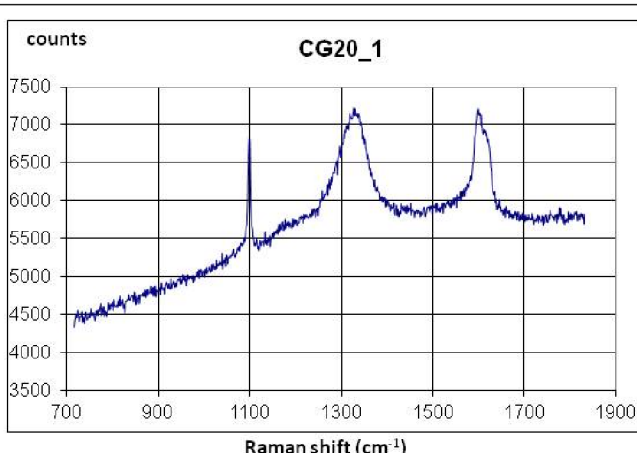
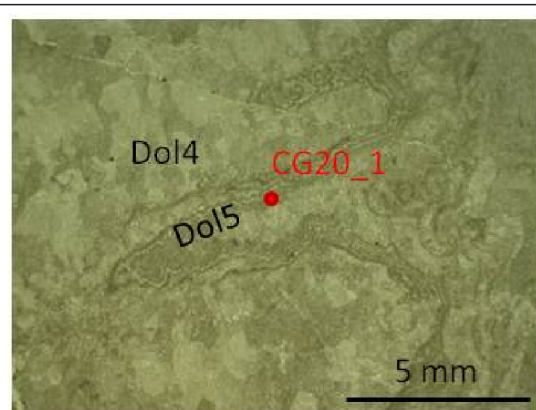
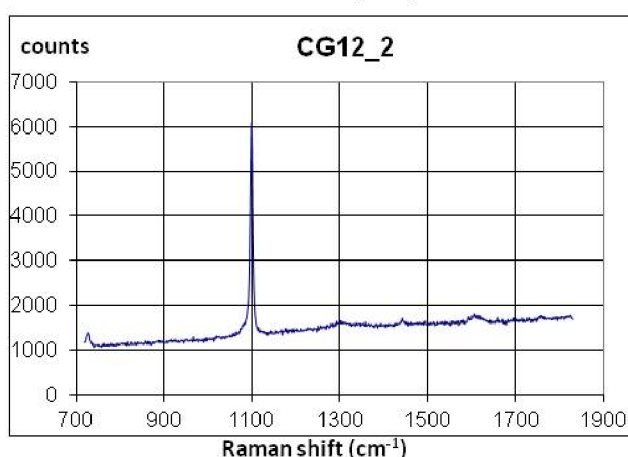
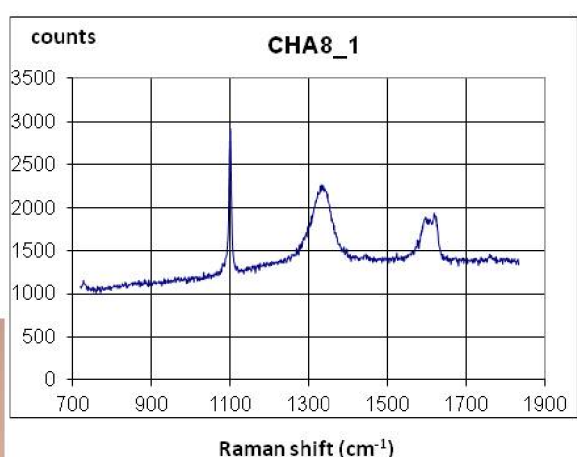
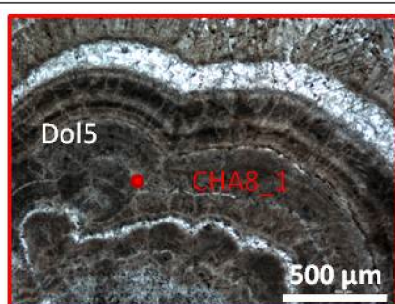


**Spectrum CG12\_1 (Dol 5):** narrow peaks at 725  $\text{cm}^{-1}$  and 1097  $\text{cm}^{-1}$  (dolomite) and two broad bands at approx. 1330  $\text{cm}^{-1}$  and 1610  $\text{cm}^{-1}$  (carbonaceous material).

