The handle http://hdl.handle.net/1887/19853 holds various files of this Leiden University dissertation.

Author: Houben, Anna
Title: Autotaxin : biochemical and functional studies
Date: 2012-09-25
The enzyme autotaxin (ATX) is expressed in breast cancer, but ATX expression levels are not a prognostic factor for clinical outcome (this thesis).

Activity-dependent probes are useful tools to monitor ATX activity in biological fluids (this thesis).

The long isoform of ATX (ATXα) contains a unique insertion in the catalytic domain. Cleavage of this insert by furin does not result in loss of activity, but could serve to regulate the interaction between ATXα and heparan sulfate proteoglycans (this thesis).

Binding of ATXα to heparin suggests a new mechanism for localized LPA production and signaling by binding of ATXα to heparan sulfate proteoglycans at the cell membrane (this thesis).

Deletion of an 18-amino acid stretch in the catalytic domain of ATX compared to its nucleotide pyrophosphatase/phosphodiesterase (NPP) family members allows the formation of a lysophospholipid binding pocket. The presence of this stretch explains why the NPP1 and NPP3 family members of ATX cannot function as a lysophospholipase (Hausmann et al, Nat Struct Mol Biol 2011; 18(2): 198-204 and Nishimasu et al, Nat Struct Mol Biol 2011; 18(2): 205-12).

The rigid interaction between the inactive nuclease domain and the active catalytic domain in the ATX structure is a clever evolutionary solution to maintain stability of the catalytic domain (Moolenaar & Perrakis, Nat Rev Mol Cell Biol 2011; 12(10): 674-79).

Studies to understand the behavior of tumor cells should not solely focus on the traits of tumor cells, but instead must include the contributions of the tumor environment as well (Hanahan & Weinberg, Cell 2011; 144(5): 646-74).


Contrary to the expectation that science will reveal one single clear answer, more often than not scientists have to be satisfied with several answers and even more questions as a result.

The human genome is like a book of 23 chapters (the “chromosomes”) with in total over three billion letters (the “nucleotides”). The fact that we comprehend only around 2% of this text indicates that we have not finished reading yet.

If you do not learn from your mistakes, you make a mistake (Johan Cruijff).

The world is a book, and those who do not travel read only one page (Aurelius Augustine, Roman philosopher, 354-430).