

## CURRICULUM VITAE

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### M.J. Hogan, M.D., Ph.D.

Associate Professor, Department of Medicine, and Department of Cellular and Molecular Medicine, University of Ottawa  
Neurologist, Division of Neurology, Ottawa Hospital General Campus

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### EDUCATION

1986 - Ph.D. Department of Physics, Queen's University, Kingston, ON  
1979 - M.D. Medicine, Queen's University, Kingston, ON  
1977 - M.A.Sc. Mechanical Engineering, University of Toronto, Toronto, ON  
1974 - B.A.Sc. Engineering Science (Physics Option), University of Toronto, (Honours) Toronto, ON

### POSTGRADUATE EXPERIENCE

1988 - 1991 Fellowship in Stroke Research, Montreal Neurological Institute  
1988 Successful completion of The Royal College of Physicians and Surgeons of Canada and the Corporation professionnelle des médecins du Québec examinations in neurology  
1985 - 1988 Neurology Resident, Kingston General Hospital, Kingston, ON  
1984 R1 Position, Medicine Rotations, Kingston General Hospital  
1980 - 1986 Research into the design and development of a large aperture emission tomography system to perform fully 3-D image reconstruction. Multiwire proportional chamber detectors were used to obtain high resolution images of small source distributions.

Ph.D. Queen's University, Kingston, ON  
 1980 General practice locum in Northbrook, ON  
 1979 - 1980 Rotating Internship, Victoria Hospital Corporation, London, ON  
 1974 - 1977 Studies of changes in surface tension of aqueous solutions of proteins during heat induced conformational changes and attempts to modify these changes using electric fields. M.A.Sc., University of Toronto

## **APPOINTMENTS**

Jan 1 - Jun 30, 2000 Sabbatical at the Imaging Research Laboratory of the John P. Robarts Research Institute, London, ON  
 1998 - Present Associate Professor, University of Ottawa  
 1998 - Present Associate Clinician Scientist, Ottawa General Hospital Research Institute  
 1998 - Present Director of Human Imaging, Dept. of Neurology, Ottawa Hospital - General Campus  
 1998 - Present Neurologist, Division of Neurology, Ottawa Hospital, General Campus  
 1997 - Present Cross-appointed to Department of Cellular and Molecular Medicine, University of Ottawa  
 1997 - 1999 Director of Visualization Laboratory, Ottawa General Hospital Eye Institute  
 1994 - 1997 Cross-appointed to Department of Physiology, University of Ottawa  
 1992 - Present Cross-appointed to School of Graduate Studies, University of Ottawa  
 1992 - 1998 Neurologist, Division of Neurology, Ottawa General Hospital  
 1992 - 1998 Assistant Professor, Department of Medicine, University of Ottawa  
 1991 - 1992 Assistant Neurologist, Montreal Neurological Hospital  
 1991 - 1992 Assistant Professor, Department of Neurology and Neurosurgery, McGill University

## **HONOURS AND AWARDS**

1992 - 1997 Medical Research Council Scholarship  
 1991 - 1992 Fraser, Monat and McPherson Scholarship, McGill University  
 1989 - 1991 Heart and Stroke Foundation of Canada Fellowship  
 1988 McNaughton Prize, Canadian Neurological Society  
 1980 - 1983 Medical Research Council Fellowship  
 1975 National Research Council Scholarship

## **COMMITTEES**

### *Ottawa Hospital, General Campus Committees:*

- Division of Neurology:
  - Clinical Care Committee
  - Clinical Research Committee
- Ottawa Hospital, General Campus Hospital Library Committee
- Neurology Training Program
- Resident Research Committee
- Ottawa Work Group for Imaging Research - Chair

### *University of Ottawa Committees:*

- Task Force on Electronic Communication - April to October 1997
- Research Institute Informatics Coordinating Committee
- Neuro Block Committee
- Informatics Steering Committee
- Computing Committee
- Ad Hoc Committee to examine the possibility of creating a new BSc program in Computational Science
- Radiation Safety Committee

## **PROFESSIONAL SOCIETIES**

American Academy of Neurology  
Canadian Congress for Neurological Sciences  
Society for Neuroscience

## **RESEARCH INTERESTS**

My research is directed at the study of physiologic events occurring during acute cerebral ischemia. These investigations include both laboratory based basic science projects and clinical human imaging studies. This work relies on metabolic and functional imaging techniques and the implementation and development of these computer based imaging methodologies form a secondary area of study within my laboratory. Current projects include the following:

1. In collaboration with investigators within the departments of Neurology and Radiology at the Ottawa Hospital, General Campus and the Department of Rehabilitation Medicine at the Royal Ottawa Hospital, the effect of goal directed rehabilitation therapy on outcome following acute ischemic stroke will be assessed by both clinical scales and imaging techniques. Functional magnetic resonance imaging will be performed on study volunteers using activation paradigms that will explore the potential of therapy to modify patterns of

functional recovery following stroke. If a treatment effect is observed, the results of these studies may impact significantly on the future management of stroke.

