

THE MEDICAL COLLEGE OF WISCONSIN

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CURRICULUM VITAE

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1. BIOGRAPHIC INFORMATION

1.1 PERSONAL DATA AND EDUCATION

Place of Birth: Hong Kong
Citizenship: U.S.A.

UNDERGRADUATE EDUCATION

1969-73 **Undergraduate Study, Tunghai University** (Taichung, Taiwan), Faculty of Sciences, Department of Physics; Major in Physics, and Minor in Biology. Awarded B.Sc. in Physics.

GRADUATE STUDIES

- 1976-78* **University of Zürich** (Zürich, Switzerland), **Faculty of Philosophy II**, Institutes I and II for Molecular Biology; Major in **Molecular Biology**, and Minor in **Physical Chemistry**.
- Swiss Federal Institute of Technology-Zurich** (Eidgenoessischen Technischen Hochschule-Zürich, Switzerland), Institutes for Molecular Biology and Biophysics; Major in **Protein Biochemistry**, and Minor in **Biophysical Chemistry**.
- 1978-79* **University of Zürich** (Zürich, Switzerland), **Faculty of Philosophy II**; Research activities in the Institutes for **Molecular Biology I and II**.
- 1979-80* **Swiss Federal Institute of Technology-Zurich** (Eidgenoessischen Technischen Hochschule-Zürich, Switzerland); Research activities in the **Microbiological Laboratory**, and Institute for **Biophysics**.

DISSERTATION

- 1980-82* **University of Louis Pasteur** (Strasbourg I, Strasbourg, France), **Faculty of Medicine, Institute for Medical Biology**
Awarded **Ph.D. in Cellular and Molecular Biology**.

POST-DOCTORAL TRAINING

- 1983-1984* **Burnham Institute** (La Jolla Cancer Research Foundation, La Jolla, California) Cancer Research Center
- 1984-1985* **University of Southern California** (Los Angeles, California) Laboratory for Developmental Biology, **Department of Basic Sciences, School of Dentistry**

1.2 PROFESSIONAL APPOINTMENTS

ACADEMIA

- 2003-Present* **Assistant Professor**, Genetics Division, Department of Pediatrics, and **Faculty, Human and Molecular Genetic Center, Medical College of Wisconsin** (Milwaukee, Wisconsin)

EDUARDO CHI-MING LAU

- 1990-1994** **Research Assistant Professor**, Center for Craniofacial Molecular Biology, and **Faculty, Department of Basic Sciences, School of Dentistry, University of Southern California** (Los Angeles, California)
- 1988-1989** **Research Assistant Professor**, Laboratory for Developmental Biology, and **Faculty, Department of Basic Sciences, School of Dentistry, University of Southern California** (Los Angeles, California)
- 1986-1988** **Research Associate**, Laboratory for Developmental Biology; Department of Basic Sciences, **School of Dentistry, University of Southern California** (Los Angeles, California)

INDUSTRY

- 2001-2002** **Director of Cardiovascular Research**, Research Laboratory, Cardiogenomics Research Group, **Specialty Laboratories, Inc.** (Santa Monica, California)
- 1995-2000** **Senior Research Scientist**, Research Laboratory, Molecular Genetics Research Group, **Specialty Laboratories, Inc.** (Santa Monica, California)

1.3 HONORS AND AWARDS

- Nomination, The 10th Royan International Research Award** (2009)
Best five researches in Reproductive Biomedicine and Stem Cells fields
- Recipient, Chairman's Achievement Award of Scientific Excellence** (1995-1996)
The last 2nd year of annual achievement awards at **Specialty Laboratories, Inc.** (Santa Monica, California) In recognition of "Outstanding Contributions and Excellence in the R&D Department"
- Member, Genomics Board** (2000-2002) **Specialty Laboratories, Inc.**
(Santa Monica, California)
- Member, Cardiovascular Board** (2001-2002) **Specialty Laboratories, Inc.**
(Santa Monica, California)
- Member, Oncology Board** (2001-2002) **Specialty Laboratories, Inc.**
(Santa Monica, California)

