



# 第二届中国大连国际DNA和基因组活动周 BIT's 2<sup>nd</sup> World DNA and Genome Day - 2011

## 主题：绿色经济时代重启生物之门

Theme: Reopen Bio-Gateway in Green Economy Era

时间：2011年4月25-30日 地点：中国大连世界博览广场

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### Hosting Organizations



Information Research Center  
of International Talent, China  
State Administration of Foreign  
Experts Affairs



China Medicinal Biotech  
Association



China Council for the Promotion  
of International Trade Dalian  
Sub-Council



Dalian Association for  
International  
Exchange of Personnal

### Operating Organization



BIT Life Sciences, Inc., China  
Foreign Experts Databank of SAFEA  
Dalian Biotechnological and Medical Experts Subdivision





## Title: Functional Genomics and New Markers for Beef Production

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### Abstract

Beef quality depends in part on muscle characteristics of live animals. Expression levels of muscle genes and their interaction can be assessed thanks to the development of transcriptomics. Tenderness is the top priority quality attribute for beef. The muscle transcriptomes of Charolais young bulls were compared on the basis of sensorial quality and shear force for the meat when grilled at 55°C. Expression of the *DNAJ1* gene was negatively related to tenderness after 14 days of ageing (patent EP06300943.5). Further, the expression levels of other stress related proteins were positively correlated with shear force at either the mRNA or protein level. The beef industry is also looking for markers of intramuscular fat in order to produce marbled meat. This has allowed identifying genes associated with meat marbling (e.g. *NAT1*, *ICER*, *A-FABP*, *leptin* and *G6PDH*). Genomic approaches have shown that genetic selection in favour of muscle growth leads to a higher proportion of fast glycolytic fibers at the expense of slow oxidative fibers with modified expression of some genes involved in growth, and also with increased expression of genes involved in glycolysis. Traceability is an important factor for consumers. Muscles from Charolais steers grazing on pasture had more oxidative characteristics than those of steers fed maize silage indoors. The expression of *selenoprotein W* was decreased in steers grazing on pasture. Thus, muscle *selenoprotein W* expression could be a putative indicator for a pasture-based system. In another study, a large number of genes corresponding to structural proteins, extracellular matrix proteins or energy metabolism enzymes were under-expressed by under-feeding, indicating relative atrophy of rapid glycolytic muscle fibres. To validate the relevance of these markers on a large population of beef cattle, an Agilent chip was developed with specific probes of the bovine muscular genes known as potential markers for beef production and quality. These markers are often specific of an animal type (steer or young bull), a breed or environmental conditions. However, some gene families (including that of *DNAJ1*) are associated with beef quality in different contexts. The IMAXIO Company will propose in service the transcriptomic analysis of bovine muscles.

### Biography

Jean-François Hocquette was born in France, in 1962. He graduated as an Engineer in Agronomy from the National Institute of Agronomy, Paris-Grignon in 1985 and received a Ph.D. from the University of Paris XI in 1990 (specialty: endocrinology). Since 1991, JF Hocquette has been a research scientist at the National Institute of Agricultural Research, Animal Husbandry and Nutrition Department, Growth and Metabolism Unit. In 1999, he was appointed head of the "Muscle Growth and Metabolism" Group (5 scientists) of the Herbivore Research Unit in the same Institute. He is currently the Director of the Herbivore Research Unit (172 staff, <http://www1.clermont.inra.fr/urh/>). JF Hocquette's research interest mainly concerns muscle biology as relevant to beef quality. He has co-authored a patent for a genomic marker for meat tenderness and has been invited as the main speaker to more than fifteen conferences in international meetings. JF Hocquette is strongly involved in the activity of the Cattle Commission of the European Association for Animal Production. In 2005, he edited a book entitled "Indicators of milk and beef quality" (460 pages, 20 review papers), EAAP Publication No. 112. He is also a member of the French Meat Academy.