

## Proteins Exiting The Cell, How To Go Where You Are Expected?

18 May 2011 [Click to Print](#)

Proteins are required within and outside the cell and it is therefore essential that all proteins are delivered to the right place. It is well known that proteins destined to some specific cellular compartments as well as proteins exiting the cell are transported through the Secretory Pathway. However, it remains unclear how these proteins are properly sorted to their final destination.

CRG researchers, from the Intracellular Compartmentation laboratory, have previously reported in the Journal of Cell Biology in 2010 the role of actin, a protein of the cytoskeleton, in the sorting of secretory proteins. They now reveal further insight into this process and describe in a new article, in the Developmental Cell journal, the involvement of actin in maintaining a proper balance of Calcium at the main sorting station of the Secretory Pathway, the trans-Golgi Network (TGN).

Since secretory proteins are very diverse and have various fates, it has long been thought that they would all be sorted to their final destination with the help of specific receptors, of which only one has been identified at the TGN after decades of research. "The most exciting part of our findings is that we describe a very novel mechanism, which does not involve specific receptors. We realized that the Calcium concentration of the trans-Golgi Network is crucial for the proper sorting of a set of soluble secretory proteins" explains Julia von Blume, first author of this work. "It is a subtle balance that is maintained by the interaction of the actin cytoskeleton, a family of actin remodelling proteins and a Calcium ion transporter at the membrane of the trans-Golgi Network. If this balance is perturbed, a large number of secretory proteins are sorted randomly, and do not reach their destination".

"These findings provide the means to understand the sorting of proteins and will help understand the pathologies such as diabetes, asthma, skin and bone morphogenesis", add the main authors of this work Julia von Blume, Anne-Marie Alleaume and Vivek Malhotra.

Sources: Centre for Genomic Regulation, [AlphaGalileo Foundation](#).

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Article URL: <http://www.medicalnewstoday.com/releases/225650.php>

**Main News Category:** Biology / Biochemistry

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