

Jules A. HOFFMANN

Born in Echternach (Luxembourg)

Married, two children (1970, 1974).

French citizen.

Studies

General Education in Luxembourg (up to 1960)

University studies in Biology and Chemistry at the University of Strasbourg (1961-1965)

Doctoral thesis (Ph.D) in Biology, University of Strasbourg (1969)



Functions

Emeritus Distinguished Class Research Director at CNRS and Group Leader, Past President of the French National Academy of Sciences (2007-2008), **Chair of Integrative Biology, Professor at University of Strasbourg Institute for Advanced Study**. Consulting Director of the Sino-French Hoffmann Institute of Immunology affiliated to the Guangzhou Medical University (China).

Previous :

Director of the CNRS Research Unit 9022 "Immune Response and Development in Insects" (1978-2005)

Director of the Institute of Molecular and Cellular Biology, CNRS, Strasbourg (1993-2005)

Research Director, CNRS, 1974-2009,

Research Associate, CNRS, 1969-1973.

Research Assistant, CNRS, 1964-1968.

Research Training Assistant, CNRS, 1963.

Laboratory Assistant at the Faculty of Sciences of the University of Strasbourg, 1962.

Post-doctoral training

Institut für Physiologische Chemie, Philipps Universität, Marburg an der Lahn.

Professor P. Karlson, 1973-1974.

Member of Academies

American Association for Cancer Research, 2019

Elected to the Académie française, 2012.

National Academy of Sciences (NAS), 2008.

Russian Academy of Sciences, 2006.

American Academy of Arts and Sciences, 2003.

Member of EMBO (European Molecular Biology Organization), 1995.

Academia Europaea, 1993.

French National Academy of Sciences, 1992.

German Academy of Sciences Leopoldina, 1987.

Distinctions

Dr *Honoris Causa*, University of Camerino, Italy, 2019.
Dr *Honoris Causa*, National Academy of Sciences, Kiev, 2018.
Dr *Honoris Causa*, University of Liege, 2014.
Dr Medicinæ Honoris Causa, University of Padova, 2013.
Honoris Causa Member, Académie de Médecine, Paris, 2012.
Nobel Prize in Physiology or Medicine, 2011.
Médaille d'Or CNRS, 2011.
Canada Gairdner Award, 2011.
Dr *Honoris Causa*, University of Ottawa, 2011.
The Shaw Prize, Life Science and Medicine, 2011.
Keio Prize for Medical Research, 2010.
Lewis Rosenstiel Award for Innate Immunity, 2010.
Balzan Prize for Innate Immunity, 2007.
Dr *Honoris Causa med.*, Technische Universität Munich, 2006.
Robert Koch Prize for Immunology, 2004.
Grand Prix de la Fondation pour la Recherche Médicale, 2004.
William B. Cooley Award for Basic and Tumor Immunology, Cancer Research Institute, 2003.
Prix Lacassagne, Collège de France, 1996.
Grand Prix Joannidès de l'Académie des Sciences, 1992.
Alexander von Humboldt Price, 1984.
Pergamon Price, 1980.
Sandoz-Wander Price, 1978.

Organization of Meetings

InterAcademy Symposium on Innate Immunity and its Interface with Adaptive Immunity, Mont Sainte Odile, 2006.
Immunity : From Flies to Humans, French National Academy of Sciences, Paris, 2003.
Co-Chair of Keystone Symposium, Innate Immunity : Evolution and Link to Adaptive Immunity (with A. Ezekowitz and F. Kafatos), Taos, 2002.
Convenor, Session 13 "Insect Physiology, Neurosciences, Immunity and Cell Biology", XXIth International Congress of Entomology, Iguassu Falls, Brazil, 2000.
Chair of the Workshop on Immunity, 40th Annual *Drosophila* Research Conference, Seattle, 24-28 Mars 1999 and the 41th Annual *Drosophila* Research Conference, Pittsburgh, 2000.
Chair, 2nd Gordon Research Conference on Antimicrobial Peptides, Barga, Italy, 1999.
Co-Chair, First Gordon Research Conference on Antimicrobial Peptides, Ventura, California, 1997.
Roussel-Uclaf Round Table on "Phylogenetic Perspectives in Immunity", Congress Center of Versailles, Paris, 1993.
EMBO Workshop on Insect Immunity, Mont Ste-Odile, 1992.
Jacques Monod Conference on "Molecular Aspects of Invertebrate Hormones", Roscoff, 1990.
International Meeting of CNRS on "Biosynthesis, Metabolism and Mode of Action of Invertebrate Hormones", Strasbourg, 1983.

