## Supplement

**Table S1.** Statistical analysis of MIF specific IgG titer of BaxM159 variants. In total, five independently repeated experiments were conducted. Statistical significance was calculated by 1-way Anova test followed by Tukey. *$p$<0.05; **$p$<0.01; ***$p$<0.001; ****$p$<0.0001, ns: non significant.

| | **1-DIQMAQ** | **2-DIQMAQ-K** | **3-EIVLAQ** | **4-DIQMGQ** | **5-DIQMAE** | **6-EIVLGQ** | **7-EIVLAE** | **8-DIQMGE** | **9-EIVLGE** |
|---|---|---|---|---|---|---|---|---|---|
| 1-DIQMAQ | | ns | ns | ** | ns | *** | ns | **** | **** |
| 2-DIQMAQ-K | ns | | ns | * | ns | ** | ns | **** | *** |
| 3-EIVLAQ | ns | ns | | * | ns | ** | ns | **** | *** |
| 4-DIQMGQ | ** | * | * | | ns | ns | ns | ns | ns |
| 5-DIQMAE | ns | ns | ns | ns | | * | ns | ** | ** |
| 6-EIVLGQ | *** | ** | ** | ns | * | | ns | ns | ns |
| 7-EIVLAE | ns | ns | ns | ns | ns | ns | | ns | ns |
| 8-DIQMGE | **** | **** | **** | ns | ** | ns | ns | | ns |
| 9-EIVLGE | **** | *** | *** | ns | ** | ns | ns | ns | |

```
hVH3 23             EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWVSAISGSGGSTYYADSVKG
BaxM-159-HC         EVQLLESGGGLVQPGGSLRLSCAASGFTFSWYAMDWVRQAPGKGLEWVSGIYPSGGRTKYADSVKG
                    ****************************** ***.**************.* **** * *******
                                  FR1             CDR1      FR2             CDR2

hVH3 23             RFTISRDNSKNTLYLQMNSLRAEDTAVYYCA------------------
BaxM-159-HC         RFTISRDNSKNTLYLQMNSLRAEDTAVYYCARVNVIAVAGTGYYYYGMDV
                    ********************************
                                  FR3                 CDR3
```

**Figure S1.** Comparison of BAXM159 VH sequence with germline VH subclass 3-23. Software clustal O was used for sequence alignment. * indicates identity, indicates similarity. Frame works, CDR identification and amino acid numbering is indicated according to kabat scheme.

