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# ATOM SARKAR, M.D./PH.D.

**The Ohio State University**
**Department of Neurological Surgery**

April 21, 2010

## CURRENT APPOINTMENTS:

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| 2006-present | The Ohio State University<br>Assistant Professor – Department of Neurological Surgery<br>Assistant Professor – Department of Chemical & Biomolecular Engineering<br>Director - Epilepsy, Tumor, and Stereotactic Surgery<br>Director - Neurological Nanomedicine<br>Associate Director - Functional Neurosurgery |

## EDUCATION:

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| 2004-2005 | Chief Resident Associate, Department of Neurological Surgery, Mayo Clinic College of Medicine, Rochester, MN, United States. |
| 2002-2004 | Postdoctoral Fellowship, Columbia University, New York, New York, United States |
| 1998-2005 | Neurosurgery Residency, Department of Neurological Surgery, Mayo Clinic, Rochester, MN. |
| 1990-1998 | M.D., Leonard M. Miller School of Medicine at the University of Miami, Department of Neurological Surgery |
| 1990-1998 | Ph.D. with honors, University of Miami, Department of Physiology and Biophysics; Focus on Molecular Neuroscience |
| 1990 | B.S., Brown University, Department of Biology |

## CERTIFICATIONS:

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| 2006 | The Cleveland Clinic Health System Gamma Knife Center: Gamma Knife Training Course, Cleveland Clinic Foundation. |

## HONORS AND AWARDS:

### Honors

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| 2008-2009 | The Lawrence Mervis, MD, Teacher of the Year Award. The Ohio State University, Columbus, OH, United States. |
| 2005 | Scholarly Achievement Award for Distinguished Academic Achievement. Department of Neurological Surgery. Mayo Clinic College of Medicine, Rochester, MN, United States. |

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| 2004 | Young Investigator Travel Scholarship. The Academy of Molecular Imaging. Mayo Clinic College of Medicine, Rochester, MN, United States. |
| 2003-2004 | Research Fellowship, Neurosurgery Research and Education Foundation, American Association of Neurologic Surgeons, Mayo Clinic College of Medicine, Rochester, MN, United States. |
| 1998 | Award of Academic Merit for Academic Excellence. Graduate School. University of Miami, Coral Gables, FL, United States. |
| 1997 | Travel Fellowship, University of Miami, Coral Gables, FL, United States. |
| 1997 | Certificate of Recognition. National Institutes of Health. |
| 1997 | Excellence in Research Award. National Institutes of Health, American Medical Student Association. |
| 1994-1997 | Faculty Commendation. Excellence in Biomedical Teaching. University of Miami, Coral Gables, FL, United States. |
| 1984-1988 | U.S. Steel Bioengineering and Technology College Scholarship. |
| 1984-1988 | Westinghouse Science and Technology College Scholarship. |

## SOCIETY MEMBERSHIPS:

Member. New York Academy of Sciences
Founding Member. American Academy of Nanomedicine
Executive Representative. Congress of Neurological Surgeons. Neuro-Oncology division.
Faculty Member. AO Spine North America
Member. Society of Neuroscience
Member. Congress of Neurological Surgeons
Member. Biophysical Society
Member. American Association of Neurological Surgeons
Member. American Association for the Advancement of Science
Member. AANS/CNS Section on Tumors

## PRIOR EXPERIENCE:

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| 1989-1990 | Laboratory Assistant Dept. of Biochemistry, University of Georgia, Athens, GA. |
| 1988 | Summer Fellowship, Department of Biochemistry, University of Georgia, Athens, GA. |
| 1987 | Summer Fellowship, Department of Molecular Virology, Rockefeller University, New York, NY, United States. |
| 1986 | Summer Fellowship, Department of Molecular Virology, Rockefeller University, New York, NY, United States. |
| 1985 | Visiting Science Fellowship, Ludwig Institute for Cancer Research, Bern |
| 1984 | Summer Fellowship, Department of Molecular Parasitology, Rockefeller University, New York, NY, United States. |
| 1983 | Summer Researcher, Department of Molecular Parasitology, Rockefeller University, New York, NY, United States. |
| 1982 | Summer Researcher, Viral Oncology and Tumor Biology Laboratory, Memorial Sloan-Kettering Cancer Center, New York, NY, United States. |

