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February 7, 2011

Places :

1. 2010 Veterinary Cancer Society (VCS) Annual Conference in San Diego, California
2. National Cancer Institute (NCI), National Institutes of Health (NIH), Bethesda, Maryland

Duration : 2010.10.28 ~ 2010.11.7

Background

Since the tumor growth is influenced by the surrounding micro-environment, cell lines xenografted at the orthotopic site or ectopic site may show the different growth pattern and metastatic potential.

Ezrin is a member of the ezrin-radixin-moesin (ERM) protein family and acts as a membrane-cytoskeleton linker protein that allows the cell to interact with its microenvironment and plays a key role in tumor growth and metastasis in several cancers, including osteosarcoma (OS).

Purposes of my study are to determine the influence of microenvironment of transplantation sites on the tumor growth and pulmonary metastasis in canine OS cell lines–xenografted mice and to investigate the ezrin expression on these tissues in the xenografted mice and canine OS patients.

The primary tumor growth and pulmonary metastatic potential were enhanced by the orthotopic transplantation, suggesting that the microenvironment at the transplantation site may play the important role in tumor metastasis of canine OS cells. Moreover, the higher ezrin expression at IT site (when compare to SC site) was correlated to the lung metastatic potential. Ezrin expression in 89% of canine OS patients suggested that ezrin may be involved in malignancy and metastasis of canine OS.

Objectives

1. to present the poster presentation and attend VCS Annual Conference
2. to observe the facilities of the NCI's laboratories and clinics
3. to learn about the research being conducted at the NCI, especially the integration of in vivo mouse model and pet animals with cancer into the study of cancer biology and treatment

1. 2010 Veterinary Cancer Society (VCS) Annual Conference in San Diego, California

Objective: to present the poster presentation and attend VCS Annual Conference

Conference Schedule

Friday, October 29, 2010 Pre-Conference Workshop and Welcome Party

Saturday, October 30, 2010 Oral Presentation (Resident Clinical and Basic Sciences) and Poster Presentation

Sunday, October 31, 2010 Oral Presentation (General Clinical and Basic Sciences) and Annual Awards Dinner at Sea World

Monday, November 1, 2010 Oral Presentation (General Clinical and Basic Science)

Conference registration

The registration desk opened on Friday, October 29th from 7:00 am to 8:00 pm

Pre-conference workshop

For enhancing the knowledge and understanding with the latest advances in clinical and basic oncology.

Clinical Oncology Workshop

- Introduction to Multimodality Cancer Care including surgery, radiation therapy, chemotherapy and immunotherapy.
- What's new in veterinary oncology? : to focus on new development in diagnosis such as PARR (PCR for antigen receptor rearrangements) and new approaches to canine and feline lymphosarcoma, melanoma vaccine, Palladia (tyrosine kinase inhibitor), and low-dose metronomic therapy.

Basic Oncology Workshop

- Molecular and Immunologic Diagnostics included a review subjects used in clinical and basic medicine such as flow cytometry, PCR assays and Western blot.
- Theoretical aspects of chemotherapy (cell-kill theory, Goldie-Coleman, Gompertzian kinetics)
- Clinical trial design involving anti-cancer agents
- The rationale design of multi-drug protocols (drug and dose selection, summation dose intensity) and pharmacokinetics (eg: carboplatin and other drugs)



