



Curriculum Vitae

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Bibliography

Rivka Ravid, Ph.D.

Consultancy:

Brain Bank Consultants

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PART 1 - Curriculum Vitae

Personal

1948 Born in, Krakow, Poland
2 daughters, born in 1970 and 1976

Education and professional career development

1965 High School graduation, Herzlia High School, Israel

1970 B.Sc. (Biology), University of Jerusalem

1974 M.Sc. degree (with honors) University of Jerusalem

Main major: Zoology; Secondary majors: Biochemistry, Immunology.

Thesis: 'Identification of Plasma Androstane diols in peripheral blood of female rats before the onset of puberty', Instructor: Prof. B. Eckstein.

1980 Ph.D. thesis: 'Steroidogenic Changes in Rat Ovaries stimulated to ovulate', Instructor: Prof. B. Eckstein, University of Jerusalem.

Post-graduate research training

1983 - 1985 Post-doctoral fellow in the Netherlands Institute for Brain Research, Amsterdam, the Netherlands; Van der Houten Fonds.
Main subjects: Neurosecretion and Immunocytochemical techniques for localization of vasopressin receptors in brain and kidney of mammals.

1985 - 1987 Fellowship from The John Douglas French Foundation for Alzheimer's Disease, Los Angeles, USA, to carry out the project on 'Alterations in the vasopressin receptor in aging and Alzheimer's disease'.

Post-doctoral courses

1981 ETP-course on: 'Basic Methods in Brain and Behavior Research in animals', Bergen, Norway.

1982 EMBO-course on: 'Immunocytochemistry and its application in Brain Research', Amsterdam, the Netherlands.

1987 PAOG-course on: 'Practical Neuroanatomy and Computer Tomography', Amsterdam, the Netherlands.

- 1988** Practical course on ‘Human Neuroanatomy’, Netherlands Institute for Brain Research, Amsterdam, The Netherlands.
- 1998** PAOG-course on: “Neuropathology of the human brain”, Free University Hospital
- 1998** ‘Neuroimaging’, Vrije Universiteit, Amsterdam, The Netherlands.

Recent/Current Positions

- 2001 – 2006**
- Head /managing/scientific director of the Netherlands Brain Bank.
 - Project leader Netherlands Institute for Brain Research.
 - Project leader on Legal and Ethical issues in Brain Banking (WP 2) and Donor Programs (WP7) at Brain-net Europe (BNE).
 - Member of the Governing board of BNE (I+II).
- 2006**
- Scientific advisor on Brain Banking to the Netherlands Brain Bank and the Royal Dutch Academy of arts and Sciences, Amsterdam, The Netherlands.
- 2007 - 2009**
- Director and founder of Brain Bank Consultants.
 - Senior scientist Netherlands Institute for Neurosciences, Amsterdam.
 - Scientific advisor to the Netherlands Brain Bank and Netherlands Institute of Neurosciences on Bio/Tissue Banking of human specimens.
- 2009 -**
- Member of the Steering committee of the Brazilian Brain Bank for Aging, San Paolo, Brazil.
 - Member of the Management Board of the UK MS-Tissue Bank, Imperial College, London, UK.

Previous employments

- 1970 - 1971** Immunological research, Department of Cell Biology, Weizmann Institute for Life Sciences, Rehovot, Israel.
- 1971 - 1972** Instructor at Department of Zoology, University of Jerusalem, Israel.
- 1973** Research fellow in Hadassah Hospital , Jerusalem, Israel.
- 1974 - 1977** Instructor at Department of Zoology, University of Jerusalem.
- 1980 - 1982** Research fellow (lecturer status), Department of Zoology, University of Jerusalem, Israel.

- 1983 - 1985** Post-doctoral fellow at the Netherlands Institute for Brain Research, Amsterdam, NL.
- 1985 - 1987** Research fellow of the John Douglas French Foundation, LA, USA/ Amsterdam, NL.
- 1987 -** Co-ordinator of the Netherlands Brain Bank. Research fellow at the Netherlands Institute for Brain Research, Amsterdam, the Netherlands.
- 1985 - 2000** Co-founder and chairmen of the European network of Brain Banking (EBBN).
- 1987 - 2001** Coordinator Netherlands Brain Bank.
- 1987 - 2006** Secretary and treasurer of the Foundation of the Netherlands Brain Bank (Stichting tot Ondersteuning van de Hersenbank).

Honors and Awards

- 1970 – 1971** Fellowship for immunological research, Department of Cell Biology, Weitzman Institute for Life Sciences, Rehovot, Israel.
- 1980 – 1982** Research fellow / Lecturer, Hebrew Univ., Jerusalem, Israel.
- 1981** Scholarship from the European Training Program in Brain and Behavior Research, to attend two courses:
1. ‘Basic methods in brain and behavior research in animals’, given by the Institute of Physiological Psychology, The University of Bergen, Norway.
 2. The 12th Summer School of Brain Research on ‘Chemical transmission in the brain’, held at the University of Amsterdam and The Netherlands Institute for Brain Research, Amsterdam, The Netherlands.
- 1982** Scholarship from the European Molecular Biology Organization, to attend the 2nd course on ‘Immunocytochemistry and its application in brain research’, at The Netherlands Institute for Brain Research (NIBR), Amsterdam, The Netherlands.
- 1982 – 1985** Fellowship from the *Dutch Van der Houten Fonds* to carry out the project on ‘Neurosecretion and immunocytochemical techniques for localization of vasopressin receptors’ in the NIBR, Amsterdam.
- 1985 – 1987** Fellowship from the *American John Douglas French Alzheimer's Foundation, Los Angeles, U.S.A.*, to carry out the project on ‘Alterations in

the vasopressin receptor in aging and Alzheimer's disease', in the NIBR, Amsterdam.

- 1990** *Hugo Van Poelgeest Prize*. Awarded to the staff of the Netherlands Brain Bank for their personal contribution to research on Alzheimer's disease and other neurological diseases, making use of human brain instead of the usual animal experiments.
- 1990** Grant for 5 year to establish the Dutch Brain Bank for Multiple Sclerosis.
- 1992** *Kabi Pharmica award* for best research paper in the field of the brain's aging and its diseases: Cowburn, R.F., C. O'Neill, R. Ravid, I. Alafuzoff, B. Winblad and C.J Fowler - Adenylyl cyclase activity in post-mortem human brain: evidence of altered G-protein mediation in Alzheimer's disease, J. Neurochem., vol. 58: 1409-1419, 1992.
- 1994 – 1998** Member of the New York Academy of Sciences.
- 1996** *NorAge - Pharmacia & Upjohn Award, 2nd prize* for best research paper in the field of the brain's aging and its diseases: Johnston, J.A., S. Norgren, R. Ravid, W. Wasco, B. Winblad, L. Lannfelt and R.F. Cowburn - Quantification of APP and APLP2 mRNA in APOE genotyped Alzheimer's brains.
- 1999** Award from '*Japan Foundation for Aging*', Tokyo, Japan; invited advisor on setting up a network of Brain Banks in Japanese National Hospitals.
- 2004** Nominated as the head of a "center of excellence" by the EU to participate in the European network of Brain Banks (6th program of the EU).
- 2006** 4 years award from the Dutch Ms Foundation (€ 1.0 million) for expanding the activities of the Multiple Sclerosis Tissue bank at the MS centre in Amsterdam.

