

Epigenomic Analysis of Grapevines Under Climatic Stress

Grapevines Business Case

NEED

Understanding plant stress responses, particularly in the context of climate change, is essential for ensuring the continued production and quality of wine grapes. Epigenomic studies offer insights into how grapevines adapt to diverse climatic conditions, aiding in the development of resilient viticulture practices.

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CHALLENGES

Climate change-related abiotic stressors such as drought, extreme temperatures, rising CO2 levels, waterlogging due to heavy rainfall, metal toxicity, and shifts in pH are **impacting grape production and quality**. Traditional genetic approaches alone cannot fully explain adaptation to these stressors, highlighting the challenge of **comprehensively understanding grapevine adaptation** and the **importance of epigenomic studies in addressing this gap**.

OUR WORK

At Sequencia Biotech, we're pioneering the use of epigenomics in the grapevine industry. Our research delves into **how climate shifts impact epigenetic changes in grapevines**. By examining DNA methylation and histone modifications, we pinpoint epigenetic markers associated with traits like drought tolerance, temperature resilience, and fruit quality. These insights into epigenetic mechanisms offer promising avenues for bolstering grapevine resilience and improving fruit quality amidst climate challenges, showcasing the pivotal role of epigenomics in viticulture's future.

Moreover, our algorithms seamlessly integrate epigenomic data with traditional genetics and other omics analyses, **providing a holistic understanding of grapevine biology**. Through collaboration with the Grapedia consortium, we translate our discoveries into innovative solutions that fortify grapevine resilience and productivity against climate fluctuations.

POTENTIAL COMMERCIAL OPPORTUNITIES

In the dynamic grapevine industry, leveraging epigenomic techniques brings forth a multitude of advantages, including:



Enhanced Grape Quality: Epigenomic markers improve flavor, aroma, and disease resistance, ensuring high-quality grapes.



Climate Resilience: Epigenomic methods develop grape varieties resilient to harsh climates.



Sustainable Agriculture: Epigenetic studies promote eco-friendly viticulture, reducing chemical reliance.



Yield Optimization: Understanding epigenetic mechanisms maximizes grape yield for abundant harvests.

REFERENCES

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