# RNAseq GRAPEDIA

*Grapedia RNAseq Business Case*

## NEED

Analyzing the molecular basis of plant responses to biostimulants is essential for optimizing their use in agriculture (Wenran Wang et al., 2020). RNA sequencing (RNAseq) allows for comprehensive profiling of gene expression (Li Ma et al., 2020), providing insights into how various biostimulants, such as or ABA, could affect grapevine physiology at the molecular level (Chenxia Cheng et al., 2015). This knowledge is crucial for improving grape quality, size, yield, and stress resilience (Marco Meneses, et al., 2020), which are vital to meet the increasing demands of sustainable agriculture.

## CHALLENGES

Grapevines exhibit complex responses to biostimulants that involve multiple genetic and biochemical pathways, in addition to several environmental conditions, such as climate and soil type (Frioni et al., 2018). This variability impedes the development of universally applicable strategies for biostimulant application in grapes, and dissecting these responses requires advanced bioinformatics tools to analyze RNAseq data effectively (Roberta Bulgari et al., 2019; Shanrong Zhao et al., 2016). By providing a detailed and comprehensive view of gene expression changes, RNAseq becomes crucial to overcome these challenges, by enabling precise identification of molecular mechanisms and helping to tailor biostimulant strategies for optimal results in diverse growing conditions.

## OUR WORK

At Sequentia Biotech, we have successfully undertaken numerous projects evaluating the effects of biostimulants on various plant species. Utilizing state-of-the-art procedures. Our recent alliance with GRAPEDIA will allow us to reach the grape community successfully; with customized solutions and potential applications to improve, for example, table grape growth, and resilience of wine grapes to abiotico, stresses such as drought and high temperatures, which are increasingly relevant due to climate change.

GRAPEDIA powered by Sequentia is extensively specialized in integrating grapevine RNA-seq data with other omics datasets to offer a concise understanding of the biological processes affected by biostimulants. This integrative analysis supports the development of predictive models and tailored strategies to optimize biostimulant use in agriculture, ensuring higher-quality produce and more sustainable agricultural practices.

## Bioinformatics Consulting Services

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## POTENTIAL COMMERCIAL OPPORTUNITIES

Applying of RNAseq in the study of biostimulants presents numerous commercial opportunities within the agriculture industry:

**Enhanced Product Development:** By identifying specific genes and pathways influenced by biostimulants, companies can develop targeted formulations that maximize grape quality, yield, and stress resilience. This precision ensures that biostimulants are more effective and can be marketed for specific agricultural needs (Marco Meneses, et al., 2020).

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**Customized Solutions for Growers:** The insights gained from RNAseq analysis allow for the creation of customized biostimulant solutions tailored to different environmental conditions and grapevine varieties. This customization enhances the efficiency and effectiveness of biostimulant applications, providing growers with reliable tools to improve crop performance (Keiji Jindo et al., 2022).

**Sustainability and Eco-friendly Practices:** RNAseq-driven research supports the development of sustainable agriculture practices by reducing the reliance on chemical fertilizers and pesticides; thus promoting healthier plant growth and resilience, and contributing to more eco-friendly viticulture (Riya Johnson et al., 2023).

**Long-term Crop Management Strategies:** The comprehensive data provided by RNAseq can help growers adapt to changing climatic conditions and other environmental challenges. This foresight ensures sustainable and profitable grape production over time (Wenran Wang et al., 2020).

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