

The elements of CRISPR-Cas-like system in genome of *Arabidopsis thaliana*: possible origin and some evidence on their functionality

Ivan Petrushin
Yuri Konstantinov, Igor Gorbenko

BGRS-2020
Novosibirsk

Introduction

- CRISPR-Cas system wide spread in prokaryotes
- We've found elements of such system in nuclear and mt genomes of green plant
- No co-localization is detected between *cas* genes and CRISPR loci

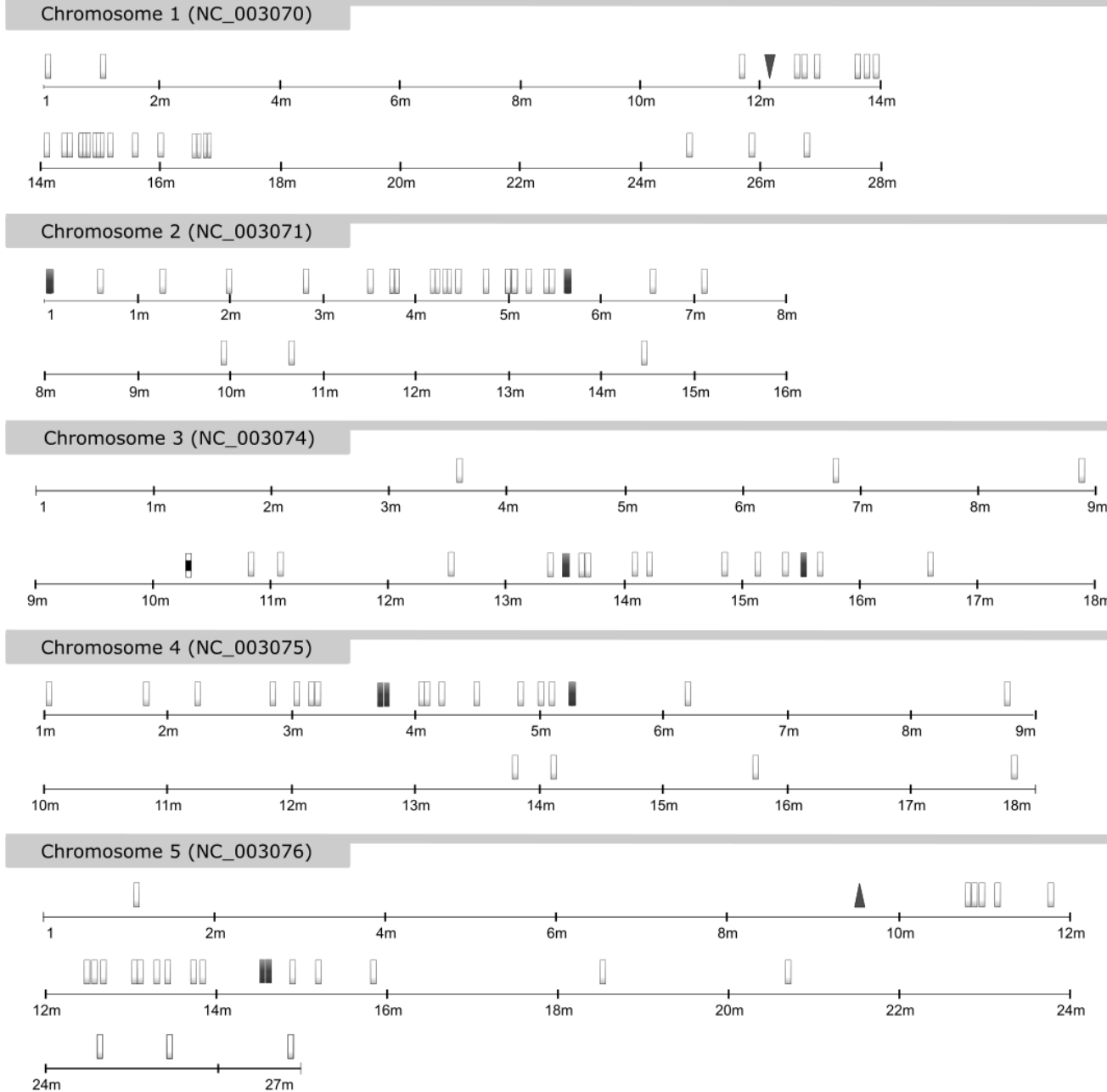
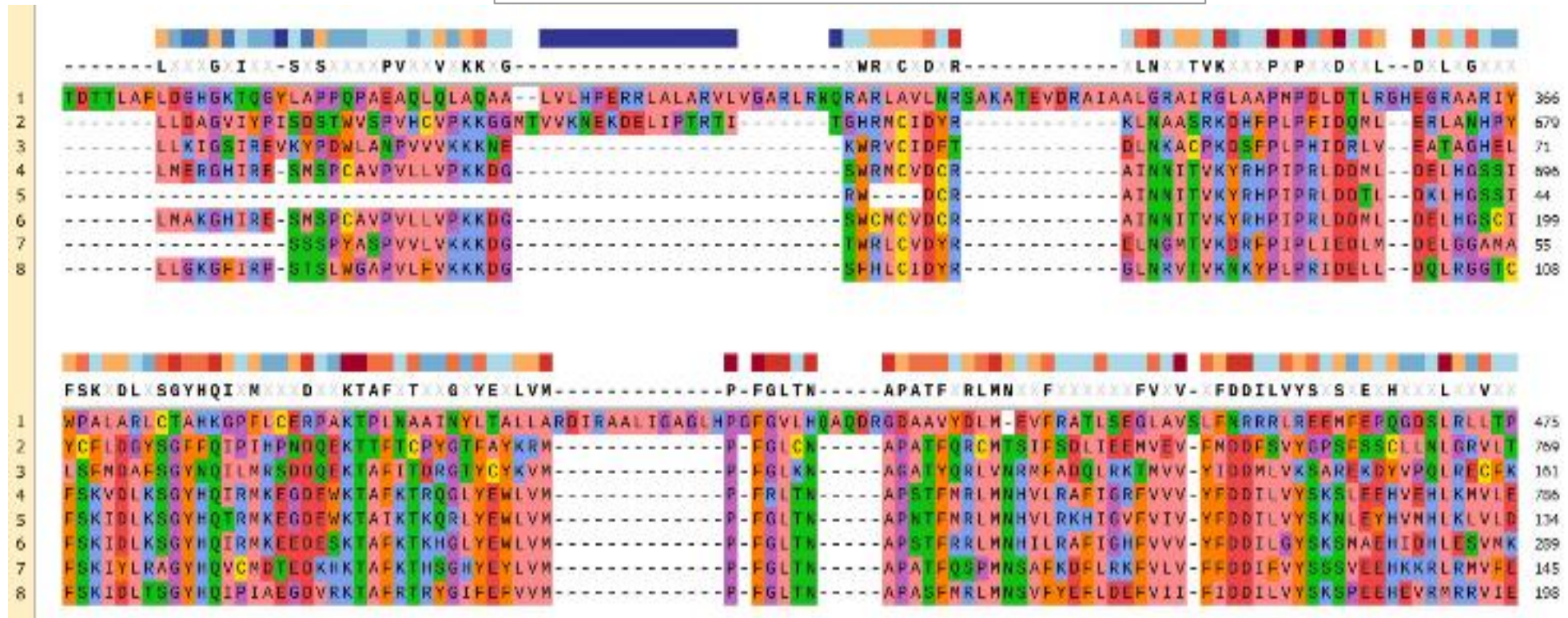
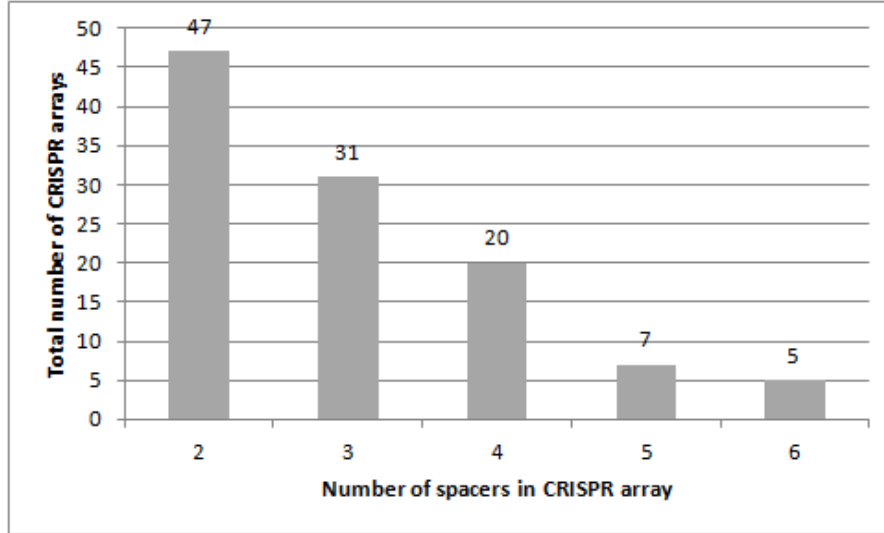


Figure 2. Localization of CRISPR-Cas system elements with *Arabidopsis thaliana* genome

Elements showed below, chromosome in brackets:

CRISPR-array (all) pfam00078:RT (all) cd09742:csm6 (3)

COG1688:cas5 (1) cd06127 (5)



Alignment of a set of found *A.thaliana* RT (positions 2-8) and Cas1/RT fusion protein from *Rhodobacter capsulatus* (pos. 1), colored according to types of amino acids

Results

- 101 CRISPR loci and 21 *cas* genes found in *A. thaliana* nuclear genome
- Total 331 spacers found, 12 have homology to plant viruses
- Some *cas* genes have homology to reverse transcriptase (RT)

CRISPR-Cas-like elements in *A. thaliana* nuclear genome may have endosymbiotic origin (imported from mitochondria)