Research in the Department of General and Visceral Surgery is concentrated on malignant diseases and obesity-related research. Cancer research is focused on basic and translational research projects, including the characterization of alterations in signal transduction pathways, and the identification of new target molecules and prognostic factors, especially for pancreatic, colorectal and gastrointestinal stroma tumors.

Our group is interested in the validation of CK1 isoforms to gain detailed information regarding their functions and regulation. Members of the highly conserved CK1 family are ubiquitously expressed in all eukaryotes. Mammalian CK1 isoforms (α, β, γ, δ, ε) and their splice variants are involved in
Localization of CK1δ expression in RGCs

Immunofluorescence staining (A) and phase contrast image (B) of the neurite growth cone of a retinal ganglion cell (RGC) using the CK1δ-specific monoclonal antibody 128A (red) and the βIII-tubulin-specific monoclonal antibody RB-9249-P0 (green). Epifluorescence microscopy of RGCs revealed that CK1δ is located in granular particles aligned at microtubules all over the growth cone.

diverse cellular processes, including membrane trafficking, circadian rhythms, cell cycle progression, chromosome segregation, apoptosis, differentiation and regeneration processes. Mutations and deregulation of CK1 expression and activity have been linked to various diseases, including neurodegenerative disorders, as in Alzheimer’s and Parkinson’s diseases, sleeping disorders, and proliferative diseases such as cancer. Consequently, recent interest in its role in carcinogenesis and degenerative diseases, and in developing CK1-specific inhibitors, has enormously increased.

Within the last two years, Joachim Bischof has concentrated on: (i) the identification of cellular kinases which influence CK1δ activity by phosphorylating CK1δ within its C-terminal regulatory domain; (ii) the role of CK1δ in the regeneration of retinal ganglion cells after optic nerve injury; and (iii) the identification of new CK1 isoform-specific small inhibitors. At the same time, Julia Richter has focused on the characterization of the role of CK1δ in tumorigenesis and the progression of colorectal cancer.