2. PROFESSIONAL EXPERIENCE IN ACADEMIA AND INDUSTRY

2.1 WORK HISTORY AND RESEARCH EXPERIENCE

<u>Period Employed</u>	<u>Employer</u>	<u>Nature of Research Activities</u>
<i>2003-Present</i>	Medical College of Wisconsin Department of Pediatrics Medical Genetics Division Milwaukee, Wisconsin	Assistant Professor, and Faculty, Human & Molecular Genetics Center Director, MCW/Froedtert Hospital Preimplantation Genetic Diagnosis Laboratory: Clinical research in preimplantation genetic diagnosis for HLA matching and single gene disorders Researcher, Children's Research Institute, Developmental & Neurogenetics Laboratory: Supervising clinical research project on diagnostic testing of genomic deletions and duplications associated with neurodevelopmental disorders and other diseases
<i>2001-2002</i>	Specialty Laboratories, Inc. Research Laboratory Cardiogenomics Research Group Santa Monica, California	Director of Cardiovascular Research: Lead scientist in the diagnostic research programs of cardiovascular diseases, osteoporosis, metabolic diseases, and inherited genetic disorders
<i>1995-2000</i>	Specialty Laboratories, Inc. Research Laboratory Molecular Genetics Research Group Santa Monica, California	Senior Research Scientist: Lead scientist in molecular diagnosis of inborn genetic disorders, neurogenetics, pharmacogenetics, and cancers
<i>1990-1994</i>	University of Southern California Ctr. for Craniofacial Mol. Biol. Health Sciences Campus Los Angeles, California	Research Assistant Professor, and Faculty, Dept. of Basic Sciences: Leading and managing research projects in disciplines of protein engineering, molecular genetics, and developmental toxicology
<i>1988-1989</i>	University of Southern California Lab for Developmental Biology	Research Assistant Professor, and Faculty, Dept. of Basic Sciences: Leading and managing research

EDUARDO CHI-MING LAU

	School of Dentistry University Park Campus Los Angeles, California	projects in disciplines of genetics of enamel disorders, evolution of the sex chromosomes, and ameloblastomas
<i>1986-1988</i>	University of Southern California Lab for Developmental Biology School of Dentistry University Park Campus Los Angeles, California	Research Associate: Working on projects involving gene mapping, and genetic polymorphism (<i>RFLP</i>) analysis
<i>1984-1986</i>	University of Southern California Lab for Developmental Biology School of Dentistry University Park Campus Los Angeles, California	Postdoctoral Fellow: Working on projects involving molecular genetics of enamel genes
<i>1983-1984</i>	La Jolla Cancer Research Fdn. (Burnham Institute) Cancer Research Center La Jolla, California	Postdoctoral Fellow: Working on projects involving leukemia-associated membrane proteins
<i>1980-1982</i>	University of Strasbourg I Institute for Medical Biology Faculty of Medicine Strasbourg, France	Doctoral Candidate: Dissertation on the theme of glycosaminoglycans (carbohydrates) in tooth development
<i>1979-1980</i>	Swiss Federal Institute of Technology Microbiological Laboratory Zürich, Switzerland	Graduate Student: Working on projects culminating in thesis on yeast genetics (Chemically induced mutagenesis and selection)

2.2 RESEARCH AND MANAGEMENT EXPERIENCES

2003-Present

PREIMPLANTATION GENETIC DIAGNOSIS / HLA MATCHING / SINGLE GENE DISORDERS / GENETIC DIAGNOSIS OF MENTAL RETARDATION / GENOMIC DUPLICATIONS AND DELETIONS

Department of Pediatrics, Human and Molecular Genetic Center, and Children's Research Institute, Medical College of Wisconsin (Milwaukee, Wisconsin)

Assistant Professor, responsible for the following clinical programs:

- (i) Preimplantation genetic diagnosis for HLA matching
- (ii) Preimplantation genetic diagnosis (PGD) of single gene disorders
- (iii) Molecular genetic diagnosis of neurodevelopmental disorders, mental retardation and learning disabilities

Clinical Assay Development:

PGD Program for HLA Matching –

This program seeks to help children in need of an HLA-matched hematopoietic progenitor cell (HPC) transplant by enabling the affected child's parents to have an HLA-matched sibling who could act as a cord blood donor for the child in need of the transplant. Single blastomere cells are biopsied from human embryos formed through IVF. The HLA haplotypes of single blastomeres, determined by Amplification Fragment Length Polymorphism (AFLP) technique using short tandem repeats (STRs), are matched with those of the affected child by linkage analysis. Embryos found to match the HLA haplotypes of the affected child are transferred to the mother. Cord blood from the placenta is collected at birth, and used as the source of HLA-matched HPCs for transplant that would allow re-growing the bone marrow of the affected sibling.

