



# HMT Newsletter

Dear Researchers,

Thank you to all who stopped by our booth in Philadelphia at the annual AACR meeting. It is always nice to catch up with old friends and meet new people involved in this ever evolving work. At the meeting, the role of metabolism in oncology was shown to be a growing and important part of cancer research. In light of this, we have extended our spring trial metabolomic profiling campaign through May 31, 2015. If there is anything we can do to support your work, please don't hesitate to contact us.

Sincerely,

Tsutomu Hoshiba  
President  
Human Metabolome Technologies America

## HMT Updates

### Conference Information

#### Metabolism and Cancer (AACR special conference)

June 7 - 10, Hyatt Regency Bellevue, Bellevue, Washington, USA

HMT will join as tabletop exhibitor and present our service and recent applications. Please drop by our booth to see what is new and share your research with us so we can create the right metabolic profile to meet your needs.

## Cancer Metabolism

### SHMT2 drives glioma cell survival in ischaemia but imposes a dependence on glycine clearance

Dohoon Kim *et al.*, *Nature*, **520**, 363-367, 2015

Cancer cells adapt their metabolic processes to support rapid proliferation, but less is known about how cancer cells alter metabolism to promote cell survival in a poorly vascularized tumour microenvironment. Here we identify a key role for serine and glycine metabolism in the survival of brain cancer cells within the ischaemic zones of gliomas. In human glioblastoma multiforme, mitochondrial serine hydroxymethyltransferase (SHMT2) and glycine decarboxylase (GLDC) are highly expressed in the pseudopalisading cells that surround necrotic foci. We find that SHMT2 activity limits that of pyruvate kinase (PKM2) and reduces oxygen consumption, eliciting a metabolic state that confers a profound survival advantage to cells in poorly vascularized tumour regions. GLDC inhibition impairs cells with high SHMT2 levels as the excess glycine not metabolized by GLDC can be converted to the toxic molecules aminoacetone and methylglyoxal. Thus, SHMT2 is required for cancer cells to adapt to the tumour environment, but also renders these cells sensitive to glycine cleavage system inhibition.

<http://www.nature.com/nature/journal/v520/n7547/full/nature14363.html>

### Hypothermic temperature effects on organ survival and restoration

Jun Ishikawa *et al.*, **Scientific Reports**, 5, No 9563.

A three-dimensional multicellular organism maintains the biological functions of life support by using the blood circulation to transport oxygen and nutrients and to regulate body temperature for intracellular enzymatic reactions. Donor organ transplantation using low-temperature storage is used as the fundamental treatment for dysfunctional organs. However, this approach has a serious problem in that donor organs maintain healthy conditions only during short-term storage. In this study, we developed a novel liver perfusion culture system based on biological metabolism that can maintain physiological functions, including albumin synthesis, bile secretion and urea production. This system also allows for the resurrection of a severely ischaemic liver. This study represents a significant advance for the development of an ex vivo organ perfusion system based on biological metabolism. It can be used not only to address donor organ shortages but also as the basis of future regenerative organ replacement therapy.

<http://www.nature.com/srep/2015/150422/srep09563/full/srep09563.html>

### Recent Publications

**Excessive degradation of adenine nucleotides by up-regulated AMP deaminase underlies afterload-induced diastolic dysfunction in the type 2 diabetic heart.**

*J. Mol. Cell Cardiol.* **80**, pp. 136-145, 2015.

[http://www.jmmc-online.com/article/S0022-2828\(15\)00016-4/abstract](http://www.jmmc-online.com/article/S0022-2828(15)00016-4/abstract)

**Mycoplasma Infection Enhances the Immunological Activation and the Warburg Effect of Metastatic Tumor Cells.**

[http://www.fasebj.org/content/29/1\\_Supplement/725.20.short](http://www.fasebj.org/content/29/1_Supplement/725.20.short)

HMT is a leading company providing metabolomic profiling based on unique and high performance CE-MS technology. We complete over 400 projects a year and our technology has contributed to the advancement of research in a variety of scientific areas. Please find more information on our website: <http://humanmetabolome.com/en/applications.html>

A promotional banner for a 'Basic Scan Trial Campaign'. The banner features a background image of a laboratory setting with a person in a white lab coat working at a workstation. On the left, there are several colorful, glowing spheres representing metabolites. The text on the banner reads: 'Basic Scan Trial Campaign', 'Introduction to CE-MS Metabolomics', '6 Sample Project: \$4,000', and 'Small sample amount, Variety of samples, Quick turnaround'.

**Basic Scan Trial Campaign**  
Introduction to CE-MS Metabolomics  
**6 Sample Project: \$4,000**  
Small sample amount, Variety of samples, Quick turnaround

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