

## CURRICULUM VITAE

Name Tom V.H. Smulders  
 Date and place of birth February 26 1970, Wilrijk (Belgium)  
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### QUALIFICATIONS

**2003-2005** Post-Graduate Certificate in Academic Practice, University of Newcastle, UK  
**1992-1998** Ph.D. in Biopsychology at Cornell University, USA. (Supervisor: Prof. Timothy J. DeVoogd)  
**1990-1992** Licentiaat in de Wetenschappen, richting Dierkunde at the University of Antwerp, Belgium  
 (Equivalent: Master of Science in Zoology)  
**1988-1990** Kandidaat in de Wetenschappen at the University of Antwerp, Belgium (Equivalent: Bachelor of Science (Biology))

### EMPLOYMENT

**2008-present** Senior Lecturer (Equivalent: Associate Professor), Newcastle University, UK  
**2003-2008** Lecturer (Equivalent: Assistant Professor), Newcastle University, UK  
**2002-2003** Temporary Lecturer, University of Newcastle upon Tyne, UK  
**2000-2002** Post-doctoral researcher, Department of Neurobiology, Duke University Medical Center, USA  
 (Supervisor: Prof. Erich D. Jarvis)  
**1998-2000** Post-doctoral researcher, Department of Physiology and Pharmacology, Wake Forest University  
 School of Medicine, USA (Supervisor: Prof. Robert E. Hampson)

### FUNDING OBTAINED

**2008** Royal Society Conference Grant: £1,285  
**2008** BBSRC Research Equipment Initiative grant: Climate-controlled chambers for the study of physiology and behaviour £146,000.  
**2007** Undergraduate Summer Research Scholarship Nuffield Foundation: A quantitative comparison of the hippocampal formation of storing and non-storing bird species. £1,360  
**2006** Undergraduate Summer Research Scholarship Nuffield Foundation: Examining the incorporation of new neurons in adult brains. £1,240  
**2006-2010** EPSRC Joint Project Grant: CARMEN (Code Analysis, Repository and Modeling for e-Neuroscience). £3,800,000 (co-investigator in multi-university collaboration)  
**2005-2006** Catherine Cookson Foundation Grant: What is the function of new brain cells? £4,000  
**2005-2008** BBSRC Research Grant: Natural regulation of adult neuronal recruitment: comparing food-hoarding and non-hoarding songbirds. £307,624  
**2005-2008** BBSRC Strategic Studentship: Encoding of Episodic-like Memory in the Hippocampus of Food-hoarding Birds. £46,000  
**2005** Undergraduate Summer Research Scholarship Nuffield Foundation: Olfaction in magpies. £1,400  
**2004-2005** BBSRC Research Grant: Neural Substrates for Spatial and Non-Spatial Memory in Food-Storing Birds (collaboration with Dr. S. Healy, Univ. of Edinburgh): £134,845  
**2003-2006** BBSRC Committee Studentship: Cognitive Strategies for Efficient Cache Distribution in Scatter-Hoarding Birds. £39,120  
**2000-2001** NRSA Institutional Post-Doctoral Fellowship from the National Institutes of Health (USA)  
**1999-2000** NRSA Individual Post-Doctoral Fellowship from the National Institutes of Health (USA)  
**1995-1996** Dallenbach Fellowship, Cornell University, Ithaca, NY  
**1995** Scholarship from the Society of General Physiologists  
**1992-1993** Philips Fellow of the Belgian American Educational Foundation (BAEF)

**ADMINISTRATIVE DUTIES**

- 2007-present** Chair of the Seminar Committee, Institute of Neuroscience, Newcastle University  
**2006-2008** Stage 2 Director for the BSc in Psychology, Newcastle University  
**2005-2007** Member of the Management Board of the Institute of Neuroscience, Newcastle University  
**2005-2007** Safety Committee, Psychology, Newcastle University  
**2005-2006** Admissions tutor for the Diploma and Certificate in Psychology  
**2003-present** Coordinator Psychology Seminar Series, Newcastle University  
**2002-2007** Mailing-list coordinator for Psychology, Newcastle University