## TEACHING EXPERIENCE:

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| 2007-present | Neurotrauma. The Ohio State University (Columbus, OH). |
| 2008 | Operating Room Personnel Spine Course. AO Spine North America (Columbus, OH). |
| 2007 | Principles and Treatment of Spinal Disorders for Residents and Fellows. AO Spine North America (Atlanta, GA). |
| 2006 | Operating Room Personnel Spine Course. AO Spine North (Philadelphia, PA) |
| 2004 | The Cellular Physiology of Disease (Columbia University, NYC) |
| 1993 - 1998 | Cellular Biophysics. Leonard M. Miller School of Medicine at the University of Miami (Miami, FL) Small group leader. |
| 1993 - 1998 | Neurophysiology. Leonard M. Miller School of Medicine at the University of Miami (Miami, FL) Small group leader. |
| 1993 - 1998 | Systemic Physiology (Cardiovascular, Respiratory, Renal, and Gastrointestinal). Leonard M. Miller School of Medicine at the University of Miami (Miami, FL) Small group leader. |
| 1993 - 1998 | Canine Cardiovascular Interventional Laboratory. Leonard M. Miller School of Medicine at the University of Miami (Miami, FL) Small group leader. |

## EDITORIAL ACTIVITIES:

**Ad Hoc Reviewer:**
Journal of Cellular and Molecular Medicine
The National Foundation for Science, Higher Education and Technological Development of the Republic of Croatia
Protein and Peptide Letters
Journal of Robotic Surgery

## PROFESSIONAL SERVICE

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| 2009-present | Task Force Committee, Medical Contributor.<br>Notes:Meetings to discuss improvement of patient care and services |
| 2008-present | Clinical Resource Utilization Committee, Medical Contributor.<br>Notes:Meetings to discuss improvement of hospital stay |
| 2006-present | Journal Club, Faculty Facilitator. |
| 2006-present | Education Committee, Member. |
| 2006-present | Neurosurgical-Neurology Epilepsy Conference, Medical Leader.<br>Notes:Collaborator and Neurosurgical Advisor |

## ADVISING:

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| 2008 | Shreyas S. Rao. Brain Mimetic Biomaterials for Investigating Tumor Cell Invasiveness. The Ohio State University, Columbus, OH. Current Position: Graduate Fellow, Chemical and Biomolecular Engineering. |

## BOOK CHAPTERS:

A Sarkar, EA Chiocca. Glioblastoma and malignant astrocytoma. In *Brain tumors: An encyclopedic approach*. Edited by Kaye and Laws. Edinburgh, New York, USA: Churchill Livingstone. (In press)

JM McGregor, **A Sarkar**. 2009. Stereotactic radiosurgery and stereotactic radiotherapy in the treatment of skull base meningiomas. *Otolaryngologic Clinics of North America*. Vol. 42, no. 4: 677-688.

## PEER REVIEWED JOURNAL ARTICLES:

J Clarke, S Register, J McGregor, J Grecula, N Mayr, J Wang, K Li, N Gupta, K Kendra, T Olencki, R Cavaliere, **A Sarkar**, S Lo. 2009. Stereotactic radiosurgery with or without whole brain radiotherapy for patients with a single radioresistant brain metastasis. *American Journal of Clinical Oncology*. (Published online ahead of print)

R Liu, S Garcia-Manyes, **A Sarkar**, C Badilla, J Fernandez. 2009. Mechanical characterization of protein L in the low-force regime by electromagnetic tweezers/evanescent nanometry. *Biophysical Journal*. Vol. 96, no. 9: 3810-3821.

SS Lo, JW Clarke, R Cavaliere, **A Sarkar**, JM McGregor, JC Grecula, JF Montebello, NA Mayr. 2007. Can whole brain radiation therapy be omitted in patients with 1 to 4 brain metastases treated with stereotactic radiosurgery?. *The American Journal of Hematology/Oncology*. Vol. 6: 47-50.

**A Sarkar**, S Caamano, JM Fernandez. 2007. The mechanical fingerprint of a parallel polyprotein dimer. *Biophysical Journal*. Vol. 92, no. 4: L36-8.

