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Stop experimenting with results

Data quality touches everything in your experiment, from design right through results. To share examples of successful data generation and exploration, we're bringing back our quarterly newsletter. Here you will find useful tips and insights from our team and the researchers we work with.

Exploring data for heart-stopping findings

When faced with several experimental variables, how do you determine which has the greatest impact on gene expression? That was the challenge facing Dr. M. Kloc when she explored the attenuating effect of Cyclosporin (CsA) and allochimeric peptide on heart transplant rejection in rats at 1, 3 and 7 days post treatment.

Precision Biomarker Resources Chief Scientific Officer, Dr. Eric Bremer, helped clarify the relationships by first performing principal components analysis to determine that time-since-transplant caused the greatest change in gene expression. Realizing that treatment still had a significant influence, Drs. Kloc and Bremer then controlled for time by comparing samples taken on the same day.

The most differentially expressed genes in these studies were mapped against canonical KEGG pathways to help understand the mechanisms by which CsA and peptide improve survival. Learn more **here**.
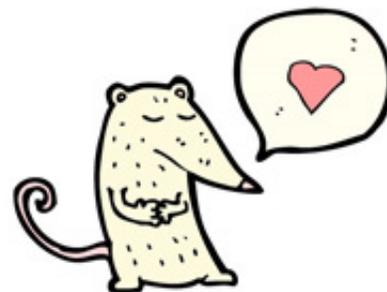
Tips for finding reliable housekeeping genes

Given that commonly used RT-qPCR housekeeping genes perform variably under different experimental conditions, how can you reliably normalize RNA expression? Many researchers have uncovered outstanding new controls by mining relevant public datasets for genes that vary least across samples. As an added advantage, this approach often identifies both highly and moderately expressed genes.

If you don't have access to relevant datasets or the capability to mine them, you can create a good shortlist of potential housekeeping genes through literature searches. After

identifying prospects, you can make a final choice by running a RT-qPCR assay using samples that highlight various conditions or subgroups in your experiment. The best control genes will always be those that demonstrate the greatest stability in your experimental system.

When Serotonin really makes you happy; One transmitter, Two Outcomes

Most well known for its role in mediating mood, serotonin is also a big player in controlling our appetite and could affect bone health. Intrigued by its many implications for human health, a group of researchers worked with Precision Biomarker Resources to understand the pathways and genes involved in the neurotransmitter's functionality. Using one dataset, Precision Biomarker Resources helped them investigate serotonin in two settings, leading to two publications.

A new model for treating appetite disorder

New gene expression analysis carried out through Precision Biomarker Resources has revealed that appetite disorders could be managed by regulating serotonin synthesis and release. Until now, another neurotransmitter, leptin, had been thought to control appetite by acting on receptors in the hypothalamus.

When a research team led by Columbia University's Dr. Vijay Yadav engineered mice to be leptin-deficient, they found that food intake was regulated by serotonin. An antagonist that blocked serotonin receptors was also found to decrease food consumption. The findings present a new model for appetite, where leptin triggers serotonin to control food intake. Read the full paper **here**.

One transmitter, two outcomes

When produced in the gut, serotonin has long been known to inhibit osteoblast proliferation and slow bone mass accrual. When released in the brain, however, it promotes accrual. Researchers led by Columbia University's Dr. Franck Oury wanted to understand how.

Working with Precision Biomarker Resources, they used cell assays to study serotonin's affect on VMH neurons in the brain and then tracked the resultant calmodulin kinase-dependent signaling cascade all the way to the sympathetic nervous system. It's here that the team found two genes involved in reducing nervous system activity usually acts as a negative regulator of bone mass accrual. Read the full paper **here**.

Discussion points

We hope you found something here to help your research. If not, give us a call at 847-866-0406 to see if we can offer some fresh perspectives in person.

Please also get in touch if you're a customer who can share your experience with peers through this newsletter. We'd be delighted to tell your story.

Questions or Comments: info@precisionbiomarker.com

Precision Biomarker Resources accelerates its clients' research and drug development by working closely with them on targeted biomarker discovery services, including microarray processing, experimental design consultation and data analysis. The team's scientific and technical expertise enhances every stage of the process, from discovery through preclinical, clinical and post-marketing studies.

Our founders were pioneers in the use of microarrays for cancer research. We have years of experience to put at your disposal. Leverage that experience to save time and effort and do what you do best - provide meaning to the results.

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