**TEACHING EXPERIENCE**

- 2006-present** Newcastle University: Cognitive Neuroscience (contributor)  
**2006-present** Newcastle University: Practice of Psychology (module leader)  
**2003-present** Newcastle University: Biological Psychology: Sex, Drugs, Rhythms & Blues (module leader)  
**2002-present** Newcastle University: Undergraduate Research Projects (contributor)  
**2004-2006** Newcastle University: Instinct, Learning and Memory (contributor)  
**2003-2006** Newcastle University: Zoology Field Course (contributor)  
**2002-2005** Newcastle University: Psychology Dissertation (contributor)  
**2000-2002** Duke University: Research supervision of undergraduate and post-graduate students  
**1997** Cornell University: Statistics and Experimental Design (teaching assistant)  
**1997** Cornell University: Biopsychology of Learning and Memory (teaching assistant)  
**1996** Cornell University: Biopsychology Laboratory (teaching assistant)  
**1996** Marine Biological Laboratory, Woods Hole, MA: Neural Systems and Behavior summer course (teaching assistant)  
**1993-1995** Cornell University: Introduction to Biology (teaching assistant)  
**1993-1996** Cornell University: Beginners' ballroom dance class (module leader)

**PROFESSIONAL ACTIVITIES***Editorial Activities*

- 2008-present** Editorial Board (Reviewing Editor) of *Frontiers in Behavioral Neuroscience*  
**2008-2010** Editorial Board of *Biology Letters* (Royal Society of London)  
**2008-2009** Guest Editor of a Special Issue on "Integrating Ecology, Psychology, and Neurobiology Within a Food-hoarding Paradigm" in *Philosophical Transactions of the Royal Society B*  
**2008-2009** Guest Editor of a Special Feature on "Brain Evolution" in *Biology Letters*

*Workshops/Symposia*

- 2009** Teaching Biopsychology, Bristol, UK (Invited Speaker)  
**2009** Food-hoarding animals: a multi-disciplinary approach to behavior, Rennes, France (Organizer)  
**2009** Large-scale spatial cognition in birds and mammals, Rome, Italy (Invited Speaker)  
**2009** Mechanisms of Cognition, Learning and Memory, Ruhr-University Bochum, Germany (Invited Speaker)  
**2008** Integrative Biology of Scatter Hoarding: Ecology, Psychology and Neuroscience, Cornell University, USA (Organizer)  
**2007** INCF Workshop on Neuroanatomical Nomenclature and Taxonomy, Karolinska Institute, Sweden (Invited Speaker)  
**2007** Stem Cells and the Brain, Newcastle University, UK (Organizer)

*Membership of Academic Societies*

- Fellow of the Higher Education Academy  
 Member of the Association for Psychological Science  
 Member of the Association for the Study of Animal Behaviour  
 Member of the British Neuroscience Association  
 Member of the International Society for Neuroethology  
 Member of the International Society for Behavioral Ecology  
 Member of the Natural History Society of Northumbria

**Peer Reviewer**Journals:

American Naturalist	Animal Behaviour
Animal Cognition	The Auk
Behavioural Brain Research	Behavioral Ecology
Behavioral Neuroscience	Biology Letters
Brain, Behavior and Evolution	Developmental Psychobiology
Ecology Letters	Ethology
European Journal of Neuroscience	Hormones and Behavior
The Ibis	Integrative and Comparative Biology
Journal of Chemical Neuroanatomy	Journal of Neurobiology
Journal of Neuroscience Methods	Neuropsychologia
Neuroscience Letters	Proceedings of the Royal Society of London B
Psychological Science	Science
Trends in Cognitive Sciences	Trends in Ecology and Evolution
Trends in Neuroscience	

Funding Agencies:

National Science Foundation (USA)	BBSRC (UK)
Academy of Sciences of the Czech Republic	

**Higher Degree Students**

PhD Students graduated:

- Dr. L. Male (Newcastle University, graduated August 2006)
- Dr. R. C. Cockcroft (Newcastle University, graduated November 2008)