The launch of PGD assay for HLA matching using linked STR markers in 2005 has established our laboratory as the 1st provider of this service in Wisconsin, as well as the 2nd provider of this service in the U.S. Since then, MCW & Froedtert Hospital has an integrated IVF, PGD and bone marrow transplantation program.

PGD Assays for Single Gene Disorders –

1. PGD for spinal muscular atrophy (SMA; Launched in 2006).
2. PGD for autosomal recessive polycystic kidney disease (ARPKD; in development).
3. PGD for cystic fibrosis mutations (Assay development in progress).

The launch of PGD for SMA in 2006 has established our laboratory as the 1st provider of PGD for single gene disorders in Wisconsin, the 3rd provider of PGD for SMA in the U.S., as well as one of 14 laboratories for providing PGD testing of single gene disorders in the U.S.

The launch of PGD for ARPKD in 2008 has established our laboratory as the 1st provider of PGD for this disorder using whole genome amplification.

Press Release:

Fighting kidney failure – Clinic targets disease in children. Milwaukee Journal Sentinel (JS Online) Feb. 17, 2008.

Genetic Testing for Neurodevelopmental Disorders & Mental Retardation –

Supervising clinical research projects on the diagnosis of genomic deletions and duplications associated with learning disabilities, mental retardation, neurodevelopmental disorders, and other genetic diseases.

Multiplex amplifiable probe hybridization (MAPH) assay for the diagnosis of subtelomeric deletions and duplications (Launched in 2005).

Diagnostic testing of genomic deletions and duplications associated with neurodevelopmental disorders and other genetic diseases using **Affymetrix Genome-Wide Human SNP Array 6.0** (Assay development in progress).

Clinical Services Provided:

1. PGD Testing for HLA Haplotype Matching
2. PGD Testing for Spinal Muscular Atrophy (SMA)
3. PGD Testing for Autosomal Recessive Polycystic Kidney Disease (ARPKD)

Service Provided to MCW / Department / Children's Hospital:

Member, Pharmacogenetics and Genomic Medicine (PGM) Initiation Steering Committee –

Providing pharmacogenetic assays to patients in the Children's Hospital of Wisconsin.

Educational Activities:

SPUR (Summer Program for Undergraduate Research) –
Sponsoring an undergraduate SPUR student, Tyeshia Boyle (2008), in the Children’s Research Institute, working on PGD testing for cystic fibrosis.

Other Accomplishments:

Building a custom designed laboratory for PGD –
Designing a state-of-the-art lab suite in Froedtert’s Hospital for providing PGD assays of human embryos formed through in vitro fertilization (IVF).
The new MCW-Froedtert clinical laboratory for PGD assay has been established in 2004.

Establishing “Developmental and Neurogenetics Laboratory” as a CLIA-certified laboratory –
Our “Developmental and Neurogenetics Laboratory” has been certified by CLIA for clinical assays in 2005.
Continuation of CLIA certification, 2007-2009

Invention Disclosures at MCW (July 15, 2005) –
1. **“Short tandem repeat (STR) probes for human major histocompatibility complex (MHC)”**. MHC is also known as human leukocyte antigen (HLA) genetic complex.
2. **“Cell lysis buffer for amplification of nucleic acids from single cell specimens, and samples of small number of cells”**: With application in single-cell genotyping and single-cell sequence analysis.

