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Integrin αvβ6: structure, function and role in health and disease

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Abbreviations: DC, dendritic cells; EBV, Epstein–Barr virus; ECM, extracellular matrix; EGFR, epidermal growth factor receptor; EMT, epithelial-to-mesenchymal transformation; ERK, extracellular signal-regulated kinase; FMDV, foot-and-mouth disease virus; HSV, herpes simplex virus; LAP, latency-associated peptide; MMP, matrix metalloproteinase; STAT3, signal transducer and activator of transcription 3; TGF-β, transforming growth factor-β; TolBC, tolerogenic B cell; Treg, regulatory T cell; Trm, tissue-resident memory T cell; uPA, urokinase-type plasminogen activator

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Abstract

Integrins are cell surface receptors that traditionally mediate cell-to-extracellular matrix and cell-to-cell adhesion. They can, however, also bind a large repertoire of other molecules. Integrin αvβ6 is exclusively expressed in epithelial cells where it can, for example, serve as a fibronectin receptor. However, its hallmark function is to activate transforming growth factor-β1 (TGF-β1) to modulate innate immune surveillance in lungs and skin and along the gastrointestinal tract, and to maintain epithelial stem cell quiescence. The loss of αvβ6 integrin function in mice and humans leads to an altered immune response in lungs and skin, amelogenesis imperfecta, periodontal disease and, in some