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Dennis F. Cudia*, 5343 Cunningham Road, Rockford, IL 61102. *The Boltzmann Principle and Degeneracy.*

The following unambiguous context free grammar G_m has productions based on the five degeneracies 1, 2, 3, 4, 6 of the genetic code. $L(G_m)$ is the set of <initiation> followed by any positive integer number of codons followed by <termination>.

$$\begin{aligned} \langle Strt \rangle &- \rightarrow \langle initiation \rangle S' \langle termination \rangle \\ S' &- \rightarrow \langle codon \rangle S' | \langle codon \rangle \\ \langle codon \rangle &- \rightarrow D_1 | D_2 | D_3 | D_4 | D_6 \\ D_1 &- \rightarrow AUG | UGG \\ D_2 &- \rightarrow UUY | UAY | CAY | CAR | AAY | AAR | GAY | GAR | UGY \\ D_3 &- \rightarrow AUU | AUC | AUA \\ D_4 &- \rightarrow GUN | CCN | ACN | GCN | GGN \\ D_6 &- \rightarrow UCY | UCR | AGY | CUY | CUR | UUR | CGY | CGR | AGR \\ N &- \rightarrow Y | R \\ Y &- \rightarrow U | C \\ R &- \rightarrow A | G \end{aligned}$$

Given any mature *mRNA*, *mr*, let N_1, N_2, N_3, N_4, N_6 , respectively, be the number of codons in *mr* of degeneracy 1, 2, 3, 4, 6, respectively, and let $x = \sum N_i$. For each non-terminal X of G_m define the syntactic entropy of X , $SE(X)$, by $SE(X) = \ln W(X)$ where $W(X)$ is the number of righthand sides of X . (Received September 20, 2010)