

## COMPARATIVE ANALYSIS OF DIFFERENTIAL GENE EXPRESSION ON PATIENTS WITH ISCHEMIC AND IDIOPATHIC CARDIOMYOPATHY IN R PROGRAMMING LANGUAGE

Polanco F.E.<sup>1</sup>, Zuzunaga R.R.<sup>2</sup>

<sup>1</sup> Ural Federal University, Yekaterinburg, Russia

<sup>2</sup> Santa Maria Catholic University, Arequipa, Peru

E-mail: fpolancoespinorusia@gmail.com

On the investigation were compared the gene expression of patients with ischemic cardiomyopathy and idiopathic cardiomyopathy to find the overlapping genes between them. The gene expression analysis of both diseases and the comparison analysis were made on programming language R.

There are many types of cardiomyopathy diseases, one of them is idiopathic cardiomyopathy. It is characterized by the fact that its cause is unknown [1]. Therefore, in the present work, a comparative analysis was carried out between the genetic expression of patients with ischemic cardiomyopathy and idiopathic cardiomyopathy. It was made to find the overlapping genes between them and try to find the converging and diverging molecular processes between them.

Data were obtained from the NCBI open biological database. The GSE5406 database was used: "Human ischemic cardiomyopathy, idiopathic cardiomyopathy, and nonfailing controls" [2]. With the help of the R programming language, gene expression analysis was carried out, comparing the genes of people with each disease with the genes of healthy people. Thus, the differences in gene expression for each disease were obtained. Genes were divided into up-regulated (expression above the norm) and down-regulated (expression below the norm). Using the already organized data a comparative analysis was carried out between the up-regulated and down-regulated groups of each disease to find the convergences (genes are expressed proportionally in both diseases) and divergences (genes are expressed inverse proportionally in both diseases) in the gene expression of both. Up-ischemia vs up-idiopathic, down-ischemia vs down-idiopathic, up-ischemia vs down-idiopathic, and down-ischemia vs up-idiopathic were compared. There were no divergent gene expressions between the up-regulated and down-regulated groups of the diseases, but there were found 36 convergences (10 up-regulated, 26 down-regulated). The two groups of genes were correlated with the help of the STRING database [3] and were found significant biological pathways that correlate one disease with the another.

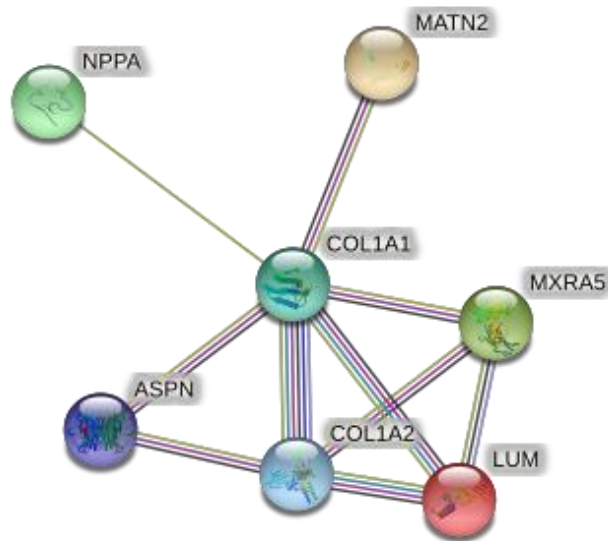


Рис. 1. Protein-protein interactions of the convergent up-regulated genes

1. G. William Dec, and Valentin Fuster. New England Journal Med. 331, 1564-1575 (1994).
2. the NCBI open biological database. Available at: <https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE5406> -Дата обращения: 08.07.2021.
3. Protein-Protein Interaction Networks. Functional Enrichment Analysis. Available at: <https://string-db.org/>.