Licensing of HLA STR Probes –
*Since 2006, we have licensed our proprietary STR probes for HLA to **the Blood Center of Wisconsin** for the co-development of a clinical assay for matching bone marrows among siblings by PCR-capillary electrophoresis.*

Community Service Activities –
Grant Review: *Proposal for Institutional Development Grant Program 2008, North Carolina Biotechnology Center.*

2001-2002

**CARDIOVASCULAR DISEASES / MOLECULAR DIAGNOSIS OF GENETIC DISORDERS /
OSTEOPOROSIS / GENOMICS / METABOLIC DISEASES**

***Research Laboratory, Cardiogenomics Research Group, Specialty Laboratories,
Inc. (Santa Monica, California)***

**Director of Cardiovascular Research, initiating and leading the following diagnostic
research programs:**

- (i) Cardiovascular diseases
- (ii) Inherited genetic disorders
- (iii) Osteoporosis

Development of novel assays for cardiovascular risk assessment –

- (i) Biomarkers for early detection of cardiovascular diseases (CVD), e.g. high-sensitive C-reactive protein (CRP), B-type natriuretic peptide (BNP; Biosite), Pro-BNP, A-type natriuretic peptide (ANP), and LDL subfractions (Quantimetrix Lipoprint System)
- (ii) Polymorphic genetic markers for detecting predisposition to cardiovascular risk, e.g. *GPIIIa*, *PAI-1*, and *ACE-I/D*
- (iii) Biomarkers for inflammation and metabolic diseases (lipid disorders, obesity and type 2 diabetes), which are associated with increased cardiovascular risk

Research & Development

Applying genomic technologies to clinical diagnostic testing –

*Evaluating further genomic technologies for SNP genotyping. **Luminex** was eventually selected for clinical testing.*

Beta-Site Testing of Molecular Genetic Assays by Invader Cleavage –

1. FV Leiden
2. Prothrombin
3. MTHFR (2 mutations)
4. Glycoprotein IIIa (*PI*^{A1/A2})
5. Plasminogen activator inhibitor-1 (*PAI-1*)

**Beta-Site Testing of Multiple Displacement Amplification (MDA) for Whole
Genome Amplification.**

Development, Validation, and Scientific Owner of Molecular Genetic Assays –

1. *HFE* genotyping for hereditary hemochromatosis by linked linear amplification

2. Collagen *COL1A1* SP1 polymorphism for osteoporosis susceptibility by allele-specific PCR
3. Glycoprotein IIIa (*PI^{A1/A2}*) genotyping for coronary artery disease by Invader
4. Plasminogen activator inhibitor-1 (*PAI-1*) genotyping for coronary artery disease by Invader technique

Compliance, Documentation, and Assay Transfer

Development of preanalytical sample preparation procedures –

Including novel methods for the isolation of DNA and RNA from serum

Development, Validation, and Scientific Owner of Clinical Trial assays –

1. Angiotensin I-converting enzyme (*ACE*) genotyping by MALDI-TOF MS
2. Glycoprotein IIIa (*PI^{A1/A2}*) genotyping by MALDI-TOF MS
3. Plasminogen activator inhibitor-1 (*PAI-1*) genotyping by MALDI-TOF MS
4. Alpha-1 antitrypsin genotyping by MALDI-TOF MS
5. HLA-A*0201 allelotyping by sequence-specific PCR
6. Gaucher disease by PCR (Vienna Lab strip assay)
7. Familial Mediterranean fever by PCR (Vienna Lab strip assay)
8. DNA typing by multiplex STR analysis (Promega *GenePrint* PowerPlex 16 system) for human identity testing and zygosity determination

Project Management & Administration

Evaluation of recent findings on molecular genetic pathology

Serving as a Member on the following Scientific Boards (Specialty Laboratories, Inc.):

Genomics
Cardiovascular diseases
Oncology

Interacting with the Marketing Team

Interfacing with the Business Development Team

Medical & Technical Writing

Contribution of numerous chapters to book series by Specialty Laboratories, Inc.:
(www.specialtylabs.com/books)

Use and Interpretation of Tests in Genetics
Use and Interpretation of Tests in Cardiology and Coagulation
Use and Interpretation of Tests in Neurology
Use and Interpretation of Tests in Gastroenterology
Use and Interpretation of Tests in Endocrinology
Use and Interpretation of Tests in Infectious Disease

Review Article:

Lau EC (2001) Genetics of Arterial Thrombosis: Contribution to Atherosclerosis. *In*: Y. Shoenfeld, D. Harats, and G. Wick (eds.): *Atherosclerosis and Autoimmunity*, Elsevier, Amsterdam, pp. 341-259.