PhD Students under supervision:

- Mr. C. Echtermeyer (University of St-Andrews, started 1/10/06)

External Examiner for PhDs:

- Dr. Z. Hodgson (University of Edinburgh)

Internal Examiner for PhDs:

- Dr. R. Santer (Newcastle University)
- Dr. C. Troakes (Newcastle University)
- Dr. A. Chen (Newcastle University)

Internal Examiner for MPhils:

- Ms. Paula Sainthouse (Newcastle University)

**Invited Departmental Seminars**

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| <b>2009</b> | <u>A neuro-ecological approach to understanding the neural basis of memory processing</u><br>Keio University, Japan..   |
| <b>2009</b> | <u>A neuro-ecological approach to understanding the neural basis of memory processing</u><br>RIKEN Brain Science Institute, Japan.  |
| <b>2009</b> | <u>Food-hoarding birds: a natural model system to understand the neural basis of memory</u> School of<br>Biological Sciences, Madurai Kamaraj University, India.  |
| <b>2007</b> | <u>Spatial memory in food-hoarding birds: evolution and ecological function.</u> School of Biology,<br>University of St-Andrews, UK.  |
| <b>2006</b> | <u>Seasonal changes in hippocampal volume in food-hoarding birds: implications for hippocampal<br/>function.</u> School of Biomedical and Natural Sciences, Nottingham Trent University,<br>Nottingham, UK. |
| <b>2005</b> | <u>Cache dispersal strategies by coal tits: a role for spatial memory?</u> Zangwill Club, Department of<br>Experimental Psychology, University of Cambridge, Cambridge, UK                                  |
| <b>2004</b> | <u>The avian hippocampus and memory for cache locations.</u> Department of Psychology, Durham<br>University, Stockton-on-Tees, UK   |
| <b>2004</b> | <u>What is the purpose of spatial memory for food-hoarding birds?</u> Sub-Department of Animal<br>Behaviour, University of Cambridge, Cambridge, UK   |
| <b>1999</b> | <u>Seasonal variation in the brain of a food-hoarding bird, the black-capped chickadee,</u> Invited<br>Symposium, Society for Behavioral Neuroendocrinology Meeting, Charlottesville, VA                    |
| <b>1997</b> | <u>Seasonal Variation in the Chickadee Brain,</u> Department of Biology, College of William and<br>Mary, Williamsburg, VA   |

**1996** Seasonal Changes in the Avian Hippocampus : Where do we go from here? University of Western Ontario, London, ON

### **Community Outreach**

**2009** Café Scientifique on Avian Cognition at the Photographers' Gallery in London  
**2009** Organizer of the "Darwin's Origins 150 Reading Group" in Newcastle upon Tyne.  
**2009** Cache or carry: storing food for tough times. North Northumberland Bird Club  
**2008** Cache or carry: how coal tits store food for later consumption. BTO Northumberland  
**2004** Cache or carry? Behavioural strategies for surviving winter. Natural History Society of Northumbria, Newcastle upon Tyne, UK  
**1999** The brain and how to take care of it. YMCA summer camp, Winston-Salem, NC  
**1996** Cache or Carry: Decisions made by Food-Hoarding Birds, Cayuga Bird Club, Ithaca, NY  
**1996** Of Birdbrains and Seahorses: a Story of Food-Hoarding Birds, Laboratory of Ornithology, Cornell University, Ithaca, NY

### **Interactions with the Media**

- Served as consultant for print media in the UK, the Netherlands, France and Germany.
- Appearances on TV (Tyne Tees-TV, BBC News) and Radio (BBC, local radio) as an expert on avian brains and cognition.
- Member of the Beacons NorthEast group

### **LANGUAGE SKILLS**

Fluent in spoken and written Dutch  
 Fluent in spoken and written English  
 Competent in spoken and written French  
 Reading and conversational skills in German  
 Notions of Italian and Latin

