

The invention relates to an imaging system comprising a fluorescence microscope and an annular filter. The microscope has an associated light source for providing an illuminated light path to an objective of the microscope for illuminating a specimen positioned on the microscope stage. The annular filter is positioned at a back focal plane of the illuminating light path such that only hollow cone of steep angled excitation light is delivered to the specimen and excluding low angle and axial light rays from entering the objective. Excitation illumination of the specimen occurs only in a limited region of the specimen corresponding to the focal volume where the light rays of the hollow cone of illumination converge. This modified configuration of the microscope and aperture increases signal to noise ratio of the resulting fluorescent image by reducing out of focus light (*i.e.*, scattered light). Photo-damage and photo-bleaching are also minimized.

#### **Diffusion Tensor and q-Space MRI Specimen Characterization**

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US-01 filed 08 Jul 2003  
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This new in vivo magnetic resonance imaging (MRI) method, especially suited for the characterization of brain white matter, combines q-space and diffusion tensor imaging concepts: Diffusion within axons is modeled as hindered diffusion parallel to an axis of the axon and restricted diffusion perpendicular to the axis. Diffusion exterior to axons is modeled as hindered diffusion with differing diffusivities parallel and perpendicular to the nerve axis. Diffusion weighted magnetic resonance images are obtained from specimens at different q values (magnitude and direction). Parameters associated with tissue microstructure are then extracted, such as the intra and extra-axonal principal diffusivities and their corresponding principal directions, and the volume fractions of intra and extra-axonal space. Improved angular resolution of fiber tracts orientation can be obtained for tractography studies, and more microstructural information can be gleaned both diagnostic and therapeutic purposes than from conventional diffusion tensor MRI.

#### **Method and System for Developing and Querying a Sequence Driven Contextual Knowledge Base**

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Raymond Tennant (NIEHS)

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452,384 filed 03 Jun 2003 (DHHS  
Reference No. E-026-2003/0-US-01)  
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Available for licensing is a system of predictive toxicology and pharmacology in the form of a multigenome/multispecies knowledge base incorporating gene and amino acid sequences, molecular expression data, gene/protein functional annotation, domain specific ontologies, and/or literature mapping. The present invention integrates large volumes of disparate information, such as genomic, proteomic, and/or toxicological knowledge in a framework that serves as a continually changing heuristic engine for predictive toxicology. The invention allows characterization of the effects of, for example, chemicals or stressors across species as a function of dose, time, and phenotype severity.

This research is described, in part, in Waters *et al.*, Environ. Health Perspect. 111 (1T): 15-18 (January 2003), and republished in Environ. Health Perspect. Toxicogenomics 111 (6): 811-824 (May 2003).

#### **Pattern Recognition of Whole Cell Mass Spectra**

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This invention analyzes mass spectra (MALDI, SELDI) from a plurality of microorganism sources and biological agents. The invention is useful for diagnosing disease, anticipating epidemic outbreaks, monitoring food supplies for contamination, regulating bioprocessing operations, and is especially useful for detecting agents of war. The invention dramatically improves spectral analysis through deconvolution of complex spectra by collapsing multiple peaks showing different molecular mass originating from the same molecular fragment into a single peak. The differences in molecular mass are apparent differences caused by different charge states of the fragment and/or different metal ion adducts of one or more of the charge states. The deconvoluted spectrum is compared to a library of mass spectra acquired from samples of known identity to unambiguously determine the identity of one or more components of the sample undergoing analysis.

#### **Stem Cell Culture, Monitoring and Storage System**

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(ORS), Ronald McKay (NINDS).  
U.S. Patent Application Serial No. 10/  
334,565 filed 30 Dec 2002 (DHHS  
Reference No. E-171-2002/0-US-01)  
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Available for licensing is a closed chamber that provides an environment for long-term culture of stem cells, stems cells of central nervous system (CNS) origin, embryonic stem cells, and other cells. The chamber is designed with top and bottom mounted cover slips that permit the observation of cells in culture under an optical microscope. This chamber has the ability to control volume and pressure of liquids and gases by an inlet tube and outlet tubes at two different vertical positions. The chamber also includes a ball joint assembly that allows for the manipulation of a glass microcapillary/microelectrode to come in close contact with the developing cells. This microcapillary/microelectrode assembly can be used to either administer growth factors (*e.g.*, monitoring growth factor levels such as BMP and CNTF) and also for electrical recording from the cells.

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#### **DEPARTMENT OF HEALTH AND HUMAN SERVICES**

##### **National Institutes of Health**

##### **Government-Owned Inventions; Availability for Licensing**

**AGENCY:** National Institutes of Health, Public Health Service, DHHS.

**ACTION:** Notice.

**SUMMARY:** The inventions listed below are owned by agencies 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