The outcomes of some research studies were documented in the following publications:

Patnaik M, Dlott JS, Fontaine RN, Subbiah MT, Hessner MJ, Joyner KA, Ledford MR, **Lau EC**, Moehlenkamp C, Amos J, Zhang B, and Williams TM (2004). Detection of genomic polymorphisms associated with venous thrombosis using the Invader bplex assay. *J Mol Diagn* **6**:137-144.

Zhang B, **Lau EC**, McGinniss MJ, Stewart T, and Patnaik M (2001) Homogenous MassARRAY platform (MALDI-TOF) mass spectrometry for automated high-throughput genotyping analysis of *GP3IIa*, *ACE*, and *PAI-1*. 16th Annual San Diego Conference on "New Technologies for Molecular Diagnosis", San Diego, CA, November 8-10, 2001. *Clin Chem* 2001;**47(11)**:2084, Abstract #32.

1995-2000

**MOLECULAR DIAGNOSIS OF GENETIC DISORDERS / HLA GENOTYPING /
PHARMACOGENETICS / MOLECULAR ONCOLOGY**

***Research Laboratory, Molecular Genetics Research Group, Specialty
Laboratories, Inc. (Santa Monica, California)***

Senior Research Scientist, Led the following diagnostic research programs –

- (i) Inherited genetic disorders
- (ii) HLA genotyping
- (iii) Hereditary thrombophilia
- (iv) Pharmacogenetics
- (v) Molecular oncology

Research & Development

**Application of genomic technologies to clinical diagnostic testing (Initiation of
“Clinical Genomics”) –**

*Evaluating novel genomic technologies for SNP genotyping. Invader and Sequenom
MassARRAY platforms were selected for clinical testing.*

Development, Validation, and Scientific Owner of Molecular Diagnostic Assays –

1. Factor V Leiden mutation for familial thrombophilia (Launched in 1995)
2. Fragile X syndrome for mental retardation (Launched in 1996)
3. HIV co-receptor *CCR5* genotyping (Launched in 1997)
4. *HFE* genotyping for hereditary hemochromatosis by PCR (Launched in 1997)
5. Prothrombin gene mutation for familial thrombophilia (Launched in 1998)
6. HLA-B27 genotyping for ankylosing spondylitis, reactive arthritis and psoriatic arthritis (Launched in 1999)
7. HLA genotyping for celiac disease susceptibility evaluation (Launched in 1999)
8. Methylene tetrahydrofolate reductase gene (*MTHFR*) mutations for folate Metabolism (Launched in 1999)
9. HLA genotyping for narcolepsy (Launched in 1999)
10. Factor V *HR2* haplotyping for familial thrombophilia (Launched in 2000)
11. HLA-A typing by PCR (Launched in 2000)
12. HLA-B typing by PCR (Launched in 2000)

Compliance, Documentation, and Assay Transfer

Development, Validation, and Scientific Owner of Clinical Trial assays –

1. Cytochrome P450 (*CYP*) *2D6* alleles for poor metabolizers
2. HLA-C typing by PCR (Pel-Freez kit)
3. Sickle cell S and C disorders by PCR
4. RhD genotyping for hemolytic disease
5. Cystic fibrosis 5 mutations for Jewish heritage
6. Connexin 26 mutations (35delG and 167delT) for hereditary hearing loss by PCR

7. Myotonic dystrophy by probe hybridization and PCR
8. Stromal-cell derived factor-1 (*SDF-1*) G801A variant for resistance to HIV Infection

Development of preanalytical sample preparation procedures –

Including novel methods for the isolation of DNA and RNA from whole blood and dry blood spots

Project Management & Administration

Evaluation of recent findings on molecular genetic pathology

Serving as a Member on the Genomics Board, Specialty Laboratories, Inc.

