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PERSONAL INFORMATION

Date of Birth: 1st September 1949
Languages: English, French
Nationalities: British & French
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EDUCATION

1983: Doctorat d'Etat, (D. Sc.) Université Paris VI (HDR equivalent), France.
1977: Ph. D. (Endocrinology / Physiology) University of Calgary, Canada.
1973: Maîtrise de Sciences Naturelles, Université de Clermont-Ferrand, France.
1970: B.Sc. (Honours) Botany / Zoology, University of Wales.

CURRENT POSITION

Professor Class Exceptional at the National Museum of Natural History (MNHN), Paris

PROFESSIONAL APPOINTMENTS

- Head of Department “Regulations and Development”, MNHN, **Paris, France** 2003 – 2017
- Deputy Director, UMR 7221, MNHN, **Paris, France** 2014 – 2017
- Head, UMR 7221 “Evolution of Endocrine Regulations”, **Paris, France** (2 terms) 1998 – 2014
- Director, Laboratoire de Physiologie, MNHN, **Paris, France** 1995 – 2002
- Professor, Laboratoire de Physiologie, MNHN, **Paris, France** 1989 – 1995
- Fellow, Max Planck Institut, Martinsreid, **Munich, Germany** (sabbatical) 1988 – 1989
- Maître de Conférences (Lecturer), Université Louis Pasteur, **Strasbourg, France** 1981 – 1989
- Fellow, MRC, Molecular Neurobiology Laboratory, **Cambridge, UK** 1986 – 1986
- Maître - Assistante associée, École Pratique des Hautes Etudes, **Paris, France** 1975 – 1981
- Maître-assistante, Université Mohammed V, **Rabat, Morocco** 1977 – 1978
- Graduate Teaching Assistant, University of **Calgary, Canada** 1973 – 1975
- Teacher with Voluntary Service Overseas, **Malawi, Africa** 1970 – 1972

RESEARCH ADMINISTRATION AND COMMISSIONS OF TRUSTS

- WHO Expert – Avoidable early environmental exposures 2016 – 2017
- Expert, Endocrine Society Task Force Endocrine Disruption 2013 – 2017
- European Thyroid Association, Executive Board Member 2014 – 2019
- European Thyroid Association, Public Health Committee 2012 – 2017
- Scientific advisory board for the national Institut de Circulation, Métabolisme et Nutrition (INSERM/CNRS/INRA), Head of Endocrinology working group 2007 – 2017
- OECD Expert (France) – Adverse Outcome Pathways, Molecular Screening 2001 – 2017
- Agence Nationale de la Recherche (ANR), Vice-President Neuroscience Committee 2012 – 2013
- FWO Expert, Belgian Research Board – Committee Bio2 2009 – 2012
- Nominated as expert for the French Ministry of Higher Education and Science 2004 – 2012
- Nominated to CNRS Physiology Commission (2 terms) 2004 – 2012
- Nominated to Scientific Council of the CNRS Life Sciences Department 2007 – 2011
- Nominated to French Government’s Conseil Supérieur de Science et Technologie (2 successive terms) 2000 – 2008

DISTINCTIONS AND AWARDS

- 2017: Finalist, EU Women Innovation Prize
- 2014: CNRS Medal for Innovation
- 2014: Officier de la Légion d'Honneur (Distinction delivered by the French government)
- 2011: Nature Publishing Group: Mentoring Award for France, with a particular mention of mentorship of women scientists
- 2005: Prix Descartes: Finalist with Prof. Gustaffson (Karolinska Institute, Sweden)
- 2004: Chevalier de la Légion d'Honneur (Distinction delivered by the French government)
- 2002: National Jury Prize: Competition of the French Ministère de la Recherche et de la Technologie "Business creation and innovative technology" for the project "Watchfrog" in recognition of technological transfer of basic research on thyroid hormone signalling in transgenic tadpoles.

