

# ***CURRICULUM VITAE***

## PERSONAL DATA:

**Current position:** Administrator of the Taiwan Mouse Clinic

**Name:** Chao-Kuen Lai (賴超坤), D.V.M, Ph.D.

**Gender:** Male

**Address:** Institute of Biomedical Sciences (IBMS), Academia Sinica, Taipei 115, Taiwan

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## EDUCATION:

**Jan., 1999** Ph.D. Microbiology and Immunology, National Yang-Ming University.

**June, 1991** M.S. Veterinary Medicine, National Taiwan University.

**June, 1984** Department of Veterinary Medicine, National Chiayi Institute of Agriculture.

## AWARDS:

**2009** The Institute of Molecular Biology (IMB) honors, Academia Sinica, for being selected as a speaker at the IMB Retreat on September 3<sup>rd</sup> - 5<sup>th</sup>, 2009

**2003** National Health Research Institutes (NHRI) Health Policy Research Fellowship Award

**1998** The Travel Stipend Award, The Molecular Biology of hepatitis B Viruses Annual Meeting, University of California, San Diego, U.S.A.

**1998** The honorary Research Award, Dr. Chien-Tien Hsu's Award Presentation, Sixth Symposium on Recent Advances in Cellular and Molecular Biology

## PROFESSIONAL EXPERIENCE:

- Aug., 2015 –present     **Administrator of the Taiwan Mouse Clinic**  
Program director: Dr. Chih-Cheng Chen
- Aug., 2011 – July, 2015     **Assistant Research Scholar**: Graduate Institute of Toxicology,  
College of Medicine, National Taiwan University.  
Projects: To characterize the regulators in regulating liver cancer stem cells.
- May, 2004 – July, 2011     **Postdoctoral Fellow**: Institute of Molecular Biology, Academia Sinica.  
Supervisor: Dr. Michael M.C. Lai  
Projects: To study the pathogenesis and replication of hepatitis C virus.
- Feb., 2003 – Apr., 2004     **Research Fellow**: Bureau of Pharmaceutical Affairs, Department of Health, Executive Yuan, Taiwan.  
Director General: Dr. Hui-Po Wang  
Projects:  
  1. To setup guidelines for Good Laboratory Practices (GLP) for non-clinical laboratory study.
  2. To setup guidelines for General Clinical Research Center (GCRC) and related laboratories for new drug development.
  3. To setup guidelines for Good Manufacturing Practices (GMP) for active pharmaceutical ingredients manufacturing.
  4. To setup guidelines for establishment and management system employed in In-Vitro Diagnostic (IVD) products.
- Aug., 2001 – Jan., 2003     **Research Scientist (Director, Research & Development)**: BioAgri. Corp. Taiwan Branch.

Supervisor: Dr. Ken Wang

Project: Generation of transgenic livestock by sperm-mediated gene transfer using a linker protein (MAb C).

Mar., 2000 – July, 2001 **Research Scientist:** Division of Food Science, Food Industry Research & Development Institute.

Supervisor: Dr. Ming-Sai Chien

Project: Certification of immunological functions and toxicological security of the healthful foods.

Feb., 1999 – Feb., 2000 **Postdoctoral Fellow:** Institute of Microbiology and Immunology, National Yang-Ming University.

Supervisor: Dr. Ling-Pai Ting

Project: To characterize the regulation of HBV gene expression by competition between positive and negative factors.

Oct., 1988 – Sept., 1989 **Technician:** Department of Veterinary Medicine, National Taiwan University.

Supervisor: Dr. An-Chung Lin

Prepared the experimental materials for students and managed department's instruments.

Aug., 1986 – Sept., 1988 **Research Assistant:** Department of Veterinary Medicine, National Taiwan University.

Supervisor: Dr. Wei-Fu Chen

Project: To characterize the envelope proteins of Newcastle disease virus and Japanese encephalitis virus.

