Abstract for the presentation of Sharon A. Tooze
Title: **Regulation of autophagosome formation in mammalian cells**

Autophagy is a conserved, lysosome-mediated degradation pathway, which is essential for cells to maintain cell homeostasis during stress, reduce accumulation of damaged proteins and organelles, and for combatting infection. Through these and other functions, autophagy contributes to the prevention of human disease. Autophagy also plays a key role in cell survival through nutrient sensing, in particular the response to altered levels of amino acids and energy. Autophagosome formation during starvation requires ER-associated membranes and contributions from organelles including the Golgi complex and endosomes. The autophagosome initially forms as a cup shaped double membrane, called a phagophore, that sequesters cytosolic material during its closure to form a vesicle. Starvation-induced autophagy, negatively regulated by mTORC1, requires the ULK protein kinase complex, which functions together with other Atg (autophagy) proteins (and complexes) to mediate the formation of the double membrane autophagosomes. My laboratory has studied the formation of the phagophore by Atg9, a multi-spanning membrane protein whose trafficking from secretory and endocytic pathway is required for initiation of the growth of the phagophore. A rabgap protein, called TBC1D14 has a key role in this initation by coordinating Rab protein effects, including Rab11 is Furthermore, we have identified the PI3P effector of the PI3P produced on the phagophore by the class III PI3kinase as WIPI2. WIPI2 recuits the Atg12-5-16 complex which catalyses lipidation of the Atg8 family of proteins. Our most recent work has been on novel regulators of autophagy, in particular the Atg8 family, through trafficking between the centrosome and Golgi complex. This will be discussed in my presentation.