ADMINISTRATION OF ACADEMIC STRUCTURES AND LARGE-SCALE NETWORKS

In my career, I have accepted numerous **major administrative roles**. I have directed the CNRS unit UMR 7221 for 2 terms (1998-2013) as well as the [Department 'Regulations and Development'](#) of the Muséum National d'Histoire Naturelle since 2001 (grouping 3 main research units and about 200 staff).

In parallel, I have **successfully coordinated two large-scale collaborative EU projects**:

- [CRESCENDO](#) (FP6, 2005-2011, total EC contribution: 10M€) brought together 22 laboratories (from 7 EU member states and 3 associated countries), 2 SMEs and 1 major Pharma stakeholder. The consortium used genomic and post-genomic approaches to study processes in development and aging that are mediated by nuclear receptors such as steroid, thyroid or orphan receptors.
- [SWITCHBOX](#) (FP7, 2011-2015, total EC contribution: 6M€) involved 8 teams from 6 international laboratories. Project goal was to exploit better knowledge of homeostatic mechanisms to facilitate maintenance of health from early life through to aging.

ONGOING PROJECTS

- PI in FP7 Marie Curie ITN, [DevCom](#). The network's objective is to bridge the gap of training, knowledge and skills between the disciplines of developmental and computational biology. 2013-2017.
- PI in FP7 collaborative project, [HUMAN](#). Project goal is to create humanized mouse models of metabolic diseases and aging. 2013-2018.
- PI in H2020 collaborative project, [THYRAGE](#). This project investigates the effects of thyroid hormone on a wide range of age-related diseases, including osteoarthritis, dementia and osteoporosis. 2016-2020.
- PI in H2020 collaborative project, [EDC-MixRisk](#). The aim is to promote safer use of chemicals for the next generation. 2015-2018.
- Partner in H2020 [HBM4EU](#). This initiative of 26 countries aims is to coordinate and advance human biomonitoring in Europe. 2017-2021.
- Coordinator of OLGa, Agence Nationale de la Recherche, Programme Blanc 2014. Thyroid hormone-dependent signaling networks and adult stem cell physiology. 2014-2017.
- Coordinator of THYPEST, ANSES Programme. 2014-2017.
- Coordinator of THYDIS, French Ministry of Environment, Sustainable Development and Energy (Endocrine Disrupting Chemicals Program - PNRPE). 2013-2017.

BASIC RESEARCH

Since founding the lab in Paris, I have **sought to understand how THs activate or repress gene activity in different tissues at various developmental states and in changing physiological conditions**. Applying this aim to amphibian as well as mouse models has required investment in technologies such as non-viral gene transfer and germinal transgenesis. These techniques have been developed and optimized with the view to study gene regulation in integrated contexts, thereby advancing physiological concepts. Cornerstones of these technologies have been patented and licensed out to successful SMEs. In the lab they have been applied to advance understanding of:

- how thyroid hormone exerts negative feedback effects on hypothalamic controls,
- how thyroid hormone regulates adult neurogenesis during aging,
- thyroid hormone actions in early amphibian development and in metamorphosis.

TECHNOLOGY TRANSFER

Two of my research interests have led to industrial exploitation:

- Developing non-viral gene transfer techniques for delivering genes into the central nervous system and the germinal transgenic technology. Patents (valid to 2015) for gene therapy applications of cationic delivery, led to establishment of [Polyplus](#). While personal research investment in vectorisation has diminished, it yielded many well-cited papers (*e.g.* Boussif et al., **PNAS** **1995**, **Times Cited 4249**) and current work concerns optimization vectors to deliver siRNAs in the neural stem cell niche.
- Acting as a national representative for France at the OECD made me aware of the need to bring novel technologies into the screening arena to increase the speed and the efficiency of chemical testing. This led to the creation of the start-up [WatchFrog](#) co-founded with G. Lemkine in 2006 using the germinal transgenic technology that we had initially developed to understand metamorphosis. The thyroid hormone disruption **test developed in the laboratory** is currently used in the US EPA Toxcast Program and is also undergoing the process for **validation by the OECD** as a generalized test (XETA) for screening of endocrine disrupting chemicals.

