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Electronic Supplementary Information

Fluorescein functionalized random amino acid copolymers in the biomimetic synthesis of $CaCO_3$

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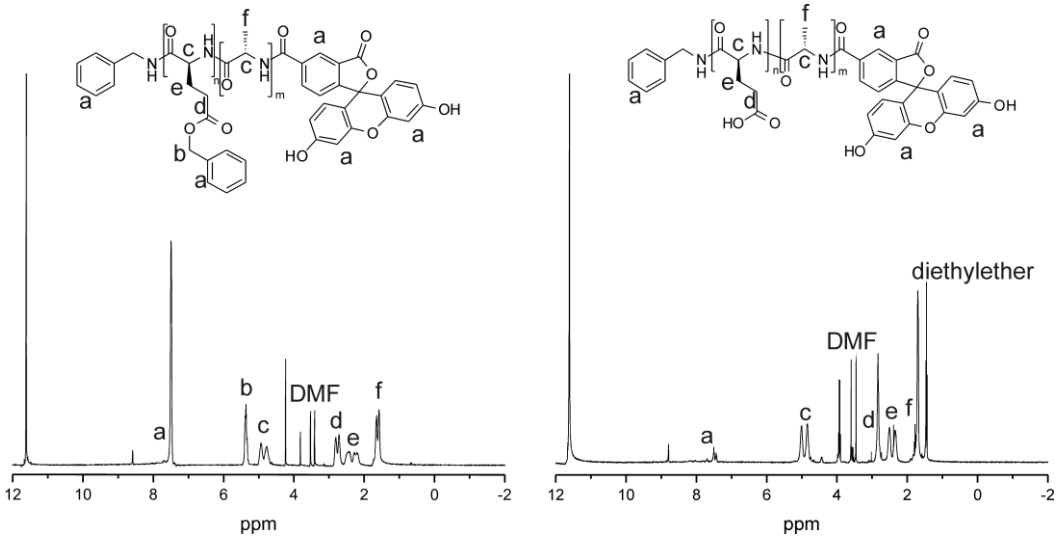
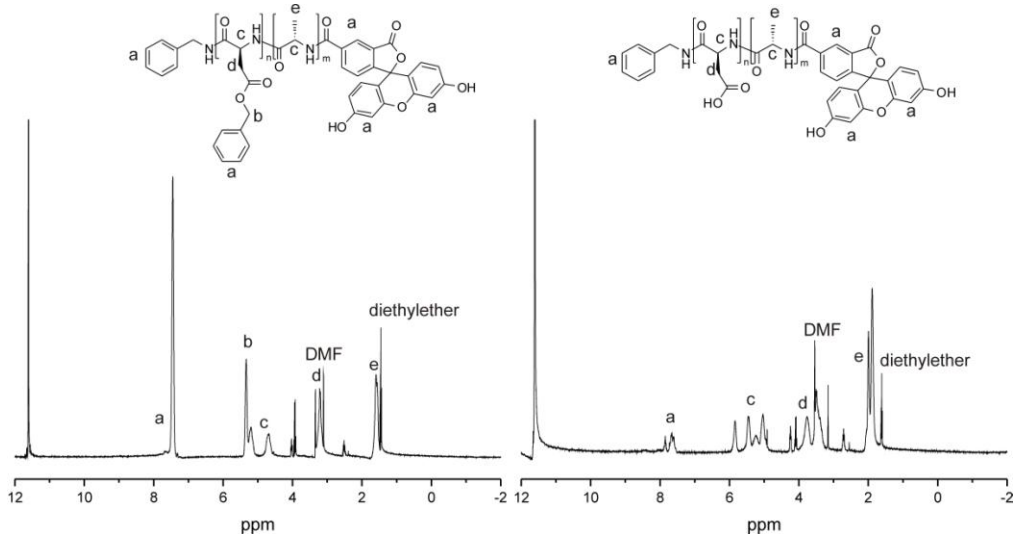


(a)