**PROFESSIONAL LICENSE:**

1984            Veterinary license

**PRESENTATION:**

- 2013**      Poster presentation: American Association for Cancer Research Annual Meeting 2013 in Washington, DC. Title: RIG-I plays a critical role in negatively regulating stemness properties in hepatoma cell lines
- 2009**      Oral presentation: Institute of Molecular Biology, Academia Sinica Retreat 2009. Aspire Park, Lung-Tan, Tao-Yuan 325, Taiwan. Title: Roles of microtubule and endosomal trafficking in Hepatitis C Virus replication, assembly and egress.
- 2007**      Poster presentation: 14<sup>th</sup> International Symposium on Hepatitis C Virus & Related Viruses. Annual Meeting in Glasgow, Scotland, UK. Title: Hepatitis C Virus NS3/4A protein interacts with ATM, impairs DNA repair and enhances sensitivity to ionizing radiation.
- 2002**      Poster presentation: 91<sup>st</sup> Poultry Science Association, Annual Meeting in the University of Delaware, Newark, U.S.A. Title: A novel and highly effective method to generate transgenic chickens: linker-based sperm-mediated gene transfer (LB-SMGT).
- 2002**      Poster presentation: American Dairy Science Association/American Society of Animal Science/ Canadian Society of Animal Science, Annual Meeting in Quebec, Canada. Title: Generation of transgenic pigs at a high efficiency by linker based sperm-mediated gene transfer.
- 2001**      Poster presentation: Proceedings of the Annual Meeting of the Health Food Society of Taiwan, 2001, Taipei, Taiwan. Title: The effect of polysaccharides of tricholoma matsutake on immunological functions.
- 2000**      Oral presentation: Invited speaker. Homemakers' Union and Foundation,

Taipei, Taiwan. Title: The concepts of food allergy.

**1998**      **Oral presentation:** The Molecular Biology of Hepatitis B Viruses, Annual Meeting in the University of California, San Diego, USA. Title: Transcription factors for box- $\alpha$  of hepatitis B viral core promoter.

**1998**      **Oral presentation:** Sixth Symposium on Recent Advances in Cellular and Molecular Biology in Taiwan, R.O.C. Title: Transcription factors of hepatitis B virus core promoter.

**1996**      **Oral presentation:** The Eleventh Joint Annual Conference of Biomedical Sciences in Taiwan, R.O.C. Title: Repression of the promoter and enhancer activities of hepatitis B virus by a bZIP family protein.

#### **PATENT:**

1. WO 03/057906 A1, July 17, 2003. Wang K., Qian J., **Lai C.-K.**

Title: "A New Vector for Genetically Modifying Non-human Animals".

<http://www.wipo.int/pctdb/en/wo.jsp?IA=WO2003057906&wo=2003057906&DISPLAY=STATUS>

2. US 2002/0194638 A1, Dec. 19, 2002. Wang K., Qian J., **Lai C.-K.**

Title: "Vector for Genetically Modifying Non-human Animals".

<http://www.freepatentsonline.com/20020194638.html>

These two patents describe the utilization of a non-liposome based linker (antibody) which attaches the nucleic acid molecules to sperm cells to generate genetically modified animals and cells by in vitro or in vivo fertilization with an egg cell.

#### **LIST OF PUBLICATIONS:**

1. **Lai C.-K.**, Saxena V., Tseng C.-H., Jeng K.-S., Kohara M., and Lai M. M. (2014). Nonstructural Protein 5A Is Incorporated into Hepatitis C Virus Low-Density Particle through Interaction with Core Protein and Microtubules during Intracellular Transport.

PLoS ONE 9(6): e99022. doi:10.1371/journal.pone.0099022.

