Dear academic editors

I response to all the comments by reviewer 2.

Reviewer 2

According to the abstract, this manuscript covers a number of different areas relating to the RNA world hypothesis, including its compatibility with (likely) primitive Earth conditions; the likely characteristics of an RNA world; and, finally, the relationship between an early life-like RNA world system(s) and other life-like systems. From the above, the manuscript then proposes that the first RNA world system may have consisted of two RNA genes of 100 base pairs each (this would probably be better described as genes of 100 nucleotides, unless the author is really proposing the presence of double–stranded RNA?). The author appears to have an (applied?) chemistry background (and has published a number of physical chemistry studies investigating the compatibility of the RNA world hypothesis with a hydrothermal vent origin of life), but has also published extensively in the social sciences area, for example applying evolutionary concepts to other 'life-like' systems, such as social insect colonies and human civilizations. There are a number of interesting points raised along the way, such as the generally one-to-one correspondence between DNA gene -> mRNA transcript -> protein enzyme -> single reaction (although many enzymes are often involved in a single pathway which transforms/produces a single substrate/product). Another interesting idea that is also raised is the possible importance of RNA solubility at high temperatures, though it does seem that the author is battling nobly (if possibly in vain) to reconcile the RNA world hypothesis with a hydrothermal vent origin of life scenario.

However, I find the manuscript contains a number of weaknesses:

One of the main issues is that paper suffers from trying to cover too many ideas, and because of this is quite long and unfocused. It is also fairly rambling: for example, lines 95-106 could be removed,

Answer: This comment is in relation to the thrid comment by reviewer 1. But, reviewer 1 agrees this part. So, I shorten this part.

The second point is that the paper contains too many errors. One example obvious to me is the reference to one of my papers [ref. 11] which states that "chemical reactions catalyzed by protein-like molecules could form ambiguous information by...coevolution with RNA", which is not at all what is written in the paper.
The English is a problem too: "soft molecules" is not a typical way of describing organic molecules, and "formation and deformation" of molecules would be better expressed as formation and degradation. Statements such as in line 232: "the first step is to limit the characteristics of life-like systems into life on Earth" leave one scratching ones head.

Answer: I remove the reference 11 from this part, and moved to line 108. I changed “soft molecules” to “organic molecules”, and changed to “formation and degradation”. The statement was changed to a sentence “… to focus …” shown in line 227.

More fundamentally perhaps, the distinction that is made between CCSI and CMIO is, as the

author himself notes, remarkably similar to that between genotype and phenotype, and information and function, and even replication and metabolism. The finding that two RNA molecules would have been sufficient to start life, seems a little like the idea that has been proposed of an RNA template and its complementary copy originally functioning as an informational/functional(= ribozymic) pair (see for example: Shay JA, Huynh C, Higgs PG (2015) J Theor Biol. 364:249-59). Also, as far as this reviewer is aware, there are no known general (= nonspecific) RNA replicase ribozymes consisting of only 100 nucleotides.

Answer: This is related to the comments about Fig. 8. I added ref 74, 75. In addition, for the size of ribozyme, I added description at line 565 – 566 and ref 67 – 69.