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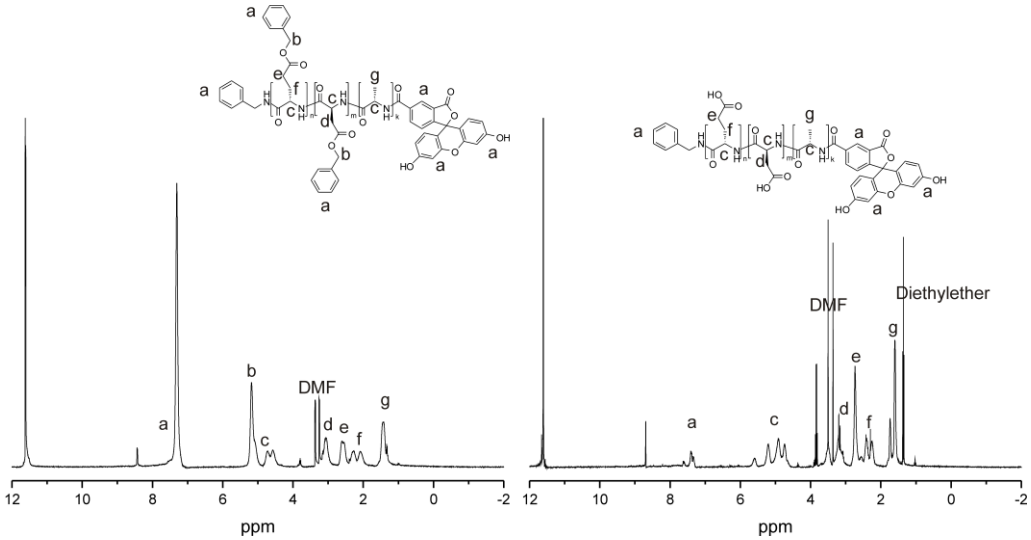

(c)

Fig.S1 ^{1}H-NMR of deprotection of the fluorescein-labeled (a) P(BLG-co-Ala) (Entry 2, Table 1), (b) P(BLA-co-Ala) (Entry 4, Table 1) and (c) P(BLG-co-BLA-co-Ala) (Entry 6, Table 1).

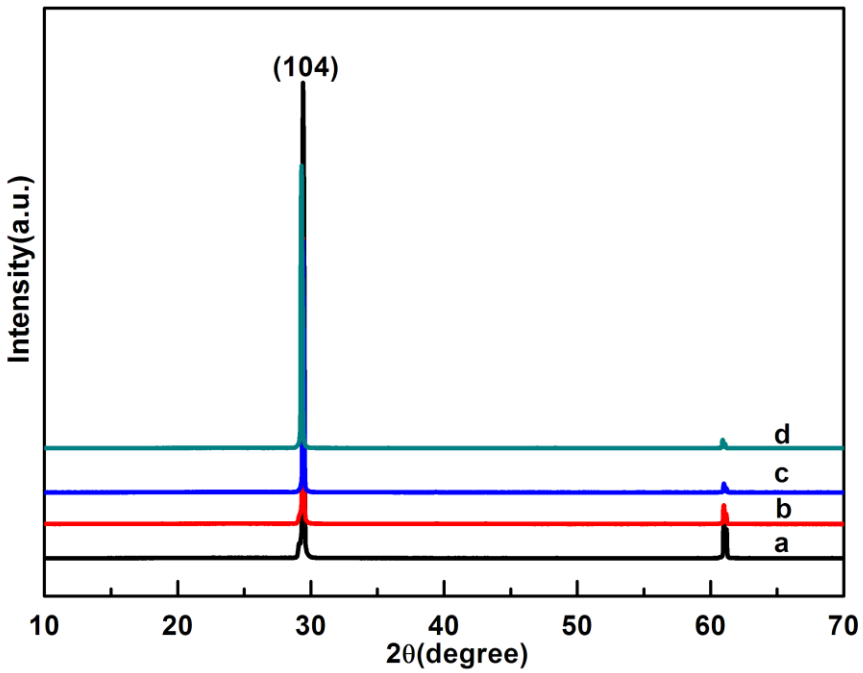

Fig.S2 XRD patterns of $CaCO_3$ crystals prepared in the absence of polymer (a); in the presence of (b) fluorescein labeled P(Glu-co-Ala); (c) fluorescein labeled P(Asp-co-Ala) and (d) fluorescein labeled P(Glu-co-Asp-co-Ala).[Copolymer] = 4.5×10^{-3} mM, [$Ca(HCO_3)_2$] = 9 mM.