Figure1. Reception of VCS conference



Figure2. Environment around conference area

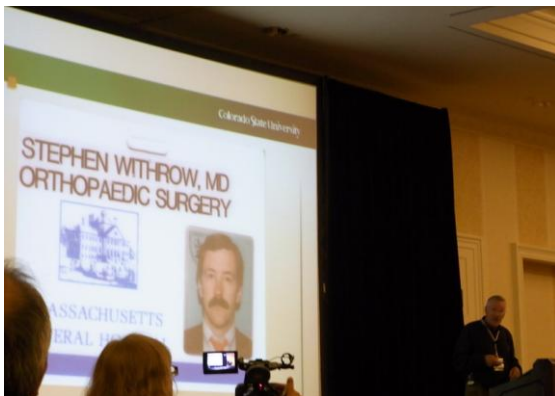


Figure3. Special speaker, Dr. Stephen Withrow

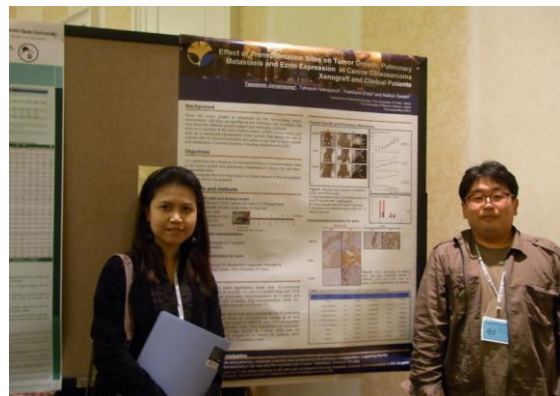


Figure4. Poster presentation

2. National Cancer Institute (NCI), National Institutes of Health (NIH), Bethesda, Maryland

Objectives:

- To observe the facilities of the NCI's laboratories and clinics.
- To learn about the research being conducted at the NCI, especially the integration of pet animals with cancer into the study of cancer biology and treatment.

National Cancer Institute

Tumor and Metastasis Biology Section, Pediatric Oncology Branch, Center for cancer research in NCI is involved in the study of biology and therapy of metastasis, primarily in childhood cancers.

The goal is to identify and understand proteins and/or processes that define the metastatic phenotype of childhood solid tumors, particularly malignant cancers of the bone (osteosarcoma) through the use of animal models, and to use this understanding to improve treatment outcomes for patients.

Ongoing projects by this group include:

1. Identification and evaluation of metastasis-associated genes and proteins in osteosarcoma
2. Development of *in vivo* assays of specific metastasis-associated processes
3. Use of 3D organ culture to observe metastasis
4. Single cell imaging and intravital imaging of metastatic cells
5. Preclinical investigation of novel antimetastatic therapeutic strategies



Figure5. Staff of Tumor and Metastasis Biology Section



Figure6. Head of Tumor and Metastasis Biology Section and Comparative Oncology Program, Dr. Chan Khanna (middle)

All visitors must enter through the NIH Gateway Center. Visitors will be required to show one form of identification (a government-issued photo ID-driver's license, passport, green card, etc.) and to state the purpose of their visit.

Location of Tumor and Biology Section

Building 37

Opportunities

1. To observe their Facilities and Ongoing experiments
 - Mouse model handling system
 - An ex vivo pulmonary metastasis assay (PuMA)

GFP-positive tumor cells were delivered to mice by tail vein injection. Following humane euthanasia, the trachea was cannulated with IV catheter and attached to the gravity perfusion apparatus. The lung were infused in the vertical position. The lung were allowed to cool at 4 °C for 20 minutes to solidify agarose medium solution. Transverse serial sections were sliced from each lobe with a scapel. 4-5 lung sections were placed on the sterile Gelfoam sections bathing in culture media. The area of GFP-positive cells was quantified by using confocal microscope.

- Using epifluorescence or confocal microscopy for monitoring and quantification of metastasis progression in mouse lung
2. To join progression meeting of their group about clinical trial of new drugs



