Poster

Discovery of lost genes in the genome of *Acinetobacter baumannii* using Anablast.

Daniel Ventosa Villalobos, Alejandro Rubio Valle, Juan Jiménez Martínez, and Antonio J. Pérez Pulido(1)

(1) Área de Genética, Centro Andaluz de Biología del Desarrollo, Ctra. de Utrera, km. 1, 41013, Sevilla

ABSTRACT

Motivation: Microbial resistance to antibiotics is currently one of the greatest threats in global health. Multiple outbreaks of multi-resistant *Acinetobacter baumannii* strains have been documented [1] and it is necessary to find new drugs against it, and the finding of new genes in the bacteria could help in this fighting. As *A. baumannii* is a highly studied organism, it is difficult to find new genes by homology with traditional predictors.

For this reason we have chosen the AnABlast program which is a new bioinformatics tool which has been successful in finding out new genes in eukaryotes. This program generates profiles of accumulated alignments in query amino acid sequences using a low-stringency BLAST strategy [2], which highlight regions with evolutionary meaning.

Methods: First, we used AnAblast to locate new coding regions in the *A. baumannii* genome. After that we analyzed the regions found by AnABlast comparing them with known sequences from the GenBank database to look for the genes found in intergenic regions and we obtain a series of candidates that we need to analyze, characterize and validate.

Results: We obtained nine candidates that have been characterized analyzing both its evolutionary conservation and function annotation. Eight of them were also found in other strains of *A. baumannii* and one could be a gene not found until now that needs to be validated.

Conclusions: Using the AnABlast program we have found nine possible coding regions not detected by other methods in the reference strain of *A. baumannii.* Although they need validation, AnABlast has proven itself useful for gene detection in prokaryotes

REFERENCES

1. Dijkshoorn, L. et al. (2007) An increasing threat in hospitals: multidrug-resistant *Acinetobacter baumannii. Nature Reviews Microbiology*, 5(12), 939-952.
2. Jiménez, A.J. et al. (2015) AnABlast: a new in silico strategy for the genome-wide search of novel genes and fossil regions. *DNA Res*. 22:439-449..