. Specific patterns in this space are then identified as being precursors.	Robert M Patton Thomas E Potok	US 13/033,756	US 8,473,314	Matthew W Garrett
[81825871](#)	200000810	Personal Cooling Air Filtering Device	A breathing air cooling and filtering device comprising carbon foam heat sinks that transfer heat to and from air forced through the slots via a blower. A separate carbon filter removes gaseous airborne contaminants.	James W Klett Bret Conway	US 09/934,501	US 6,430,935	Nestor E. Franco
[81827422](#)	200101031	A Process of Gathering and Summarizing Internet Information	A software method is described for quickly gathering and organizing massive amounts of information from internet sites, then distilling this information into a form directly and explicitly emenable for use by an information analyst.	Mark Elmore, Joel Reed, Thomas Potok, Nagiza Samatova, N. Treadwell	US 10/157,704	US 7,072,883; US 7,693,903; US 7,315,858; CA 2,471,398; MX 006072;	Matthew W Garrett
[81828874](#)	200401368	An Agent-based Method for Distributed Clustering of Textual Information	A complete description of the A computer method and system for storing, retrieving and displaying information has a multiplexing agent that calculates a new document vector for a new document to be added to the system and transmits the new document vector to master cluster agents	Jimmie N Treadwell Mark T Elmore Joel W Reed Thomas E Potok	US 10/963,241	US 7,805,446	Matthew W Garrett
[81828500](#)	200601759	Dynamic Dimensionality Reduction for Data Stream Analysis	The method and system of the invention involves processing each new document coming into the system into a document vector, and creating a document vector with reduced dimensionality for comparison with the data model without recomputing the data model. These operations are carried out by a first computer while a second computer updates the data model, which can be comprised of an initial large group of documents and is premised on the computing an initial data model to provide a reference point for determining document vectors from documents processed from the data stream.	Thomas E Potok Yu Jiao	US 12/072,723	US 7,937,389	Matthew W Garrett
[81832642](#)	201102668	A Process to Recommend and Discover Interesting On-Line Documents	This disclosure describes a system that can read millions of news feeds per day about topics (e.g., your customers, competitors, markets, and partners), and give you a small set of the most relevant items that you need to read to keep current with the overwhelming amount of information currently available. Topics of interest are chosen by the user of the system for use as seeds. The seeds are vectorized and compared with the target documents to determine their similarity. The similarities are then sorted from highest to lowest so that the most similar seed and target documents are at the top of the list. This output is produced in XML format so that an RSS Reader can format the XML. This allows for easy Internet access to these recommendations.	Thomas E Potok Robert M Patton Chad A Steed	US 13/737,652	US 9,558,185	Matthew W Garrett
[81832800](#)	201202870	A Method of Filtering and Recommending Documents	One challenge in dealing with the explosion of information we currently face is how to filter noise from relevant information over a large set of documents. Scanning through hundreds of documents is very time consuming and error prone. Our approach uses a set of known good information to find significant terms and phrases that are then used to recommend new documents. Our approach is fast and scalable, and has been very successful on real world data.	Thomas E Potok Robert M Patton	US 13/920,649	US 9,256,649	Matthew W Garrett

[81827376](#)	200100993	Nanoengineered Membranes for Controlled Transport	The invention pertains to the use of carbon nanofibers (CNFs) as membranes for controlling molecular transport. These devices provide nanoscale control of molecular transport by mimicking biological cellular membranes. Semi-permeable membranes are created from the directed self-assembly of CNFs, allowing for the passage of moleculea smaller than the wall to wall spacing of the CNFs. The diffusion limits can be controlled by the separation of the fibers, both laterally and along the direction of transport. Chemical potential gradients can be engineered and used to direct transport. Advanced iterations of these membranes can involve chemical derivatization of the fibers to further affect the diffusion limits or possibly affect selective permeability or facilitated transport. Additionally, individually addressable CNF electrodes can be integrated with the membrane to provide an electrical driving force for transport and an electronic interface in the fluid for control and detection.	Mitchel J Doktycz Douglas Lowndes Michael L Simpson Michael A Guillorn Vladimir I Merkulov Timothy E Mcknight Anatoli Melechko	US 10/383,309	US 7,641,863	Eugene R. Cochran
[81828173](#)	200201199	Parallel Macromolecular Delivery and Biochemical/Electrochemical Interface to Whole Cells Employing Carbon Nanofibers	An array of carbon nanofibers is interfaced with a whole cell. The nanofiber array allows the delivery of macromolecules to the cell for long term biochemical maniulation of the cell.	Guy Griffin Timothy E Mcknight Michael L Simpson Michael A Guillorn Vladimir I Merkulov V V. Melechko	US 10/408,294	US 8,993,327	Eugene R. Cochran
[81828236](#)	200301261	Fabrication of Nanopipes Using Vertically Aligned Carbon Nanofiber Templates	A method of fabricating tubular nanostructures usually composed of Si02.	Douglas Lowndes Timothy E Mcknight Michael L Simpson Mitchel J Doktycz Michael A Guillorn Vladimir I Merkulov V V. Melechko Bojan Ilic	US 11/985,551	US 8,142,877	Eugene R. Cochran