Figure 7. NIH Visitor Gateway Center



Figure 8. Building 37



Figure 9. Mouse handling system

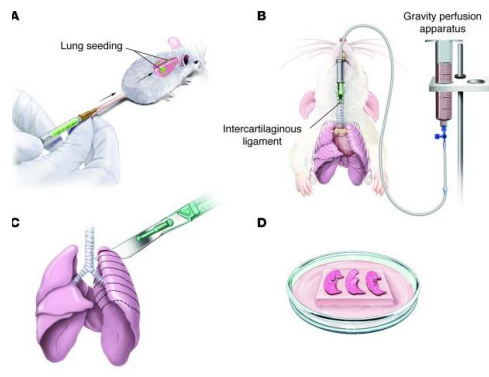


Figure 10. Diagram of the PuMA experimental approach

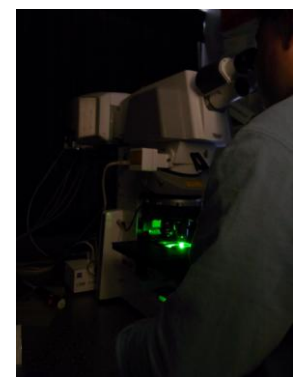


Figure 11. Confocal microscope

Animal hospital provides the veterinary care to cats and dogs of the Washinton D.C. metro area. This hospital has been accredited by American Animal Hospital Association. Oncology team of this here is doing some clinical trials, such as tyrosine kinase inhibitor, Masivet[®] .

Services Open 24 hours every day

- Wellness Care Services
- Urgent Care Services
- Surgery
- Internal Medicine
- Oncology
- Pain Management
- Cardiology
- Laser therapy
- Elective Hospitalization
- Diagnostic services



Figure 12. Front view of Friendship Hospital



Figure 13. Examination room



Figure 14. Treatment room



Figure 15. Surgical room

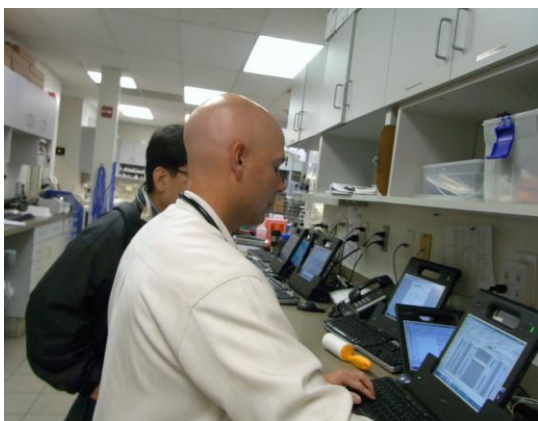


Figure 16. Data record with computer

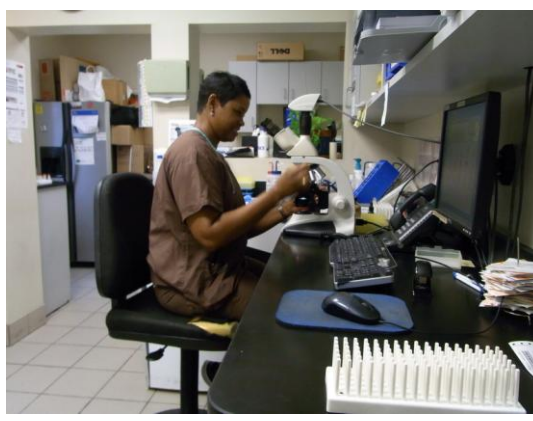


Figure 17. Diagnostic services

My Opinion

To study the biology of tumor behavior, the using of mouse model has become the important part of basic and clinical cancer research because they can provide the insight of the mechanisms that underlies the development of the primary tumor growth and metastases and to provide the ability to test the novel therapeutic agents.

Annual VCS Conference can enhance my understanding with the latest advances in basic and clinical oncology from pre-conference workshop, scientific oral presentation and poster presentation.

NIH is the amazing experience starting from entrance gate until experimental room inside the building. Tumor and Metastasis Biology section is the one of the scientific program of Pediatric Oncology Branch at NCI. Pediatric Oncology Branch is dedicated to improving outcome for children and young adult with cancer, including osteosarcoma. They conduct translational research in vitro, in vivo, ex vivo, and clinical trials. This laboratory gave a lot of information and idea to think and design my further experiment related study of tumor and metastasis biology.

Thank you very much to this program funding that support me for all trips. The great opportunities to attend 2010 VCS Annual Conference and going to NIH gave me a lot of knowledge and better understanding about veterinary sciences, especially oncology. Moreover, I would like to thank you to staff of VCS, NCI and Friendship Hospital For Animals who help to explain, demonstrate, and give the useful information to me kindly.