REPRESENTATIVE PUBLICATIONS

Single author books:

- Demeneix B., *Losing Our Minds: How environmental pollution impairs with human intelligence and mental health*, Oxford University Press, 2014, 312pp.
Translation in French: *Le Cerveau Endommagé. Comment la pollution altère notre intelligence et notre santé mentale*, Ed. Odile Jacob, 2016, 414p.
- Demeneix B., *Toxic Cocktail: How chemical pollution is poisoning our brains*, Oxford University Press, 2017, 280pp. Translation in French should be published in fall 2017 (Ed. Odile Jacob).

List of 10 representative publications (since 2005):

H-Index 40; total citations without self-citations: 9977; average citations per item: 55.77

- [1] Hassani Z., Lemkine G.F., Erbacher P., Palmier K., Alfama G., Giovannangeli C., Behr J.P., Demeneix B.A. (2005) Lipid-mediated siRNA delivery down-regulates exogenous gene expression in the mouse brain at picomolar levels. **Gene Medicine**, 7(2):198-207.
- [2] Lemkine G.F., Raj A., Alfama G., Turque N., Hassani Z., Alegria-Prévoit O., Samarut J., Levi G., Demeneix B.A. (2005) Adult neural stem cell cycling in vivo requires thyroid hormone and its alpha receptor. **FASEB J**, 19(7):863-5.
- [3] Fini J.B., Le Mével S., Turque N., Palmier K., Zalko D., Cravedi J.P. and Demeneix B.A. (2007) An In Vivo Multiwell-Based Fluorescent Screen For Monitoring Vertebrate Thyroid Hormone Disruption. **Environmental Science And Technology**, 41(16):5908-14.
- [4] Hassani Z., François J.C., Alfama G., Dubois G.M., Paris M., Giovannangeli C., Demeneix B.A. (2007) A hybrid CMV-H1 construct improves efficiency of PEI-delivered shRNA in the mouse brain. **Nucleic Acids Research**, 35(9):e65.
- [5] Decherf S., Seugnet I., Kouidhi S., Lopez-Juarez A., Clerget-Froidevaux M.S., Demeneix B.A. (2010) Thyroid hormone exerts negative feedback on hypothalamic type 4 melanocortin receptor expression. **Proc Natl Acad Sci U S A**, 107(9):4471-6.
- [6] Lopez-Juarez A., Remaud S., Hassani Z., Jolivet P., Pierre Simons J., Sontag T., Yoshikawa K., Price J., Morvan-Dubois G., Demeneix B.A. (2012) Thyroid hormone signaling acts as a neurogenic switch by repressing Sox2 in the adult neural stem cell niche. **Cell Stem Cell**, 10(5):531-43.
- [7] Fini J.B., Le Mével S., Palmier K., Darras V.M., Punzon I., Richardson S.J., Clerget-Froidevaux M.S., Demeneix B.A. (2012) Thyroid hormone signaling in the *Xenopus laevis* embryo is functional and susceptible to endocrine disruption. **Endocrinology**, 153(10):5068-81.
- [8] Bellanger M., Demeneix B.A., Grandjean P., Zoeller R.T., Trasande L. (2015) Neurobehavioral deficits, diseases, and associated costs of exposure to endocrine-disrupting chemicals in the European Union. **J Clin Endocrinol Metab**, 100(4):1256-66.
- [9] Préau L., Le Blay K., Saint Paul E., Morvan-Dubois G., Demeneix B.A. (2016) Differential thyroid hormone sensitivity of fast cycling progenitors in the neurogenic niches of tadpoles and juvenile frogs. **Mol Cell Endocrinol.**, 420:138-51.
- [10] Fini J.B., Mughal B.B., Le Mével S., Leemans M., Lettmann M., Spirhanzlova P., Affaticati P., Jenett A., Demeneix B.A. (2017) Human amniotic fluid contaminants alter thyroid hormone signalling and early brain development in *Xenopus* embryos. **Scientific Reports**, 7, 43786. doi: 10.1038/srep43786.