Six National French Meetings on Ecdysone Research, 1980-86.

European Symposium on Ecdysone Research, Strasbourg, 1979.

Insect Physiology Congress, Strasbourg, 1975.

Editorial Work

Guest Editor of *the Volume on : Primitive Immune Systems*, Immunological Reviews, 2004.

Co-Editor (with B. Beutler) of *the Section of Innate Immunity*, Current Opinion in Immunology, 2003.

Innate Immunity, (with A. Ezekowitz), Humana Press 2002.

Co-Editor (with A. Ezekowitz) of *Innate Immunity*. Current Opinion in Immunology, 1996, 1998.

Phylogenetic Perspectives in Immunity : The Insect Host Defense, in Molecular Intelligence Unit, R.G. Landes, 1994.

Cellular and Molecular Aspects of Insect Immunity, 34th Forum in Immunology, Research in Immunology 141, 895-960, Elsevier Institut Pasteur, Paris, 1990.

Biosynthesis, Metabolism and Mode of Action of Invertebrate Hormones, Springer-Verlag, 1985.

Progress in Ecdysone Research, Elsevier North Holland, 1980.

International Contracts (Coordinator or PI)

National Institutes of Health Antiviral Defenses, 2012-2017.

National Institutes of Health, Antiviral Defenses, 2007-2011.

Research Training Network, European Program on Malaria-Mosquitoes, 2000-2004.

National Institutes of Health, Innate Immunity, 1998-2004 and 2004-2008.

Training and Mobility in Research, European Program, 1996-2000.

Human Frontiers in Science Program, Innate Immunity, 1995-1998.

