

Dynamical Modelling of Autophagy in the Context of Alzheimer Disease

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Abstract

Autophagy is a biological process which occurs in all cells whereby peptides and proteins are broken down, or catabolised, into amino acids and simpler monosaccharides. The proper functioning of autophagy in neurons has been linked to several age related neurodegenerative diseases, including Alzheimer's, Dementia, and Huntington's disease. In this report I create a dynamical model to simulate and further understand the kinetics of Autophagy in neurons.

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1 Introduction and Motivation

2 Autophagy: A Basic Description

Autophagy is an essential process that occurs in every cell in the body. It is an essential part of cell function, and is involved in everything from maintaining cell homeostasis to disease prevention.

It can be split into three types. They are macroautophagy, microautophagy, and chaperone mediated autophagy. In macroautophagy, bubble like compartments in the cell called autophagosomes fuse with the cytoplasm, thus taking up any glycoproteins or other waste products contained therein. These autophagosomes are then transported to acidic compartments known as lysosomes. In these lysosomes, glycoproteins and other waste products are broken down into