Training step: 10k, Validation Perplexity: 13.75 out of 19 **GLN** Amino acid group 3 ALA **ARG** ASN ALA **ASP** 2 CYS SEC CYS SEC GLN **GLU PRO** MET PHE **GLY** 1 ARG HIS LEU TRP ILE ASN LYS PYL SER 0 **TYR MET** HIS LEU PHE **SER GLU PRO** THR -1 XAA ASX GLX TRP LYS PYL **TYR** VAL THR GLY -2 XAA ASX GLX VAL -3

3

5

4

2

0

-2

Training step: 20k, Validation Perplexity: 13.3 out of 19 **GLN** Amino acid group 3 ALA **ARG** ASN ALA **ASP** 2 CYS SEC CYS SEC GLN **GLU PRO** PHE MET 1 **GLY** ARG HIS LEU TRP ASN ILE LYS PYL SER 0 TYR **MET** HIS LEU PHE **SER GLU PRO** THR XAA ASX GLX -1 TRP LYS PYL **TYR** VAL THR GLY -2 XAA ASX GLX VAL -3 2 3 5 0 4

Training step: 30k, Validation Perplexity: 12.95 out of 19 **GLN** Amino acid group 3 ALA **ARG** ALA ASN **ASP** 2 **ASP** CYS SEC CYS SEC GLN **GLU PRO** PHE MET 1 **GLY** ARG HIS LEU TRP ASN ILE LYS PYL SER 0 TYR **MET** HIS LEU PHE **GLU PRO SER** XAA ASX GLX THR -1TRP LYS PYL **TYR** VAL GLY THR -2 XAA ASX GLX VAL -3 0 2 3 5 4

Training step: 40k, Validation Perplexity: 12.68 out of 19 **GLN** Amino acid group 3 ALA **ARG** ALA ASN **ASP ASP** 2 CYS SEC CYS SEC GLN **GLU PRO** PHE 1 MET **GLY** ARG TRP HIS LEU ASN ILE LYS PYL SER 0 TYR **MET** HIS LEU PHE **GLU PRO SER** XAA ASX GLX THR -1 TRP LYS PYL **TYR** VAL ĞLY -2 XAA ASX GLX THR VAL -3 0 2 3 5 -24

Training step: 50k, Validation Perplexity: 12.51 out of 19 **GLN** Amino acid group 3 ALA **ARG** ALA **ASN** ASP 2 **ASP** CYS SEC **CYS SEC** GLN **GLU PRO** RHE 1 **GLY** MET ARG TRP HIS LEU ASN ILE LYS PYL SER 0 TYR **MET** HIS LEU PHE **GLU PRO SER** XAA ASX GLX THR -1TRP ILE LYS PYL **TYR** VAL ĞLY -2 XAA ASX GLX THR VAL -3 0 2 3 5 -2 4

Training step: 60k, Validation Perplexity: 12.37 out of 19 **GLN** Amino acid group 3 ALA **ARG** ASN ASP 2 **ASP** CYS SEC CYS SEC GLN **GLU PRO** PHE 1 **GLY** ARG MET TRP ASN HIS LEU ILE LYS PYL SER 0 TYR **MET** HIS LEU PHE GLU PRO XAA ASX GLX **SER** THR -1TRP **TYR** LYS PYL GLY VAL -2 XAA ASX GLX THR -3 2 3 6 -20 4 5

Training step: 70k, Validation Perplexity: 12.23 out of 19 **GLN** 3 Amino acid group ALA **ARG** ASN 2 **ASP** CYS SEC **CYS SEC** GLN **GLU PRO** 1 PHE **GLY** ARG TRP HIS LEU ILE SER LYS PYL 0 **TYR MET** HIS LEU PHE GLU PROXAA ASX GLX **SER** THR -1TRP ILE **TYR** LYS PYL GLY VAL XAA ASX GLX -2 THR VAL

3

4

5

6

2

-2

0

Training step: 80k, Validation Perplexity: 12.12 out of 19 GLN 3 Amino acid group ALA **ARG** ALA ASN 2 **ASP** CYS SEC GLN **CYS SEC GLU PRO** 1 PHE **GLY** ARG TRP HIS LEU ILE SER LYS PYL 0 TYR HIS LEU **MET** PHE GLU PROXAA ASX GLX **SER** THR -1 TRP GLY ILE **TYR** LYS PYL VAL XAA ASX GLX -2 THR VAL