### **PUBLICATIONS**

#### **Peer-reviewed**

1. **Smulders, T.V.**, Sasson, A.D. and DeVoogd, T.J. (1995) Seasonal Variation in Hippocampal Volume in a Food-Storing Bird, the Black-Capped Chickadee. *J Neurobiol* 27 (1) pp. 15-25.
2. **Smulders, T.V.** and Dhondt, A.A. (1997) How much memory do tits need ? *TREE* 12 pp. 417-418.
3. **Smulders, T.V.** (1998) A game theoretical model of the evolution of food-hoarding : applications to the Paridae. *Am Nat* 151 (4) pp. 356-366.
4. Van der Linden, A., Verhoye, M., Van Audekerke, J., Peeters, R., Newman, S.W., **Smulders, T.V.**, Eens, M., Balthazart, J. and DeVoogd, T.J. (1998) Non invasive in-vivo anatomical studies of the oscine brain by high resolution MRI microscopy. *J Neurosci Meth* 81 (1-2) pp. 45-52.
5. **Smulders, T.V.**, Casto, J.M., Nolan, V., Jr., Ketterson, E.D., and DeVoogd, T.J. (2000) Effects of experience and testosterone on four brain regions in the dark-eyed junco (*Junco hyemalis*). *J Neurobiol* 43 pp. 244-253.
6. **Smulders, T.V.** and DeVoogd T.J. (2000) Expression of immediate early genes in the brain of the black-capped chickadee (*Poecile atricapillus*) during a food-hoarding task. *Behav Brain Res*, 114 (1-2) pp. 39-49.
7. **Smulders, T.V.**, Shiflett, M.W., Sperling, A.J. and DeVoogd, T.J. (2000) Seasonal changes in neuron numbers in the hippocampal formation of a food-hoarding bird: the black-capped chickadee. *J Neurobiol*, 44 (4) pp. 414-422
8. Darlington, R.B. and **Smulders, T.V.** (2001) Problems with residual analysis. *Anim Behav* 62 (3) 599-602.
9. Shiflett, M.W., Gould, K.L., **Smulders, T.V.** and DeVoogd, T.J. (2002) Septum volume and food-storing behavior are related in parids. *J Neurobiol* 51 (3) 215-222
10. **Smulders, T.V.** (2002) Natural breeding conditions and artificial increases in testosterone have opposite effects on the brains of adult male songbirds. *Horm Behav* 41(2) 156-169
11. Jarvis, E.D., Smith, V.A., Wada, K., McElroy, M., **Smulders, T.V.**, Rivas, M.V., Carninci, P., Hayashisaki, Y., Dietrich, F., Wu, X., Yu, J., Wang, P.P., and Hartemink, A.J. (2002) A framework for integrating the songbird brain. *J Comp Physiol-A* 188 pp.961-980.

