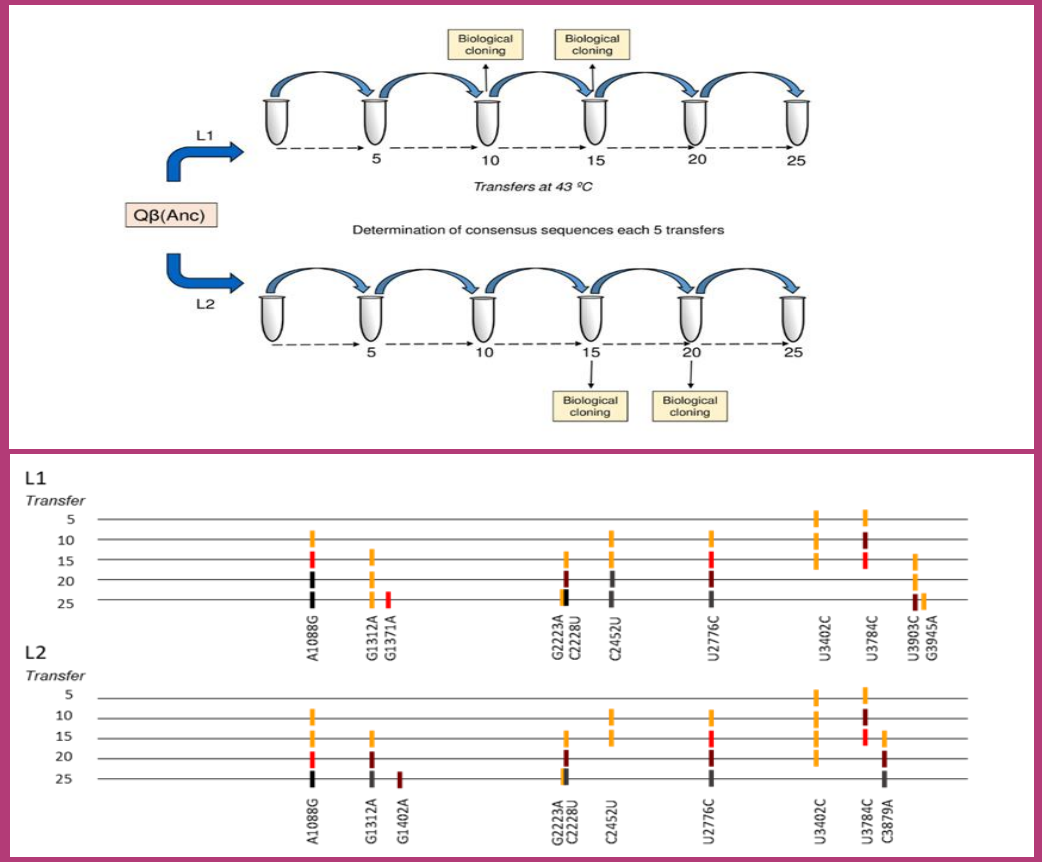
Intra-Population Competition during Adaptation to Increased Temperature in an RNA Bacteriophage

RNA phage evolution is governed by high error rates, which give rise to highly heterogeneous populations that are composed of a dynamic and heterogeneous mutant spectrum that determines a great part of their properties.

The intra-population dynamics of the levivirus Qβ, when it is propagated at higher-than-optimal temperature, has been characterised in this work



The results show the difficulties to predict the mutations that will fix during an adaptive process on the basis of their selective advantages when they are present as single mutations. Adapting populations experienced rapid changes that involved the ascent of particular genotypes and the loss of some beneficial mutations of early generation.

Artificially reconstructed populations, containing a fraction of the diversity present in actual populations, fixed mutations more rapidly, illustrating how population bottlenecks may contribute to determine the adaptive pathways.

When the availability of beneficial mutations under a particular selective condition is elevated, **the final outcome of adaptation depends more on** the occasional occurence of **population bottlenecks** and **how mutations combine in genomes than on** the **selective value of particular mutations**.

Arribas M. and Lázaro E. 2021. International Journal of Molecular Sciences,22,6815.
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