

Structure and Function of Collagen Receptor Integrins

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Description of the scientific aims

We study the structure-function relationship of the collagen receptor integrins. This has led e.g. to the development of small molecule inhibitors for collagen receptors. In addition we are also interested in integrin signaling, especially atypical signaling mechanisms, including low avidity integrin–ligand interactions and signaling by nonactivated integrins. Most recently, we have studied the role of collagen receptor signaling in prostate cancer and the consequences of extracellular post-translational modifications, such as citrullination, in the integrin ligands. In a separate project we have developed new software for quantitative bioimaging (BioImageXD).

Selected publications 2010-

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2. Sipilä K, Haag S, Denessiouk K, Käpylä J, Peters EC, Denesyuk A, Hansen U, Konttinen Y, Johnson MS, Holmdahl R, Heino J. Citrullination of collagen II affects integrin-mediated cell adhesion in a receptor-specific manner. *FASEB J*, 28(8): 3758-68, 2014.
3. Kankaanpää P, Paavolainen L, Tiitta S, Karjalainen M, Päivärinne J, Nieminen J, Marjomäki V, Heino J, White D.J. BioImageXD: an open, general-purpose and high-throughput image-processing platform. *Nature Methods*, 9(7):683-9, 2012.
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5. Jokinen J, White DJ, Salmela M, Huhtala M, Käpylä J, Sipilä K, Puranen JS, Nissinen L, Kankaanpää P, Marjomäki V, Hyypiä T, Johnson MS, Heino J. Molecular mechanism of $\alpha 2 \beta 1$ integrin interaction with human echovirus 1. *EMBO J*, 29(1):196-208, 2010.