Interacting with the Marketing Team

Interfacing with the Business Development Team

Medical & Technical Writing

Contribution of numerous chapters to book series by Specialty Laboratories, Inc.:
(www.specialtylabs.com/books)

Use and Interpretation of Tests in Genetics
Use and Interpretation of Tests in Neurology
Use and Interpretation of Tests in Gastroenterology
Use and Interpretation of Tests in Endocrinology
Use and Interpretation of Tests in Infectious Disease

Article for Continued Education:

Lau EC. Hereditary hemochromatosis. *Diag Endo Immunol Metab* (2000) **18(12)**:383-395. Education Article, Amer Assoc Clin Chem (Washington DC).

The outcomes of some research studies were presented in the following conferences:

Lau EC, Leushner J, and Patnaik M (2000) Automated detection of the factor V Leiden mutation using MALDI-TOF mass spectrometry on the MassARRAY system. 15th Annual San Diego Conference on “The Current Revolution: *SNPs* and Chips in Molecular Diagnosis”, Anaheim, CA, November 16-18, 2000. *Clin Chem* 2000; **46(11)**:1880, Abstract #30.

Khachatryan A, Bakker A, **Lau EC,** and Patnaik M (2000) Unspliced HIV-1 mRNA quantitation by NASBA and electrochemiluminescence. 38th Annual Meeting of the Infectious Diseases Society of America, New Orleans, LA, September 7-10, 2000, Abstract #133.

Wang JQ, **Lau EC,** and Peter JB (1999) The sensitivity of mutant-enriched *RFLP*-PCR to detect somatic *k-ras* mutant cells in stool specimens for screening and early diagnosis of colorectal and pancreatic cancers. 100th Annual Meeting of the American Gastroenterological Association & Digestive Disease Week, Orlando, Florida, May 16-19, 1991. *Gastroenterology* 1999; **116** (4), A526 AGA, Abstract #G2311.

1990-1994

**DEVELOPMENTAL TOXICOLOGY / EUKARYOTIC GENETICS / RECOMBINANT
PROTEIN EXPRESSION / PROTEIN ENGINEERING / PROTEIN CHARACTERIZATION**

***Center for Craniofacial Molecular Biology, School of Dentistry, University of
Southern California (Health Sciences Campus, Los Angeles, California)***

Research Assistant Professor, Leading and managing two research programs:

- (i) **Developmental toxicology: Principal Investigator for NIH-funded Center Grant project** “Glucocorticoid receptor gene expression during craniofacial morphogenesis in congenic murine strains”. *Study the genetic determination of glucocorticoid- vs. retinoic acid-induced palatal clefting and cranial neural tube defects; as well as preventive therapy of teratogen-induced palatal clefting and cranial neural tube defects*
- (ii) **Molecular biology of enamel matrix biomineralization: Co-Principal Investigator for NIH-funded Program Grant project** “Amelogenin function in biomineralization”. *Study the alternative splicing of mouse amelogenin gene transcripts; ectopic expression of amelogenin proteins in bacteria, yeast and insect cells; fermentation of bacterial cells in large-scale production of recombinant amelogenins; characterization of recombinant amelogenins using physical and chemical methods; and alterations of amelogenin structure for functional determinations using site-directed mutagenesis techniques*

New Innovation Disclosure at USC (1994; USC File #94-2437) –

“Methionine Therapy (Preventive Treatment) of Teratogen-Induced Craniofacial Clefting, Neural Tube Defects, and Other Malformations”. *Part of our findings has also been published:*

Lau EC, and Li Z-Q (1995) Protection of mice from teratogen-induced cleft palate by exogenous methionine. *Proc Soc Exp Biol Med* **209**:141-145.