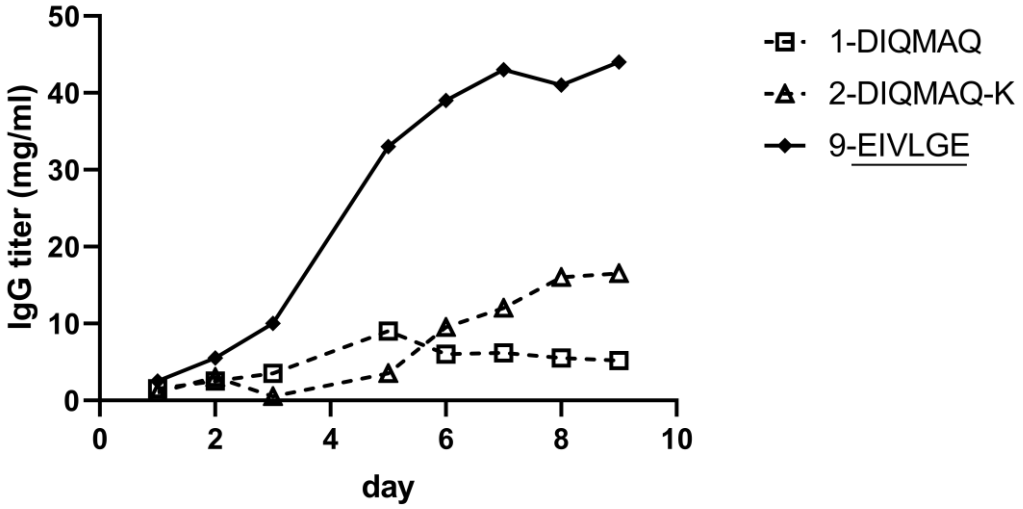


**Figure S2.** IgG titer of indicated BaxM159 variants at 10 L bioreactor scale. IgG titer was determined by ELISA.

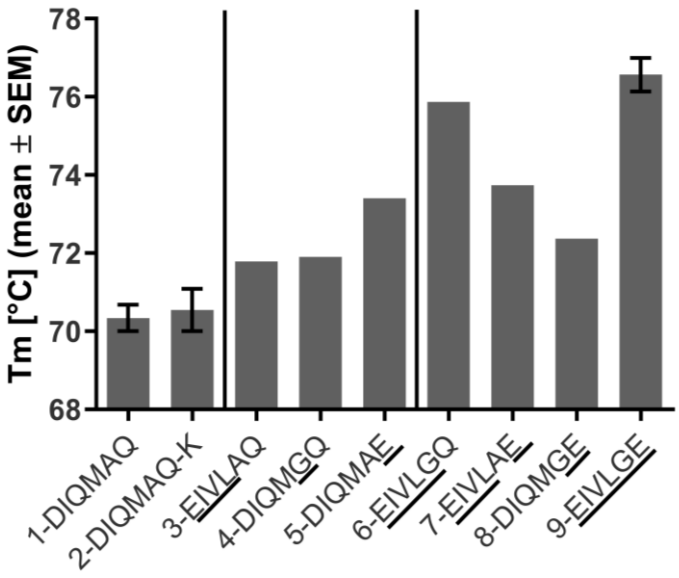


**Figure S3.** Thermal stability of BaxM159 variants determined by differential scanning calorimetry. Standard error mean (SEM) is indicated by whiskers.

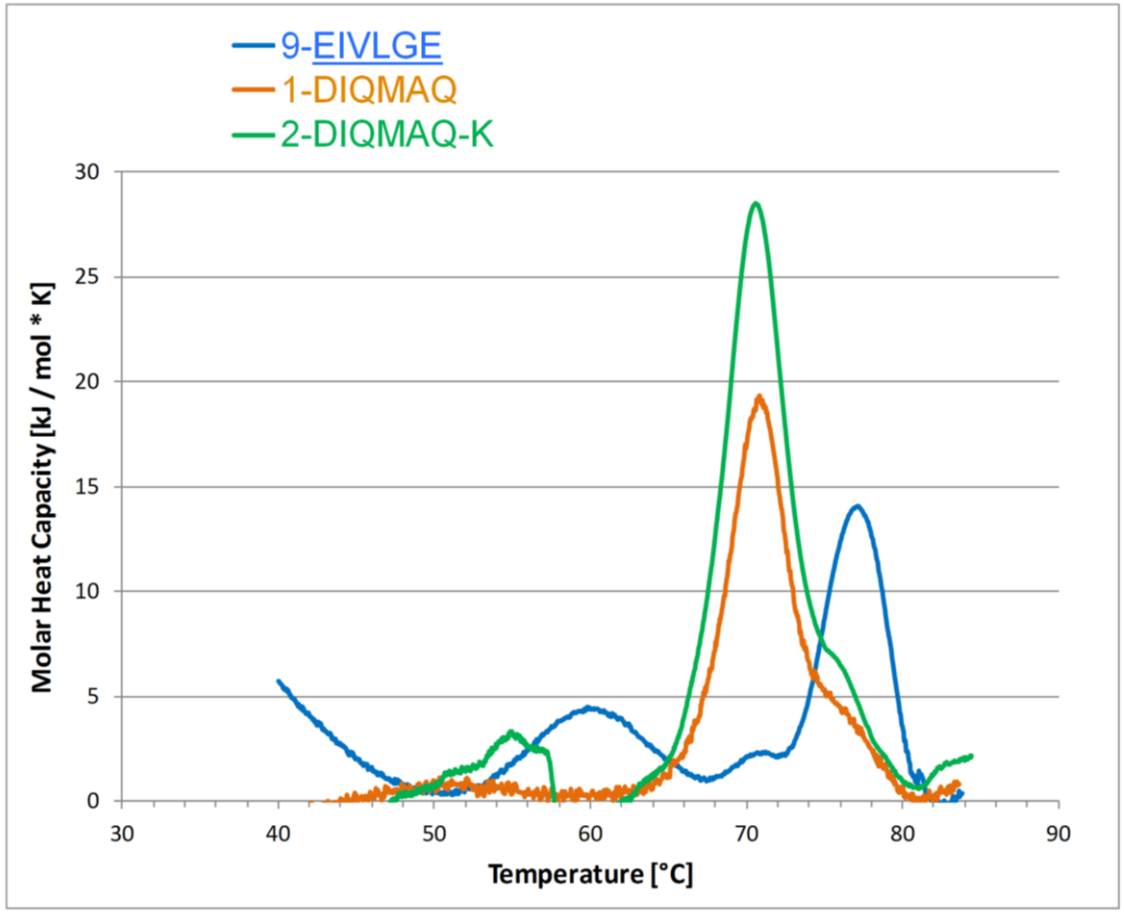


**Figure S4.** Differential scanning calorimetry thermograms of BaxM159 variants 1-DIQMAQ, 2-DIQMAQ-K and 9-EIVLGE.