Characterization of Differential Protein Regulation in Meningioma Aggressiveness

Dr. Ferreira's Skull Base Tumor Lab

Anna Cichocki and Rachel Catterall
Introduction to Meningiomas

- WHO Grades: (according to histopathology)

Grade 1: Benign
Grade 2: Atypical
Grade 3: Malignant

Grade 1.5: Histologically grade 1, can invade and recur (Ferreira et al)
Challenges of Meningiomas

No chemotherapy

Radio-resistant tumors

RESEARCH

Find biomarkers to improve early diagnosis, predict radioresistance, and develop chemotherapy treatments
Research

In our lab:
- Patient Specimens
- Human Meningioma Cell Cultures
Our Focus

Characterize differential regulation of:
- AKAP12
- phospho-RB1 S780
- NF2 (Merlin)
- p53
- SMAD2/3

} Conclusive findings!
Western Blot Protocol

Step 1
Perform electrophoresis

Step 2
Transference

Step 3
Block

Step 4
Incubate with primary antibody

Step 5
Incubate with secondary antibody

Step 6
Revelation Imaging

**Then repeat to quantify with Beta-actin**
Differential Expression Levels of AKAP12 Across Meningioma Grades

The graph shows the expression levels of AKAP12 and β-actin across different grades of meningioma. The bar chart indicates that the expression of AKAP12 is highest in Grade 1.5, while β-actin expression remains relatively constant across grades.
Differential Phosphorylation Levels of RB1 Across Meningioma Grades

Grade 1  |  Grade 1.5  |  Grade 2  |  Grade 3

RB1 S780
β-actin
Conclusion

AKAP12 and RB1 are downregulated across the meningioma grades.
Our Hypothesis

- AKAP12 and RB1 downregulation may be linked to aggressiveness in meningiomas
- AKAP12 and RB1 may participate in the same phosphorylation cascade
- AKAP12 and RB1 are involved in the cell cycle
Dr. Ellenbogen, M.D.
Mrs. Ellenbogen
Christina Buckman
Jim Pridgeon, MHA

Dr. Ferreira, M.D., Ph.D.
Dr. Carolina Parada, Ph.D.
Tina Busald