1988-1989

**MOLECULAR BASIS OF HUMAN INHERITED DISORDERS / TUMORS /
COMPARATIVE GENETICS / CHROMOSOMAL EVOLUTION**

*Laboratory for Developmental Biology, School of Dentistry, University of
Southern California (University Park Campus, Los Angeles, California)*

Research Assistant Professor, coordinating and conducting the following research projects:

- (i) **Human inherited disorders:** Linkage analysis of human amelogenesis imperfecta disorder
- (ii) **Chromosomal evolution:** Evolution of the sex chromosomes
- (iii) **Molecular genetics of amelogenin:** Isolation of amelogenin genes from genomic DNA libraries. Isolation and characterization of genomic sequences for mouse and human amelogenin
- (iv) **Tumorigenesis: Co-Principal Investigator for NIH-funded research project** "Differential Gene Expression in Ameloblastomas". Study the differential expression of amelogenin gene in ameloblastomas

1986-1988

MAMMALIAN GENE MAPPING

*Laboratory for Developmental Biology, School of Dentistry, University of
Southern California (University Park Campus, Los Angeles, California)*

Research Associate, conducting the following research projects:

- (i) **Chromosomal assignment of amelogenin genes:** Localization of the amelogenin gene(s) on the human and mouse chromosomes
- (ii) **DNA polymorphism:** Restriction fragment length polymorphism (*RFLP*) analysis of the human amelogenin genes
- (iii) **Phylogenetics:** Phylogenetics of enamel genes among various vertebrate species

1984-1985

DEVELOPMENTAL MOLECULAR GENETICS OF TOOTH ENAMEL PROTEIN

Laboratory for Developmental Biology, School of Dentistry, University of Southern California (University Park Campus, Los Angeles, California)

Post-Doctoral Fellow, conducting the following research projects:

- (i) Characterization and subcloning of the murine cDNA for amelogenin proteins
- (ii) Amelogenin gene expression during murine tooth development
- (iii) Screening mouse tooth cDNA library for enamel genes
- (iv) Defining the antigenic domains of amelogenin protein

1983-1984

MEMBRANE PROTEINS IN CANCERS

Cancer Research Center, La Jolla Cancer Research Foundation (La Jolla, California)

Post-Doctoral Fellow, conducting the following research projects:

- (i) Purification of early stage-specific membrane glycoproteins
- (ii) Characterization of membrane glycoproteins expressed in human erythroleukemic cells at different stages of differentiation and maturation
- (iii) Immunodetection of cell-surface and extracellular matrix protein markers expressed by various cancer cells

3. SCHOLARLY ACTIVITIES

3.1 PUBLICATIONS (SELECTED)

REFEREED JOURNAL ARTICLES / ORIGINAL PAPERS

- Bick SL, Bick DP, Wells BE, Roesler MR, Strawn EY, **Lau EC** (2008). Preimplantation HLA haplotyping using tri-, tetra-, and pentanucleotide short tandem repeats for HLA matching. *J Assist Reprod Genet* 25(7):323-331 (Published online: <http://dx.doi.org/10.1007/s10815-008-9233-2>).
- Swanson A, Strawn E, **Lau E**, and Bick D (2007). Preimplantation genetic diagnosis: technology and clinical applications. *WMJ* 106(3):145-51.
- Patnaik M, Dlott JS, Fontaine RN, Subbiah MT, Hessner MJ, Joyner KA, Ledford MR, **Lau EC**, Moehlenkamp C, Amos J, Zhang B, and Williams TM (2004). Detection of genomic polymorphisms associated with venous thrombosis using the Invader biplex assay. *J Mol Diagn* 6:137-144.
- Lau EC**, and Li Z-Q (1995) Protection of mice from teratogen-induced cleft palate by exogenous methionine. *Proc Soc Exp Biol Med* 209:141-145.
- Moradian-Oldak J, Simmer JP, **Lau EC**, Diekwisch T, Slavkin HC, and Fincham AG (1995) A review of the aggregation properties of a recombinant amelogenin. *Connect Tiss Res* 32(1-4):125-130.
- Moradian-Oldak J, Simmer JP, **Lau EC**, Sarte PE, Slavkin HC, and Fincham AG (1994) Detection of monodisperse aggregates of a recombinant amelogenin by dynamic light scattering. *Biopolymers* 34:1339-1347.
- Simmer JP, Hu C-C, **Lau EC**, Sarte P, Slavkin HC, and Fincham AG (1994) Alternative splicing of the mouse amelogenin primary RNA transcript. *Calcif Tissue Int* 55:302-310.
- Fincham AG, Moradian-Oldak J, Simmer JP, Sarte P, **Lau EC**, Diekwisch T, and Slavkin HC (1994) Self-assembly of a recombinant amelogenin protein generates supramolecular structures. *J Struct Biol* 112:103-109.
- Simmer JP, **Lau EC**, Hu C-C, Aoba T, Lacey M, Nelson D, Thiemann F, Zeichner-David M, Snead ML, Slavkin HC, and Fincham AG (1994) Isolation and characterization of a mouse amelogenin expressed in *Escherichia coli*. *Calcif Tissue Int* 54:312-319.
- Lau EC**, Li Z-Q, Santos V, and Slavkin HC (1993) Messenger RNA phenotyping for semi-quantitative comparison of glucocorticoid receptor transcript levels in the developing embryonic mouse palate. *J Steroid Biochem Mol Biol* 46:751-758.
- Lau EC**, Li Z-Q, and Slavkin HC (1993) Preparation of denatured plasmid templates for PCR amplification. *BioTechniques* 14:378.