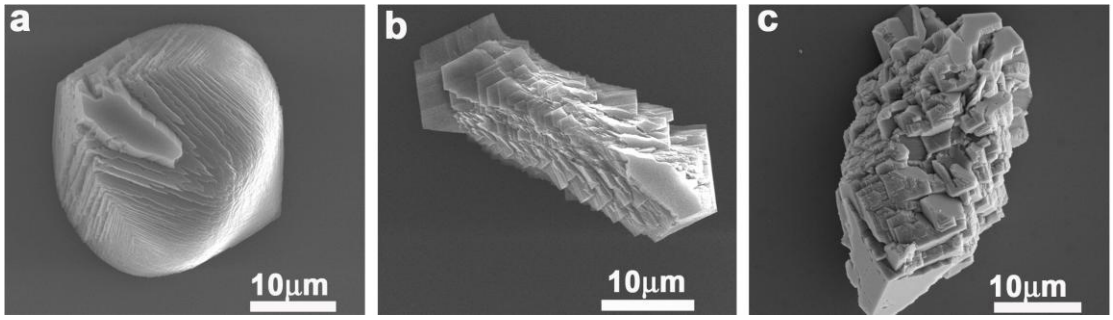

Fig.S3 SEM images of $CaCO_3$ crystals formed on glass substrates in supersaturated $Ca(HCO_3)_2$ solutions after 72 h mineralization in the presence of (a) P(Glu-co-Ala); (b) P(Asp-co-Ala), and (c) P(Glu-co-Asp-co-Ala) .[Copolymer] = 4.5×10^{-3} mM, [$Ca(HCO_3)_2$] = 9 mM.

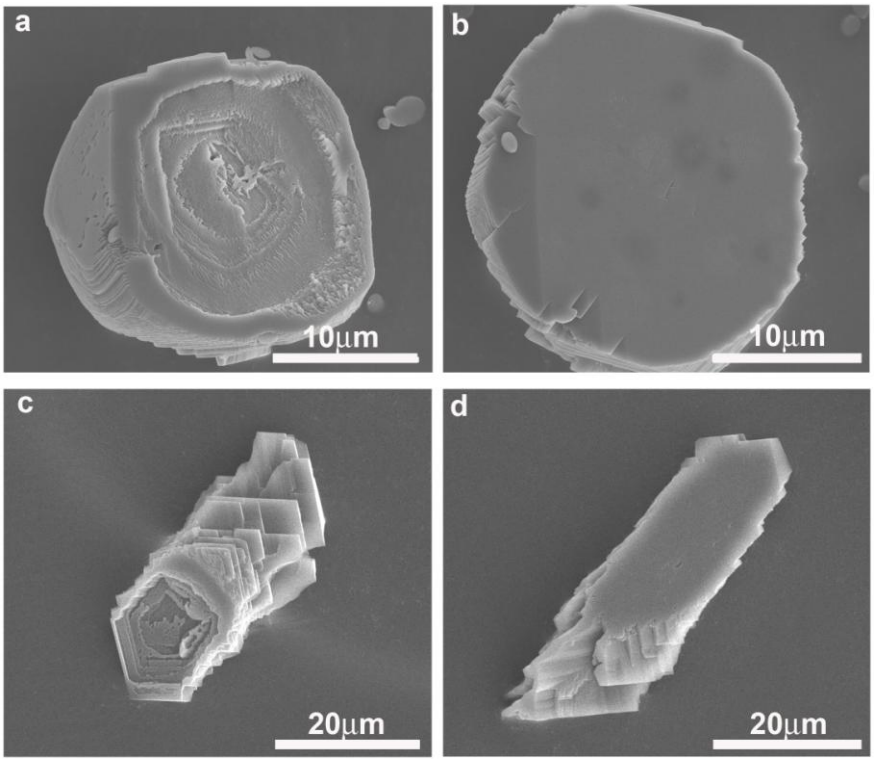

Fig.S4 SEM images of $CaCO_3$ crystals with exposed nucleated faces prepared in present of fluorescein labeled (a-b) P(Glu-co-Ala) and (c-d) P(Asp-co-Ala), [Copolymer] = 4.5×10^{-3} mM.