2

-2

0

3

4

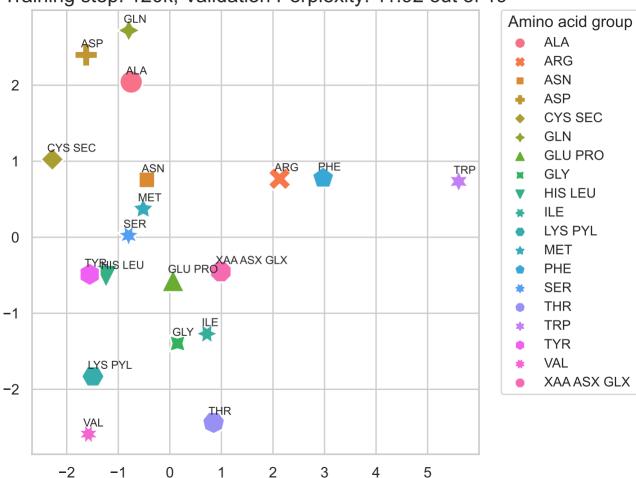
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Training step: 90k, Validation Perplexity: 12.04 out of 19 3 GLN Amino acid group ALA **ARG** ALA ASN 2 **ASP** CYS SEC GLN CYS SEC **GLU PRO** 1 PHE ARG **GLY** TRP HIS LEU ILE SER LYS PYL 0 **MET** TYR HIS LEU PHE GLU PROXAA ASX GLX **SER** THR -1 TRP **TYR** LYS PYL VAL XAA ASX GLX -2 THR VAL 2 3 5 6 -20 4

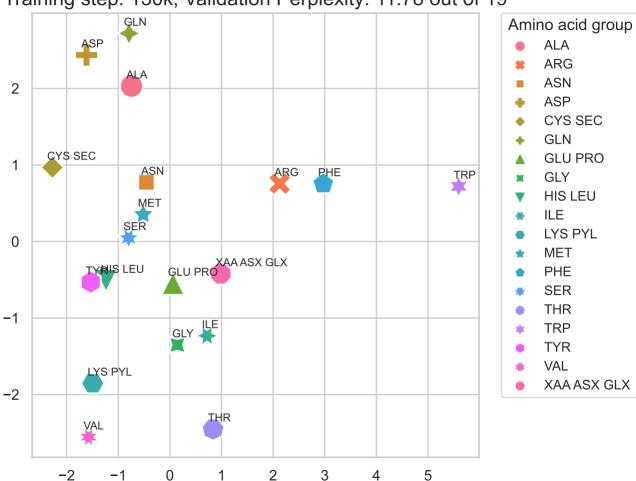
Training step: 100k, Validation Perplexity: 11.97 out of 19 3 **GLN** Amino acid group ALA **ARG** ALA ASN 2 **ASP** CYS SEC GLN CYS SEC **GLU PRO** 1 PHE ARG **GLY** TRP ASN MET HIS LEU ILE SER LYS PYL 0 **MET** TYPHIS LEU GLU PROXAA ASX GLX PHE **SER** THR -1GLY TLE TRP **TYR** LYS PYL VAL XAA ASX GLX -2 THR 2 3 5 6 -2 0 4

Training step: 110k, Validation Perplexity: 11.88 out of 19 GLN Amino acid group ALA **ARG** ASN 2 **ASP** CYS SEC GLN CYS SEC **GLU PRO** 1 PHE ARG ASN TRP **GLY** HIS LEU MET ILE SER LYS PYL 0 **MET** GLU PROXAA ASX GLX TYRUS LEU PHE **SER** THR -1 TRP **TYR** VAL LYS PYL XAA ASX GLX -2 THR 2 3 5 -2 0 4