Membership in scientific organizations and committees

- 1 International Society for Neurochemistry, 1985 - 2000.
- 2 Society for Neuroscience, 1985 - .
- 3 International Society for Neuropathology, 1992 – 2000.
- 4 Dutch working group on aging and dementia, 1988 - 1991.
- 5 Amsterdam working group on developmental disturbances of the human brain, 1987 - 1991.
- 6 “Eurage” sub-committees of the group Aging of The Brain and Senile Dementia: ‘Tissue banking’ and ‘Neuropathological Diagnostic Criteria’, sub-committees of ‘Tissue Banking’ and ‘Molecular Neuropathology’ of the Eurage subgroup ‘Molecular Biology of Aging’, 1988 - 1991.
- 7 Organizing committee member of the meeting ‘From gene to man - 5 years gerontological research in The Netherlands’, 1989.
- 8 Secretary Treasurer of the Medigon Dwarsverband Gerontologie, 1988 - 1991.
- 9 European Society of Brain Banking: Clinico-pathological correlations (CPC), 1989 - 1992.
- 10 Research group on Dementia of the World Federation of Neurology, 1985 - 2000.
- 11 Organizing committee of the 17th Summer School on ‘The human hypothalamus in Health and Disease’, Amsterdam, 1991.
- 12 Co-chairman and founder of the European Brain Bank Network for neurobiological studies in neurological and psychiatric disorders (EBBN), 1991 - 1997.
- 13 Chairman Organizing Committee of the European Brain Bank Meeting, ‘European Brain Banking in the Decade of the Brain’, Amsterdam, 1993.
- 14 Consultant Molecular Geriatrics, Chicago, USA, 1992 - 1995.
- 15 Member of the Amsterdam group of clinico-pathological correlations, 1992 - 1995.
- 16 Member of the MRC Committee, ‘Brain Bank Users’, Harrow, UK, 1994.
- 17 Organizer of the workshop ‘New approaches in European Brain Banking procedures and protocols’, Thessaloniki, Greece, 1994.
- 18 Co-organizer of the ENA-Workshop ‘Brain Banking: The use of human brain material for fundamental and strategic research’, Amsterdam, 1995.
- 19 Committee for evaluation of MS Brain Banks in the U.K., 1997.
- 20 Member of the American Association for the advancement of Science, 1997 - 1999.

- 21 Organizing Committee of the 6th International Conference on Alzheimer's Disease and Related Disorders, Amsterdam, The Netherlands, 1998.
- 22 Organizer of the Workshop 'Brain and Data Banking', 6th International Conference on Alzheimer's disease and Related Disorders, Amsterdam, The Netherlands, 1998.
- 23 Member of the National Working Group 'Human Tissue', Netherlands Center Alternatives to Animal Use (NCA), Utrecht, The Netherlands, 1998.
- 24 Member of the scientific board of the UK Multiple Sclerosis Society Bank at the Imperial College of Medicine, Charring Cross Hospital, London, UK, 1998 - 2009.
- 25 Member of the Scientific board of the Brain Bank, La Salpetriere Hospital, Paris, France, 1999 – 2003.
- 26 Member and Governing board of 'European Brain Banking': BRAIN-NET EUROPE, 1999 - 2006.
- 27 Scientific advisor of 'Otsuka Pharmaceutical Co., Ltd', Tokushima, Japan.
- 28 MRC-UK referee for the evaluation of grant applications of the London Alzheimer Brain Bank and the Parkinson Brain Bank at the Institute of Psychiatry, London, UK, 2000.
- 29 Scientific advisory board of ComtecMed, 2007 - .
- 30 Scientific Advisory board IQPharma, USA, 2008 - .
- 31 Member of International Society for Biological and Environmental Repositories ISBER.
- 32 Marble Arch group on Bio Banking (2006 -).
- 33 Member European Science Foundation (ESF) group on Biobanking (2006 -).
- 34 Scientific board INVITROM; project leader of In vitro disease models (2005 -).
- 35 SAB of the Japanese network of Brain Banks (2000 -).
- 36 Steering committee of the Brazilian Brain Bank for aging; Advisor to the Ethics committee (2006 -).

Teaching appointments

Lectures and Practical Courses

- 1972 - 1976** Comparative anatomy and physiology - Course for B.Sc. Biology students and for first-year medical and pharmacy students, University of Jerusalem, Israel.
- 1977 - 1982** General Endocrinology for Biology students, University of Jerusalem, Israel (lectures and practical course).
- 1987** ETP/ENA/IBRO Practical Course on Molecular neuroanatomy; Ligand anti-Ligand immunocytochemistry.
- 1991** Co-organizer of the 17th Summer School on 'The human hypothalamus in health and disease'.
- 1992** Practical course on 'Human Neuro-anatomy', the Netherlands Institute for Brain Research, Amsterdam, the Netherlands.
- 1993** Postgraduate course on 'Parkinson and Dementia', organized by the Dr. G.J. Van Hoytema Stichting, University of Twente, the Netherlands.
- 1994** Organizer of the Workshop 'New Approaches in European Brain Banking procedures and protocols', Brain Bank Workshop, Thessaloniki, Greece.
- 1995** - Co-organizer of the ENA Workshop 'Brain Banking; the use of human brain material for fundamental and strategic research', September 3, Amsterdam, the Netherlands.
- Practical course on 'Brain Banking and neurodegenerative diseases', in the framework of the Amsterdam Graduate School of Neurosciences, Pathophysiology of the Central Nervous System (cursus ED 223 - Pathofysiologie van het zenuwstelsel).
- 1996** - Lecture on 'Brain Banking and practical course in pathology/molecular pathology', in the framework of 'The Amsterdam International Medical Summer School', 'Alzheimer's and other dementias', Faculty of Medicine, University of Amsterdam, Amsterdam Medical Center.
- Practical course on 'Brain Banking and neurodegenerative diseases', in the framework of the Amsterdam Graduate School of Neurosciences, Pathophysiology of the Central Nervous System (cursus ED 223 - Pathofysiologie van het zenuwstelsel).

