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Mechanisms of *Cytochrome C* release from mitochondria

http://www.nature.com/cdd/journal/v13/n9/abs/4401950a.html

Edited by B Zhivotovsky

C Garrido , et al, *Cell Death and Differentiation* (2006) **13,** 1423–1433. doi:10.1038/sj.cdd.4401950; published online 5 May 2006

In healthy cells, cytochrome *c* (Cyt *c*) is located in the mitochondrial intermembrane/intercristae spaces, where it functions as an electron shuttle in the respiratory chain and interacts with cardiolipin (CL). Several proapoptotic stimuli induce the permeabilization of the outer membrane, facilitate the communication between intermembrane and intercristae spaces and promote the mobilization of Cyt *c* from CL, allowing for Cyt *c* release. In the cytosol, Cyt *c* mediates the allosteric activation of apoptosis-protease activating factor 1, which is required for the proteolytic maturation of caspase-9 and caspase-3. Activated caspases ultimately lead to apoptotic cell dismantling.

Nevertheless, cytosolic Cyt *c* has been associated also to vital cell functions (i.e. differentiation), suggesting that its release not always occurs in an all-or-nothing fashion and that mitochondrial outer membrane permeabilization may not invariably lead to cell death. This article dealt with the events involved in Cyt *c* release from mitochondria, with special attention to its regulation and final consequences.

Jewish and Middle Eastern non-Jewish populations share a common pool of Y-chromosome biallelic haplotypes

www.pnas.org

M. F. Hammer , et al

Haplotypes constructed from Y-chromosome markers were used to trace the paternal origins of the Jewish Diaspora. A set of 18 biallelic polymorphisms was genotyped in 1,371 males from 29 populations, including 7 Jewish (Ashkenazi, Roman, North African, Kurdish, Near Eastern, Yemenite, and

Ethiopian) and 16 non-Jewish groups from similar geographic locations. The Jewish populations were characterized by a diverse set of 13 haplotypes that were also present in non-Jewish populations from Africa, Asia, and Europe. A series of analyses was performed to address whether modern Jewish Y-chromosome diversity derives mainly from a common Middle Eastern source population or from admixture with neighboring non-Jewish populations during and after the Diaspora. Despite their long-term residence in different countries and isolation from one another, most Jewish populations were not significantly different from one another at the genetic level. Admixture estimates suggested low levels of European Y-chromosome gene flow into Ashkenazi and Roman Jewish communities. A multidimensional scaling plot placed six of the seven Jewish populations in a relatively tight cluster that was interspersed with Middle Eastern non-Jewish populations, including Palestinians and Syrians. Pairwise differentiation tests further indicated that these Jewish and Middle Eastern non-Jewish populations were not statistically different. The results support the hypothesis that the paternal gene pools of Jewish communities from Europe, North Africa, and the Middle East descended from a common Middle Eastern ancestral population, and suggest that most Jewish communities have remained relatively isolated from neighboring non-Jewish communities during and after the Diaspora.

Biotechnology Asia 2005 Innovation Award for CinnaGen Co.

www.cinnagen.com

BIOTECHNOLOGY Asia 2005 Innovation Awards aimed at recognizing achievements and innovation in biotechnology research held in August 16-18 2005 at the Putra World Trade Centre Malaysia.

The award presentation was held in conjunction with Biotechnology Asia 2005 Exhibition and Conference. This important event offered a diverse range of latest products, services, and technologies as well as extensive networking opportunities for industry players, policymakers and government officials.

More than 40 companies had signed up for the 2005 exhibition including exhibitors like CinnaGen Inc, Millipore Singapore Pte Ltd, Interscience Sdn Bhd, Roche Diagnostics, Sigma-Aldrich (M) Sdn Bhd, as well as research institutions like Forest Research Institute of Malaysia, Biotechnology Centre Malaysian Agriculture Research and Development Institute (Mardi) and Malaysian Cocoa Board

CinnaGen has owned the gold award for it's state-of-the-art DNA Extraction Kit**.**

Effect of aerobic exercise training on mtDNA deletion in soleus muscle of trained and untrained Wistar rats

http://bjsm.bmjjournals.com/cgi/content/full/39/8/517

A Jafari , M A Hosseinpourfaizi , M Houshmand and A A Ravasi , *British Journal of Sports Medicine* 2005;**39**:517-520; doi:10.1136/bjsm.2004.014068

Background: According to the theory of mitochondrial aging, oxidative stress plays a major role in aging and age related degenerative diseases. Since oxygen consumption and reactive oxygen species rate increase during aerobic exercise, we hypothesised that heavy aerobic training could lead to enhanced mitochondrial DNA (mtDNA) deletion in postmitotic tissues, leading in turn to premature aging and degenerative diseases.