**Spectrum CG12\_2 (Dol 4):** narrow peaks at 725  $\text{cm}^{-1}$  and 1097  $\text{cm}^{-1}$  (dolomite).

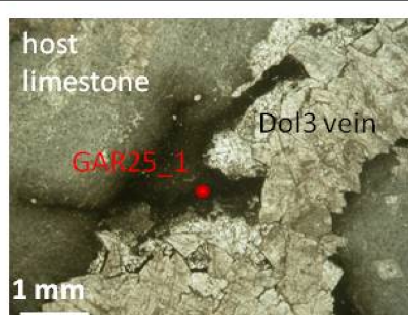
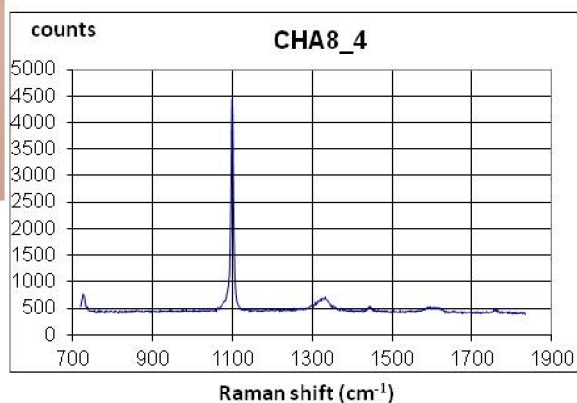
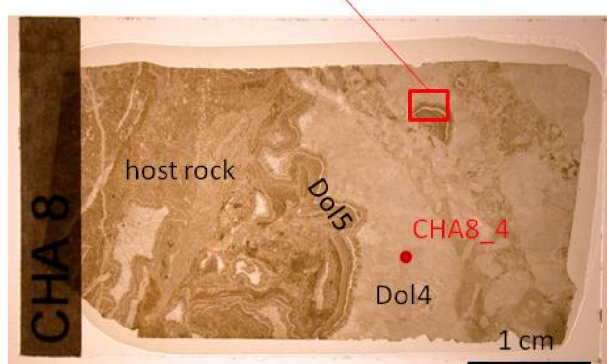


**Spectrum CG20\_1 (Dol 5):** narrow peak at 1097  $\text{cm}^{-1}$  (dolomite) and two broad bands at approx. 1330  $\text{cm}^{-1}$

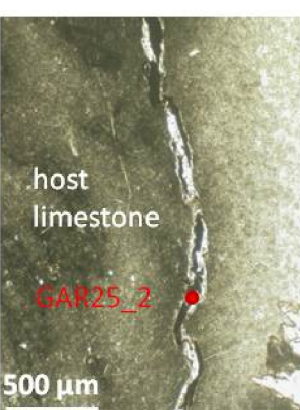
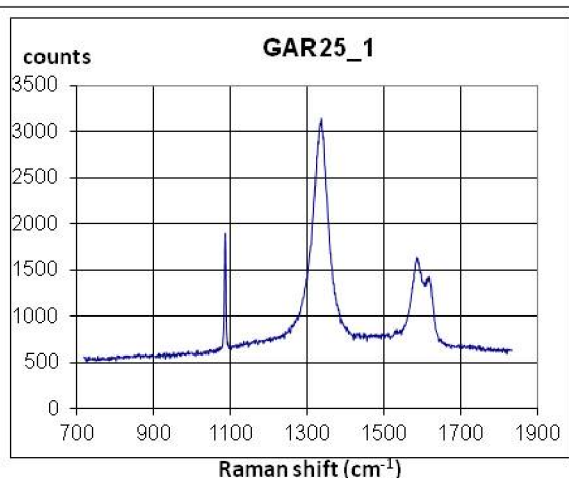


**Spectrum CHA8\_1 (Dol 5):** narrow peaks at 725  $\text{cm}^{-1}$  and 1097  $\text{cm}^{-1}$  (dolomite) and two broad bands at approx. 1330  $\text{cm}^{-1}$  and 1610  $\text{cm}^{-1}$  (carbonaceous material).

