

Metal content determination of the purified HupK protein from homologous host was performed. The HupK protein was shown to contain nickel atom in 1:2 molar ratio, and no Fe atom was detected in the sample. In order to determine, which amino acids assist in binding the nickel atom, the sequences of the HupK and the large subunits of the hydrogenases were compared. Conserved regions could be recognized at the N- and C-termini, while the middle part of the proteins was variable. The alignment uncovered two conserved cysteine residues as candidates for coordination of the metal. One of them is in the R-X-F-X-X-C motif at the amino terminus, other one is in the D-P-C-X-X-F motif at the carboxyl terminus. In order to examine the putative role of these residues, site-directed mutagenesis were performed and the effects of the mutations were monitored via the hydrogenase activities of the membrane-associated hydrogenases. A mutant carrying alanine instead of Cys378 had only 65% activity of the wild-type strain. However, the replacement of the Cys54 by alanine led to a considerable reduction in the hydrogenase activity (to 25% of the wild type level). Ni content investigation of the Cys54Ala mutant HupK protein revealed that it contains the same amount of Ni atom like the wild-type protein.

The R-X-C-X-X-C and the D-P-C-X-X-C sequences in the large subunits of NiFe hydrogenases have been shown to be essential for their activity and the cysteine residues have been proposed to form a coordination sphere surrounding the NiFe center (Przybyla et al. 1992, Volbeda et al., 1995.). In the HupK protein, phenylalanines substitute the first and the last cysteines. In order to confer the motifs of the hydrogenase large subunit on HupK, the two phenylalanines were replaced by cysteines. The effect of these mutations on the biosynthesis of the membrane-bound hydrogenase is being investigated.

Maróti G, Fodor BD, Rákhely G, Kovács AT, Arvani S, Kovács KL (2003) Accessory proteins functioning selectively and pleiotropically in the biosynthesis of [NiFe] hydrogenases in *Thiocapsa roseopersicina*. *Eur. J Biochem* 270(10):2218-2227.

Przybyla AE, Robbins J, Menon N, Peck HD Jr. (1992) Structure-function relationships among the nickel-containing hydrogenases. *FEMS Microbiol Rev* 8(2):109-135

Volbeda A, Charon MH, Piras C, Hatchikian EC, Frey M, Fontecilla-Camps JC (1995) Crystal structure of the nickel-iron hydrogenase from *Desulfovibrio gigas*. *Nature* 373(6515):580-587.

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Anthropological Analysis of the Medieval Cemetery of 'Szeged-Vár'

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The environs of Szeged was a populated area from the primitive age; archeological finds prove there were Roman inhabitants at the time of Roman Empire, and later habitation during the great migrations of Huns, Gepids and Avars. This area was important because this is where Maros runs into the Tisza River, the Maros River being an excellent and cheap transport possibility of salt from Transylvania.

The first mention of the Medieval town is from 1246. As a result of the Turkish occupation of Hungary limited data is available, making the archeological excavation of Szeged-Vár very important.

The Medieval cemetery of Szeged-Vár was used from the Hungarian conquest to 1543, and from 1686 until 1713. The excavations have been going on since 1999, and by now approximately 700 graves have been excavated, along with some objects and crypts.

In this study, we have researched 425 graves excavated between 1999 and 2004. The basis of the anthropological analysis was the determination of sex and age of death, inclusion metric data, and paleopathological and taxonomical analysis. To determine these data, we have used common anthropological methods. Paleopathological and taxonomical examinations have been carried out using macromorphological methods, though in certain cases radiographical analysis was also applied.

After the determination of sex and age, we could establish that in this population the sex ratio was 50%-50%; the percentage of infants (INF1, INF2, JUV) was 49%, and elderly (SEN) 7%.

By means of the measurements of humerus, radius, ulna, tibia and femur we determined the height of people. The average of the height of adult males was 170 cm, adult females 160 cm; the highest was 181 cm both among males and females, the minimum height was 157.5 cm among males and 147.7 cm among females.

In accordance with general medieval health, many of the skeletons showed different forms of paleopathological lesions: periostitis, osteomyelitis, arthritis; minor developmental anomalies: sacralisation, lumbarisation, spina bifida, dislocation of the hip; traumas: fractures of humerus, radius, ulna, ribs or clavicle. There also were infectious bony lesions due to TB and syphilis. We found some metabolic disturbances of bone: osteoporosis; and circulatory and hematologic disorders as well: cribra orbitalia and cribra cranii.

The taxonomical analysis could yield some very interesting information because there is no such data available for this town. There are some finds in the area of a 'Kun' population (for example in Kiskundorozsma), and we suppose there was a Mongolid population in Szeged after the Hungarian conquest. For taxonomical analysis we have to research anatomical variations like sutura metopica, os Wormiana, torus palatinus, torus mandibulae and maxillae, fossa canina and several dental variations.

This presentation is for the preliminary results only.

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