JW Thoman, M Ammirati, LP Caragine Jr, JM McGregor, **A Sarkar**, EA Chiocca. 2006. Brain tumor imaging and surgical management: the neurosurgeon's perspective. *Topics in Magnetic Resonance Imaging:TMRI*. Vol. 17, no. 2: 121-6.

**A Sarkar**, EA Chiocca. 2006. Editorial: Prognostic indicators. *Journal of Neurosurgery*. Vol. 105, no. 2: 161-2; discussion 162.

**A Sarkar**, S Caamano, JM Fernandez. 2005. The elasticity of individual titin PEVK exons measured by single molecule atomic force microscopy. *The Journal of Biological Chemistry*. Vol. 280, no. 8: 6261-4.

**A Sarkar**, RB Robertson, JM Fernandez. 2004. Simultaneous atomic force microscope and fluorescence measurements of protein unfolding using a calibrated evanescent wave. *Proceedings of the National Academy of Science*. Vol. 101, no. 35: 12882-6.

**A Sarkar**, RB Robertson, and JM Fernandez. 2004. Simultaneous atomic force microscope and fluorescence measurements of protein unfolding using a calibrated evanescent wave. *Proceedings of the National Academy of Science*. Vol. 35, no. 101: 12882-12886.

**A Sarkar**, MJ Link. 2004. Distal anterior inferior cerebellar artery aneurysm masquerading as a cerebellopontine angle tumor: Case report and review of literature. *Skull Base*. Vol. 2, no. 14: 101-107.

**A Sarkar**, PD Brown, DA Gorman, and BE Pollock. 2002. Evaluation of gamma-knife radiosurgery in the treatment of oligodendroglial and mixed oligodendroastrocytomas. *Journal of Neurosurgery*: 653-656.

**A Sarkar**, BE Pollock, PD Brown, DA Gorman. 2002. Evaluation of gamma knife radiosurgery in the treatment of oligodendrogliomas and mixed oligodendroastrocytomas. *Journal of Neurosurgery*. Vol. 97, no. 5 Suppl: 653-6.

**A Sarkar**, IM Dickerson. 1997. Cloning, Characterization, and Expression of a Calcitonin Receptor from Guinea Pig Brain. *Journal of Neurochemisty*. Vol. 2, no. 69: 445-464.

M Sudol, H Greulich, L Newman, **A Sarkar**, J Sukegawa, T Yamamoto. 1993. A novel Yes-related kinase, Yrk, is expressed at elavated levels in neural and hematopoetic tissues. *Oncogene*. Vol. 4, no. 8: 823-831.

A Hossain, **A Sarkar**, NH Sarkar. 1991. Mixed inocula of mouse mammary tumor cell subpopulation results in changes of organ-specific metastasis. *Clinical and Experimental Metastasis*. Vol. 1, no. 6: 501-515.

DE Stewart, **A Sarkar**, JW Wampler. 1990. Occurrence and role of cis peptide bonds in protein structures. *Peptides*. Vol. 214: 253-260.

**A Sarkar**, WH Gunzburg. 1986. Spleen specific expression of an MMTV related transcript associated with the Mtv-6 locus in BALB/c mice. *Virology*. Vol. 154: 233-239.

M Wallach, **A Sarkar**. 1984. Evolutionary conservation of histidine-rich genes and RNAs in malaria parasites. *Progress in Clinical and Biological Research*. Vol. 155: 109-117.

## CONFERENCES AND LECTURES:

**A Sarkar**. 2009. Nanotechnology in Medicine. 13th North American Neuromodulation Society, Annual Meeting.

**A Sarkar**. 2009. The cellular physiology of disease. Presented at Columbia University. New York, NY.

**A Sarkar**. 2009. Nanotechnology and epilepsy. 59th Congress of Neurological Surgeons, Annual Meeting.

**A Sarkar**. 2009. Developing a model of glioma migration at the single molecule level. Neurosurgical Society of America, Annual Meeting.

**A Sarkar**. 2009. Intraoperative adjuncts to increase the extent of glioma resection. 8th Annual International Neuro-Oncology Update. Hyatt on Capitol Square. Columbus, OH, USA.