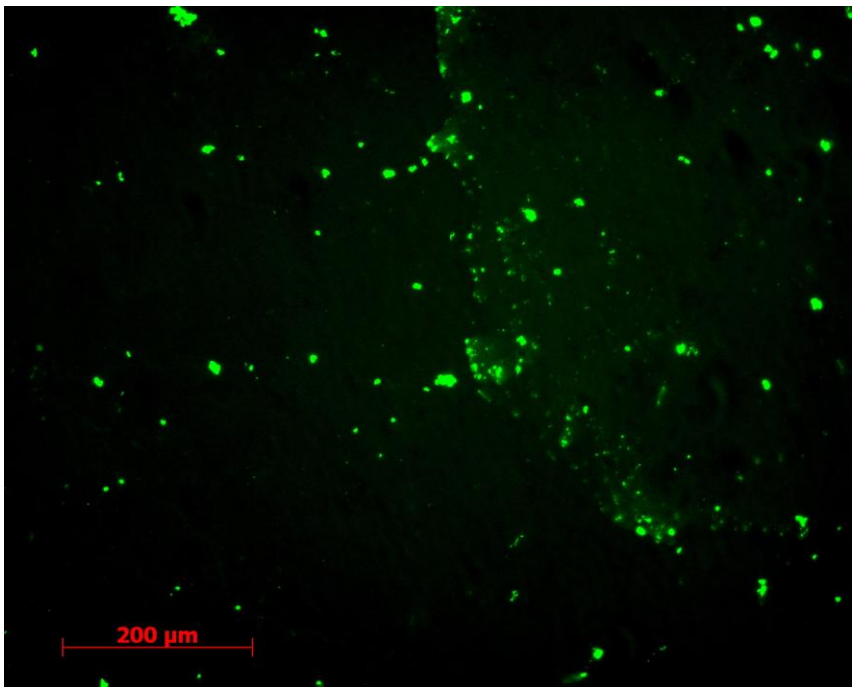

Fig.S5 Fluorescent microscopy image of fluorescein labeled copolymer aggregates physisorbed on glass substrates.

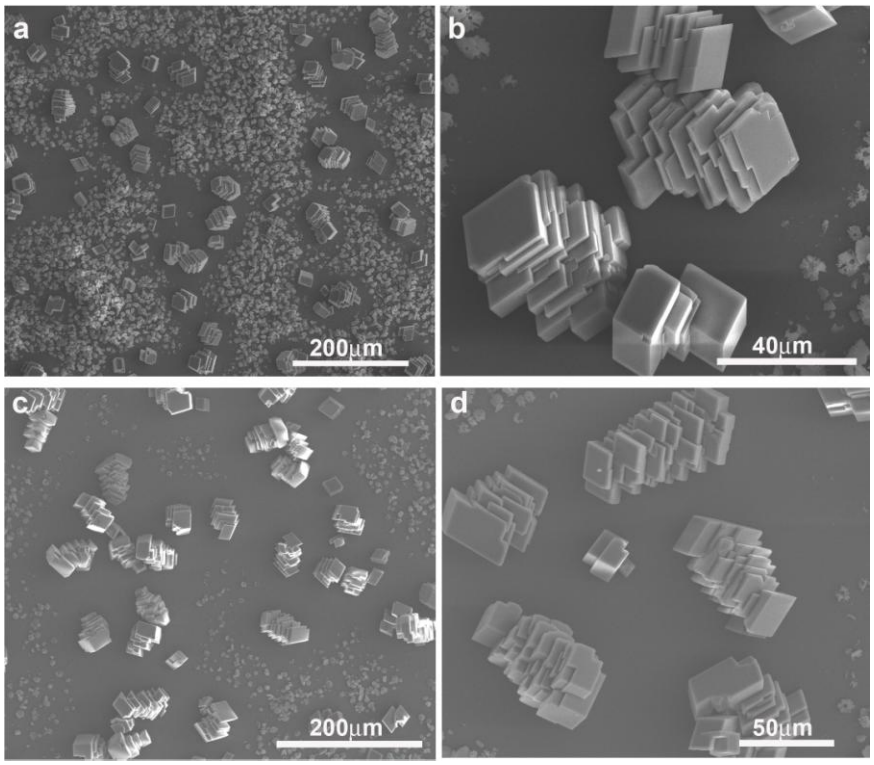

Fig.S6 SEM images of the **overgrown** $CaCO_3$ crystals prepared in the fresh supersaturated $Ca(HCO_3)_2$ solutions. Two $CaCO_3$ **samples** prepared in presence of (a, b) fluorescein labeled P(Glu-co-Ala) and (c,d) fluorescein labeled P(Asp-co-Ala) were used in this overgrowth experiment. [Ca $(HCO_3)_2$] = 9 mM.