12. Shiflett, M.W., **Smulders, T.V.**, Benedict, L. and DeVoogd, T.J. (2003) Reversible inactivation of the hippocampal formation in food-storing black-capped chickadees (*Poecile atricapillus*). *Hippocampus* 13, 437-444.
13. Reiner, A., Perkel, D.J., Bruce, L., Butler, A.B., Csillag, A., Kuenzel, W., Medina, L., Paxinos, G., Shimizu, T., Striedter, G.F., Wild, M., Ball, G.F., Durand, S., Güntürkün, O., Lee, D.W., Mello, C.V., Powers, A., White, S.A., Hough, G., Kubikova, L., **Smulders, T.V.**, Wada, K., Dugas-Ford, J., Husband, S., Yamamoto, K., Yu, J., Siang, C., and Jarvis E.D. (2004) Revised nomenclature for avian telencephalon and some related brainstem nuclei. *J Comp Neurol*, 473, 377-414.
14. Reiner, A., Perkel, D.J., Bruce, L., Butler, A.B., Csillag, A., Kuenzel, W., Medina, L., Paxinos, G., Shimizu, T., Striedter, G.F., Wild, M., Ball, G.F., Durand, S., Güntürkün, O., Lee, D.W., Mello, C.V., Powers, A., White, S.A., Hough, G., Kubikova, L., **Smulders, T.V.**, Wada, K., Dugas-Ford, J., Husband, S., Yamamoto, K., Yu, J., Siang, C., and Jarvis E.D. (2004) The avian brain nomenclature forum: Terminology for a new century in comparative neuroanatomy. *J Comp Neurol*, 473, E1-E6.
15. The Avian Brain Nomenclature Consortium (Jarvis, E.D., Güntürkün, O., Bruce, L., Csillag, A., Karten, H., Kuenzel, W., Medina, L., Paxinos, G., Perkel, D.J., Shimizu, T., Striedter, G., Wild, M., Ball, G.F., Dugas-Ford, J., Durand, S., Hough, G., Husband, S., Kubikova, L., Lee, D., Mello, C.V., Powers, A., Siang, C., **Smulders, T.V.**, Wada, K., White, S.A., Yamamoto, K., Yu, J., Reiner, A. and Butler, A.B.) (2005) Avian brains and a new understanding of vertebrate brain evolution. *Nature Reviews Neuroscience* 6, 151-159
16. **Smulders, T.V.**, Lisi, M.D., Tricomi, E., Otter, K.A., Chruszcz, B., Ratcliffe, L.M. and DeVoogd, T.J. (2006) Failure to detect seasonal changes in the song system nuclei of the black-capped chickadee (*Poecile atricapillus*). *J. Neurobiol.* 66 (9), 991-1001.
17. Ferreira, A.R.J., **Smulders, T.V.**, Sameshima, K., Mello, C.V. and Jarvis, E.D. (2006) Vocalizations and Associated Behaviors of the Sombre Hummingbird (*Aphantochroa cirrhochloris*) and the Rufous-breasted Hermit (*Glaucis hirsutus*). *The Auk* 123 (4), 1129-1148.
18. **Smulders, T.V.** (2006) A multi-disciplinary approach to understanding hippocampal function in food-hoarding birds. *Rev Neurosci* 17 (1-2), 53-69.
19. Smith, V.A., Yu, J., **Smulders, T.V.**, Hartemink, A.J. and Jarvis, E.D. (2006) Computational Inference of Neural Information Flow Networks. *PLoS Computational Biology* 2 (11), 1436-1449.
20. Male, L.H. and **Smulders, T.V.** (2007) Memory for food caches: not just for retrieval. *Behav Ecol* 18 (2), 456-459.
21. Male, L.H. and **Smulders, T.V.** (2007) Hyper-dispersed cache distributions reduce pilferage: A field study. *Animal Behaviour*. 73(4), 717-726.
22. Male, L.H. and **Smulders, T.V.** (2007) Memory decay and cache site preferences in hoarding coal tits - a laboratory study. *Behaviour* 144, 693-710.
23. Smith, L.S., Austin, J., Baker, S., Borisyuk, R., Eglén, S., Feng, J., Gurney, K., Jackson, T., Kaiser, M., Overton, P., Panzeri, S., Quián Quiroga, R., Schultz, S.R., Sernagor, E., Smith, V.A., **Smulders, T.V.**, Stuart, L., Whittington, M. and Ingram, C. (2007) The CARMEN e-Science pilot project: Neuroinformatics work packages. *Proceedings of the UK e-Science All Hands Meeting 2007 10-13 September 2007* (ed: S. J. Cox), 591-598, 2007 (ISBN 978-0-9553988-3-4).
24. Male, L.H. and **Smulders, T.V.** (2008) Hyper-dispersed cache distributions reduce pilferage: A laboratory study. *Journal of Avian Biology* 39, 170-177.
25. Zinkivskay, A., Nazir, F. and **Smulders, T.V.** (2009) What-Where-When memory in magpies (*Pica pica*). *Animal Cognition*. 12, 119-125.
26. **Smulders, T.V.** (2009) The relevance of brain evolution for the Biomedical Sciences. *Biology Letters*. 5, 138-140.
27. **Smulders, T.V.** (2009) Darwin 200: Special feature on brain evolution. *Biology Letters*. 5, 105-107
28. Echtermeyer, C., **Smulders, T.V.** and Smith, V.A. (2009) Causal Pattern Recovery from Neural Spike Train Data using the Snap Shot Score. *Journal of Computational Neuroscience*. In press.
29. **Smulders, T.V.**, Gould, K. and Leaver, L.A. (submitted) Detailed knowledge of ecology and natural history makes specific predictions about cognition and neurobiology of food-hoarding animals. *Philosophical Transactions of the Royal Society B*
30. Pravosudov, V.V. and **Smulders, T.V.** (submitted) Introduction. Integrating Ecology, Psychology, and Neurobiology Within a Food-hoarding Paradigm. *Philosophical Transactions of the Royal Society B*
31. Roth, T. II, Brodin, A., **Smulders, T.V.**, La Dage, L. and Pravosudov, V.V. (submitted) Processes underlying volumetric changes in the hippocampus. *Philosophical Transactions of the Royal Society B*
32. Holland, S.M. and **Smulders, T.V.** (in revision) How episodic is episodic-like memory? *Biology Letters*
33. Lange, C.H., Orell, M. and **Smulders, T.V.** (in revision) Seasonal variation in foraging and hoarding by free-ranging willow tits *Poecile montanus*. *Journal of Avian Biology*

