

Curriculum Vitae

1. Name: ECHTAY, Karim Salim

2. Address and Contact Info.:

University of Balamand
 Faculty of Medicine & Medical Sciences
 Department of Biomedical Sciences
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3. Date of Birth: 04/10/65.

4. Present Family Status: Married

5. Current Academic Rank: Associate Professor

6. Degrees/Education:

- Ph.D/Biochemistry	Ludwig Maximilians-University-Munich (LMU)-Germany	1999
- M.Sc./Biochemistry	American University of Beirut (AUB)-Lebanon	1991
- B.S./Biology-Chemistry	Lebanese American University (LAU) Lebanon	1989

7. Academic Experience:

- Assistant Dean for Graduate Studies-	Faculty of Medicine, University of Balamand	July 2013-present
- Associate Professor	Faculty of Medicine, University of Balamand	Sept 2008- present
- Assistant Professor	Faculty of Medicine, University of Balamand	July 2003-Aug 2008
- Coordinator Med. I program	Faculty of Medicine, University of Balamand	2003-present
- Coordinator Med. II program	Faculty of Medicine, University of Balamand	2003-present
- Visiting Lecturer	Faculty of Medicine, University of Balamand	Dec. 2002-Jan. 03
- Visiting Lecturer	Faculty of Medicine, American University Of Beirut, Lebanon	Dec. 2001-Jan. 02
- Post-doctoral Research fellow	Medical Research Council (MRC) Dunn Human Nutrition Unit, Cambridge, United Kingdom	May 2000-Jun. 03
- Post-doctoral Research fellow	Institute of Physical Biochemistry, Ludwig-Maximilians-University (LMU), Munich, Germany	Jan. 1999-April 00
- Senior research assistant	Biochemistry Department, Faculty of Medicine, American University Of Beirut (AUB), Beirut, Lebanon	Jun. 1991-Oct. 94
- Part time instructor	Chemistry Department, Lebanese American University (LAU), Beirut, Lebanon	1991-1994

- Part time instructor	Makassed National College of Nursing, Beirut-Lebanon	1991-1992
- Part time instructor	Biology Department, American University of Beirut (AUB), Beirut, Lebanon	1989-1991

8. Publications and Presentations:

8.1. Publications

i). Refereed Journal

- Julnar Usta, Yasmine Hachem, Omar Al-Rifai, Yolla Bou-Moughlabey, **Karim Echtay**, David Griffiths, Hania Nakkash-Chmaisse, Rajaa Fakhoury Makki. **Fragrant chemicals lylal and lilial decrease viability of HaCat cells' by increasing free radical production and lowering intracellular ATP level: Protection by antioxidants.** *Toxicol in Vitro* 2013, **27**, 339–348.
- Takla G. El-Khoury, Georges M. Bahr and **Karim S. Echtay** **Muramyl dipeptide-induced mitochondrial proton leak in macrophages is associated with up-regulation of uncoupling protein-2 and the production of reactive oxygen and reactive nitrogen species.** *FEBS J* 2011, **278**, 3054-3064,
- **Echtay KS** (2011) **4-hydroxy-trans-2-nonenal and mitochondrial uncoupling proteins.** In *Lipid Peroxidation: Biological Implications* (Angel Catalá, ed), pp 71-91. Transworld Research Network, Kerala, India.
- Usta, J; Racha, K; Boushra, K; Shatha, S; Yolla, B; Omar, R; **Echtay, K** **Linalool Effect on HepG2 cells: Structure Function Relation** *Planta Med* 2011, **77**: PG22.
- Usta, J; Shatha, S; Racha, K; Yolla, B; Omar, R; Sawsan, K; **Echtay, K** **Possible mediators underlying Linalool effect on HepG-2 but not primary hepatocytes: Comparative study** *Planta Med* 2011, **77**: PF27.
- N. El-Jamal, G. M. Bahr, **K. S. Echtay** **Effect of muramyl peptides on mitochondrial respiration** *Clin Exp Immunol* 2009, **155**, 72-78.
- **Karim S. Echtay** **Mitochondrial uncoupling proteins-What is their physiological role?** *Free Radic Biol Med* 2007, **43**, 1351-1371.
- **Karim S. Echtay** **Mitochondrial uncoupling proteins and 4-hydroxy-2-nonenal: a possible physiological role in protection against oxidative damage.** *Acta Physiologica* 2007, **191**, S658.
- **Karim S. Echtay**, and Martin D. Brand **4-hydroxy-2-nonenal and uncoupling proteins: an approach for regulation of mitochondrial ROS production.** *Redox Report* 2007, **12**, 26-29.
- **Karim S. Echtay**, Julian L. Pakay, Telma C. Esteves and Martin D. Brand **Hydroxynonenal and uncoupling proteins: a model for protection against oxidative damage.** *BioFactors* 2005, **24**, 119-130.
- Martin D. Brand, Julie A. Buckingham, Telma C. Esteves, Katherine Green, Adrian J. Lambert, Satomi Miwa, Michael P. Murphy, Julian L. Pakay, Darren A. Talbot and **Karim S. Echtay** **Mitochondrial superoxide and ageing: uncoupling protein activity and superoxide production.** *Biochem Soc Symp* 2004, **71**, 203-213.

