Cell morphology, character, function and interaction with other cells are established and predominantly determined by their architectural organization, i.e. the cytoskeleton, in both normal and pathological states, in situ and in cell culture. In particular, our studies focus on the structural and molecular elements forming the cytoplasmic filament systems, notably the microfilament bundles as well as the intermediate-sized filaments and their anchorage structures, the dense plaques located on the cytoplasmic sides of the cell-cell connecting junctions, i.e. primarily the adhering junctions and the desmosomes. We are extending and completing our analyses of the major constituent molecules of these cell type-specific junctions using biochemical and immunological methods, including chemical cross-linking as well as high-resolution immunofluorescence and immunoelectron microscopy. To this end, we generate antibodies against cell type-specific cytoskeletal molecules and examine, in collaboration with pathologists, their diagnostic value for tumor cell typing, notably for the identification of the specific primary tumor of metastatic tumor cells. In addition, we have recently demonstrated spontaneous and cumulative syntheses of proteins that then can be assembled to certain novel and semistable structures, including cell-cell junctions, that are able to transform “out of histogenesis” a given tumor cell type directly to a novel different tumor cell type.

**Future Outlook:**
The ongoing and future work aims at the completion of the molecular composition of the cell-cell junctions and the identification of novel types of junctions; their specific functions and mode of formation; the elucidation of their value in tumor diagnosis; and of their roles in tumor spread and metastasis.

**ESSENTIAL PUBLICATIONS:**