**A Sarkar**. 2008. Neuromodulation. Presented at Texas A&M University, to the Texas Brain and Spine Institute. College Station, TX. (March)

**A Sarkar**. 2008. Neurological disease and the single molecule. Presented at Texas A&M University, Neurosciences Seminar. College Station, TX. (March)

**A Sarkar**. 2008. Single molecule mechanical studies of unstructured proteins. Neurosurgical Society of America, Annual Meeting.

**A Sarkar**. 2008. How surgery can improve the epileptics life when anti-convulsants fail. 55th Annual Medical Alumni Society; The Ohio State University, College of Medicine. Columbus, OH.

B Reader Cuson, K Wassenaar, K Thomas, **A Sarkar**, A Abduljalil, MV Knopp, P Schmalbrock. 2008. Initial study of Parkinson's disease at 7T: Can differences between Parkinson's patients and healthy controls be depicted? 16th Annual International Society for Magnetic Resonance in Medicine.

SS Lo, JW Clarke, JM McGregor, JC Grecula, **A Sarkar**, J Wang, N Gupta, K Li, R Cavaliere, NA Mayr. 2008. Stereotactic radiosurgery with or without whole brain radiotherapy for patients with 2-4 radioresistant brain metasases. 50th American Society for Therapeutic Radiology and Oncology.

**A Sarkar**. 2007. Deep brain stimulation and neuromodulation for medically intractable neuro-psychiatric diseases. Presented at The Ohio State University, Medical Center, to the Departments of Neurosurgery and Neurology. Columbus, OH. (September)

**A Sarkar**. 2007. Until there is a cure: Deep brain stimulation for the treatment of Parkinson's disease. Presented at The Ohio State University, to the Central Parkinson's Society, Spring Symposium. Columbus, OH. (April)

**A Sarkar**. 2007. Single molecule mechanics and disease. Presented at The Ohio State University, to the Department of Chemical and Biomolecular Engineering. Columbus, OH. (January)

**A Sarkar**. 2007. Deep brain stimulation: Neuromodulation in psychiatric disorders. Presented at The Ohio State University, Medical Center, to the Department of Psychiatry. Columbus, OH. (January)

**A Sarkar**. 2007. Deep brain stimulation and neuromodulation. Presented at The Ohio State University, to the Department of Physical Medicine and Rehabilitation. Columbus, OH. (January)

R Liu, **A Sarkar**, JM Fernandez. 2007. A new single molecule force microscopy tool reveals cycles of unfolding and refolding pathways of protein-L. Presenter. 51st Biophysical Society, Annual Meeting.

**A Sarkar**. 2005. Nanomechanics of the nervous system. Presented at Dartmouth College, to the Center for the Integration of Medicine and Innovative Technology (Harvard/MIT/Draper Lab). Advanced Technologies in the Neurosciences, Translational Research, and Health Policy. Hanover, NH. (October)

**A Sarkar**. 2005. Single molecule micromechanics - building tools for nanomedicine. Presented at The Ohio State University, Medical Center, to the Department of Neurosurgery. Columbus, OH. (August)

**A Sarkar**. 2005. Single molecule techniques uncover the world of mechanobiology. Presented at the Mayo Clinic, College of Medicine, to the Department of Biomedical Engineering. Rochester, MN. (May)

**A Sarkar**. 2005. Nanotechnology, neurosurgery, and single molecules - the new triumvirate. Presented at the Mayo Clinic, College of Medicine, to the Department of Neurological Surgery. Rochester, MN. (April)

**A Sarkar**. 2005. Breaking the diffraction limit captures single molecule dynamics. Presented at the Second International Symposium on EMCCD Technology, to the Spinal Cord Injury Group. Sponsored by Yale University (New Haven, CT), Andor Technology (Belfast, Northern Ireland), and the EU Programme for Peace and Reconciliation. New Haven, CT. (April)

**A Sarkar**. 2005. Developing tools for exploring forces in the CNS. Presented at the Mayo Clinic, College of Medicine, to the Spinal Cord Injury Group. Rochester, MN. (April)

**A Sarkar**. 2005. Understanding forces in the CNS, one molecule at a time. Presented at the University of Pittsburg, Medical Center, to the Department of Neurological Surgery. Pittsburg, PA. (March)

**A Sarkar**. 2005. Protein microeconomics and nanotechnology as new tools for neuro-oncology research. Presented at the Tri-Campus Neuro-Oncology Research Videoconference. Mayo Clinic College of Medicine. Rochester, MN. (February)

**A Sarkar** and JM Fernandez. 2005. Direct single molecule mechanical studies of protein fibers. 67th Annual Meeting of the American Academy of Neurological Surgery.