- Telma C. Esteves, **Karim S. Echtay**, Tanya Jonassen, Catherine F. Clarke and Martin D. Brand
Ubiquinone is not required for proton conductance by uncoupling protein 1 in yeast mitochondria. *Biochem. J.* 2004, **379**, 309- 315.
- Considine M, Goodman M, **Echtay KS**, Whelan J, Brand MD, Sweetlove LJ
Superoxide stimulates a proton leak in potato mitochondria that is related to the activity of uncoupling protein. *J. Biol. Chem.* 2003, **278**, 22298-302.
- **Karim S. Echtay**, Telma C. Esteves, Julian L. Pakay, Mika B. Jekabsons, Adrian J. Lambert, Manuel Portero-Otín, Reinald Pamplona, Antonio J. Vidal-Puig, Steven Wang, Stephen J. Roebuck and Martin D. Brand
A signaling role for 4-hydroxy-2-nonenal in regulation of mitochondrial uncoupling. *EMBO J.* 2003, **22**, 4103-4110.
- **Karim S. Echtay**, Michael P. Murphy, Frances H. Blaikie, Jordi Asin-Cayuela, Helena M. Cochemé, Katherine Green, Julie Buckingham, Ellen R. Taylor, Fiona Hurrell, Gillian Hughes, Satomi Miwa, Christopher E. Cooper, Dimitri A. Svistunenko, Robin A. J. Smith, and Martin D. Brand
Superoxide Activates Uncoupling Proteins by Generating Carbon-Centered Radicals and Initiating Lipid Peroxidation: studies using a mitochondria-targeted spin trap derived from α -phenyl-*n*-tert-butylnitron. *J. Biol. Chem.* 2003, **278**, 48534-48545.
- Mika B. Jekabsons, **Karim S. Echtay**, Ignacio Arechaga, and Martin D. Brand
Molecular Properties of Purified Human Uncoupling Protein-2 Refolded from Bacterial Inclusion Bodies. *J. Bioenerg. Biomembr.* 2003, **35**, 409-18.
- **Karim S. Echtay**, Damien Roussel, Julie St-Pierre, Mika B. Jekabsons, Susana Cadenas, Jeff A. Stuart, James A. Harper, Stephen J. Roebuck, Alastair Morrison, Susan Pickering, John C. Clapham and Martin D. Brand.
Superoxide activates mitochondrial uncoupling proteins. *Nature*, 2002, **415**, 96-99.
- Susana Cadenas, **Karim S. Echtay**, James A. Harper, Mika B. Jekabsons, Julie A. Buckingham, Evelyn Grau, Alejandro Abuin, Helen Chapman, John C. Clapham & Martin D. Brand.
The basal proton conductance of skeletal muscle mitochondria from transgenic mice overexpressing or lacking uncoupling protein-3. *J. Biol. Chem.* 2002, **277**, 2773-2778.
- **Karim S. Echtay**, Michael P. Murphy, Robin A. J. Smith, Darren A. Talbot and Martin D. Brand.
Superoxide activates mitochondrial uncoupling protein 2 from the matrix side: studies using targeted antioxidants.. *J. Biol. Chem.* 2002, **277**, 47129-47135.
- Mika B Jekabsons, **Karim S. Echtay** and Martin D. Brand
Nucleotide binding to human uncoupling protein-2 refolded from bacterial inclusion bodies. *Biochem. J.*, 2002, **366**, 565-571.
- **Karim S. Echtay** and Martin D. Brand.
Uncoupling proteins and superoxides. *Int. J. Obes.* 2002, **26**, S13.
- Martin Klingenberg and **Karim S. Echtay**
Uncoupling Proteins - The Issues From a Biochemist Point Of View. *Biochim. Biophys. Acta*, 2001, **1504**, 128-143.
- **Karim S. Echtay**, Edith Winkler, Karina Frischmuth and Martin Klingenberg.