MAJOR PUBLICATIONS

- J.A. HOFFMANN (1970). Les organes hématopoiétiques de deux Insectes Orthoptères : *Locusta migratoria* et *Gryllus bimaculatus*. *Z. Zellforsch.* Vol **106** 451-472
- J.A. HOFFMANN (1973). Blood-forming tissues in Orthopteran Insects : an analogue to Vertebrate hemopoietic organs. *Experientia.* Vol **29** 50-51
- J.A. HOFFMANN, J. KOOLMAN, P. KARLSON & P. JOLY (1974). Molting hormone titer and metabolic fate of injected ecdysone during the fifth larval instar and in adults of *Locusta migratoria*. *Gen. Compar. Endocri.* Vol **22** 90-97
- P. KARLSON, J. KOOLMAN & J.A. HOFFMANN (1975). Biochemistry of ecdysone. *Amer. Zool.* Vol **15** 49-59
- G. TSOUPRAS, B. LUU & J.A. HOFFMANN (1982). Isolation and identification of three ecdysteroid conjugates with a C-20 hydroxy group in eggs of *Locusta migratoria*. *Steroids.* Vol **40** 551-560
- M.F. COSTET, M. EL ACHOURI, M. CHARLET, R. LANOT, P. BENVENISTE & J.A. HOFFMANN (1987). Ecdysteroid biosynthesis and embryonic development are disturbed in insects (*Locusta migratoria*) reared on plant diet (*Triticum sativum*) with a selectively modified sterol profile. *Proc. Nat. Acad. Sci.* Vol **84** 643-647
- J. LAMBERT, E. KEPPI, J.L. DIMARCQ, C. WICKER, J.M. REICHHART, B. DUNBAR, P. LEPAGE, A. VAN DORSSELAER, J.A. HOFFMANN, J. FOTHERGILL & D. HOFFMANN (1989). Insect immunity. Isolation from immune blood of the Dipteran *Phormia terranova* of two novel antibacterial peptides with sequence homology to rabbit lung macrophage bactericidal peptides. *Proc. Nat. Acad. Sci.* Vol **86** 262-266
- M. LAGUEUX, L. LWOFF, M. MEISTER, F. GOLTZENÉ & J.A. HOFFMANN (1990). cDNAs from neurosecretory cells of brains of *Locusta migratoria* (Insecta, Orthoptera) encoding a novel member of the superfamily of insulins. *Eur. J. Biochem.* Vol **187** 249-254
- J.A. HOFFMANN & D. HOFFMANN (1990). The inducible antibacterial peptides of dipteran insects. *Res. Immunol.* Vol **141** 910-918
- DIMARCQ JL, HOFFMANN D, MEISTER M, BULET P, LANOT R, REICHHART JM & HOFFMANN JA (1994). Characterization and transcriptional profiles of a *Drosophila* gene encoding an insect defensin. A study in insect immunity. *Eur. J. Biochem.* Vol **221** 201-209
- LEMAITRE B, KROMER-METZGER E, MICHAUT L, NICOLAS E, MEISTER M, GEORGEL P, REICHHART JM & HOFFMANN JA (1995). A recessive mutation, immune-deficiency (imd), defines two distinct control pathways in the *Drosophila* host defense. *Proc. Natl. Acad. Sci.* Vol **92** 9465-9469
- FRANC N, DIMARCQ JL, LAGUEUX M, HOFFMANN JA & EZEKOWITZ A (1996). Croquemort, a novel *Drosophila* hemocyte/macrophage receptor that recognizes apoptotic cells. *Immunity.* Vol **4** 431-443
- LEMAITRE B, NICOLAS E, MICHAUT L, REICHHART JM & HOFFMANN JA (1996). The dorsoventral regulatory gene cassette spaetzle/toll/cactus controls the potent antifungal response in *Drosophila* adults. *Cell.* Vol **86** 973-983
- FERRANDON D, JUNG AC, CRIQUI MC, LEMAITRE B, UTTENWEILER-JOSEPH S, MICHAUT L, REICHHART JM & HOFFMANN JA (1998). A GFP-drosomycin reporter transgene reveals a local immune response in *Drosophila* that is not dependent on the *Toll* pathway. *EMBO J.* Vol **17** 1217-1227
- DIMARCQ JL, BULET P, HETRU C & HOFFMANN JA (1998). Cysteine-rich antimicrobial peptides in invertebrates. *Biopolymers* (Peptide Science). Vol **47** 465-477
- HOFFMANN JA, KAFATOS FC, JANEWAY CA JR & EZEKOWITZ RAB (1999). Phylogenetic perspectives in innate immunity. *Science.* Vol **284** 1313-1318
- RUTSCHMANN S, JUNG AC, ZHOU R, SILVERMAN N, HOFFMANN JA & FERRANDON D (2000). Role of *Drosophila* IKK α in a Toll-independent antibacterial immune response. *Nature Immunol.* Vol **1** 342-347
- TZOU P, OHRESSER S, FERRANDON D, CAPOVILLA M, REICHHART JM, LEMAITRE B, HOFFMANN JA & IMLER JL (2000). Tissue-specific inducible expression of antimicrobial peptide genes in *Drosophila* surface epithelia. *Immunity.* Vol **13** 737-748

