

Cathepsin dan Calpain: Enzim pemecah protein dalam sel = Cathepsin and Calpain: Proteolytic enzyme in cell

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Abstrak

Cathepsin dan calpain adalah anggota sistein protease yang merupakan enzim proteolitik yaitu enzim yang mengkatalisis pemecahan protein melalui hidrolisis ikatan peptida. Hidrolisis ikatan peptida pada ribuan protein baik di dalam maupun di luar sel berfungsi untuk mengontrol dinamika turn-over protein. Cathepsin merupakan enzim keluarga papain yang terletak di lisosom. Enzim tersebut memiliki 11 anggota yang berperan dalam pencernaan, presentasi antigen serta remodeling matriks. Calpain adalah kelompok sistein protease sitoplasmik yang aktivitasnya tergantung kalsium. Calpain mempunyai implikasi dalam proteolisis sejumlah protein intraseluler yang berhubungan dengan peningkatan kalsium intraseluler. Aktivasi protease tersebut berhubungan dengan pengikatan membran yang diikuti autolisis. Protein regulator seperti protein kinase C, actin-binding protein dan integrin sitoplasmik mengalami pemotongan oleh calpain, maka calpain dianggap berperan dalam proses signaling seluler.

.....Cathepsin and calpain are cystein protease family as proteolytic enzyme that catalize breakdown of protein through hydrolysis of peptide bonds. Hydrolysis of peptide bond in many thousand proteins both intracellular and extracellular regulates the protein turnover. Cathepsin is papain family enzyme which is located in lysosome. This enzyme has 11 members that involve in digestive, antigen presenting and matrix remodeling, whereas calpain is cytoplasmic cystein protease and its activity is calcium dependent. Calpain has a role in proteolytic of intracellular protein related with calcium enhancement. Activation of that protease seems to correlate with membrane binding following autolysis. Some of regulator protein such as C kinase protein, actin- binding protein and cytoplasmic integrin are cut by calpain, therefore calpain has a role in cellular signaling process.