The effects and expression profiling of microRNAs in chordomas

Session I
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miRNA expression Profiling

• miRNAs have a role in cancers
• Genes & Pathways → Better understand the molecular biology
• Dysregulated miRNAs
• Molecular biology of Chordoma still poorly understood

Fire & Mello, Nobel Prize
"a fundamental mechanism for controlling the flow of genetic information"
Sources of miRNA

- 8 skull base chordoma tumor tissues
- 8 nucleus pulposus samples from acute disc hernia
- Nucleus Pulposus: No direct Total RNA Isolation from tissue
Nucleus Pulposus

• Fujita et. al., 2005 “CD24 antigen exists in both chordoma and NP”
• Choi et. al, 2008, “NP originates from the notochord in mice”
• EMA, Galectin-3, Vimentin, CD24 and Brachyury markers
• Recurrent Sacral Chordoma
• Carries important chordoma markers such as Brachyury and CD24.
• First CF approved Cell Line
U-CH1

- Recurrent Sacral Chordoma
- Carries important chordoma markers such as Brach and CD24
- First Chordoma Cell Line
miRNA microarray Profile of Chordoma

• 962 human miRNAs (Agilent, Ver. 3.0)
• GeneSpring data analysis software, T Test $P<0.05$

• miRNAs with 4-fold difference
The image shows a heat map comparing miRNA expression levels between Chordoma and NP samples. The miRNAs listed in the heat map include miR-451, miR-140-3p, miR-140-5p, miR-424, miR-483-5p, miR-181a, miR-30b, miR-144, miR-148a, miR-126, miR-142-3p, miR-99a, miR-25, miR-486-5p, miR-223, miR-30c, miR-146b-5p, miR-320c, miR-497, miR-423-5p, miR-320d, miR-150, miR-340, miR-331-3p, miR-183*, miR-96, miR-181b, miR-95, miR-1290, and miR-374b. The expression levels are color-coded, with yellow indicating low expression and red indicating high expression. The samples are labeled CH1 to CH12 and NP1 to NP14.
Confirmation of the miRNA Expression Analysis

A. miR-31 Expression

B. miRNA Expression

C. miRNA Expression

D. miRNA Expression
The FAM-labeled miRNA level decreases over time
Transfected miR-31 is expressed at the highest level after 8 hours
miR-31 Decreases Cell viability to 70% at day 3
miR-31 induced apoptosis in U-CH1 cells after 48 hours
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hsa-miR-31 Decreases the Expression of c-MET and radixin
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Thanks for your Attention