

**Programma 2013/2014 Docente: Prof.ssa Antonella Ragnini**

**AAS Intracellular trafficking and human diseases (3CFU) for:**

**LM BCM, LM BEU and Master of Science in Pharmacy University of Tor Vergata**

Intracellular Membranes: Components of biological membranes and factors that regulate membrane curvature: proteins containing BAR-domains, Coatamer and scaffold proteins

Biochemical and microscopy instruments used in studying intracellular protein trafficking: Correlative microscopy, super-resolution microscopy, fluorescence-based microscopy to study protein dynamics

Role of the endoplasmic reticulum (ER) in intracellular trafficking: proteins involved in ER membrane tabulation (YOP and reticulons) and human-related diseases

The ER exit sites and the Mechanisms of Vesicle Budding. Function of proteins regulating ER to Golgi trafficking and human dysfunctions with defects in ER exit and vesicle budding

Function of Rab small GTPases and their binding partners (GAPs, GEFs, RabGDI, Rab escort protein) in regulating intracellular trafficking. Rab protein function in neuronal trafficking and cancer

Intracellular molecular motors and their function in intracellular trafficking. Molecular basis of Griscelli Syndrome

The Golgi apparatus. Mechanisms of protein trafficking between Golgi stacks: an unresolved problem

Role of TRAPP complexes, Golgins and membrane tethering factors. Diseases related to defects in membrane tethering

Lipid signalling and intracellular trafficking. Phosphoinositides, sphingolipids and fatty acids function in protein trafficking and membrane identity

Membrane flux between the Golgi and the plasma membrane. Main proteins involved in regulating early, late endosomes and recycling compartments: dynamics and function.

The membrane fusion machinery (SNAREs, SNAPs, NSF, synaptotagmin and synaptobrevin) and diseases related to defects in this machinery.

**All texts are original articles and reviews written in English and suggested by the lecturer at each lesson.**

**Exams will consist in a written report of 5 max 8 pages on one or multiple subjects of the course chosen by the student. The student will be requested at the exam to discuss his/her report with the teacher.**