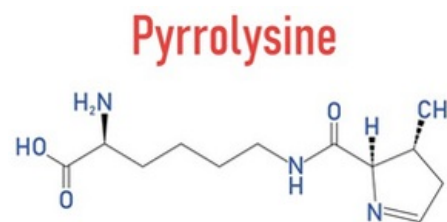


Pyrrolysine

At the turn of the 1970s and 1980s, the twenty-first - selenocysteine (Sec) - and recently the twenty-second, **pyrrolysine (Pyl)** were added to the classically coded twenty amino acids . Unlike all previous amino acids, triplets are encoded, which normally serve as signals to terminate translation (see genetic code). Specifically, the triplet UGA serves for the incorporation of selenocysteine and **UAG** for the incorporation of pyrrolysine.



The occurrence **of pyrrolysine (Pyl)** is so far limited to members of the *Methanosarcinaceae* family of archaeobacteria and the bacterium *Desulfitobacterium hafniense* . The involvement **of pyrrolysine** in the metabolism of these organisms is related to their exceptional ability to use methylamines as an energy source. They do this through the enzymes **methylaminomethyltransferases** , and for their successful synthesis it is necessary that one **UAG** triplet located in the reading frame of their mRNA is read not as a termination signal , but as a signal for pyrrolysine incorporation. *In addition*, *D. hafniense* encodes a system that incorporates **selenocysteine** into proteins , so this bacterium is the only known organism that uses all 22 amino acids in photosynthesis.

Links

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- Amino acids

Source

At the request of the author and with the permission of the publisher, adapted from Jonák J: RNA in proteosynthesis. Coding for selenocysteine and pyrrolysine. Živa 5/2007, 195-198.

- JONÁK, J. RNA in proteosynthesis. Genetic code and preparation of aminoacyl-tRNA. *Alive* [online]. 2007, year 2007, vol. 5/2007, pp. 195-198, also available from <<http://ziva.avcr.cz/files/ziva/pdf/rna-v-proteosynthese-geneticky-kod-a-priprava-amino.+pdf> >. ISSN 0044-4812.

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