- 1999**
- Practical course on 'Brain Banking and neurodegenerative diseases', in the framework of the Amsterdam School of Neurosciences, Pathophysiology of the Central Nervous System (curus ED 223 - Pathofysiologie van het zenuwstelsel).
 - Practical course on 'Advanced Neurosciences', The Netherlands Institute for Brain Research, Amsterdam, the Netherlands.
 - Postgraduate course on 'Molecular Neurobiology', School for Neurosciences, Amsterdam, the Netherlands.
 - APO-course for psychiatrists, Amsterdam Medical Center, the Netherlands.
- 2000**
- APO-course for psychiatrists, Amsterdam Medical Center, the Netherlands. Neurowetenschappen Amsterdam - laboratory course.
- 2001**
- APO-course for psychiatrists, Academic Medical Center, University of Amsterdam.
- Practical course for medical students and students of medical biology, University of Amsterdam.
- Neuroanatomy for medical and biology students, University of Amsterdam.
 - Neuropathology Practical Tutorial, ONWA, Amsterdam.
 - The Amsterdam International Medical Summer School "Bridging Neurology and Psychiatry", Amsterdam.
- 2002**
- "Neuropathology practical tutorial". Graduate School Neurosciences "Pathophysiology of the Nervous System", University of Amsterdam.
 - APO-course for psychiatrists, Academic Medical Center, University of Amsterdam.
- 2003**
- 'Principles of neuroscience'.
 - "neuropathology practical tutorial". Graduate School Neurosciences "Pathophysiology of the Nervous System", University of Amsterdam.
 - APO-course for psychiatrists, Academic Medical Center, University of Amsterdam..
- 2006**
- "IBRO Neuroscience workshop on human brain tissues". Department of Anatomy, Faculty of medical sciences, University of Sri Jayewardenepura, 14-18 December 2006, Colombo, Sri Lanka.
 - 'Neuroanatomy /neuropathology of the human brain' for medical students, Maysor, India.

Tutoring of students

- 1987 - 1988** Van Zwieten, E.J. (Faculty of Medicine, Vrije Universiteit Amsterdam, major subject): Localization and age-related changes of VP-binding sites in human brain, using immunocytochemistry and autoradiography at the light microscopic level.
- 1987** Van der Berg, W. (Faculty of Psychology, University of Amsterdam, optional subject): Possible effects of post-mortem delay on immunocytochemically stained vasopressin binding sites in immersion-fixed brain and kidney of the Wistar rat.
- 1987 - 1988** Kos, W. (Faculty of Chemistry, University of Amsterdam, minor subject): Alterations in vasopressin binding and production sites in the senescent rat brain.
- 1988 - 1989** Korthals-Altes, R. (Faculty of Medicine, University of Amsterdam): Quantification of histo-pathological alterations which can be used as diagnostic criteria for Alzheimer's disease.
- 1988 - 1995** Van Zwieten, E.J., Ph.D. student, The Netherlands Institute for Brain Research: Alterations in vasopressin binding and production sites in aging and in Alzheimer's disease.
- 1989 - 1995** Van de Nes, J., Ph.D. student, The Netherlands Institute for Brain Research: Clinical diagnostics interpretation of cerebral deposits of abnormal fibres.
- 1998** Meijer, G.A.H. (Faculty of Chemistry (Science and Policy), Utrecht University in co-operation with the National Working Group "Human Tissue", Netherlands Center Alternatives to Animal Use (NCA): Practical and legal options and difficulties in scientific research with human material in the Netherlands.
- 2001** Budisantoso, T., student, Final Project Medical Biology, The Netherlands Institute for Brain Research: "Can dementia with Lewy Bodies be better delineated within the group of mixed Alzheimer/Lewy Body pathology by immunohistochemistry for alpha-synuclein?"
- 2002** -Bakker, H. student, Final Project Medical Faculty, The Netherlands Institute for Brain Research: "Can clusters-symptoms be formed within patients with

Lewy Bodies?”.

-Van Hattum, F. student, Final project medical Faculty, The Netherlands Institute for Brain Research: “A pathological quantitative analysis of Lewy bodies and neurofibrillary tangles in the brains of demented patients correlated to clinical symptoms of dementia with Lewy bodies”.

-Haumann, J., medical student, junior investigator: “The establishment of a national network of tissue banking”.

2003-2004 A. van Walbeek, medical student, Scientific project: “Alpha-synuclein staining of Parkinson disease with dementia tissues and comparison with Dementia with Lewy Bodies”.

2005-2006 R.Bolweg, medical student, UVA: Scientific project: "Clinico-pathological correlations in Diffused Lewy Body Disease".

Dutch and International Conferences

1989

Organizer of a Workshop on 'Neuropathological Diagnostic Criteria for Alzheimer's Disease at The Eurage Meeting of Aging of the Brain and Senile Dementia, Florence, Italy.

Organizer of the meeting 'From gene to men - gerontological research in The Netherlands', (Organisatie bijeenkomst Medigon Dwarsverband 'Van gen tot mens - gerontologisch onderzoek in Nederland'). Medigon Retraite, Egmond aan Zee, The Netherlands, (lecture).

1990

Co-organizer Longitudinal aging research in the Netherlands, Egmond aan Zee, The Netherlands, (lecture).

1991

Co-organizer 17th International Summer school of brain research 'The human hypothalamus in health and disease', Amsterdam, The Netherlands, (lecture).

Co-organizer European Brain Bank meeting, Barcelona, Spain, (lecture).

1992

Co-organizer Information about the MS Brain Bank for MS patients, Diaconessen Hospital, Eindhoven.

Organizer of a workshop on Brain Banking at the 3rd International Conference on Alzheimer's Disease and related disorders, Padova, Italy.

Organizer of the workshop 'MS Brain Bank', Groningen, The Netherlands.

1993

Organizer of the meeting 'European Brain Banking in the Decade of the Brain', Amsterdam, The Netherlands.

1994

Co-organizer of the meeting of the European Brain Bank Network for neurobiological studies in neurological and psychiatric disorders, Barcelona, Spain.

Organizer of the Workshop 'New Approaches in European Brain Banking procedures and protocols', Thessaloniki, Greece.

1995

Co-organizer of the ENA Workshop: 'Brain Banking: the use of human brain material for fundamental and strategic research', Amsterdam, The Netherlands.

1998

Organizer and Chairman of the Roundtable on Brain Banking at the 6th International congress on Alzheimer's disease and associated disorders, Amsterdam, The Netherlands.

2007

Biomarkers in 'Vascular dementia'.

2008

Dementia Biomarker at Cony2: "Controversies in neurology".

2009

Biobanks can make or break Biomarkers in ADPD.

Biomarkers in AD/PD "Controversies in Neurology 3".