[81819348](#)	200401481	Method and Apparatus for Extracting Molecular Species from Intact Cells	Methods and apparati are described that enable the extraction of molecular species from intact, viable cells. Vertically aligned arrays of needles, spikes, pipes and partial pipes are described that feature radial dimensions small enough to penetrate within the smallest of cells, but are long enough to provide a significant penetration depth into cells and subcellular regions. Surface modification and other functionalization strategies are described which allow the penetrant structure to capture intracellular molecular species and effectively remove them from the viable, penetrated cell.	Timothy E Mcknight Michael L Simpson Anatoli Melechko	US 11/904,862	US 8,101,388	Eugene R. Cochran
[81819352](#)	200401483	Method and apparatus for maintaining substrate-dependent survival of an organism	Methods and apparati are described which provide for organism survival only while the organism resides on a substrate and maintains residence of a substrate bound material within the cell's intracellular domain.	Timothy E Mcknight Michael L Simpson Anatoli Melechko	US 11/624,040	US 8,076,124	Eugene R. Cochran
[81829355](#)	200902211	Platform for immobilization and observation of subcellular processes	This platform mechanically immobilizes small cellular structures, preferably spherical in geometry, at discrete locations of an open or microfluidically accessed substrate. This immobilization provides for reagent delivery/removal to/from the immobilized structure using either convective or diffusive transport, including the microfluidic delivery and removal of material to and away from the immobilized species. The platform allows microscopic observation of the immobilized material and immobilizes said material in a manner that allows spatial registration of individual immobilized species and clamping of their respective three dimensional configuration on the immobilization platform over periods of time.	Timothy E Mcknight Udaya C Kalluri Anatoli Melechko	US 13/369,849	US 8,815,780	Eugene R. Cochran

[81915053](#)	201904430	Cell-free metabolic pathway optimization through removal of select proteins.	The use of cell-free extracts for metabolite production has been significantly studied and several prominent labs have shown its efficacy as a potential production platform. However, as more work has been undertaken, it has been shown that cell-free extracts are not without inefficiencies. For instance, cell-free extracts fed with glucose while capable of consuming the substrate will disperse it to deleterious metabolic pathways. We created a solution that would allow researchers and engineers to remove deleterious pathways from cell-free extracts without causing the traditionally unhealthy cells that result from the removal of deleterious but often essential pathways. Simultaneously this would allow for the creation of non-conventional metabolic states, as removing proteins from cell-free extracts after the fact, allows for cell viability to be ignored.	Mitchel J Doktycz David Garcia Ben P Mohr Jaime Lorenzo N Dinglasan	US 63/013,066		Jennifer T Caldwell
[SOFTWARE](#)							
	50000004	PIRANHA: A Knowledge Discovery Engine (Source Code; 2012)	A new approach to text analytics that uses software agents distributed over very large computer clusters that can quickly filter through large volumes of documents, show relationships between them and present relevant information to business and government analysts. The Piranha text analytics software, which can scale from working on a single PC to a supercomputer, speeds up the search for relevant information by grouping and comparing documents.	Brian Klump, Robert Patton, Tom Potok, Joel Reed, Jim Treadwell, Craig Cunic, Phillip Martin	TXu 1-703-6990		Matthew W Garrett
	50000045	RAPTOR: An Enterprise Knowledge Discovery Engine (Source Code; 2012)	Enterprises generate large quantities of information contained in documents, presentations, spreadsheets, and databases. This information is stored across file shares, intranet portals, user desktops, and other business unit applications. Combined with a lack of structured organizational tools, keywords, tags, or other automated retrieval tools, organizations struggle to index, search, and find information across these disparate platforms. Raptor, an enterprise automation and collaboration software developed by ORNL, integrates ORNL's Piranha, a knowledge discovery engine, with Microsoft Office SharePoint Server. Included in this application are MS OCS, Office, Search, and SharePoint directories and files that form a knowledge management platform, as well as Wikis, tag clouds, and other applications. By incorporating the Piranha search capability within SharePoint, Raptor allows users to coordinate research activities across the globe in near real time. Data visualization of search results is provided by Piranha functionality. Microsoft SQL Server Analysis and Integration Services (SSAS, SSIS) and other business intelligence (BI) tools are used to find and render information. Cross-agency collaboration concerns such as data locality, multi-tenancy, security, and access controls allow for increased partnership and knowledge sharing.	Robert Patton, Steven Young	Txu 1-874-534		Matthew W Garrett
	50000040	Distribute The Highest Selected Textual Recommendation (DTHSTR) (Source Code; June 2012)	The DTHSTR technology provides a user with a personalized, humanly manageable list of documents from a significantly larger, unmanageable set of documents without the user performing keyword searches. DTHSTR reduces the amount of direct user input (typing, purchases, shopping carts, search terms) and maximizes the use of desired user context (text in documents, text on web pages). Innovatively combining the use of text categorization, extraction, and clustering allows DTHSTR to push relevant information (or tags) to users solely based on the documents shared or provided to the engine. Results are fast, efficient, and targeted to the specific interests of each user regardless of the application domain. DTHSTR can also operate as a filter for the Piranha technology, enabling analysis of even larger volumes of documents.	Robert Patton, Tom Potok	TXu 1-852-660		Matthew W Garrett