

# Pan-Yeast Autonomously Replicating Sequences for Enhanced Plasmid Stability

**The technology offers a suite of autonomously replicating sequences (ARS) optimized for stable plasmid replication across multiple yeast species, facilitating genetic research and industrial applications.**

## What is the Problem?

ARS sequences function as an origin of replication for DNA and are useful for plasmid-based expression systems in yeast. Maintaining stable plasmid replication in yeast is crucial for both research and industrial applications. However, the sequence determinants of ARS function vary significantly among different yeast species, limiting the use of current ARS modules to a narrow range of yeasts. This variability leads to inefficient plasmid maintenance and hinders cross-species genetic studies and biotechnological processes.

## What is the Solution?

The technology is a set of ARS sequences that function efficiently across a wide range of yeast species, including *Saccharomyces cerevisiae*, *Kluyveromyces lactis*, and *Pichia pastoris*. These sequences have been optimized through high-resolution mapping and deep mutational scanning to ensure maximal ARS function. The pan-yeast ARS modules enable stable plasmid replication and maintenance, making them ideal for plasmid-based expression systems and genetic research across diverse yeast species. These innovations offer a robust solution for researchers and industries looking to enhance plasmid stability and efficiency in yeast, driving forward genetic research and biotechnological advancements.

## What is the Competitive Advantage?

**Wide Species Range:** These ARS sequences are functional in at least 10 different species of budding yeast, spanning significant evolutionary distances.

**Enhanced Stability:** The optimized ARS sequences provide improved plasmid stability compared to existing ARS modules.

**Versatility:** This technology is suitable for various applications, including industrial biotechnology and academic research, facilitating cross-species studies and genetic engineering.

**Ease of Use:** The ARS modules can be readily integrated into existing plasmid systems, simplifying the process of plasmid maintenance and replication in multiple yeast species.

**Technology ID**

BDP 7226

## Category

Research Tools

Selection of Available Technologies

## Authors

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## Learn more



## Patent Information:

[US20160002647A1](#)

## References

1. Liachko, I., Dunham, M. J.(2014) , <https://pmc.ncbi.nlm.nih.gov/articles/PMC3959236/>,  
<https://academic.oup.com/femsyr>, 14, 364-367