S Caamano, **A Sarkar**, JM Fernandez. 2005. The elasticity of the individual titin PEVK exons measured by single molecule atomic force microscopy. 49th Biophysical Society Annual Meeting.

**A Sarkar**. 2004. Developing nanobiological tools for neurosurgical research. Presented at Wayne State University, School of Medicine, to the Department of Neurosurgery. Detroit, MI. (December)

**A Sarkar**. 2004. Evanescent nanometry: A new tool for single molecule investigation. Presented at the 10th International Workshop on "Single Molecule Detection and Ultrasensitive Analysis in Life Sciences". Berlin, Germany. (September)

**A Sarkar**. 2004. Mechanobiology as a new paradigm for neurosurgical research. Presented at the Dartmouth-Hitchcock Medical Center, to the Departments of Neurosurgery and Neurology. Lebanon, NH. (July)

**A Sarkar**. 2004. Building tools for exploring mechanobiology. Presented at the University of Miami, School of Medicine, to the Department of Physiology and Biophysics. Miami, FL. (January)

**A Sarkar**, RB Robertson, H Li, JM Fernandez. 2004. Direct measurements of total internal reflection fluorescence evanescent fields by atomic force microscopy. 48th Biophysical Society Annual Meeting.

**A Sarkar**, RB Robertson, JM Fernandez. 2004. Application of nanotechnology to neurosurgical research. 73rd American Association of Neurological Surgeons Meeting.

**A Sarkar**. RB Robertson, JM Fernandez. 2004. Watching single molecules unfold one at a time. 54th Congress of Neurological Surgeons, Annual Meeting.

ASR Koti, **A Sarkar**, RB Robertson, C Badilla-Fernandez, JM Fernandez. 2004. Single molecule force and fluorescence studies of the enhanced green fluorescent protein (EGFP). 48th Biophysical Society Annual Meeting.

**A Sarkar**, RB Robertson, JM Fernandez. 2004. Measuring distance with nanometer precision. Annual Meeting of the Academy of Molecular Imaging.

**A Sarkar**. 2003. Combining atomic force microscopy and total internal reflection fluorescence microscopy. Presented at the First International Symposium on EMCCD Technology. Sponsored by Queens University (Belfast, Northern Ireland), Andor Technology (Belfast, Northern Ireland), and the EU Programme for Peace and Reconcilliation. Limavady, Northern Ireland. (September)

**A Sarkar**, PD Brown, DA Gorman, BE Pollock. 2002. Evaluation of gamma-knife radiosurgery in the treatment of oligodentroglial and mixed oligodendroastrocytomas. 11th International Meeting of the Leksell Gamma Knife Society. Prague, Czech Republic.

**A Sarkar**, RE Wharen Jr, RJ Uitti. 2002. Novel cyst formation after deep brain stimulator placement: Description of a case and treatment. 52nd Congress of Neurological Surgeons, Annual Meeting.

**A Sarkar**, MJ Ebersold, LM Quast. 2001. Spinal cord hemangioblastomas in von Hippel-Lindau syndrome: A 25-year Mayo Clinic review. 70th American Association of Neurological Surgeons Meeting.

**A Sarkar**, BE Pollock. 2001. New onset trigeminal neuralgia after vestibular Schwannoma radiosurgery: Description of case and treatment. 51st Congress of Neurological Surgeons, Annual Meeting.

**A Sarkar**, MJ Link. 2000. Intracranial aneurysm in association with polyarteritis nodosa. 50th Congress of Neurological Surgeons.

**A Sarkar**, M Ebersold, L Quast. 2000. Central nervous system von Hippel-Lindae: Management and treatment. 4th International Symposium on von Hippel-Lindau.

