

Slide 29: Samtools Flagstat Report On this slide, we have the **Samtools Flagstat report**, which provides essential statistics about the quality of our sequencing data. Ensuring high-quality data is critical for accurate downstream analysis.

Key highlights from the report include three types of essential readings :

1. **Total Reads:** ensures. That the data has sufficient depth for reliable analysis.
2. **Mapped Reads:** A high percentage of reads successfully aligned to the reference genome, confirming the reliability of the data.
3. **Paired-End Reads and Duplicates:** Paired-end reads enhance alignment accuracy, while a low duplicate rate minimizes the impact of technical artifacts.

This validation is crucial for studying gene expression changes induced by mitoxantrone. For example, the quality of this data enabled us to observe how the **LUNX protein moves to the cell surface during senescence**, making it an accessible therapeutic target.

-In summary, this report demonstrates the robust foundation of our data, ensuring that the results we'll discuss in later slides are scientifically sound and reliable."

Slide 33: Results Overview and FGFR Implications "let's discuss the **results** and their implications.

Our study showed that combining **mitoxantrone-induced senescence** with **LUNX-targeting antibodies** resulted in a significant reduction in lung cancer cell survival, as observed in both lab and animal models.

Here's how this two-step treatment works:

1. **Step 1 – Immunogenic Senescence:** Mitoxantrone induces senescence in lung cancer cells, by stopping their division and bringing the **LUNX protein to the cell surface**, making it a visible target.
2. **Step 2 – Targeting LUNX:** LUNX-specific antibodies bind to this protein, marking the cancer cells for destruction by **natural killer (NK) cells**.

Now, let's connect this to broader implications. One pathway closely linked to cancer progression is the **FGFR (Fibroblast Growth Factor Receptor) signaling pathway**.

- **FGFR Overexpression in Lung Cancer:** FGFR signaling plays a key role in tumor growth, angiogenesis, and metastasis. In some cases, its overactivity may contribute to **resistance to chemotherapy** like mitoxantrone by promoting cell survival and repair of DNA damage.
- **Combination Therapy Opportunities:** This highlights the potential for combining FGFR inhibitors with mitoxantrone. Suppressing FGFR-driven survival signals could enhance the drug's effectiveness, particularly in patients with FGFR-overexpressing tumors.

Finally we can conclude, these results validate the potential of combining chemotherapy with targeted therapies like LUNX-specific antibodies and also open doors for integrating **pathway-specific inhibitors** like FGFR inhibitors to improve outcomes.