Methods: Sixty adult male 2 month old Wistar rats were divided into six equal groups. Two groups were trained for 3 months by running on a treadmill (5 days/week, incline 6°; group 1: 40 m/min, 20 min/day; group 2: 20 m/min, 40 min/day), while two sedentary groups participated in aerobic exercise only at the end of the study (incline 6°; group 3: 40 m/min; group 4: 20 m/min). To control for physical and physiological parameters, two groups of untrained animals were killed at the beginning (group 6) and end (group 5) of the study. Expand long PCR was used to investigate mtDNA deletion in soleus muscle and a sequencing method was used to confirm the mtDNA deletion break point.

Results: the results did not show any mtDNA deletion in untrained rats or in those that underwent moderate training (group 2). It was only found mtDNA deletion (4.6 kb) in the soleus muscle of heavily trained rats (group 1).

The International Hospital Federation honours pioneers in medicine from the United Arab Emirates

www.cags.org.ae

The International Hospital Federation (IHF) has honoured H.H. Sheikh Hamdan Bin Rashid Al Maktoum as the world's best personality in the fields of health, education, and sports for 2001-2005. Sheikh Hamdan, Dubai Deputy Ruler, Minister of Finance and Industry and Head of the Dubai Department of Health and Medical Services, is the first Arab personality who is accorded this honour. During the functions of the International Medical Diagnostics (IMD-Dubai 2005) Conferences, the IHF also honoured five pioneers in medicine from the United Arab Emirates. Professor Per-Gunnar Svensson, Director General of IHF, presented the Awards for "Health Services Achievements in the Middle East" to Prof. Najib Al Khaja, Dr. Mahmoud Taleb Al Ali, Dr. Sharaban Abdullah, Dr. Awatif Al Bahar, and Dr. Ameena AlMarzouqi for their contributions in health care.

Presently, Professor Najib Al Khaja is the Director of the Cardiology and Cardiothoracic Surgery Centre, Dubai Hospital. He is also Professor and Head of Academic Department of Surgery, Vice-Dean of the Dubai Medical College for Girls, and Member of the Board of Trustees and Secretary General of the Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Sciences. Dr. Al Khaja is also a visiting consultant to the Cardio thoracic Centre in Monaco. Prof. Al Khaja is the member of Scandinavian Association for Thoracic and Cardiovascular Surgery, International College of Angiology, Saudi Heart Association, UAE Medical Association, European Association of Cardiothoracic Surgery, Asian Annals of Cardiothoracic & Vascular Surgery, Emirates Medical Journal - Editorial Board and the Arab Board for Postgraduate Studies. He is also member of the Third World Academy of Science (TWAS). In 1999, Prof.Al Khaja received the award of the "Best Employee of the Year"

From right to left: Prof. Najib Al Khaja, Mr. Qadhi Saeed Al Murooshid, Director General, Department Of Health & Medical Services (DOHMS), and Professor Per-Gunnar Svensson, Director General of IHF.

from the Department of Health and Medical Services (DOHMS) in Dubai. He also received a special award for teh establishment of the Cardiac Surgery Department and his

distinguished role in the field in Dubai Hospital under DOHMS.

Dr. Mahmoud Taleb Al Ali is a consultant geneticist and head of Genetics Centre at Al Wasl Hospital Dubai. He is also the Director of the Centre for Arab Genomic Studies. Dr. Al Ali is an adjacent Assistant Professor in the Department of Biochemistry at the Faculty of Medicine & Health Sciences, UAE University. Dr. Al Ali graduated in Laboratory Medicine from University of Kentucky, USA and received his Ph.D. in Biochemistry & Molecular Endocrinology from University of London Medical School. At the present Dr. Al Ali is involved in laboratory diagnosis and research related to inherited metabolic diseases. He has developed a department of metabolic genetics that serves the region.