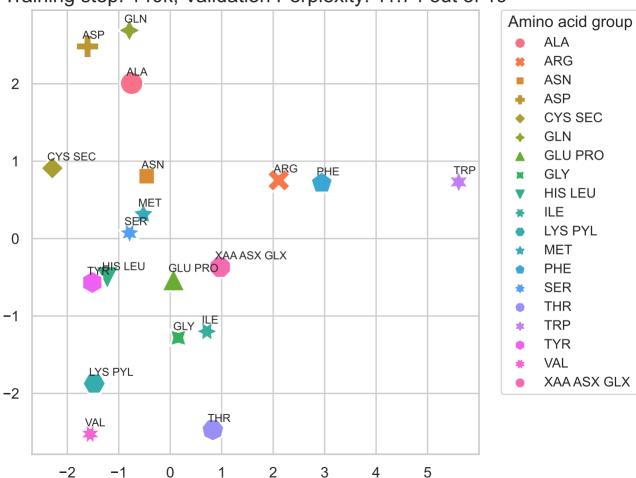
Training step: 120k, Validation Perplexity: 11.92 out of 19



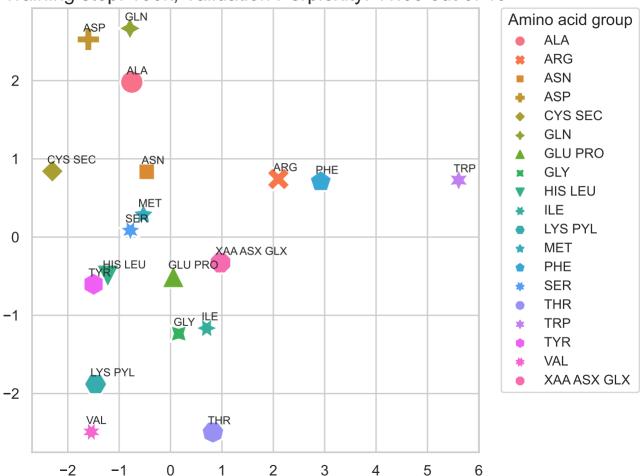
Training step: 130k, Validation Perplexity: 11.78 out of 19



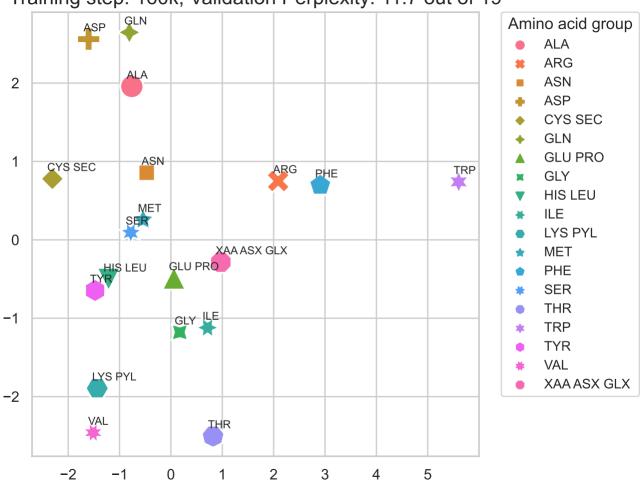
Training step: 140k, Validation Perplexity: 11.74 out of 19



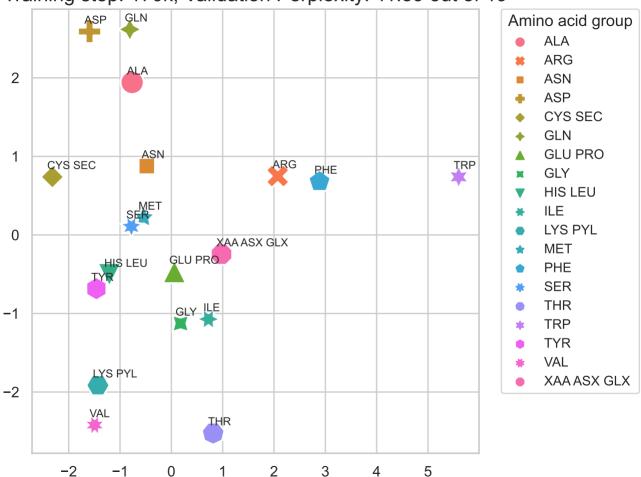
Training step: 150k, Validation Perplexity: 11.68 out of 19