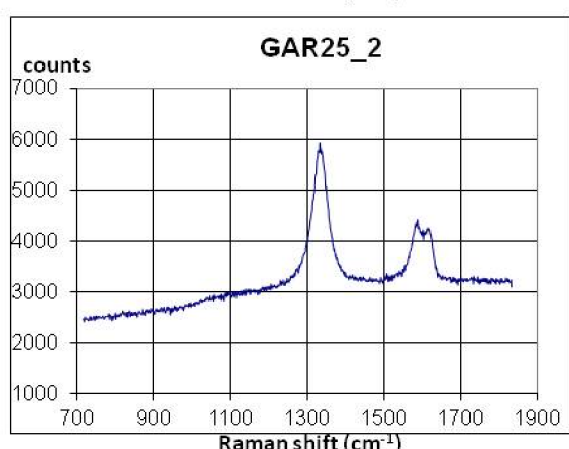
**Spectrum CHA8\_4 (Dol 4):** narrow peaks at 725  $\text{cm}^{-1}$  and 1097  $\text{cm}^{-1}$  (dolomite).



**Spectrum GAR25\_1 (carbonaceous material finely dispersed into the host limestone flanking dolomite veins):** narrow peak at 1085  $\text{cm}^{-1}$  (calcite=host limestone) and two broad bands at approx. 1330  $\text{cm}^{-1}$  and 1610  $\text{cm}^{-1}$  (carbonaceous material).



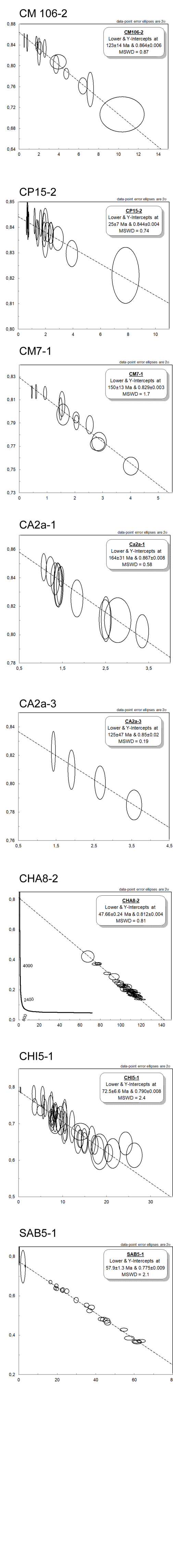
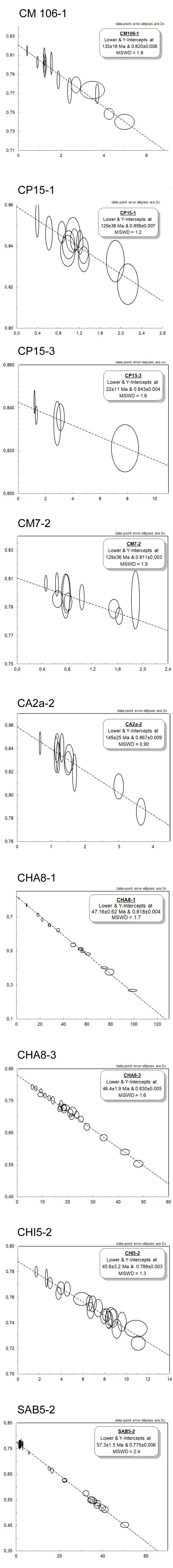
**Spectrum GAR25\_2 (carbonaceous material filling a thin fracture):** two broad bands at approx. 1330  $\text{cm}^{-1}$  and 1610  $\text{cm}^{-1}$  (carbonaceous material).



**Fig. S1.** Micro-Raman spectra on dolomite cements rich in carbonaceous material (Dol5; samples CG12, CG20, CHA8), on carbonaceous material filling fractures (sample GAR25, spectrum GAR25\_2) and on finely dispersed into the host limestone flanking dolomite veins (sample GAR25, spectrum GAR25\_1).

$^{207}\text{Pb}/^{206}\text{Pb}$

$\text{Pb}^{207}/\text{Pb}^{206}$



**Fig. S2.** Tera-Wasserburg diagrams plotting  $^{207}\text{Pb}/^{206}\text{Pb}$  vs  $^{238}\text{U}/^{206}\text{Pb}$  for 17 ages calculated as lower intercepts using Isoplot 3.71