Successful protein extraction from over-fixed and long-term stored formalin-fixed tissues.

Abstract:
One of the major breakthroughs in molecular pathology during the last decade was the successful extraction of full-length proteins from formalin-fixed and paraffin-embedded (FFPE) clinical tissues. However, only limited data are available for the protein extraction efficiency of over-fixed tissues and FFPE blocks that had been stored for more than 15 years in pathology archives. In this study we evaluated the protein extraction efficiency of FFPE tissues which had been formalin-fixed for up to 144 hours and tissue blocks that were stored for 20 years, comparing an established and a new commercial buffer system. Although there is a decrease in protein yield with increasing fixation time, the new buffer system allows a protein recovery of 66% from 144 hours fixed tissues compared to tissues that were fixed for 6 hours. Using the established extraction procedure, less than 50% protein recovery was seen. Similarly, the protein extraction efficiency decreases with longer storage times of the paraffin blocks. Comparing the two buffer systems, we found that 50% more proteins can be extracted from FFPE blocks that were stored for 20 years when the new buffer system is used. Taken together, our data show that the new buffer system is superior compared to the established one. Because tissue fixation times vary in the routine clinical setting and pathology archives contain billions of FFPE tissues blocks, our data are highly relevant for research, diagnosis,
and treatment of disease.