- GEORGEL, P., NAITZA S., KAPPLER, C., FERRANDON, D., ZACHARY, D., SWIMMER, C., KOPCZYNSKI, C., DUYK, G., REICHHART, J-M., AND HOFFMANN, J.A. (2001). *Drosophila* Immune Deficiency (IMD) is a Death Domain Protein that Activates Antibacterial Defence and Can Promote Apoptosis. *Developmental Cell*. Vol **1**, 1-20, 503-514
- MICHEL T, REICHHART JM, HOFFMANN JA & ROYET J. (2001). *Drosophila* Toll is activated by Gram-positive bacteria via a circulating peptidoglycan recognition protein. *Nature*. Vol **414**, 756-759
- GOTTAR M, GOBERT V, MICHEL T, BELVIN M, DUYK G, HOFFMANN JA, FERRANDON D, ROYET J, (2002). The *Drosophila* immune response against Gram-negative bacteria is mediated by a peptidoglycan recognition protein, *Nature*. Vol **416**, 641-644
- LIGOXYGAKIS P, PELTE N, HOFFMANN JA, REICHHART JM, (2002), Activation of *Drosophila* Toll during fungal infection by a novel blood serine protease, *Science*. Vol **297**, 114-116
- HOFFMANN JA, (2003). The immune response of *Drosophila*. *Nature*. Vol **426**, 33-38.
- DOSTERT C, JOUANGUY E, IRVING P, TROXLER L, GALIANA-ARNOUX D, HETRU C, HOFFMANN JA, IMLER JL (2005). The Jak-STAT signaling pathway is required but not sufficient for the antiviral response of *Drosophila*. *Nature Immunol*. Vol **6**, 946-953.
- FROLET C, THOMA M, BLANDIN S, HOFFMANN JA, LEVASHINA EA (2006). Boosting NF- κ B Dependent Basal Immunity of *Anopheles gambiae* Aborts Development of *Plasmodium berghei*. *Immunity*. Vol **25**, 677-685.
- BEUTLER B, EIDENSCHENK C, CROZAT K, IMLER JL, TAKEUCHI O, HOFFMANN JA, AKIRA S (2007). Genetic analysis of resistance to viral infection. *Nature Reviews of Immunology*. Vol **7**, 753-766.
- FERRANDON D, IMLER JL, HETRU C, HOFFMANN JA (2007). The *Drosophila* systemic immune response: sensing and signalling during bacterial and fungal infections. *Nature Reviews of Immunology*. Vol **7**, 862-874.
- LEMAITRE B, HOFFMANN JA (2007). The host defense of *Drosophila melanogaster*. *Annual Review of Immunology*. Vol **25**, 697-743.
- HOFFMANN JA (2007). Antifungal defense in *Drosophila*. *Nature Immunology*. Vol **8**, 543-545.
- DEDDOUCHE S, MATT N, BUDD A, MUELLER S, KEMP C, GALIANA-ARNOUX D, DOSTERT C, ANTONIEWSKI C, HOFFMANN JA, IMLER JL (2008). The DExD/H-box helicase Dicer-2 mediates the induction of antiviral activity in *Drosophila*. *Nature Immunology*. Vol **9**, 1425-1432.
- FRAITURE M, BAXTER RH, STEINERT S, CHELLIAH Y, FROLET C, QUISPE-TINTAYA W, HOFFMANN JA, BLANDIN SA, LEVASHINA EA (2009). Two mosquito LRR proteins function as complement control factors in the TEP1-mediated killing of *Plasmodium*. *Cell Host Microbe*. Vol **5**, 273-84.
- MISHIMA Y, QUINTIN J, AIMANIANDA V, KELLENBERGER C, COSTE F, CLAVAUD C, HETRU C, HOFFMANN JA, LATGE JP, FERRANDON D, ROUSSEL A (2009). The N-terminal domain of *Drosophila* Gram-negative binding protein 3 (GNBP3) defines a novel family of fungal pattern recognition receptors. *Journal of Biological Chemistry*. Vol **284**, 28687-28697.
- HETRU C, HOFFMANN JA (2009). NF-kappaB in the immune response of *Drosophila*. *Cold Spring Harb Perspect Biol*. Vol **6**. Review.
- MUELLER S, GAUSSON V, VODOVAR N, DEDDOUCHE S, TROXLER L, PEROT J, PFEFFER S, HOFFMANN JA, SALEH MC, IMLER JL (2010). RNAi-mediated immunity provides strong protection against the negative-strand RNA vesicular stomatitis virus in *Drosophila*. *Proc Natl Acad Sci U S A*. Vol **45**, 19390-19395.
- ELEFThERIANOS I, WON S, CHTARBANOVA S, SQUIBAN B, OCORR K, BODMER R, BEUTLER B, HOFFMANN JA, IMLER JL (2011). ATP-sensitive potassium channel (K(ATP))-dependent regulation of cardiotoxic viral infections. *Proc Natl Acad Sci U S A*. Vol **29**, 12024-12029.
- KEMP C, MUELLER S, GOTO A, BARBIER V, PARO S, BONNAY F, DOSTERT C, TROXLER L, HETRU C, MEIGNIN C, PFEFFER S, HOFFMANN JA, IMLER JL (2013). Broad RNA interference-mediated antiviral immunity and virus-specific inducible responses in *Drosophila*. *The Journal of Immunology*. Vol **2**, 650-658.