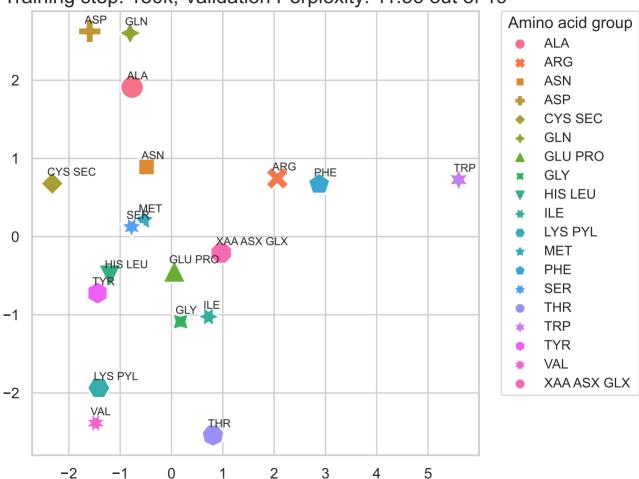
Training step: 160k, Validation Perplexity: 11.7 out of 19



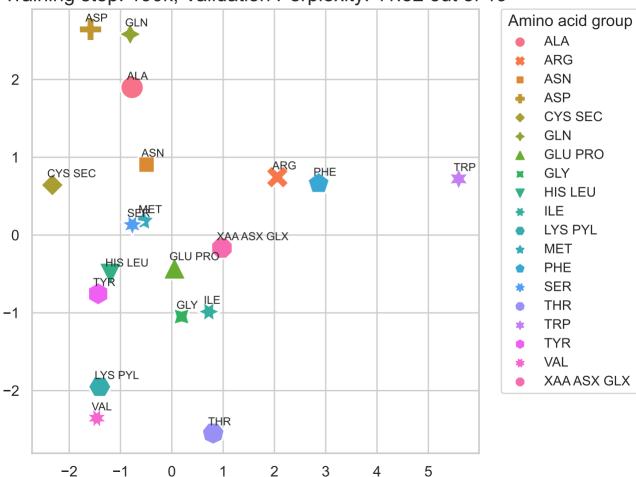
Training step: 170k, Validation Perplexity: 11.59 out of 19



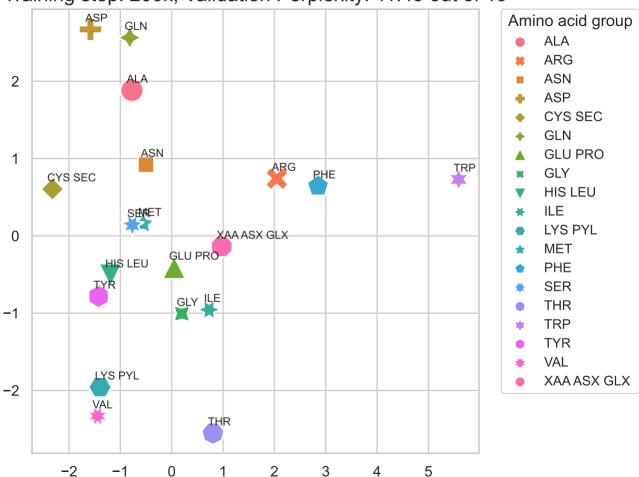
Training step: 180k, Validation Perplexity: 11.56 out of 19



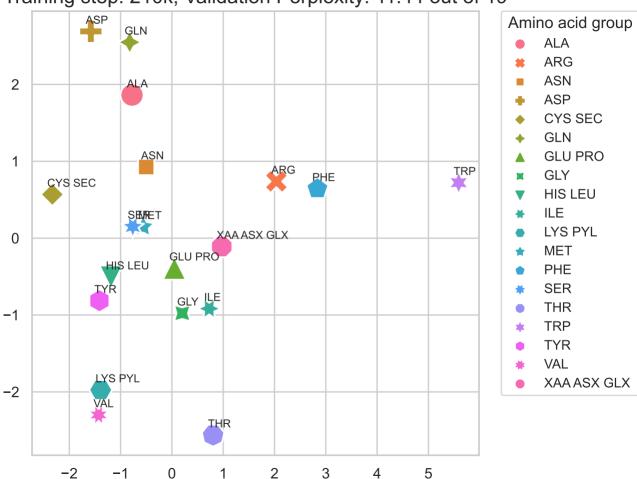
Training step: 190k, Validation Perplexity: 11.52 out of 19



