

Genome Assembly and Annotation - Information about interpretation of output metrics came from the QUAST manual: <https://quast.sourceforge.net/docs/manual.html>

SPAdes identified more contigs overall than ABySS. Some statistics had significant differences such as the N50 (272520 for ABySS and 193475 for SPAdes), NG50 (272520 for ABySS and 178662 for SPAdes), and auN (301881.7 for ABySS and 224465.2 for SPAdes). Something important to note is that ABySS did not detect misassemblies, while SPAdes has non-zero values for # misassemblies, # misassembled contigs, # local misassemblies, # scaffold gap loc. Mis. and # unaligned contigs. ABySS recognized larger areas of alignments with no misassemblies, relocations, translocations, indels, or inversions. This was not true for SPAdes which found more issues in the assembly.

The N50 value of 272520 on ABySS and 193475 for SPAdes means that half of the contigs were as long or longer than this many base pairs. A larger score indicates higher quality results. The L50 is the number of contigs that are above the N50 value. When we add a G into these, such as NG50 and LG50 we are now doing the calculations in regards to the entire reference genome, rather than just the assembly size. In addition to the N50 and L50, auN is yet another way to describe contiguity. The number of misassemblies in total includes all of the different types mentioned above like relocations, translocations, indels, or inversions. These misassemblies mean that there is some sort of gap in the sequence, such as the gene is separated on different chromosomes (translocations) or on opposite strands (inversions) for example.

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Subsystem: Glutathione: Redox cycle

Curator: GvetaG

This subsystem's description is:

Glutathione (GSH) is a tripeptide (gamma-Glu-Cys-Gly), which is present in high concentration in most living cells from microorganisms to man. The biological importance of GSH is mainly related to the free sulphhydryl moiety of Cys residue. Which confers unique redox (Eox = -0.24) and nucleophilic properties. GSH serves a pivotal role in numerous and very diverse cellular functions, including free radical scavenging, redox reactions, formation of deoxyribonucleotides, detoxification of xenobiotics, amino acid transport and leukotriene biosynthesis (in eukaryotes), and many others. Main forms of GSH include:

- (i) reduced GSH;
- (ii) oxidized GSSG and
- (iii) mixed disulfides: mostly GSS-protein and GSSR (R = suitable residue such as cysteine or CoASH). For example, CoASSG is a major component of the CoA pool in yeast and E. coli (Lewin 1981)
- (iv) thiol esters, which function as intermediates in metabolism of certain compounds, such as methylglyoxal and formaldehyde

Under unstressed physiological conditions much of the tripeptide is present in the free reduced form. In E. coli GSH content is very high and accounts for more than 1% of dry cell weight. The concentration of oxidized form is usually much smaller, with the GSSG/GSH ratio generally being greater than 50. This balance is maintained by GSH reductase (at the expense of NADPH), ensuring a cellular environment where essential sulphhydryl groups of key enzymes and co-enzymes are protected. The opposite conversion of GSH to GSSG can be catalyzed by:

- GSH peroxidase, which eliminates H₂O₂ and organic peroxides
- GSH transhydrogenases - a group of enzymes involved in thiol-disulphide exchanges (protein disulphide isomerase, thiol-transferase, thiol-disulphide oxidoreductase). The majority of these activities have not been associated with any sequences yet, and are not encoded in this SS
- or be caused by non-enzymic processes

GSH-related enzymes can be grouped into those concerned with:

- biosynthesis and degradation (encoded in SS: "Glutathione: gamma-glutamyl cycle")
- reduction and oxidation (encoded in this SS)
- conjugation and those in which GSH serves as a cofactor (encoded in SS: "Glutathione: Non-redox reactions", "Glutathione-dependent pathway of formaldehyde detoxification", and others)

References

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For more information, please check out the description and the additional notes tabs, below