2. I am conducting laboratory based studies to investigate the mechanisms of ischemic preconditioning by cortical spreading depression. Preconditioning confers an ability to the brain to resist subsequent ischemic insult. The potential role of activation of both the L-type voltage sensitive and the NMDA receptor linked calcium channels in this process is the focus of this work.
3. In collaboration with Drs. P. Morley and J. Tauskela at the National Research Council and Dr. A. M. Hakim at the Neuroscience Research Institute, studies will be undertaken to investigate the effect of modulation of calcium channel activation and free intracellular calcium on ischemic preconditioning. These studies will attempt to establish a link between calcium homeostasis and the ischemic preconditioning effect induced by cortical spreading depression.
4. I am collaborating with other investigators at the Neuroscience Research Institute to develop new image based statistical analysis tools to investigate various metabolic events occurring in both cerebral ischemia and other disease states.

Significant collaboration and interaction with other members of the Neuroscience Research Institute and University community is ongoing and these studies are undertaken in rich academic and clinical teaching environments. There are potential opportunities for qualified graduate students and post-doctoral fellows in these projects.

## RESEARCH KEYWORDS

- autoradiography
- calcium channels
- cerebral ischemia
- radiotracer kinetics and modelling
- receptor binding

## RESEARCH GRANTS RECEIVED

1999 - 2000 **Heart and Stroke Foundation of Ontario** - *Induced moderate hypothermia in the treatment of acute ischemic stroke.* \$23 644/yr  
Principal Applicant: Dr. P Hebert  
(Co-Applicants: Dr. MJ Hogan, Dr. C Wherett)

- 1997 - 2000 **Heart and Stroke Foundation of Ontario** - *Effect of modulation of calcium homeostasis on Ischemic neuroprotection.* \$50 080/yr  
Principal Applicant: Dr. MJ Hogan  
(Co-Applicants: Dr. AM Hakim, Dr. P Morley)
- 1997 -1998 **Heart and Stroke Foundation of Ontario** - *Functional recovery of the human brain after stroke: a comparison of two rehabilitation programs.*  
Principal Applicant - Dr. MJ Hogan \$25 000/yr  
(Co-Applicants: Dr. D Grinnell, Dr. B Heisel, and Dr. L Avruch)
- 1995 - 1997 **Heart and Stroke Foundation of Ontario** - *Calcium channel activation, trophic factors and neuroprotection in cerebral ischemia.*  
Principal Applicant: Dr. M.J. Hogan \$49 466/yr  
(Co-Applicants: Dr. R Schmidt-Kastner, Dr. AM Hakim)
- 1995 - 1997 **London Life Medical Research Award** - *Improving the brain's resistance to stroke damage.* \$100 000/yr  
Principal Applicant: Dr. AM Hakim,  
(Co-Applicants: Dr. MJ Hogan, Dr. R Schmidt-Kastner, Dr. G Robertson)
- 1994 - 1996 **Heart and Stroke Foundation of Ontario** - *Calcium channel activation and tissue acidosis in acute cerebral ischemia.* \$59 334.  
Principal Applicant: Dr. M.J. Hogan  
(Continued funding from July 1/1996 to June 30/1997) \$20 000
- 1992 - 1997 **Medical Research Council of Canada** - Scholarship.  
Personal salary support. \$58 850/yr
- 1992 - 1994 **Medical Research Council of Canada** - Scholarship.  
Support awarded with scholarship. \$40 000/yr
- 1992 - 1994 **Heart and Stroke Foundation of Ontario** - *Determination of the effect of tissue acidosis on calcium channel function in focal cerebral ischemia.*  
Principal Applicant: Dr. MJ Hogan \$28 034

## RESEARCH TRAINEES

Dr. Hogan is currently accepting applicants for graduate studies. Research areas of interest are outlined in the NRI RESEARCHERS section of this website as well as in this curriculum vitae.

