

研究论文

电泳和质谱技术研究4种胰脏铁蛋白的亚基类型和等电点特性

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摘要 采用电泳和质谱技术对所制备的鸡、鸭、牛和猪胰脏铁蛋白的亚基类型和等电点特性进行了研究。采用天然聚丙烯酰胺凝胶电泳(PAGE)技术研究的结果表明, 上述4种铁蛋白呈现不同的迁移率, 据此可知鸡胰铁蛋白的相对分子质量(M_r)>鸭胰铁蛋白的 M_r >黄牛胰铁蛋白的 M_r >猪胰铁蛋白的 M_r , 而且均大于马脾铁蛋白(HSF)的 M_r 。采用十二烷基硫酸钠(SDS)-PAGE技术研究的结果表明, 上述4种铁蛋白均由H(heavy chain)和L(light chain)类型的亚基组成, 但H和L亚基的相对数量(即H/L亚基数量的比值)有差别。采用肽指纹图谱技术分别鉴定各铁蛋白的H和L亚基。选用变性等电聚焦方法研究发现, 上述4种铁蛋白分别由3~6种不同等电点的亚基聚合物组成, 说明铁蛋白的H和L亚基之间呈现复杂的相互作用和不同的聚合物。不同陆生动物胰脏铁蛋白亚基之间相互作用的强度和聚合态存在着差异, 这一差异特性可能与调控铁蛋白释放铁的速率有关, 也与动物对铁的需求和铁解毒速率有关。

关键词 [电泳](#) [质谱](#) [肽质量指纹图谱](#) [铁蛋白](#) [胰脏](#) [亚基](#) [鉴定](#)

Characteristics of subunit types and isoelectric points in four pancreas ferritins by electrophoresis and mass spectrometry

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Abstract

The pancreas ferritins from chickens, ducks, cattle and pigs were isolated by thermal denaturation, ammonium sulphate fractionation and DEAE-52 cellulose anion exchange chromatography separately, in order to obtain the characteristics both subunit types and isoelectric points. Four ferritins such as chicken pancreas ferritin (ChPF), duck pancreas ferritin (DPF), cattle pancreas ferritin (CaPF), and pig pancreas ferritin (PPF) showed different mobility in polyacrylamide gel electrophoresis (PAGE). The relative molecular masses (M_r) of these ferritin were indicated to be M_r (ChPF)> M_r (DPF)> M_r (CaPF)> M_r (PPF), which are all bigger than that in horse spleen ferritin (HSF). Sodium dodecyl sulfate (SDS)-PAGE results indicate that ChPF, DPF, CaPF and PPF consist of H and L subunits, showing different ratios of H/L subunits. Two subunit types in the ferritin were further identified by peptide-mass fingerprinting (PMF) technology. The four ferritins such as ChPF, DPF, CaPF and PPF in denatured-isoelectric focusing (IEF) gel show the subunit polymers containing from 3 to 6 with different pI values, respectively. These phenomena reveal the complicated interactions and different polymers between H and L subunits in the ferritins. There are differences both interaction intensities and polymers in the ferritin subunits coming from different mammals. These heterogeneity may response to the rate of iron release in ferritins and to the detoxification requirement of iron in animals in vivo.

Key words [electrophoresis](#) [mass spectrometry \(MS\)](#) [peptide mass fingerprinting](#) [ferritin](#) [pancreas subunit](#) [identification](#)

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