**A Sarkar**, IM Dickerson. 1997. Analysis of calcitonin receptors in the guinea pig. Eastern Student Research Forum.

**A Sarkar**, IM Dickerson. 1997. An exploration of the physiologic role of the calcitonin receptor. American Medical Student Association Annual Meeting.

AE Leubke, **A Sarkar**, GP Dahl, IM Dickerson. 1996. Tissue distribution of the CGRP receptor. 10th International Congress of Endocrinology.

**A Sarkar**, IM Dickerson. 1996. Cloning, characterization and functional studies of a guinea pig diencephalic calcitonin receptor. Society for Neuroscience, 26th Annual Meeting.

**A Sarkar**, IM Dickerson. 1994. Cloning the guinea pig calcitonin receptor. Society for Neuroscience, 24th Annual Meeting.

**A Sarkar**, H Siddique, NH Sarkar. 1989. Molecular modeling of the mouse mammary tumor virus nucleocapsid zinc-finger protein. American Society for Microbiology Annual Meeting.

## EDUCATIONAL LECTURES:

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| 2009 | Central nervous system trauma. Invited Lecturer. Med 2 Students. The Ohio State University, College of Medicine. Columbus, OH. |
| 2009 | Neurotrauma. Invited Lecturer. Med 3 Students. The Ohio State University, College of Medicine. Columbus, OH. |
| 2008 | Central nervous system trauma. Invited Lecturer. Med 2 Students. The Ohio State University, College of Medicine. Columbus, OH. |
| 2007 | Neurotrauma. Invited Lecturer. Med 3 Students. The Ohio State University, College of Medicine. Columbus, OH. |

## RESEARCH GRANTS:

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| 06/15/2009- 05/31/2012 | "Brain mimetic materials for cancer cell migration studies." NSF 0854015. $300,000.00. Co-Investigator. |

## CURRENT AND PENDING CLINICAL TRIALS:

**Clinical Trials**

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| 12/2008 - present | Phase II: Multicenter, Exploratory study Evaluating the Treatment Effect of Surgery Plus Gliadel® Wafer in Patients with Metastatic Brain Cancer. Gliadel. Columbus, OH, USA. http://clinicaltrials.gov/ct2/show/NCT00525590<br>Role: Principal Investigator<br>Sponsor Protocol ID: 2008W0148<br>Secondary ID: OSU-07107<br>Summary: The purpose of this study is to determine the effect of the surgical intervention and insertion of GLIADEL wafers on the neurocognitive functioning in patients with metastatic brain cancer. |

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| 10/2008<br>present | Phase II: Safety and Efficacy Study Evaluating Glutamic Acid Decarboxylase Gene Transfer to Subthalamic Nuclei in Subjects with Advanced Parkinson's Disease. Neurologix, Inc. Columbus, OH, USA. http://www.neurologixpdtrial.com/<br>Role: Co-Investigator<br>Sponsor Protocol ID: 2008H0193<br>Summary: This investigational study is designed to determine if intracranial administration of glutamic acid decarboxylase (GAD), the enzyme that aids in the production of GABA, will help restore normal function in the brain and alleviate the symptoms associated with Parkinson's disease. |
| 08/2008-<br>present | Ohio Brain Tumor Study. Columbus, OH, USA.<br>Role: Co-Investigator<br>Secondary ID: 2008C0076 |
| 06/2008-<br>present | Phase III: Randomized Study of Neuradiab in Combination With External Beam Radiation and Temozolomide Versus External Beam Radiation and Temozolomide in Patients With Newly Diagnosed Glioblastoma Multiforme. Bradmer Pharmaceuticals, Inc. Columbus, OH, USA.<br>http://clinicaltrials.gov/ct2/show/NCT00615186<br>Role: Principal Investigator<br>Sponsor Protocol ID: BRAD-301<br>Secondary ID: 2008W0148;NCT00615186<br>Summary: The current study will investigate whether the addition of Neuradiab to surgery, radiation and adjuvant chemotherapy (temozolomide) will improve the survival of patients with glioblastoma and whether the drug regimen is safe. |
| 01/2008-<br>present | OSU Brain Tumor Tissue Bank and Nuero-Oncology Information System. The Ohio State University. Columbus, OH, USA.<br>Role: Co-Investigator<br>Sponsor Protocol ID: 2006C0055 |