Differences in cell marker expression by equine bone marrow-derived mesenchymal stem cells associated with blood antigen type and breed.

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Introduction
There is significant variability in the clinical outcomes following therapeutic use of mesenchymal stem cells (MSCs) for equine musculoskeletal disease. Among the possible causes are differences in the immunogenic response to MSCs. The characterization of MSCs from different donor sources is important in the identification of less immunogenic allogeneic donor MSCs, and may facilitate standardisation of clinical treatments. The aim of this study was to define marker expression differences between two breeds, and horses with different erythrocyte antigen profiles.

Materials and Methods
MSCs derived from the bone marrow of 18 Thoroughbred (TBs) and 18 Standardbreds (STBs), including 8 blood erythrocyte Aa, Ca, and Qa antigen negative (EAN) horses, were evaluated. From each horse MSCs from passages 2, 4, 6, and 8 were labelled and evaluated by flow cytometry. Cell surface expression of CD11a/18, CD44, CD90 and major histocompatibility (MHC) class II antigens were assessed. Trilineage assays for differentiation into adipogenic, chondrogenic and osteogenic cells lines were used to verify characterization of the MSCs.

Results
Differences in MSC marker expression between breeds and blood antigen types over time were significant. Standardbreds had lower expression of MHC class II antigens than did TBs at passages 2, 4 and 6, and may be the less immunogenic MSC donor as compared to TBs. CD90 antigen expression was significantly higher in EAN STBs compared to blood erythrocyte antigen positive STBs for all passages. All MSC samples showed high expression of CD44 and low expression of CD11a/18.

Relevance to Clinical Equine Practice
Blood erythrocyte antigen negative STBs are preferred donors of MSCs for allogenic treatment.

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