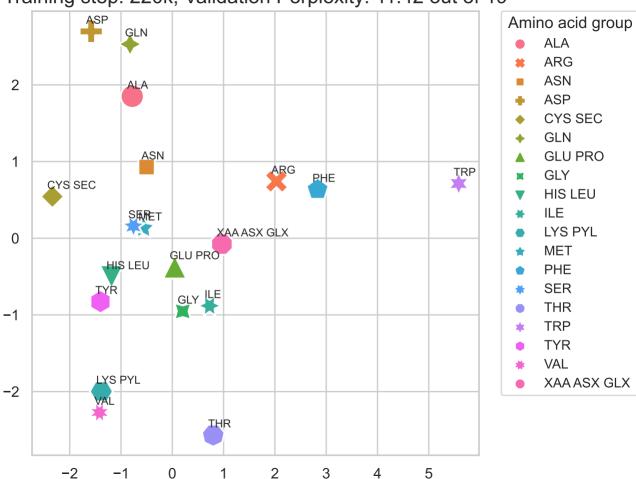
Training step: 200k, Validation Perplexity: 11.49 out of 19



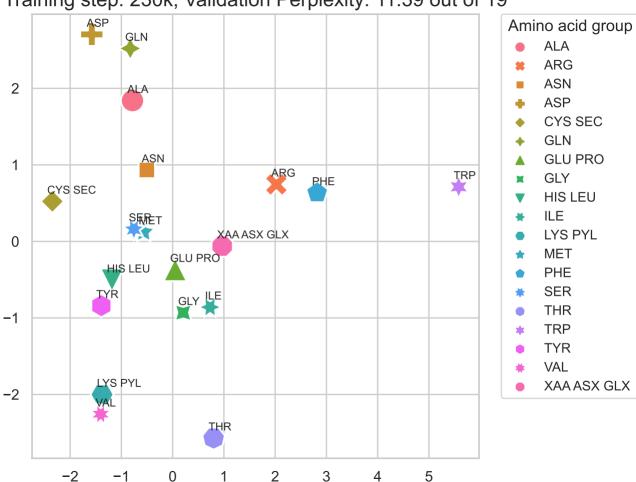
Training step: 210k, Validation Perplexity: 11.44 out of 19



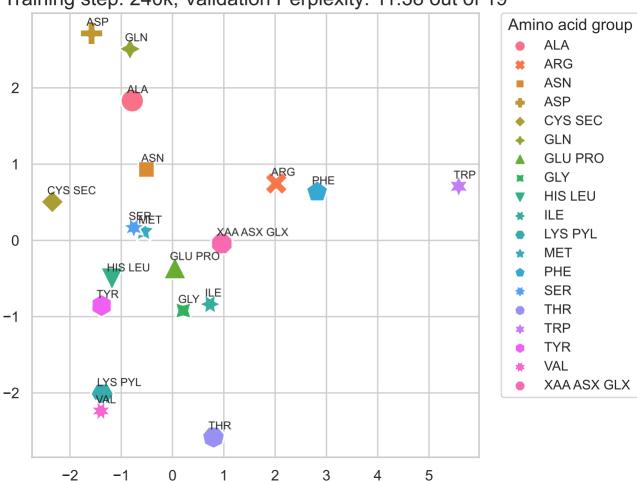
Training step: 220k, Validation Perplexity: 11.42 out of 19



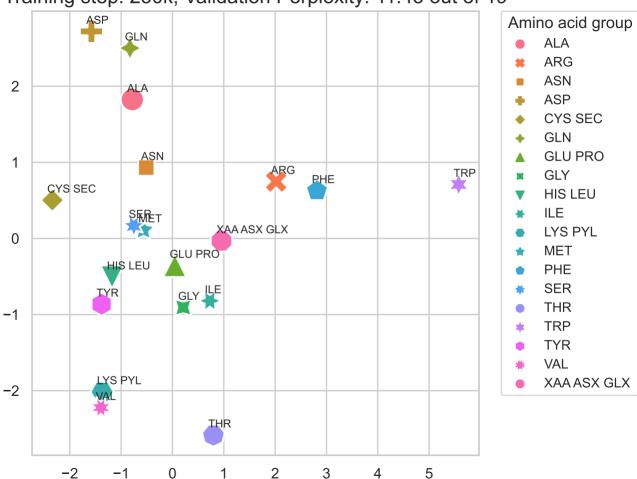
Training step: 230k, Validation Perplexity: 11.39 out of 19



Training step: 240k, Validation Perplexity: 11.38 out of 19



Training step: 250k, Validation Perplexity: 11.45 out of 19



Training step: 260k, Validation Perplexity: 11.34 out of 19