## PUBLICATIONS (PEER-REVIEWED PAPERS)

- + abstracts for publications denoted with an asterisk are found later in this homepage
1. McKee BTA, Dinsdale HB, Hogan MJ, Howse DCN, Kulick J, Mak HB, Stewart AT. Description and performance of a prototype PET system for small volume imaging. Nucl Instr and Methods. (1988) A267: 392-403.
  2. McKee BTA, Hogan MJ, Howse DCN. Compton scattering in a large-aperture positron imaging system. IEEE Trans Med Imaging. (1988) 7: 1989-202.
  3. Hogan MJ, Brunet DG, Ford PM, Lillcrap D. Lupus anticoagulant, antiphospholipid antibodies and migraine. Can J Neurol Sci. (1988) 15: 420-425.
  4. Hogan MJ, Gjedde A, Hakim AM. Nimodipine binding in focal cerebral ischemia. Stroke. (1990) 21(Suppl IV): IV-78-IV-80.
  5. Hogan MJ, Harvey PJ, Howse DC, McKee BTA. Image reconstruction for a 3-D PET system using a minimum norm constraint. Phys Med Biol. (1991) 36: 35-46.
  6. Hogan MJ, Gjedde A, Hakim AM. Activity of the dihydropyridine calcium channels following cerebral ischemia. Arzneim Forsch/Drug Res. (1991) 41(I)Nr.3a: 332-333.
  7. Hogan MJ, McKee BTA, Clack R, Harvery PH, Hiltz LG, Howse DC. Accurate attenuation correction for a 3-D PET system. Phys Med Biol. (1991) 36: 603-619.
  8. Hakim AM, Hogan MJ. In-vivo binding of nimodipine in brain. I. The effect of focal cerebral ischemia. J Cereb Blood Flow Metab. (1991) 11: 762-770.
  9. Hogan MJ, Gjedde A, Hakim AM. In vivo binding of nimodipine in the brain: II. Binding kinetics in focal cerebral ischemia. J Cereb Blood Flow Metab. (1991) 11: 771-778.
  10. Takizawa S, Hogan MJ, Hakim AM. The effects of a competitive NMDA receptor antagonist (CGS-19755) on cerebral blood flow and pH in focal ischemia. J Cereb Blood Flow Metab. (1991) 11: 786-793.
  11. Hogan MJ, Gjedde A, Hakim AM. In vivo distribution of CGS-19755 within brain in a model of focal cerebral ischemia. J Neurochem. (1992) 58: 186-191.
  - +12. Hogan MJ, Hakim AM. Reversibility of nimodipine binding to brain in transient cerebral ischemia. J Neurochem. (1992) 59: 1745-1752.
  - +13. Hakim AM, Hogan MJ, Carpenter S. Time course of cerebral blood flow and histologic outcome after focal cerebral ischemia in rats. Stroke (1992) 23: 1138-1144.
  14. Hogan MJ, Hakim AM; Nimodipine binding in cerebral ischemia: Response to therapy. Drugs in Develop (1993) 2: 325-335.
  - +15. Takizawa S, Hogan MJ, Buchan A, Hakim AM; In-vivo binding of [<sup>3</sup>H]nimodipine in rat brain after transient forebrain ischemia. J Cereb Blood Flow Metab. (1994) 14: 397-405.
  16. Hogan MJ, Takizawa S, Hakim AM; In vitro binding of [<sup>3</sup>H]Nimodipine and [<sup>3</sup>H]CGS19755 to rat brain in focal cerebral ischemia. Exp Neurol. (1995) 134(1): 56-63.

- +17. Matsushima K, Hogan MJ, Hakim AM; Cortical spreading depression protects against subsequent focal cerebral ischemia in rats. *J Cereb Blood Flow Metab.* (1996) 16: 221-226.
- 18. Osuga S, Hakim AM, Osuga H, Hogan MJ; In-vivo uptake of [<sup>3</sup>H]nimodipine into brain during cortical spreading depression. *J Cereb Blood Flow Metab.* (1997) 17: 586-590.
- 19. Osuga S, Hogan MJ; In-vivo uptake of [3H]Nimodipine in focal cerebral ischemia modulation by hyperglycemia. *J Cereb Blood Flow Metab.* (1997) 17: 1057-1065.
- 20. Hazell AS, Hakim AM, Senterman MK and Hogan MJ: Regional activation of L-type calcium channels in experimental thiamine deficiency. *J Neurosci Res.* (1998) 52: 742-749.
- 21. Matsushima K, Schmidt-Kastner R, Hogan MJ, Hakim, AM: Cortical spreading depression activates trophic factor expression in neurons and astrocytes and protects against subsequent focal brain ischemia. *Brain Res.* (1998) 807: 47-60.
- 22. Tauskela J, Chakravarthy BR, Murray C, Wang Y, Comas T, Hogan MJ, Hakim AM, Morley P. Evidence from cultured rat cortical neurons of differences in the mechanism of ischemic preconditioning of brain and heart. *Brain Res.* (1999) 827: 143-151.
- 23. Osuga H, Osuga S, Wang F, Fetni R, Hogan MJ, Slack RS, Hakim AM, Ikeda J, Park DS: Cyclin-dependent kinases as a therapeutic target for stroke. *Proc Natl Acad Sci USA* (in press, June 2000).

**PUBLICATIONS (INVITED AND NON-REFEREED PAPERS)**

- 1. Hogan MJ, Hakim AM. Pathophysiology of stroke: Laboratory and clinical insights. *Current Opinion in Neurology and Neurosurgery* (1990) 3: 46-49 (Invited Article).
- 2. Morley P, Hogan MJ, Hakim AM. Calcium-mediated mechanisms of ischemic injury and protection. *Brain Pathology* (1994) 4: 37-47.

Updated Jun 28, 2000