**Supplementary Figure 1.** A 63 year-old male patient with a histologically verified MALT lymphoma of the stomach (light blue arrows) and the left parotid gland (light blue arrowheads). The parotid lesion shows only a very faint tracer uptake on 18F-FDG-PET and the fused color-coded PET/CT that was interpreted as physiological muscle uptake by one rater and as mild inflammation of the gland by the other rater. On CE-CT, where the lesion was missed by both raters, the left parotid gland appears only slightly larger than the right gland, and there are some uncharacteristic calcifications; however, no lesion can be delineated. On DWI and fused color-coded DWI-MRI, the lesion shows a very high, clearly abnormally high signal, indicative of strong diffusion restriction (high cellular density). The thickened gastric wall shows no abnormal tracer uptake on PET and PET/CT and is unspecific on CE-CT, whereas it shows an abnormally high signal on DWI and DWI-MRI, in good accordance with the histologically verified lymphoma. Note: the homogeneous high signal of the spleen on DWI(-MRI) is physiological.

**Supplementary Figure 2.** A 56-year old male patient with histologically verified, infra-diaphragmatic SLL/CLL in the retroperitoneal/paraaortic lymph nodes (light blue arrows). These nodal lymphoma manifestations show a high signal (i.e., diffusion restriction) on DWI and the fused color-coded DWI-MRI images, and were thus rated as positive. On the other hand, they fail to show an elevated tracer uptake, relative to the surrounding tissues, on the 18F-FDG-PET and the fused color-coded PET/CT images, and were thus rated as negative. On CE-CT, the lymph nodes were rated as positive due to their abnormal long-axis diameter (>1.5 cm).