Uncoupling Proteins 2 and 3 Are Highly Active H⁺ Transporters And Highly Nucleotide Sensitive When Activated By Coenzyme Q (Ubiquinone). *Proc.Natl.Acad.Sci. USA*, 2001, **98**, 1416-1421.

- **Karim S. Echtay**, Martin Bienengraeber and Martin Klingenberg.
The Role of Intrahelical Arginines in the Functional Properties of Uncoupling Protein 1 (UCP1). *Biochemistry*, 2001, **40**, 5243-5248.
- **Karim S. Echtay & Martin D. Brand**
Coenzyme Q induces GDP sensitive proton conductance in kidney mitochondria. *Biochem.Soc.Trans.* 2001, **29**, 763–768
- M. Klingenberg, E. Winkler and **K. Echtay**
Uncoupling protein, H⁺ transport and regulation. *Biochem. Soc. Trans.* 2001, **29**, 806–811
- **Karim S. Echtay**, Edith Winkler, Martin Bienengraeber and Martin Klingenberg. **Site-Directed Mutagenesis Identifies Residues in Uncoupling Protein (UCP1) Involved in Three Different Functions.** *Biochemistry*, 2000, **39**, 3311-3317.
- **Karim S. Echtay**, Edith Winkler and Martin Klingenberg.
Coenzyme Q is an obligatory cofactor for uncoupling protein function. *Nature*, 2000, **408**, 609-613
- **Karim S. Echtay**, Edith Winkler, Martin Bienengraeber and Martin Klingenberg
Identification of pH Sensors in Uncoupling Protein (UCP-1). *Biophysical J*, 1999, **76**, A231
- **Karim S. Echtay**, Qingyun Liu, Tom Caskey, Edith Winkler, Karina Firschmuth, Martin Bienengraeber and Martin Klingenberg.
Regulation of UCP-3 by Nucleotide is Different From Regulation of UCP-1. *FEBS Lett*, 1999, **450**, 8-12
- Klingenberg M, **Echtay, K.S.**, Bienengraeber, M., Winkler, E. and Huang, SG.
Structure-Function Relationship in UCP1. *Int. J. Obes.*, 1999, **23**, S24-S29
- Martin Bienengraeber, **Karim S Echtay** and martin Klingenberg
H⁺ transport by uncoupling protein (UCP-1) is dependent on a histidine pair absent in UCP-2 and UCP-3. *Biochemistry* 1998, **37**, 3-8
- **Karim S Echtay**, Martin Bienengraeber, Edith Winkler and Martin Klingenberg
In the uncoupling protein (UCP-1) His-214 is involved in the regulation of purine nucleoside triphosphate but not diphosphate binding. *J. Biol. Chem.*, 1998, **273**, 24368-24374
- **Karim S Echtay**, Martin Bienengraeber and Martin Klingenberg
Mutagenesis of the uncoupling protein of brown adipose tissue. Neutralization of E190 largely abolishes pH control of nucleotide binding. *Biochemistry* 1997, **36**, 8253-8260

8.2. Presentations

i). Conferences Attended & Abstracts

- Usta, J; Racha, K; Boushra, K; Shatha, S; Yolla, B; Omar, R; **Echtay, K**
Linalool Effect on HepG2 cells: Structure Function Relation
(Abstract) 59th *International Congress and Annual Meeting of the Society for*

Medicinal Plant and Natural Product Research. September 4.-9, 2011, Antalya, Turkey.

- Usta, J; Shatha, S; Racha, K; Yolla, B; Omar, R; Sawsan, K; **Echtay, K**
Possible mediators underlying Linalool effect on HepG-2 but not primary hepatocytes: Comparative study (Abstract) *59th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research*. September 4.-9, 2011, Antalya, Turkey

- **Karim S. Echtay**
Mitochondrial uncoupling proteins and 4-hydroxy-2-nonenal: a possible physiological role in protection against oxidative damage (Abstract) *Joint Meeting of the Slovak Physiological Society & the Physiological Society & the Federation of European Physiological Societies*. September 11-14, 2007, Bratislava, Slovakia

- **Karim S. Echtay** and Martin D. Brand
4-hydroxynonenal and uncoupling proteins: A model for protection against oxidative damage (Abstract) *3rd International Meeting of the HNE-Club "Role of 4-Hydroxynonenal and related lipid peroxidation products in cell pathophysiology"*. Genoa, Italy, June 16-18, 2006