34. **Smulders, T.V.** and Jarvis, E.D. (in revision) Electrophysiological properties of the auditory telencephalon in freely behaving songbirds using microelectrode arrays
35. **Smulders, T.V.**, Sambandan, D. and Jarvis, E.D. (in revision) Population electrophysiological activity predicts numbers of *zenk* expressing neurons in awake, behaving animals.
36. Cockcroft, R.C. and **Smulders, T.V.** (in revision) Leptin suppresses food-hoarding in coal tits (*Periparus ater*).
37. **Smulders, T.V.** and Jarvis, E.D. (in prep) Neural Responses to Self-Generated Vocalizations in Songbirds Suggest a New Model of Auditory Feedback
38. Cockcroft, R.C. and Smulders, T.V. (in prep) Are caches necessary for daily mass gain? A test of the Digestive Bottleneck Hypothesis.
39. Lange, C.H., Walker, L., Orell, M. and **Smulders, T.V.** (in prep) Seasonal changes in the hippocampus of hoarding and non-hoarding titmice.
40. Feenders, G. and Smulders, T.V. (in prep) The use of non-spatial cues in cache retrieval by magpies (*Pica pica*).

#### ***Invited Book Chapters/Contributions***

1. **Smulders, T.V.** and DeVoogd, T.J. (2000) The avian hippocampal formation and memory for hoarded food: spatial learning out in the real world. In: BRAIN, PERCEPTION, MEMORY. Advances in Cognitive Neuroscience. (J.J. Bolhuis, Ed.) Oxford University Press, Oxford, pp. 127-148.
2. Feenders, G. & **Smulders, T.V.** (2008) Episodic-like memory in food-hoarding birds. In: HANDBOOK OF EPISODIC MEMORY (E. Dere, A. Easton, L. Nadel & J.P. Huston Eds), Elsevier, The Netherlands, pp. 197-216.
3. **Smulders, T.V.** (2009) Large-scale spatial cognition in food-hoarding birds? In: Large-scale spatial cognition in birds and mammals: a report of an ESF workshop (H.-P. Lipp, Ed) in press.

#### ***Book Reviews***

1. **Smulders, T.V.** and Hampson, R.E. (2000) "Beyond the cognitive map: from place cells to episodic memory", by A.D. Redish (Book Review). Q Rev Biol 75 (4), 491-492.
2. **Smulders, T.V.** (2004) "Neurobiology of Spatial Behaviour", Ed. by K.J. Jeffery (Book Review). Anim Behav 86 (2), 433-434.
3. Smulders-Srinivasan, T.K. and **Smulders, T.V.** (2007) "Adult neurogenesis: stem cells and neuronal development in the adult brain", by G. Kempermann (Book Review). J Chem Neuroanat. 34, 145-146.