2. Saxena V., Lai C.-K., Chao T.-C., Jeng K.-S., and Lai M. M. (2012). Annexin A2 is involved in the formation of Hepatitis C virus replication complex on the lipid raft. *J. Virol.* 86(8): 4139-4150
3. Lai C.-K., Jeng K.-S., Machida K., and Lai M. M. (2010). Hepatitis C virus and release depend on endosomal trafficking of core protein. *J. Virol.* 84: 11590-11598. SCI.
4. Lai C.-K., Jeng K.-S., Machida K., and Lai M. M. (2008). Association of hepatitis C virus replication complexes with microtubules and actin filaments is dependent on the interaction of NS3 and NS5A. *J. Virol.* 82: 8838-8848. SCI.
5. Lai C.-K., Jeng K.-S., Machida K., Cheng Y.-S., and Lai M. M. (2008). Hepatitis C virus NS3/4A protein interacts with ATM, impairs DNA repair and enhances sensitivity to ionizing radiation. *Virology* 370: 295-309. SCI.
6. Machida K., Cheng K. T.-H., Lai C.-K., Jeng K.-S., Sung V. M.-H., and Lai M. M. (2006). Hepatitis C virus triggers mitochondrial permeability transition with production of reactive oxygen species, leading to DNA damage and STAT3 activation. *J. Virol.* 80: 7199-7207. SCI.
7. Chang K., Qian J., Jiang M.-S., Liu Y.-H., Wu M.-C., Chen C.-D., Lai C.-K., Lo H.-L., Hsiao C.-T., Brown L., Bolen J., Huang H.-I., Ho P.-Y., Shih P.-Y., Yao C.-W., Lin W.-J., Chen C.-H., Wu F.-Y., Lin Y.-J., Xu J., and Wang K. (2002). Effective generation of transgenic pigs and mice by linker based sperm-mediated gene transfer. *BMC Biotechnol.* 19: 2(1):5. SCI.
8. Sun C.-T., Lo W.-Y., Wang I.-H., Lo Y.-H., Shiou S.-R., Lai C.-K., and Ting L.-P. (2001). Transcription repression of human hepatitis B virus genes by negative regulatory element-binding protein/SON. *J. Biol. Chem.* 276: 24059-24067. SCI.
9. Lai C.-K. and Ting L.-P. (1999). Transcriptional repression of human hepatitis B virus genes by a bZIP family member, E4BP4. *J. Virol.* 73:3197-3209. SCI.

10. Tseung H.-B., Lai C.-K., Lin D.-T., Lin Y.-L., Chen C.-W., Lian W.-C., and Chen W.-F. (1993). Purification of envelope glycoproteins of the Newcastle disease virus. **J. Chinese Soc. Vet. Sci.** 19: 11-18.
11. Chen W.-F., Lai C.-K., Tsaur N.-J., and Lai C.-Y. (1990). Some characteristics of Newcastle disease virus matrix protein and molecular weight of mouse immunoglobulin isotypes heavy & light chains. **J. Chinese Soc. Vet. Sci.** 16: 1-9.
12. Chen W.-F., Lai C.-Y., Lai C.-K., and Tsaur N.-J. (1990). Monoclonal antibodies specific for Japanese encephalitis virus. **J. Chinese Soc. Vet. Sci.** 16: 11-22.

#### **PROFESSIONAL EXPERTISE :**

- **Oncology:** sphere formation assay, flow cytometry, immunohistochemistry, migration and invasion assay, in-vivo tumorigenicity experiments (including ectopic and orthotopic tumor xenograft model), cell proliferation assay.
- **Immunology:** polyclonal and monoclonal antibody generation & purification, Western blotting, ELISA, immuno-precipitation, immuno-fluorescence, isolation of tumor cell subpopulations by flow cytometry, lymphocytes proliferation assay.
- **Virology:** virus purification, plaque assay, infection inhibition assay, hemagglutination test, primary cell culture, HCV replicon cells.
- **Protein:** immunofluorescence staining, proteomics, computational proteomics, 2-D gel electrophoresis, in-gel digestion, expression & purification of recombinant protein, protein gel electrophoresis, preparation of subcellular extract, CAT assay.
- **Nucleic Acid:** RNAi screening, CHIP-on-CHIP application, cDNA & genomic library screening, plasmid construction, DNA sequencing, PCR, RT-PCR, mammalian cell culture, transfection, binding affinity analysis of transcriptional factors, nucleic acids purification, Southern and Northern hybridization, gel shift assay (EMSA), S1 mapping, Southwestern.