Molecular Medicine

Mollie Medcast
Episode 1 Transcript: VPR and HSP27, Breast Cancer and Estrogen, Chronic Allograft Nephropathy

Hello and thanks for downloading us. It is my pleasure to welcome you to the very first podcast for the biomedical journal *Molecular Medicine*. My name is Margot Gallowitsch-Puerta and I am the Assistant Editor here for our journal.

In this episode, our very first one: "A Hot Shock For HIV," "A Pesticide and A Hormone – In It Together," and "Kidney Transplant Recipients Express Themselves."

But before we get started with some of our journal content, let me just take a minute to tell you about how we got started.

We've seen great advances in the biomedical sciences over the last several decades and this has been due to the integration of fields like molecular and structural biology, biochemistry and immunology. Integrating these fields has done two things. It has given us a new perspectives to think about and given us powerful new tools which we're now using in medical research.

Molecular medicine is the discipline concerned with understanding the pathogenesis of disease at the molecular level, and, based on that knowledge, designing specific molecular tools for diagnosis, treatment and prevention. We introduced our journal in 1994 so that scientists and researchers could communicate their recent discoveries to a multi-disciplinary, international audience who is interested in understanding and curing disease.

Molecular Medicine is published bimonthly by the Feinstein Institute for Medical Research which is located in Manhasset, New York and this week's podcast will cover some of the manuscripts that we have in our May-June 2007 issue. So let's get started.

I think you probably all know that HIV stands for Human Immunodeficiency Virus and that HIV weakens the body's ability to combat infections. What you may not know is that the CDC estimates that there are over 40,000 new cases in the United States each year. There is no cure for HIV or the disease it causes, acquired immune deficiency syndrome, or AIDS.

A Hot Shock for HIV
The first manuscript in our line-up is by Dr. Liang from the University of Maryland School of Medicine and it deals with this topic. It's entitled, "Anti-Vpr Activities of Heat Shock Protein 27." Vpr is a virion-associated protein that's highly conserved among HIV type 1, simian immunodeficiency virus and other lentiviruses. Vpr has some distinct activities in host cells some of which include cell cycle arrest and cell killing. The precise biological role of Vpr-induced apoptosis of target cells is unclear right now, but it may represent a host self-destructive mechanism in order to prevent the spread of the virus. Dr. Liang and colleagues searched for cellular proteins that could be capable of suppressing Vpr's activities. They started out with a fission yeast model system (go yeast) and used it to identify a small heat shock protein. This little heat shock protein was able to specifically inhibit the activities of Vpr in both fission yeast and mammalian cells. There is, luckily, a human paralogue of this effective heat shock protein called, heat shock protein 27 or HPS27. Dr. Liang found that HSP27, was responsive to HIV infection in vitro and responded specifically to vpr gene expression during infection. These results demonstrate that heat shock-targeted strategies may help reduce the detrimental Vpr-

mediated effects that we see in HIV-infected patients.

Cancer is a disease that causes the cells in a person's body to change and grow out of control (ACS). Breast cancer is the most common form of malignant disease occurring among women of the western world and environmental substances seem to be involved in this etiology. (quick vocab lesson in case you don't know what etiology means, according to wikipedia, etiology is the study of causation coming from the Greek meaning 'concerned with causes' – so in this example, environmental substances may be involved in the etiology of breast cancer)

A Pesticide and a Hormone – In it Together
Our next manuscript deals with this topic and is entitled: "Gene and Protein Expressions Induced by 17beta estradiol and Parathion in Cultured Breast Epithelial Cells" and it's by Drs. Calaf and Roy. A lot of studies have found an association between cancer and exposure to pesticides. One of these pesticides is called parathion. Parathion is an organophosphorous pesticide used in agriculture to control mosquito plagues. And another topic we hear a lot about is breast cancer and estrogen. There is an association between breast cancer and prolonged exposure to estrogen, and that suggests that this hormone may also play a role in this disease. We don't know exactly what causes breast carcinogenesis and in this work, Drs. Calaf and Roy determined the effects of a pesticide which is parathion and estrogen in the form of 17β estradiol, on human breast epithelial cell transformation. Their results showed that parathion alone as well as in combination with 17β estradiol could induce malignant transformation of an immortalized human breast epithelial cell line. Their additional data suggest that parathion has the potency to cause malignant transformation of breast epithelial cells through modulation of expression of cell cycle regulated genes. Knowledge of these specific genetic changes is critical for our understanding of the molecular basis for breast carcinogenesis.

Last but not least for this week:

Kidney Transplant Recipients Express Themselves
Improvements in immunosuppression have led to the progressive decrease in acute rejection in renal transplant recipients. Although long-term allograft survival is improving, late graft loss from chronic allograft nephropathy remains a significant clinical problem. Non-invasive monitoring after kidney transplantation would be useful, particularly for predicting acute rejection. Dr. Mas and colleagues from the Virginia Comonwealth University in Richmond, Virginia evaluated gene expression levels at different post-transplantation times in urine samples from kidney transplant recipients. Their results showed characteristic patterns of mRNA levels in the different kidney transplant patient groups indicating that these levels may reflect allograft function. While prospective studies are needed to confirm these results, the evaluation of molecular markers in urine samples could represent an invaluable resource for monitoring kidney transplant patients and predicting the development of chronic allograft nephropathy.

That's it for this week. You can find these papers and many more of them on our website: ***www.molmed.org*** that's w..w..w…dot m o l m e d… dot… o r g.

Additionally, we are pleased to announce our "pre-submission enquiry service".
If you are thinking about submitting a paper to *Molecular Medicine* but you're not sure if it falls with in the scope of our journal send me an email at margot@molmed.org with a summary of your novel work and its significance and I'll get back to you. Once again my email address is: m-a-r-g-o-t@molmed.org
That's it for this week. From Long Island, New York this is margot@molmed.org thanks for listening!

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