The urokinase plasminogen activator (uPA) system is one of the best-investigated protease systems, both under physiological and pathological conditions, including various types of cancer. However, effects of co-expression of members of the uPA system in soft-tissue sarcoma (STS) patients at the protein level in both tumour tissue and serum have not been investigated yet. We examined 82 STS patients for protein levels of uPA, PAI-1 and uPAR in tumour tissue and serum by ELISA. A significant correlation between high antigen levels of uPA, PAI-1 or uPAR in tumour tissue, and of uPAR in serum, with poor outcome of STS patients was found for the first time. Most strikingly, we observed an additive effect of combined uPA, PAI-1 or uPAR levels in tumour tissue extracts with uPAR levels in serum on patients' prognosis. High uPA/uPAR, PAI-1/uPAR and uPAR/uPAR antigen levels in tumour tissue/serum were associated with a 5.9-fold, 5.8-fold and 6.2-fold increased risk of tumour-related death (P=0.003, 0.001 and 0.002, respectively) compared with those patients who displayed low levels of the respective marker combination. As expression of members of the uPA system in tumour tissue and serum is additively correlated with prognosis of STS patients.
patients, our results suggest that combinations of these biomarkers can identify STS patients with a higher risk of tumour-related death.