BONNAY F, COHEN-BERROS E, HOFFMANN M, KIM SY, BOULIANNE GL, HOFFMANN JA, MATT N, REICHHART JM (2013). big bang gene modulates gut immune tolerance in *Drosophila*. *Proceedings of the National Academy of Sciences U S A*. Vol 8, 2957-2962.

FUKUYAMA H, VERDIER Y, GUAN Y, MAKINO-OKAMURA C, SHILOVA V, LIU X, MAKSOUD E, MATSUBAYASHI J, HADDAD I, SPIROHN K, ONO K, HETRU C, ROSSIER J, IDEKER T, BOUTROS M, VINH J, HOFFMANN JA (2013). Landscape of protein-protein interactions in *Drosophila* immune deficiency signaling during bacterial challenge. *Proceedings of the National Academy of Sciences U S A*. Vol 26, 10717-10722.

TARTEY S, MATSUSHITA K, VANDENBON A, ORI D, IMAMURA T, MINO T, STANDLEY DM, HOFFMANN JA, REICHHART JM, AKIRA S, TAKEUCHI O (2014). Akirin2 is critical for inducing inflammatory genes by bridging I κ B- ζ and the SWI/SNF complex. *EMBO Journal*. Vol 20, 2332-2348.

MAJZOUB K, HAFIRASSOU ML, MEIGNIN C, GOTO A, MARZI S, FEDOROVA A, VERDIER Y, VINH J, HOFFMANN JA, MARTIN F, BAUMERT TF, SCHUSTER C, IMLER JL (2014). RACK1 controls IRES-mediated translation of viruses. *Cell*. Vol 5, 1086-1095.

LAMIABLE O, KELLENBERGER C, KEMP C, TROXLER L, PELTE N, BOUTROS M, MARQUES JT, DAEFFLER L, HOFFMANN JA, ROUSSEL A & IMLER JL (2016). Cytokine Dieldel and a viral homologue suppress deleterious IMD-dependent gene expression in *Drosophila*. *Proc. Natl. Acad. Sci USA*. Vol 113, 698-703.

GOTO A, OKADO K, CAI H, BARBIER V, LAMIABLE O, TROXLER L, SANTIAGO E, KUHN L, PALK D, SIVERMAN N, HOLLEUFER A, HARTMANN R, LIU J, TENG T, HOFFMANN JA, MEIGNIN C, DAEFFLER L, IMLER JL (2018). The kinase IKK β regulates a STING- and NF-K β dependent antiviral response pathway in *Drosophila*. *Immunity*. Vol 49, 225-234.

VANPOUILLE-BOX C, HOFFMANN JA, GALLUZZI L, (2019). Pharmacological modulation of nucleic acid sensors – therapeutic potential and persisting obstacles. *Nature Reviews Drug Discovery*. Vol 18, 845-867.