Invited referee and Reviewing

Invited referee

(3-4 times /year for the following Journals)

American Journal of Bio-Ethics (AJOB); Current Alzheimer Research; Neuroscience Letters; Journal of Alzheimer's disease (JAD); J. Biological Chemistry (JBC); J. Neurological Sciences (JNS); J. Neural Transmission; J. Immunol. Methods; Journal of Neurochemistry; J. Of Molecular NeuroBiology; Neuroscience Letters; Cell and Tissue Banking; Molecular Psychaitry.

Reviewing

- 1992** MRC referee for the evaluation of grant application of the Cambridge Brain Bank.
- 1994** MRC referee on 'Brain Banking protocols'.
- 1997** Multiple Sclerosis Society referee for the evaluation of a grant application.
Multiple Sclerosis Society referee for the evaluation of an application for a central UK Brain Bank for MS.
- 1998 - 2001** Member Editorial Board for the Journal of Alzheimer's Disease.
Associate editor JAD, IOS Press.
- 2003 -** Member of the management board of the UK Multiple Sclerosis Society Tissue Bank at the Imperial College of Medicine, Charring Cross Hospital, London, UK.
Member of the scientific advisory board of 'Otsuka Pharmaceutical Co., Ltd', Tokushima, Japan.
- 2004** External reviewer for the Israeli Science Foundation.
- 2005** External reviewer for the UK Alzheimer Society.

Collaborative projects

National

Ravid, R. with:

Amor, S, B.A. 't Hart, N. Heijmans (Biomedical Primate Research Centre, Rijswijk), J.M. van Noort (TNO Prevention and Health, Leiden), P. Smith (ICSM, UK), R. Reynolds (Imperial College, Charing Cross Campus, London, UK): Role of axonal damage and autoimmunity to axonal components in the pathogenesis of experimental demyelinating diseases (2001 - 2006).

Barkhof, F. (Dept. of Radiodiagnostics, VU Medical Centre, Amsterdam), Ch. Polman (Dept. of Neurology, VU Medical Centre, Amsterdam), O.R. Hommes (Dept. of Neurology, University of Nijmegen) and J. Valk (Dept. of Diagnostic Radiology, VU Medical Centre, Amsterdam): Spinal MR imaging in Multiple Sclerosis (1993 - 1995).

Barkhof, F. (Dept. of Radiodiagnostics, VU Medical Centre, Amsterdam), P. Scheltens, P.J.W. Pouwels, P. van der Valk, R.A. van Schijndel, H.J. Ader, M.P. Witter, R. Ravid (NBB), C. Jonker and R.A. Manoliu: Magnetization Transfer in Alzheimer's Disease (1999 - 2007).

Barkhof, F., P. Scheltens, P. van der Valk, W. Kamphorst, E.C.W. van Straaten (Departments of Radiology, Neurology and Neuropathology, VU Medical Centre, Amsterdam) and P. Ince (Department of Pathology, University of Sheffield, UK): Histopathological correlates of white matter changes on MRI in the elderly: an innovative, international, approach using post mortem MRI (2001 - 2007).

Barkhof, F. Dubelaar, E. (NIBR, Amsterdam), Swaab, D.F. (NIBR, Amsterdam), Grosveld, F.G. (Dept. of Cell Biology, Erasmus University Rotterdam, Rotterdam) and R.H.A. Plasterk (Netherlands Cancer Institute, Amsterdam): Cell biological and genetic determinants of aging and Alzheimer's Disease (2000 - 2006).

Bö, L., P. van der Valk, C. Polman, F. Barkhof, Depts. of Pathology, Neurology and Radiology, VU University Medical Center, Amsterdam, The Netherlands, R. Ravid, Netherlands Brain Bank, Amsterdam, The Netherlands, I. Huitinga, Netherlands Institute for Brain Research, Amsterdam, The Netherlands, C. Verweij, Molecular Cell Biology, VU University Medical Center, Amsterdam, The Netherlands - Histopathology of the grey matter in MS (2003 - 2007).

- Boddeke, H. (Dept. of Medical Fysiology, University of Groningen Groningen) - A study of the involvement of the chemokine fractalkine and its receptor RBS11 in Multiple Sclerosis (2000 - 2005).
- Boer, K. and S. Lunshof (Dept. Obstet. Gynaec., University of Amsterdam): Immunocytochemical localization of vasopressin and oxytocin binding sites in human placenta and uterus, (1988).
- Bolhuis, P.A., W.A. Van Gool and H. Van Crevel (Dept. of Neurology, Academic Medical Center, Amsterdam): Cerebrospinal fluid markers of Alzheimer's disease.
- Bothmer, J., M. Markerink and J. Jolles (Dept. of Neuropsychology and Psychobiology, University of Limburg, Maastricht): Cerebral cortex inositol phospholipids in Alzheimer's disease patients and matched controls (1992 - 1995).
- Copray, J.C.V.M. (Dept. of Medical Fysiology, University of Groningen, Groningen): The role of p75^{ntr}-mediated neurotrophin signaling in MS lesion formation (2001 - 2005).
- De Kloet, R., L.M. Havekes and D.F. Swaab (TNO Prevention and Health, Gaubius Laboratory, Leiden and NIBR, Amsterdam): The APOE phenotype and the concentration of APOE/b-A4 complexes in the CSF of AD patients and controls (1995 - 2000).
- De Vos, R.A.I. (Regional Laboratory for Pathology and Microbiology, Enschede), E.N.H. Jansen (Medical Spectrum Twente, Enschede), D.F. Swaab and F.C. Stam (NIBR, Amsterdam): Clinico-pathological correlation of Diffuse Lewy Body Disease (1991 - 1996).
- Eikelenboom, P. (Dept. of Psychiatry, VU Medical Centre, Amsterdam), J.M. Rozemuller, W. Kamphorst and F.C. Stam (Dept. of Pathology, VU Medical Centre, Amsterdam) and D.F. Swaab (NIBR, Amsterdam): Cerebral amyloid deposits in SDAT and Scrapie (1988 - 1991).
- Eikelenboom, P. (Dept. of Psychiatry, VU Medical Centre, Amsterdam), F.C. Stam, J.M. Rozemuller (Dept. of Pathology, VU Medical Centre, Amsterdam) and D.F. Swaab (NIBR, Amsterdam): Regulation of β -amyloid precursor protein by inflammatory and neurotropic factors (1988 - 1993).
- Erkut, Z.A., M.A. Hofman and D.F. Swaab (NIBR, Amsterdam): Increased activity of hypothalamic corticotropin-releasing hormone (CRH) neurons in Multiple Sclerosis (1992 - 1996).

