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[\[Image PDF \(635K\)\]](#) [\[References\]](#)**Role of Acidic Amino Acid for Regulating Hydroxyapatite Crystal Growth**[Takuya MATSUMOTO<sup>1\)</sup>](#), [Masayuki OKAZAKI<sup>2\)</sup>](#), [Masahiro INOUE<sup>3\)</sup>](#), [Jun-Ichi SASAKI<sup>1\)</sup>](#), [Yoshinosuke HAMADA<sup>1\)</sup>](#) and [Junzo TAKAHASHI<sup>1\)</sup>](#)

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**Abstract:**

Non-collagenous proteins in hard tissue matrix are thought to play a pivotal role in regulating the crystal growth of hydroxyapatite (HAp). As most non-collagenous proteins are acidic proteins containing acidic amino acid-rich sequences, we examined the growth of HAp crystals from HAp seed crystals in the presence/ absence of acidic amino acid. New HAp formation generally started from the P-surface of HAp. However, in the presence of acidic amino acid, new HAp formation was observed on both P-surface and C-surface of HAp seed crystals. Furthermore, newly formed HAp showed specific orientation along the long-axis direction of HAp seed crystals. In terms of crystallinity, HAp formed in the presence of acidic amino acid showed low crystallinity. These results suggested that, in biomineralization, the adsorbed or free state of acidic amino acid would influence crystal formation and orientation as follows: 1) If free in solution, acidic amino acid would inhibit HAp crystal growth; 2) If adsorbed or immobilized on matrix, acidic amino acid would become HAp nucleation site and regulate the orientation of HAp crystals.

**Key words:**[Hydroxyapatite](#), [Crystal growth](#), [Acidic amino acid](#)

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