Dubai International Medical Care and Diagnostic Conference & Exhibition (IMD Dubai) 2005

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Under the patronage of H.H. Sheikh Hamdan Bin Rashid Al Maktoum, Deputy Ruler of Dubai, Minister of Finance & Industry, President of the Department of Health and Medical Services, the Dubai International Medical Care and Diagnostic Conference & Exhibition IMD Dubai 2005 was held from 10-12 September, 2005. The event took place in the Dubai International Exhibition Centre, Dubai – United Arab Emirates.

IMD Dubai 2005 included parallel conferences and exhibitions, including:

- Dubai International Emergency and Catastrophe Management Conference and Exhibition
- Dubai International Pathology and Genetics Conference & Exhibition
- Dubai International Obs-Gyne and Fertility Conference and Exhibition
- Dubai International Otorhinolaryngological, Head & Neck Surgery Conference and Exhibition
- Dubai International Hospital Management Conference and Exhibition
- Dubai International Hospital Architectural Design and Biomedical Conference and Exhibition
- Dubai International Surgical Conference & Exhibition
- Pan Regional Nursing Conference
- Dubai International Urology Conference & Exhibition

IMD Dubai 2005 was held in cooperation with the Department of Health & Medical Services, the International Hospital Federation, Charite University Berlin. The conference was supported by the Ministry of Health, Dubai Chamber of Commerce & Industry, Dubai Municipality, Ministry of Interior, Dubai Police General H.Q., Emirates Medical Association, Sheikh Hamdan Bin Rashid Al Maktoum Award for Medical Sciences – Centre for Arab Genomic Studies, and Medica - Messe Dusseldorf.

Congenital ills main cause of infant mortality

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Genetic and congenital disorders are responsible for a considerable proportion of infant mortality within Arab populations, said Professor Ghazi Omar Tadmouri, Assistant Director of the Centre for Arab Genomic Studies (CAGS).

Prof. Tadmouri said this while delivering a presentation “The Catalogue of Transmission Genetics in Arabs (CTGA): The UAE as a Model” on the last day of the third Dubai International Conference on Medical Sciences.

“At present, congenital malformations are the second leading cause of infant mortality in the (Persian) Gulf Cooperation Council countries, including Bahrain, Kuwait, Oman and Qatar,” said Dr Tadmouri.

He said that in view of the need to remain up-to-date on the latest genetic disorders in Arab populations, the Centre for Arab Genomic Studies launched a pilot project to catalogue genetic disorders described in Arab individuals.

The information collected was compiled in a database named the Catalogue of Transmission Genetics in Arabs, which is available to the public through the CAGS web site at http://www.cags.org.ae/.

According to a search conducted in September this year through the Online Mendelian Inheritance in Man (OMIM), an authoritative directory of inherited disorders, the presence of 752 abnormal Mendelian characters in Arabs were found. The results showed that most of the genetic disorders reported in Arabs were from Tunisia, Morocco, Algeria, Lebanon and Saudi Arabia. Smaller numbers of genetic disorders were described in other Arab populations.

“A striking observation is the presence of an overwhelming number of recessively inherited genetic traits in Arab patients. In agreement with many other reports on the subject, we believe that high rates of consanguinity among Arabs as well as the structure of Arab families could be major factors to explain this observation,” Dr Tadmouri said.

He said that throughout the Arab world, consanguineous marriages are traditionally common. Overall, around 40 to 50 per cent of marriages in the Arab world are consanguineous, he said, adding that first cousin marriages are the most common consanguineous marriages in the Arab world.

Dr Tadmouri said the majority of genetic diseases in Arabs result from single-gene alterations. If proper infrastructure is available, diagnostic services for many of these genetic disorders may be offered to people at risk, he added.

The CAGS implemented a strategy to investigate the details of genetic disorders in the UAE using different sources of information, through careful monitoring of international and national peer-reviewed publications, accessing hospital records in Dubai, Sharjah, Abu Dhabi and Al Ain. The CAGS is aiming at building a web of contacts with local practitioners and researchers to cover cases of genetic disorders that are yet unpublished.

“The use of published literature as a source of information allowed us to determine the presence of at least 178 genetic disorders in the Arab population of the UAE. Hospital records proved to be an invaluable source of information since they indicated the presence of 37 genetic disorders for which occurrence data were not previously published or their incidence is unknown in certain localities,” Dr Tadmouri said.

It is estimated that at least 215 genetic disorders and congenital abnormalities exist in the Arab population of the UAE. Many genetic diseases are confined to a small number of patients, or families, or tribes, or sometimes limited to small geographical regions, Dr Tadmouri pointed out.

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