- Erkut, Z.A. (NIBR, Amsterdam): Is stress of dying physiological or psychological (2000 - 2001).
- Fliers, E., W.M. Wiersinga, S.E.F. Guldenaar and D.F. Swaab (Dept. of Endocrinology, Academic Medical Center, Amsterdam and NIBR, Amsterdam): TRH cells in the human hypothalamus (1993 - 1996).
- Fliers, E., D.F. Swaab, W.M. Wiersinga, O. Bakker, S.E.F. Guldenaar, W.J.G. Hoogendijk, W. Kamphorst, F.C. Stam and B. Fisser (Dept. of Endocrinology, Academic Medical Center and NIBR, Amsterdam and Dept. of Pathology, VU Medical Centre, Amsterdam): The role of the hypothalamic TRH cell in Alzheimer's disease and depression (1994 - 2001).
- Fliers, E. (Dept. of Endocrinology and Metabolism, Academic Medical Center, Amsterdam), W.G.J. Hoogendijk, R. Ravid, D.F. Swaab, U. Unmehopa, T.J. Visser and W.M. Wiersinga: Thyroid hormone and depression (1999 - 2005).
- Fodor, M., F.W. van Leeuwen, A. Oskam, S.E.F. Guldenaar, C. Beyer, J.B. Hutchison, A. Wozniak and D.F. Swaab (NIBR, Amsterdam, Dept. of Anatomy and Cell Biology, University of Ulm, Germany, MRC Neuroendocrine Development and Behavioural Group, Babraham Institute, Cambridge University, United Kingdom): The mechanism of sexual differentiation of the human hypothalamus in relation to gender and sexual orientation (1994 - 1998).
- Fodor, M. (VU, Amsterdam) and D.F. Swaab (NIBR, Amsterdam): Somatostatin receptor (sst2A) in the human brain (1999 - 2000).
- Gerrits, P.O., H. 's-Gravenmade, J.M. Minderhoud and G. Holstege (Dept. of Anatomy and Embryology and Dept. of Neurology, Faculty of Medicine, University of Groningen) and D.F. Swaab (NIBR, Amsterdam): Pathological changes in the periaqueductal gray (PAG) in Multiple Sclerosis (1993 - 1995).
- Gerritse, K., M. Fasbender, W. Boersma and E. Claassen (Medical Biological Laboratory, TNO, Rijswijk): In situ detection of antigen-specificity of cells and antibodies involved in CNS immunopathology in Multiple Sclerosis (1992 - 1995).
- Goudsmit, E., M.A. Hofman, F.W. Van Leeuwen, M. Mirmiran, C.W. Pool, W. Witting, D.F. Swaab (NIBR, Amsterdam) and W. Kamphorst (Dept. of Neuropathology, VU Medical Centre, Amsterdam): Will stimulation of neurons repair or prevent degeneration in aging or Alzheimer's Disease? (1990 - 1992).

- Groot, C.J.A. de and P. Van der Valk (Dept. of Pathology, VU Medical Centre, Amsterdam): Gliacell interactions in Multiple Sclerosis (1993 - 2000).
- Hart, B.A. 't, Ch. Polman and K. Nicolay (Biomedical Primate Research Centre, Rijswijk, Dept. of Neurology, VU Medical Centre, Amsterdam and Bijvoet Centre for Biomolecular Research, Utrecht University, Utrecht): Comparative Analysis of CNS white matter lesions in Multiple Sclerosis and 'common marmoset' experimental autoimmune encephalomyelitis (EAE) with magnetic resonance imaging (MRI) and histology (1996 - 2001).
- Heutink, P and P. Rizzu, P. (Molecular Genomics Section, Dept. of Human Genetics, VU Medical Center, Amsterdam), V. Bonifati (Dept. of Neurosciences, La Sapienza University, Rome, Italy) and W. Kamphorst (Dept. of Pathology, VU Medical Center, Amsterdam): Comparison of region specific mRNA expression profiles of PSP brains with those of Alzheimer, FTDP-17, Pick disease, and non affected brains using DNA microarray technology (2000 -).
- Hoogendijk, W.J.G.(Deptment of Psychiatry, VU Medical Centre, Amsterdam), J.N. Zhou, J.S. Purba, Ch.W. Pool, M. Feenstra, W. Van Tilburg, P. Eikelenboom and D.F. Swaab (NIBR, Amsterdam and Dept. of Psychiatry, VU Medical Centre, Amsterdam): Brain changes in depression (1991 - 2000).
- Hoogendijk, W.J.G., Ch.W. Pool, M.H.A. Botterblom, J. Gilhuis, I.E.C. Sommer, M.G.P. Feenstra, W. Kamphorst, M.A. Hofman, W. van Tilburg, P. Eikelenboom and D.F. Swaab (NIBR, Amsterdam, Dept. of Psychiatry, Vrije Universiteit and Dept. of Neuropathology, VU Medical Centre, Amsterdam): Depression and the noradrenergic system in AD (1991 - 1998).
- Hoogendijk, W.J.G., U. Unmehopa, B. Fisser, D.F. Swaab (NIBR, Amsterdam), E. Fliers (Department of Endocrinology and Metabolisms, Academic Medical Center, Amsterdam), P. Eikelenboom (Department of Psychiatry, VU Medical Centre, Amsterdam) and F.J.H. Tilders (Department of Pharmacology, VU Medical Centre, Amsterdam): Increased plasma corticoid concentration as a risk factor for depression and cognitive disorder in the elderly (2001 - 2005).
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External Funds and Grants

The Brain Bank operated for many years in the framework of the Brain Bank Foundation; the annual running costs are on the average € 820,000/year. In her position of secretary treasurer of the Foundation and head of the Brain Bank, Dr. Ravid spent a great deal of time and effort in realizing the goals of the Brain Bank and making sure the financial coverage will be adequate and sufficient for the coming years. This activity is very hectic and time consuming and had to ensure the yearly financial stability of the bank, as only 30% of the budget was structurally funded.

Since its foundation, the financing of the Brain Bank has been based upon short-term subsidies and Dr. Ravid made endless efforts to raise funding from patient's organisations and donations to the Foundation. She also introduced a cost-recovery compensation from end users, including both academia and industry on the basis of an annual membership and contribution.

The annual recurrent research grants/funding raised externally 2001-2007:

The Foundation for the Support of MS Research	€	111,635
The Netherlands Brain Association	€	4,538
Dutch Parkinson Patients' Association	€	12,500
The International Alzheimer Research Foundation	€	22,690
Stichting International Parkinson Fonds	€	12,500
European Union FP6; European Brain Bank Consortium	€	101,000
of centers of excellence		
Annual contribution of researchers and industry	€	105,000
Total annual value:	€	<u>369,863</u>

In 2006 Dr. Rivka Ravid and the Brain Bank has been awarded € 1.0 million for a 4 year period by the Dutch Multiple Sclerosis Society to secure the future activities of the MS Brain Bank .

