



PROTEINE 2016

Dissecting Biological Complexity
at the Molecular Level

Main topics:

Deciphering complex biological processes by structural biology
Models of Biological Complexity
Cell Complexity of Diseases
New Approaches in Protein Science

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CHARACTERIZATION OF EQUINE AMNIOTIC FLUID BY A PROTEOMIC APPROACH

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Amniotic fluid (AF) is a complex biological matrix containing nutrients, growth factors and antimicrobial effectors to protect the fetus and allow it to mature. Characterization of the physiologic AF proteome is a prerequisite to study its changes during diseases and discover new biomarkers. Proteomic techniques have recently been applied to the characterisation of horse amniotic membrane [1] and bovine conceptus fluids [2], whereas the equine AF proteome remains uncharacterised notwithstanding its high diagnostic potential. The aim of this study was to identify by a proteomic approach the most abundant proteins of equine AF.

AF samples were collected at parturition from 24 healthy mares that delivered healthy foals. Sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE) was performed on 4-12% gels. Representative lanes were cut in 23 slices, trypsin-digested and analysed by mass spectrometry (MS).

After SDS-PAGE all samples presented a similar pattern characterized by two clusters of bands: the first with molecular weights (MW) higher than 62 kDa and the second with MW lower than 34 kDa. Thirty-four proteins were unambiguously identified by MS and subsequently categorised by their molecular function and biological process according to Gene Ontology. Most of the proteins were involved in cellular growth and/or maintenance (38%) and transport (26%), followed by protein metabolism (9%). Twelve proteins (e.g. fibronectin, lumican, thrombospondin and fibulin) belonged to or interacted with the extracellular matrix (ECM) playing an important role in the development of foetal tissues. Most of the remaining proteins were classified as transport (e.g. albumin, major allergen Equ c1 and alpha-fetoprotein) delivering nutrients, ions and lipids essential for foetal growth and development. The present study successfully applied SDS-PAGE coupled to MS identifying the most abundant proteins of equine AF. The importance of ECM and transport proteins was highlighted.

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