- Julian L. Pakay Telma Esteves, **Karim S. Echtay**, and Martin D. Brand
HNE induces mild uncoupling of mitochondria specifically through effects on the ANT and UCPs (Abstract) *2nd International Meeting of the HNE-Club HNE and Lipid Peroxidation Products: from basic science to medicine* Berlin, Germany July 6 - 9, 2004

- **Karim S. Echtay**, and Martin D. Brand
A signalling role for 4-hydroxy-2-nonenal in regulation of mitochondrial uncoupling (Abstract) *2nd Meeting of the HNE-Club HNE and Lipid Peroxidation Products: from basic science to medicine* Berlin, Germany July 6 - 9, 2004

- **Karim S. Echtay** & Martin D. Brand
Uncoupling proteins & Superoxide (Abstract) *Nobel minisymposium: Frontiers in Medicine „Molecular Genetics of Mitochondrial Dysfunction“* at Nobel Forum, Karolinska Institutet, Stockholm, Sweden, May 25-26, 2003

- Telma C. Esteves, **Karim S. Echtay** & Martin D. Brand
Ubiquinone and the uncoupling function of UCP1 in mitochondria (Abstract) *Nobel minisymposium: Frontiers in Medicine „Molecular Genetics of Mitochondrial Dysfunction“* at Nobel Forum, Karolinska Institutet, Stockholm, Sweden, May 25-26, 2003

- Darren A. Talbot, **Karim S. Echtay** & Martin D. Brand
Inhibition of UCP3 causes mitochondria oxidative damage (Abstract) *Biochemical Society meeting „Stress, Signalling and Control“* University of Essex, UK 2 - 4 July 2003

- Telma C. Esteves, **Karim S. Echtay** & Martin D. Brand
Ubiquinone is not a regulatory cofactor for UCP1 (Abstract) *Biochemical Society meeting „Stress, Signalling and Control“* University of Essex, UK 2 - 4 July 2003

- Darren A Talbot, **KS Echtay**, MD Brand
Control of mitochondrial superoxide production by UCP3 (Abstract) *3rd Conference on Mitochondrial Physiology*, Schröcken, Vorarlberg, Austria 12-15 Sept. 2003.

- **Karim S. Echtay** & Martin D. Brand
Uncoupling proteins & Superoxide (Abstract) *9th International Congress on Obesity*, Sao Paulo, Brazil, August 24-29, 2002.
- Martin Klingenberg, **Karim Echtay**, Edith Winkler, Frits Kamp
Cofactor role of coenzyme Q in uncoupling proteins (Abstract) *Third Conference of the International Coenzyme Q₁₀ Association*, London, England, November 22-24, 2002.
- M.D. Brand, M.B. Jekabsons, D. Roussel, J. St-Pierre, S. Cadenas, J.C. Clapham, J.A. Harper, J.A. Stuart, **K. Echtay**
The function of UCP1 homologues (Abstract) *Biochemical society meeting- Signalling Homeostasis*, Trinity College Dublin, 11-13 July 2001.
- M. Klingenberg, **K. Echtay** & Winkler E.
Uncoupling protein function (Abstract) *Biochemical society meeting- Signalling Homeostasis*, Trinity College Dublin, 11-13 July 2001.
- M. Klingenberg, E. Winkler, **K. Echtay** and K. Frischmuth.
A Fresh Look at Uncoupling Proteins (Abstract). *3rd Albany Conference: Frontiers of Mitochondrial Research*. Rensselaerville, New York, USA September 2000.
- M. Klingenberg, **K. Echtay**, E. Winkler.
A New Look at Uncoupling Proteins (Abstract). *11th European Bioenergetics Conference (EBEC)*. University of Sussex, Brighton, UK. 9-14 September 2000.
- **Karim S Echtay**, Edith Winkler, Martin Bienengraeber and Martin Klingenberg. **Identification of pH Sensor in UCP** (Abstract). *43rd Biophysical Annual Meeting*. Baltimore, Maryland, USA. February 1999.
- **Karim S Echtay**, Qingyun Liu, Tom Caskey, Edith Winkler, Karina Frischmuth, Martin Bienengraeber and Martin Klingenberg.
Uncoupling Protein 3 (UCP-3): Regulation by Nucleotide is Different from UCP1 (Abstract). *Molecular Basis of Biomembrane Transport*. Monopoli, Bari, Italy. June 1999
- Martin Klingenberg, **Karim S Echtay** and Edith Winkler.
Structure-Function Relationship in UCP1 and UCP3 (Abstract). *Molecular Basis of Biomembrane Transport*. Monopoli, Bari, Italy. June 1999.
- **Karim S Echtay**, Martin Bienengraeber and Martin Klingenberg.
pH Regulation of Nucleotide Binding to Uncoupling Protein (UCP-1) (Abstract). *2nd Albany Conference: Frontiers of Mitochondrial Research*. Albany NY, USA, September 1998.
- **Karim S Echtay**, Martin Bienengraeber and Martin Klingenberg.
Glu-190 in the Uncoupling Protein is Essential for the pH Regulation of Nucleotide Binding (Abstract). *The Molecular Basis of Biological Membrane: Protein Structure and Function*. Albufeira, Portugal, April 1997.
- Martin Bienengraeber, **Karim S Echtay** and Martin Klingenberg.
UCP Expressed in E.coli – Trail of renaturation (Abstract) *Membranforum Frankfurt*. Frankfurt am Main. Germany. March 1996
- **Karim Salim Echtay**, Ghada Haddad and Amira Harb.
Effect of Vitamin D2 on the Activity of Intestinal Protein kinase C (Abstract) *The Lebanese Association For the Advancement of Science*. Beirut, June 1994.
- **Karim Salim Echtay**, Julnar Usta and Camille Nassar.