Expertise's and research activities

Dr. Rivka Ravid is a Tissue/Bio banker and a neuroscientist; her main expertise's are in Brain/tissue /Bio Banking (BTB -banking) and the use of human specimens for research. She started in 1987 as the Coordinator of the Brain Bank (NBB) and was since 2001 the Managing and scientific Director of the Netherlands Brain Bank and a Scientific Project

leader at the Netherlands Institute for Brain Research, Amsterdam, The Netherlands. Her line of work and main interests include setting up Tissue and Bio banks, making the public aware of the need for human specimens for clinical and basic research to discover disease etiology and develop therapies and treatments to cure these diseases. Dr. Ravid pioneered the setting up a national donor program in the Netherlands and invested several years in professionalizing procedures to optimize the transparency and accountability. She put a lot of effort in the harmonization and refinement of the procedures for procurement, handling, storage and dissemination of specimens for research.

Her interest in the possible causes and pathologies underlying various neurological and psychiatric disorders led her to start a search for biomarkers and the improvement of early diagnostics.

The NBB under the leadership of Rivka Ravid has performed pioneering work in the establishment of a national program for research on neurological and psychiatric disorders, by introducing unique protocols and procedures, as well as formulating a legal and ethical Code of Conduct. She also set up a rapid autopsy system in collaboration with the Institute of Pathology of the hospital of the Free University of Amsterdam and was the founder of the EU-guidelines for legal and ethical issues in Tissue banking.

In the past 3 years she has been mainly busy with setting up a donor programme for research on psychiatric disorders, mainly major depression, bipolar disorders and schizophrenia and started the inventarisation of setting up a donor-programme for pain/misgraine research.

The NBB pioneered and established a well organized system of rapid autopsies, with several unique features:

- 1 A very short post-mortem delay of 2-4 hours, which makes modern neurobiological research possible and maximizes the use of brains obtained via our donor-system.
- 2 A fresh dissection procedure is used, a difficult regimen to establish, requiring qualified staff at inconvenient times, but a prerequisite for an increasing range of technical procedures which cannot make use of fixed or rapidly frozen samples.

Dr.Ravid also set up a large and comprehensive collection of both frozen and formalin fixed material, in addition to a large collection of lumbar-puncture and post-mortem CSF in search of biological markers to help in the development of diagnostic tests for early discovery of the various neurodegenerative diseases. The quality of the sampled material is checked and controlled by proper matching for the various ante- and post-mortem factors and by

measuring the pH.

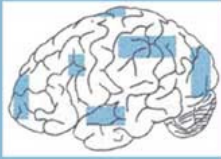
Since 1993, as part of her function of co-chair of the European Brain Bank Network (EBBN), Dr.Ravid has a close collaboration with many European, American, Japanese and other groups, in an attempt to establish a standardized set of protocols and procedures which will be used in Brain Banking on an international level, and also in collaboration with the Research Group on Dementia, in the framework of the World Federation of Neurology, on the standardization of clinical and neuropathological diagnostic criteria. In 1999 she was one of the founders of Brain-net Europe, which aims at collaboration and exchange of brain banking expertise within the European community.

In many of the research projects that make use of the specimens obtained from the NBB, her personal contribution goes beyond mere delivery of material.

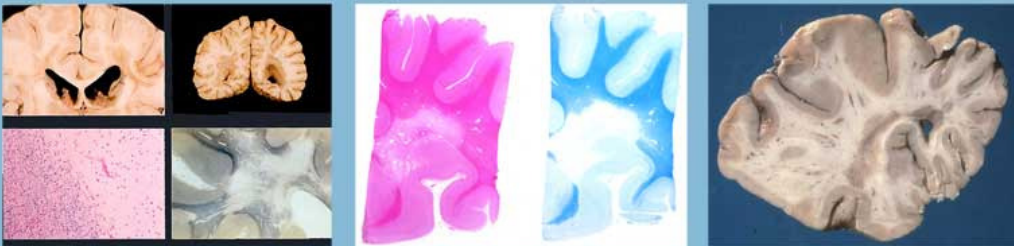
a. She was involved in the discovery of Tau mutations on chromosome 17 in Dutch families with FTD. This was done in collaboration with dr J. van Swieten and S. Rosso (Dept of Neurology, Dijkzigt Hospital, Rotterdam) and with Prof.P. Heutink and dr P. Rizzu (Dept of Antropogenetics, Erasmus University, Rotterdam). It concerns the combined tracing of families with mutations for DNA, genetic testing during life and convincing the patients and next-of-kin of the importance of brain research after death, in order to confirm the clinical diagnosis and to investigate the specific pathology. An additional collaborative project is ongoing with dr Y. Ihara (Tokyo University, Japan) concerning the functional implications of several Tau mutations.

b. Dr.Ravid investigated the particular brain pathology in patients with fronto-temporal dementia without mutations, in collaboration with dr W. Kamphorst (Pathological Institute, VU Medical Centre). Similar collaboration has been started with dr D. Mann (University of Manchester, UK) and dr M. Makifuchi (Dept. of Pathology, Nijgata Hospital, Japan) on a larger group of patients with similar pathology.

c. In collaboration with the radiology department and the MS center in Amsterdam, Dr.Ravid established a new and unique insitu MRI-guided dissection protocols for the evaluation of the post-mortem changes in Multiple Sclerosis (Bö L, Geurts JG, **Ravid R**, Barkhof F. Magnetic Resonance Imaging as a tool to examine the neuropathology of Multiple Sclerosis. *Neuropathol Appl Neurobiol*, 30(2):106-117 , 2004).



NETHERLANDS BRAINBANK



MR versus Histopathology

isointense vague T2 lesion

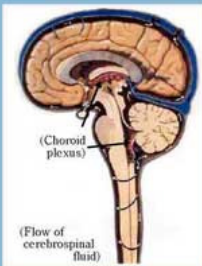
isointense on T1
MTR:0.32
T1-CR:0.96
Axonal density: 95%

LCA

HLA-DR

ORO

Bodian



MS csf-bank



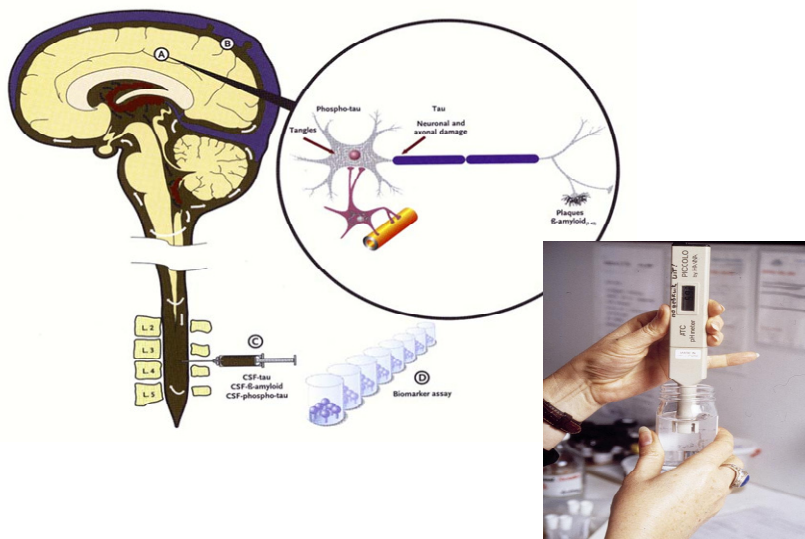


Team Netherlands Brainbank



The team of the Netherlands Brain Bank 2006

R. Ravid has set up together with her colleagues at the pathology department of the Free University of Amsterdam a large and comprehensive collection of both frozen and formalin fixed material, in addition to a large collection of blood and CSF from living patients. These specimens are serving the extensive search for Bio- markers to help in the development of diagnostic tests for early discovery of the various neurodegenerative diseases.