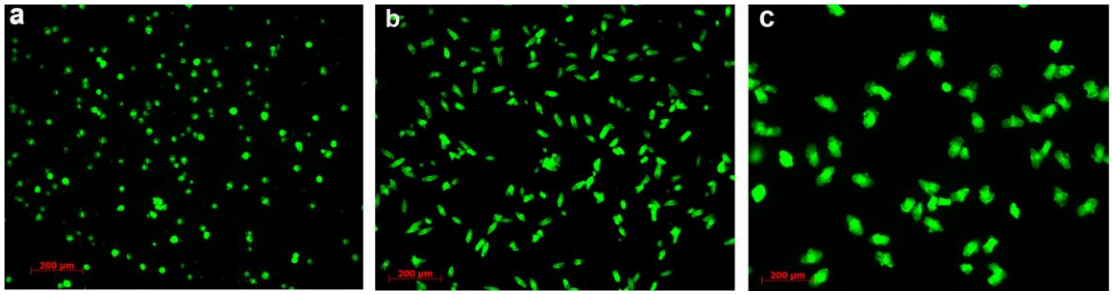

Fig.S7 Fluorescent microscopy images of $CaCO_3$ crystals prepared in presence of (a) fluorescein labeled P(Glu-co-Ala) and (b) fluorescein labeled P(Asp-co-Ala). [Copolymer] = 4.5×10^{-3} mM, [$Ca(HCO_3)_2$] = 9mM. (c) fluorescein labeled P (Glu-co -Asp- co-Ala).[Copolymer] = 3.3×10^{-3} mM, [$Ca(HCO_3)_2$]=9mM.

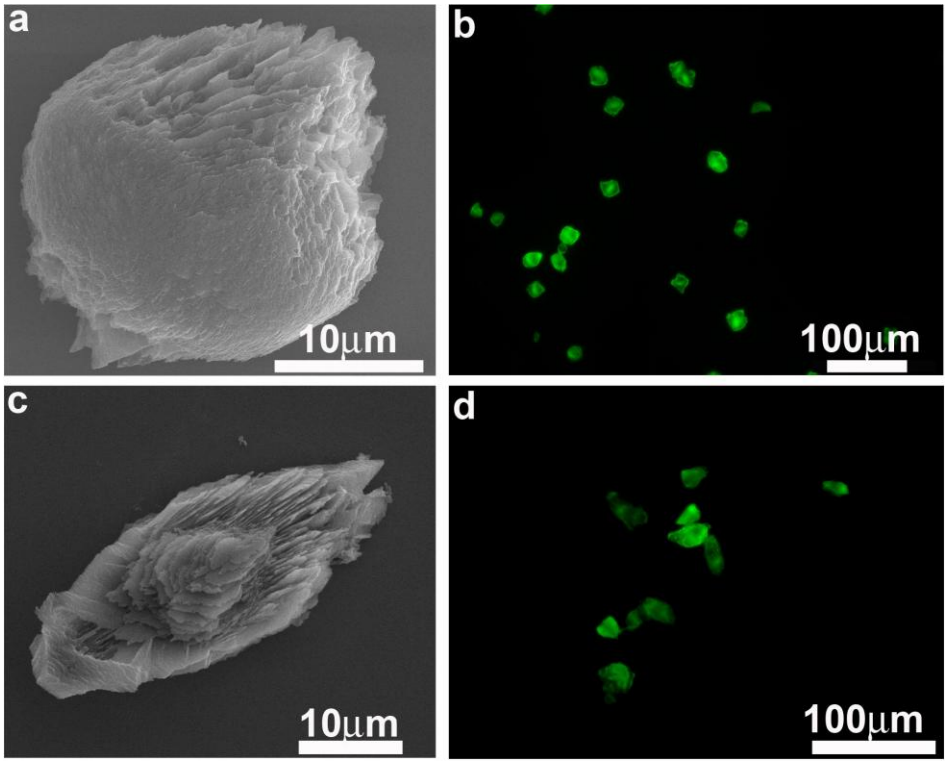

Fig.S8 SEM **(a, c)** and **(b, d)** fluorescence microscopy images of the $CaCO_3$ crystals prepared in present of fluorescein labeled **(a,b)** P(Glu-co-Ala) and **(c,d)** P(Asp-co-Ala) that were subsequently etched with 1.0 M acetic acid for 30 s.