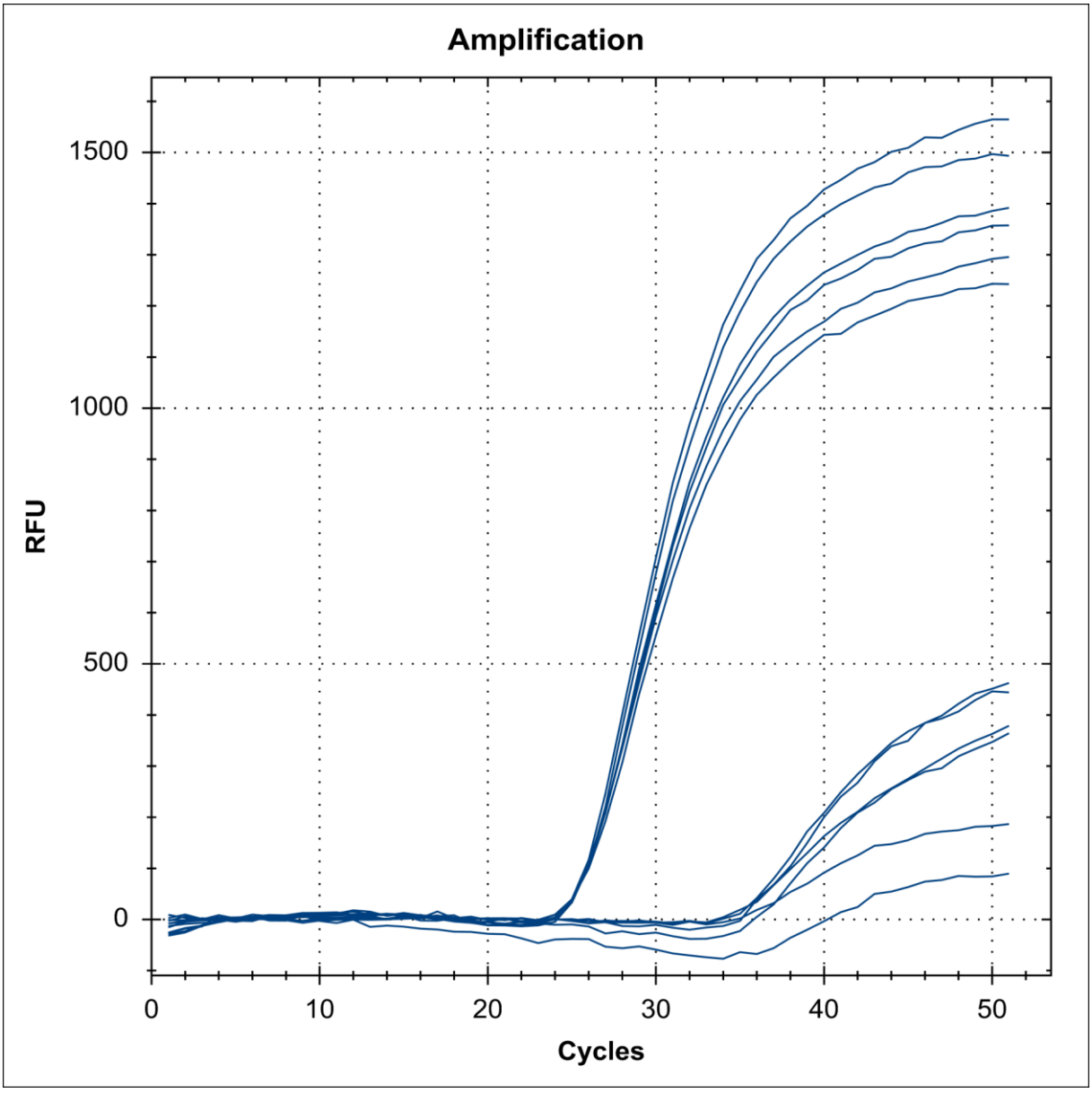
We have tested the best buffer used to perform Reverse Transcriptase with Taq polymerase (only). Based on this publication, the 10X generation 6 buffers with a wide range (2mM-8mM) of MgSO4 was tested. We did not get any reverse transcriptase or RT-PCR to work.

https://www.biorxiv.org/content/10.1101/2020.05.27.120238v1

https://www.biorxiv.org/content/10.1101/2020.05.27.120238v1.full.pdf

Our best results are shown in the figure below. The six curves going up to ~1500 is regular RT-PCR with Mashup and Taq. The six curves below ~500 are just Taq. Same buffer, same MgSO4, same starting material. Tried to reproduce the "just Taq" signal the next day, with little success (data not shown).



The only difference is that they used Thermococcus kodakaraensis enzyme, while we have Thermus aquaticus. In conclusion, one enzyme RT-PCR may work, but it is not worth spending more time (have used a week trying) optimizing this suboptimal reaction.