International activities

In the past years the Brain Bank in Amsterdam provided research specimens from 3000 autopsies for over 500 research projects in 30 countries worldwide. Dr.Ravid has turned the Brain Bank into a dynamic and tangible organisation which actively supports, advises and helps research worldwide. The bank is a bridge between the donors, their next of kin, clinicians, researchers, pathologists, ethics committees, legislators and policy makers.

Overview of disseminated samples in the period 1990-2007



These research efforts based on material obtained from the Amsterdam Brain bank resulted in 1000 papers in top scientific journals; R. Ravid is an active participant in 188 of these peer-reviewed publications.

Dr. Ravid is involved as a referee and member of the Scientific advisory board (SAB) of several Bio/Tissue/Brain banks in the France, Brazil, India, Italy, Japan, Spain, UK and the USA. Dr.Ravid has also served as an advisor to the Japanese Government in setting up a national network of Brain Banks in 22 national hospitals in Japan.

Dr.R. Ravid works as a Scientific advisor to a large number of pharmaceutical companies in Europe, India, USA, Asia and Australia (Abbott (USA), Astra Zeneca (Sweden+UK), Asterand (UK), Avantis (Belgium), Glaxo –Smith-Kline (USA+UK), Jansen-Cilag (Belgium, Europe), Johnson and Jonson (Belgium +UK), Merck (USA), Novartis (Switzerland) , Nymox (USA), Pfizer (UK+USA), Solvay (The Netherlands), T-Gene (USA) and Otsuka Pharmaceuticals (Japan).

The majority of these collaborations were established on the basis of a scientific collaboration with the aim to advance clinical and basic research and expand the expertise in molecular genetics and medicine (see papers by Corneveaux et al. 2008 ; Webster et al. 2008; Coon et al. 2008; Reiman et al. 2007).

Many of the collaborations result in joint publications and contribute significantly to improving early diagnostics and personalized medicine by identifying Bio-markers for disease and developing therapies and drugs based on the patient's genetic makeup.

Dr. R. Ravid plays a leading role in new initiatives and creating 'state of the art Tissue and Biobanks' in various European and Asian countries.

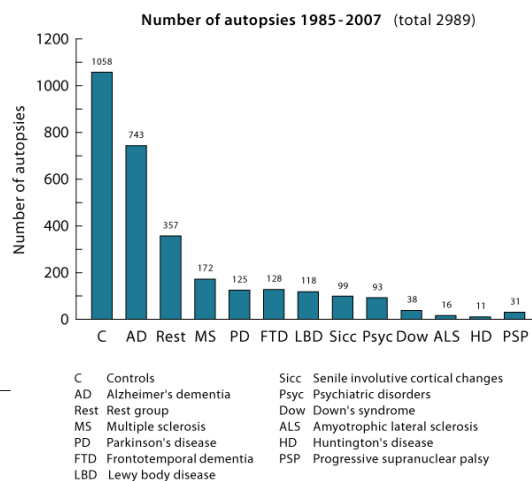
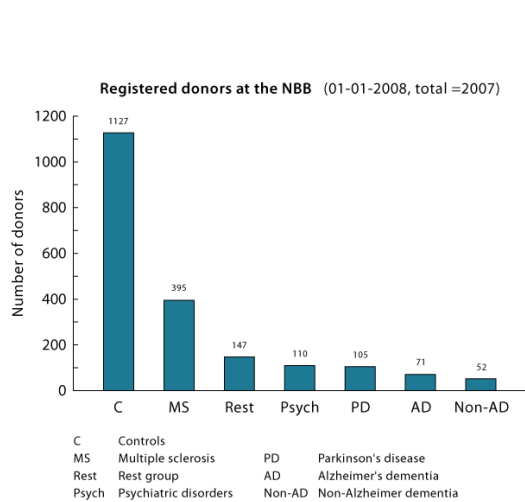
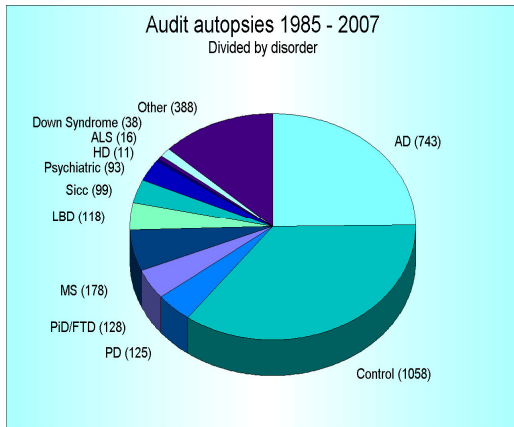
A unique achievement of Dr.Ravid is the incorporation of Bioinformatics, and data protection and incorporating Genomics and Proteomics as an integral part of the work of the various banks. She also recently established a DNA/RNA bank in the Netherlands.

In 1999 Dr.Ravid was elected as a member of the Governing Board of the European initiative on Brain banking (BNE), an FP6-consortium and network of excellence of 19 brain banks, which aims at collaboration and exchange of brain banking expertise within the European community.

R. Ravid had a leading role in this network, was board member of the management team and project leader for the European donor programs (WP7) and ethical and legal guidelines in Brain Banking (WP2).

Recently, Dr. Ravid published several papers on Brain Banking Bio/Tissue Banking, summarizing the legal and ethical code of conduct, based on Declarations, Conventions, Recommendations, Guidelines and Directives issued by international key organizations, such as the Council of Europe, European Commission, World medical Association and the World Health Organization; this code of conduct will hopefully become the general rule and will aid in future European Legislation for donors, Bio and Tissue banks (Ravid 2008, Ravid and Grinberg 2008; Ravid 2009).

Audit of autopsies and registered donors in the period 1985-2007:



Please note the large number of registered healthy donors and rapid autopsies of control donors.

European Activities Brain Banking



Quality assessment for the concordance trial at BNE-II in Munich, 2006.