- Lau EC**, Simmer JP, Bringas P, Hsu DD-J, Hu C-C, Zeichner-David M, Thiemann F, Snead ML, Slavkin HC, and Fincham AG (1992) Alternative splicing of the mouse amelogenin primary RNA transcript contributes to amelogenin heterogeneity. *Biochem Biophys Res Commun* **188**:1253-1260.
- Watson JM, Spencer JA, Graves JAM, Snead ML, and **Lau EC** (1992) Autosomal localization of the amelogenin gene in monotremes and marsupials: Implications for mammalian sex chromosome evolution. *Genomics* **14**:785-789.
- Snead ML, Luo W, Hsu DD-J, Melrose RJ, **Lau EC**, and Stenman G (1992) Human ameloblastoma tumors express the amelogenin gene. *Oral Surg Oral Med Oral Pathol* **74**:64-72.
- Chapman VM, Keitz BT, Distech, CM, **Lau EC**, and Snead ML (1991) Linkage of amelogenin (*Amel*) to the distal portion of the mouse X chromosome. *Genomics* **10**:23-28.
- Fincham AG, Hu Y, **Lau EC**, Slavkin HC, and Snead ML (1991) Amelogenin post-secretory processing during biomineralization in the postnatal mouse molar tooth. *Arch oral Biol* **36**:305-317.
- Fincham AG, Bessem CC, **Lau EC**, Pavlova Z, Shuler CF, Slavkin HC, and Snead HC (1991) Human developing enamel proteins exhibit a sex-linked dimorphism. *Calcif Tissue Int* **48**:288-290.
- Fincham AG, Hu Y, **Lau EC**, Pavlova Z, Slavkin HC, and Snead ML (1990) Isolation and partial characterization of a human amelogenin from a single fetal dentition using HPLC techniques. *Calcif Tissue Int* **47**:105-111.
- Lau EC**, Mohandas TK, Shapiro LJ, Slavkin HC, and Snead ML (1989) Human and mouse amelogenin gene loci are on the sex chromosomes. *Genomics* **4**:162-168.
- Luo W, Roop DR, **Lau EC**, Melrose RJ, Mostofi R, Stenman G, and Snead ML (1988) *In situ* hybridization analysis of keratin gene expression in human ameloblastomas. *J Oral Pathology* **17**:534-540.
- Snead ML, Luo W, **Lau EC**, and Slavkin HC (1988) Spatial- and temporal-restricted pattern for amelogenin gene expression during mouse molar tooth organogenesis. *Development* **104**:77-85.
- Snead ML, Bessem CC, **Lau EC**, Zeichner-David M, MacDougall M, Vides J, Fincham AG, and Slavkin HC (1987) Amelogenin protein epitopes defined by antipeptide antibodies. *J Dent Res* **66**:117.
- Lau EC**, Bessem CC, Slavkin HC, Zeichner-David M, and Snead ML (1987) Amelogenin antigenic domain defined by clonal epitope selection. *Calcif Tissue Int* **40**:231-237.
- Snead ML, **Lau EC**, Zeichner-David M, Fincham AG, Woo SLC, and Slavkin HC (1985) DNA sequence for cloned cDNA for murine amelogenin reveal the amino acid sequence for enamel-specific protein. *Biophys Biochem Res Comm* **129**:812-818.
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