Hyper-spectral Raman imaging correlating chemical substitution and crystallinity in biogenic hydroxyapatite: dentin and enamel in normal and hypoplastic human teeth

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In this supplement, we provide additional supporting information on the atomic force microscope (AFM) image on tooth thin section (Fig. S1), the microscopic image and backscattered electron (BSE) image at the cervical positon of normal and hypoplastic tooth (Fig. S2), intensity, FWHM, and spectral position of the amide I Raman band image (Fig. S3), population distribution of Γ-ν correlation for the dental phases (Fig. S4), average FWHM of 960 cm-1 mode at the dentin-enamel junction (Fig. S5) and Raman spectroscopy of normal and hypoplastic enamel (Fig. S6).



Figure S1. AFM images of polished tooth thin section at enamel area (a) and dentin area (b).



Figure S2. Representative optical microscope images of the normal (a-c) and hypoplastic (e-g) teeth locating cervical position at increasing magnification. Backscattered electron (BSE) image at the cervical position of normal (d) and hypoplastic teeth (h) at the same locations shown in optical microscope images (c) and (g), respectively.



Figure S3. Intensity (a), FWHM(b), and spectral position (b) of the amide I 1667 cm-1 peak for the same position as the 960 cm-1 P-O stretch mode in figure 4. On the left the dentin shows a clear signal while the enamel shows no signal due to the lack of protein.

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Figure S4. Population distribution of Γ-ν correlation for the dental phases, orange lines indicate the enamel, green lines indicate the dentin-enamel junction, blue lines indicate the intertubular dentin and the black lines indicate the dental tubules.



Figure S5. Average FWHM of 960 cm-1 mode at the dentin-enamel junction corresponding to the pink box in Figure 5.

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Figure S6. Representative Raman spectra of normal and hypoplastic teeth at enamel region.