Work packages 2 and 7 of BNE-II; shared with colleagues from UK and France.

R. Ravid is regularly invited as a speaker/chairperson in Dutch, European and international scientific meetings (for details, please see full-length CV). She has organized many meetings and workshops on Brain /Tissue /Bio Banking in order to try to harmonize the European and international standards for the clinical and neuropathological diagnostic criteria in Tissue Banking and develop standard procedures for the accrual of tissue, dissection procedures, research protocols and clinical and neuropathological documentation of research specimens. Dr.Ravid is regularly organizing sessions on Bio-markers at various international meetings to accelerate the development of targets and therapies.

Consultancy

www.brainbankconsultants.com

The screenshot shows the homepage of Brain Bank Consultants. At the top, the text "BRAINBANK CONSULTANTS" is displayed in white on a dark orange background. Below this is a navigation menu with six items: "Home", "About us", "Collaborations", "Consultancy", "Publications", and "Contact us". Each item is accompanied by a small image: a brain, a person in a lab, a person in a lab, a person in a lab, a garden, and a keyboard with an @ symbol. The main content area is divided into two columns. The left column has a heading "Welcome to 'Brain Bank Consultants'" and contains three images: a person in a lab, a brain, and another brain. Below these images is the text: "Our company is registered at the Amsterdam Chamber of Commerce and Industry : 342721280000". The right column has a heading "News and events:" and lists four events: "Mar '07 ESH-EBMT Euroconference", "May '07 Biobusinessesevent", "July '07 Brazilian Aging Brain Study Group", and "Nov '07 The Fifth International Congress on Vascular Dementia". At the bottom of the page, there is a copyright notice: "copyright © 2007 Maalkom.nl & Brainbank Consultants".

After working for many years as the director of the Netherlands Brain Bank (NBB), Dr. Ravid founded the Consultancy in which experience and expertise are used to help others in setting up state of the art Bio /Tissue banks, using the model of the Netherlands Brain Bank she set up in Amsterdam.

“Brain Bank Consultants” is established to actively assist and advise the scientific community and biotech /pharmaceutical companies in their search of available specimens for scientific research.

The overall aim of “Brain Bank Consultants” is to direct the scientists / companies not only to the proper sources and repositories who store human specimens but also to assist the recipient of such samples in the underlying legal and ethical prerequisites one should adhere to for the proper use of human tissues.

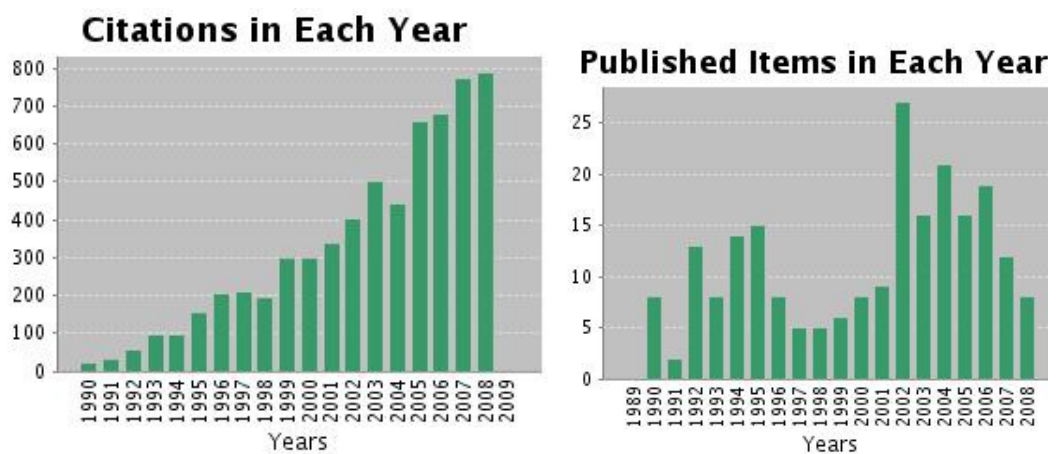
4 R's form the core of this consultancy service:

1. Assistance in the finding the **Resources** and search for proper samples for research/testing.
2. Advise on the **Regulations** and the medico-legal and ethical prerequisites on which the specimens have been recruited and will be used.
3. Assistance in conducting **Research** by choosing the optimal in-vitro and molecular-biology procedures to be successfully applied on human tissue /CSF samples.
4. Assistance in interpreting the obtained **Results** by training and guidance for scientists who are unfamiliar with the use of human specimens. Assistance in localizing and identifying the pathological abnormalities present in the specimens and the correlation-analysis of these abnormalities to the clinical symptoms and clinico-pathological processes and disease mechanisms.

PART 2 – Publications

Scientific Publications

R. Ravid published and is co-author on **188** papers in peer-reviewed journals, wrote **28** bookchapters, was editor of **4** books and presented **150** papers at scientific meetings as key-lectures, plenaries, oral presentations and posters.



H-i : 44

Books edited

- Cruz-Sánchez FF, Cuzner ML, **Ravid R**. Neuropathological Diagnostic Criteria for Brain Banking, Biomedical and Health Research, Vol. 10, IOS Press, Amsterdam, 253 p., 1995.
- MRC Topic Review; 'The MRC's Role and Guidelines for MRC-funded Brain Banks', 1995.
- Swaab DF, Hofman MA, Mirmiran M, **Ravid R**, Van Leeuwen FW. The human hypothalamus in health and disease. Progress in Brain Res., Vol. 93, Elsevier Science Publishers, Amsterdam, 481 p., 1992.
- Van Bezooijen CFA, **Ravid R**, Verhofstad AAJ. From Gene to Man - Gerontological Research in the Netherlands, Pasmans, The Hague, 448 p., 1991.

Book chapters

2007

Ravid R. The pitfalls and practicalities in collecting and banking human brain tissues for research on psychiatric and neurological disorders. In: Proceedings of the 1st Fukushima Brain Bank symposium, in :Psychiatry and clinical Neurosciences, Vol.61, nr. 2, pp S19-23, Blackwell-Synergy, 2007.

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Matsumoto I, Niwa SI, **Ravid R.** Psychiatric Brain banks: Situation in Europe and Asia. In: The Post-Mortem Brain in Psychiatric Research, G. Agam, R.H. Belmaker and I. Everall (Eds.), Kluwer Academic Publishers, Massachusetts, USA, 3-10, 2002.

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Ravid R, Swaab DF, Van Zwieten EJ, Salehi A. Controls are what makes a brain bank go round. In: Neuropathological Diagnostic Criteria for Brain Banking, Biomedical and Health Research, Vol. 10, F.F. Cruz-Sánchez, M.L. Cuzner and R. Ravid (Eds), IOS Press, Amsterdam, The Netherlands, pp. 4-13, 1995.

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