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Comparative metabolism of kinetoplastids

Anzhelika Butenko[1], **Fred R Opperdoes**[2], **Pavel Flegontov**[1], **Julius Lukes**[3] and **Vyacheslav Yurchenko**[1]
[1]University of Ostrava, Czech Republic
[2]Universite Catholique de Louvain, Belgium
[3]Biology Centre of the Academy of Sciences of the Czech Republic, v. v. i., Czech Republic

Kinetoplastids (Euglenozoa, Kinetoplastea) is a widespread group of single cell eukaryotes, which includes free-living kinetoplastids and parasitic trypanosomatids. Trypanosomatids can be restricted to one host (monoxenous) or have a life cycle involving two hosts (dixenous). The latter group contains *Trypanosoma* and *Leishmania* species pathogenic for vertebrates and plant parasites *Phytomonas*. Comparative genomic analysis of a free-living kinetoplastid, *Bodo saltans* and several trypanosomatids has illuminated some key traits accompanying emergence of parasitism in this group. Our analysis of 13 kinetoplastid genomes (including the genomes of *Leptomonas pyrrhocoris, Leptomonas seymouri, Blechomonas ayalai* and *Paratrypanosoma confusum* sequenced by us) revealed that the adoption of the parasitic lifestyle led to the loss of about 50% of the genes. Among these are genes belonging to metabolic pathways of lysine and histidine catabolism and aromatic amino-acid degradation. The acquisition of novel genes for pteridine reduction, threonine dehydration, the urea cycle, protection against ROS and diaminopimelate metabolism was also documented. *B. saltans* and trypanosomatids still share some metabolic traits such as glycosomes, a unique set of the pyrimidine biosynthetic pathway genes, an ATP-phosphofructokinase, an alternative oxidase, synthesis of fatty acids *via* a set of elongases and a few others. We also searched for meiosis associated genes and performed the recombination analysis using genomes of 6 *L. pyrrhocoris* isolates originated from Central America. The results indicate the presence of meiosis related genes in *L. pyrrhocoris* surprisingly accompanied by the absence of recombination.

Biography

Anzhelika Butenko is currently a PhD student at the Life Science Research Centre, University of Ostrava, Czech Republic. The topic of her research is comparative genomics of kinetoplastid protists. She has published several seminal papers in prestigious journals.

anzhelika.i.butenko@gmail.com

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