Biochemical Alteration in the Jejunum of Rat with Cysteamine-Induced Duodenal Ulcer (Abstract) *The Lebanese Association For the Advancement of Science*. Beirut, April 1992

ii). Invited Speaker at International Conferences

- September 11-14, 2007, Bratislava, Slovakia
Joint Meeting of the Slovak Physiological Society & the Physiological Society & the Federation of European Physiological Societies. Title of the talk: "Mitochondrial uncoupling proteins and 4-hydroxy-2-nonenal: a possible physiological role in protection against oxidative damage."
- June 16-18, 2006, Genoa, Italy.
3rd International Meeting of the HNE-Club "Role of 4-Hydroxynonenal and related lipid peroxidation products in cell pathophysiology". Title of the talk: "4-hydroxynonenal and uncoupling proteins: A model for protection against oxidative damage"
- July 6-9, 2004, Berlin, Germany
2nd International Meeting of the HNE-Club "HNE and Lipid Peroxidation Products: from basic science to medicine" Title of the talk "A signalling role for 4-hydroxy-2-nonenal in regulation of mitochondrial uncoupling,,
- August 2002, Sao Paulo-Brasil.
9th International Congress on Obesity-
- May 2002, New York, USA
New York Academy of Science at the symposium entitled "*The molecular and Biochemical Basis of Thermogenesis: A Target for Obesity*"
- March 2002, Dublin, Ireland
Biochemical Society at Trinity College University of Dublin. Title of talk "Toward understanding the physiological functions of uncoupling proteins homologous"

9. Ongoing Research:

- **Mitochondrial efficiency in health and disease**

Mitochondria are energy-producing organelles contained in human cells. They possess a series of energy-producing molecules that collectively are called the respiratory chain and are responsible for synthesizing the energy-rich molecule ATP by oxidative phosphorylation. They have many other important roles required for the maintenance of cellular health, mostly relating to energy conservation, as well as participating in ion homeostasis in cells, particularly Ca^{++} ions. Disorders of the mitochondrial respiratory chain constitute groups of diseases such as obesity, diabetes, neurodegenerative disorders, aging and others. Recently, considerable international research interest and resources have been directed to deal with these health problems. So, mitochondrial functions in health and disease provide the backdrop to the research projects in our laboratories

10. Honors and Awards:

- **Member of Editorial Board of:**

- 1- ISRN Cell Biology Journal
- 2- International Journal of Applied and Natural Sciences (IJANS)
- 3- Journal Biochemistry and Biotechnology

- **Member of Executive Committee of the Lebanese Association for the Advancement of Sciences (LAAS).**

- **Hermann Esterbauer Award** (2006). This award is donated to a young scientist for outstanding contributions to research in the field of the lipid peroxidation product 4-hydroxynonenal in memory of Prof. Hermann Esterbauer from the University of Graz (Austria)
- **Patent:**
Title: Regulation of the function of uncoupling proteins, e.g. in treatment of obesity, diabetes and neurodegenerative diseases, comprises use of coenzyme Q or analogues as a cofactor.
Patent Number(s): DE10044805-A1
Inventor(s): KLINGENBERG M, WINKLER E, ECHTAY K S